

Maps and Meanings: Urban Cartography and Urban Design

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ABSTRACT

In today's practices of urban design, the map acts as a documentary and design tool as well as a legal document. Its usefulness hinges on its perceived truthfulness and objectivity in the representation of reality. Yet this has not always and everywhere been the case. There was a time in Western and non-Western societies where the nature of the map and the acts of mapping were very different. This study traces this difference in an attempt to understand the process of change and its impact on the nature and quality of human settlements.

To do this, the study explores points of intersection between urban design and urban history. Focussing on Southeast Asia, it examines the transition from pre-modern to modern modes of mapping enabled through the mediation of Western intervention. The aim is to comparatively trace the map's historical evolution in intertwining Western and non-Western contexts. Using archival materials, the study brings together Southeast Asian urban history, history of urban cartography, and urban design theories. It shows how different forms of mappings reveal culturally specific ways of seeing and understanding the world. Pre-modern maps typically prioritised sacred and profane space and the proliferation of religious knowledge over the need to satiate any geographical enquiries. As technological developments in Europe brought about new forms of cartography, Western ideas about space, previously dominated by socio-religious beliefs, were openly challenged by science and exploration. The Enlightenment period's embrace of reasoned knowledge and rational thought filtered into mapping practices, which was eventually embraced globally to the demise of sacred space. Yet the past survived in urban history, and between the retrospective view of urban history and the projective view of urban design a new schism emerged.

By examining the role of the map at a conjunction of urban history and urban design, the study attempts to show how the Enlightenment's rational mapping proliferated into the non-Western world, how the production of urban space shifted from a socio-culturally motivated style to a highly theorised framework, how the concept of the modern city was born alongside the emergence of modern urban planning, how the emergence of modern thinking about the city corresponded with new ways of designing, and how theorists reacted to the modernist urban design

rationalism which was anchored in the authority of scientific mapping. Through this path of enquiry the study strives to uncover some of the lost meanings and functions of the map, and to examine new approaches to dealing with the loss of quality and identity in today's urban environments.

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INTRODUCTION: AIMS AND METHOD

An early career posting in Kuala Lumpur, Malaysia, fostered my enthusiasm for the practice of urban design. It also encouraged a broader passion for reflecting on patterns of urban development from a historical perspective. Working and living in Malaysia at this time, I grappled with many questions concerned with cultural identity and the extent to which entrenched socio-cultural factors or practices affect the physical resolution of modern cities. Perhaps the vibrancy of life in my adopted city of Kuala Lumpur, the smells of sumptuous street food, the activity at all hours, the cultural diversity, the tropical environment ensuring many everyday practices occur in the public realm, and the practicalities and romance of the urban architecture led me to question motivations behind the choices people make in realising lived space. I was intrigued by the shifting from what appeared to be a distinctly Southeast Asian style of modernisation to prioritising a Western style of urbanisation. Southeast Asian cities, particularly in the 1990s, experienced wholesale expansion of their urban centres. In most instances the fast-track urbanisation of this region involved modern topographical analyses and two-dimensional master planning solutions, typically undertaken by imported design consultants. Professional practice made me aware of the common myriad factors contemporary cities are required to address. From the need for high speed transport systems, to global aspirations for connectedness with communities beyond their immediate borders, to fostering local resources, identity, and talents, the complex nature of urban life seemed to be shaped by many factors. Yet why did rapid economic expansion of the late 1990s appear to translate the mechanical requirements of Southeast Asian cities into forms which seemingly reflected Western-inspired tower blocks and homogeneous urban environments? What are the most influential tools in the practice of urban design? How have humans imagined, designed, and realised their settlement throughout history? Have people always and everywhere thought about their cities in the same way? These and other related questions sparked my interest in the “map” and the notion of “mapping.”

Why specifically look at the map? What role does the modern map play in the realisation of an urban environment? The map is a cultural construct and seems to be an essential tool in the process of creating human environments. While the

complexities entrenched in mappings have been widely acknowledged by scholars of geography, cartography, chorography, anthropology, philosophy, and, to a degree, sociology, few studies have examined the evolution of the map and the city as synchronised events. To what extent has the map's changing nature affected Western and non-Western built contexts, and can the complexities of mapping reflect the meanings involved in the creation of human settlements, are questions that have received limited attention in current literature.

Aims and Definitions

The primary aim of this study is to examine the fundamental connection between a visual representation of a form of human settlement, broadly referred to as a “map,” and the reality of settlement itself. This examination is conducted in Western and non-Western contexts in order to understand, on the one hand, the agency of the map in spatial conception of settlement, and on the other, the meanings and narratives, direct or symbolic, that the map conveys. This study focuses on only one aspect amidst many which influence the form of past and present cities: the historical evolution of the map and its effect on, and association with, the city and urban space from pre-modernity to post-modernity.

In this study a “map” is understood primarily as a graphic interpretation of space, geography, or objects, using signs and symbols to give meaning to its chosen form of representation, which may even transcend the physical.¹ While “mapping” concerns the process of producing a map, in which data that may consist of, but are not limited to, anything of spiritual, imaginal, cosmological, geographical, ideological, physical, or topographical nature, which is then, in a highly selective way, collected, collated, and interpreted into a type of representation of space. In modern scholarly studies, “mapping” has become a verb widely adopted to describe a process of inquiry and subsequently the results of that process. The distinguishing factors of the mode of inquiry adopted here are, firstly, a focus on the socio-cultural meanings of the map, and secondly, the possibilities of the agency of mapping for urban design and what

¹ Laxton, Paul. 2001. *J. B. Harley: The New Nature of Maps: Essays in History of Cartography*. USA: John Hopkins University Press, 16.

maps reveal in representing different spatialities.² By following the historical role of the map and understanding its conceptual framework, we might be able to understand the ways in which maps and mapping affect design outcomes.

Human settlement, its patterns, influences, methods, and motivations, have been hypothesised for many a century, from both singular and multi-faceted perspectives. Historically, social processes of settlement formation included place and society evolving together without any comprehensive pre-planning undertaken, perhaps adapting to geographic difficulties or particular rules of land ownership.³ Other alternatives for urban formations included settlement patterns being controlled by certain rules dictated by social, religious, or legal understandings and requirements, as was the case with geomancy, the Laws of the Indies, the Islamic religious laws, or interpretations of literary works.⁴ A major aspect of settlement formation can be traced to our cultural as well as our emotional needs and desires.⁵ Some of these processes include consultation with the fields of cartography and geography, for collated data that explicates the origins of cities and settlement patterns.

Modernity has prompted a range of investigations into mapping processes in city creation, for example, works by 1960s art movements, such as the Dadaists, Surrealists and later architectural offices (eg. Archigram and *Utopie*). These works, which were accorded with the rise of the utopian movement, were included in new

² Corner, James. 1999a. "The Agency of Mapping: Speculation, Critique and Invention." In *Mappings*, edited by Denis Cosgrove, 213-252. London: Reaktion Books Ltd, 213. Corner differentiates between planning and mapping as the latter enables possibilities whereas planning limits potential in its tracing of space rather than creating it. See also, for the abstract and theoretical nature of maps, Wood, Denis. 1992. *The Power of Maps*. New York: Guilford Press; Monmonier, Mark. 1991. *How to Lie with Maps*. Chicago: University of Chicago Press; Pickles, John. 1992. "Texts, Hermeneutics and Propaganda Maps." In *Writing Worlds*, edited by Trevor J Barnes and James Duncan. London: Routledge.

³ Atkin, Tony, and Joseph Rykwert. 2005. *Structure and Meaning in Human Settlements*. Philadelphia, Pennsylvania: University of Pennsylvania Museum of Archaeology and Anthropology, 12.

⁴ See Hakim, Besim Selim. 1986. *Arabic-Islamic Cities: Building and Planning Principles*. 1st ed. London: Kegan Paul International Ltd. Original edition, 1979. Reprint, 1988. Hakim, Besim. 1978. Sidi Bou Said, Tunisia. Halifax, Nova Scotia, Canada: Nova Scotia Technical College, Canada, 20-23, Call to prayer for this city meant residents of the old town located their houses within a 250 metre zone from the minaret to hear the voice of the muezzin. In addition see Nasr, Seyyed Hosein. 1966. *Ideals and Realities of Islam*. London: George Allen and Unwin Ltd. On Southeast Asia where religion and religious traditions were seen as reasons behind certain indigenous built forms, see Marr, David, and Anthony Milner. 1986. *Southeast Asia in the 9th to 14th Centuries*. Singapore: Institute of Southeast Asian Studies; Bacus, Elizabeth, Ian Glover, and Peter Sharrock. 2008. *Interpreting Southeast Asia's Past: Monuments, Image and Text*. Singapore: NUS Press.

⁵ Atkin & Rykwert, 2005, 9. The traditions and variety of Southeast Asian urban forms may be further understood through consulting texts such as Widodo, Johannes. 2004. *The Boat in the City: Chinese Diaspora and the Architecture of Southeast Asian Cities*. Singapore: Marshall Cavendish Academic, also Chihara, Daigoro. 1996. *Hindu-Buddhist Architecture in Southeast Asia*. Leiden: E. J. Brill.

editions of Bannister Fletcher's book, recognised for its contribution as a source on the history of architecture and landscape.⁶ These movements of modern inquiry interpreted different modes of mapping for creating built form, yet their practices were largely considered utopian and experimental, and therefore, on the whole, not credible options for realising the city.⁷ A contemporary resurgence in interest into investigations of an overlap between cartography and the creation of urban landscaped environments has occurred since protagonists of the Landscape Urbanism movement began adopting mapping processes for research and design in the late 1990s.⁸ A flow-on effect resulted in the surface architecture genre of buildings, yet like many earlier attempts, did not necessarily translate into applying these processes to analysis of the broader urban environment. Thus in rethinking the agency of map and the process of mapping, this study traces the socio-cultural and intellectual contents of early maps and their influence historically, if any, on urban form and settlement patterns. Does settlement precede the map? Or does the map precede settlement? And to what extent does the map motivate and capture cultural influences of settlement? These are some of the questions this study attempts to address.

The study approaches the concepts of maps and mapping within the intellectual sphere developed in the writings of Denis Cosgrove, Thongchai Winichakul, Matthew Edney, and James Corner. Cosgrove argues that “[m]apping is a process which involves both a ‘complex architecture of signs’...and a ‘visual architecture’ through which the worlds they construct are selected, translated, organised and shaped.”⁹ He highlights contemporary scholarly considerations of pre-modern maps, ranging from material objects to metaphors.¹⁰ From a different standpoint, Winichakul looks at the non-Western context of Siam (Thailand) in its resistance to colonisation and the shaping of its identity and appreciation of nationhood, and the role of mapping in this

⁶ Banham, Reyner. 1976. *Megastructure: Urban Futures of the Recent Past*. London: Thames and Hudson Ltd, 92. Refer chapter 5 “Fun and Flexibility” for a discussion of a myriad of projects in the mid-1960s which were characterised by their lack of “nut-and-bolt” proposals, yet elaborate drawings and models espoused their promotion of fantasy for new living environments, 84.

⁷ *Ibid.*, 101. The use of Barbarella type images to populate these representations, Banham suggests, “nothing could more aptly illustrate the proposition that megastructures were ideal cities containing other people’s Utopias...”

⁸ Mostafavi, Mohsen, Ciro Najile, and Architectural Association. 2003. *Landscape Urbanism: A Manual for the Machinic Landscape*. London: Architectural Association, 7.

⁹ Cosgrove, Denis. 1999b. “Introduction: Mapping Meaning.” In *Mappings*, edited by Denis Cosgrove, 1-23. London: Reaktion Books Ltd, 3.

¹⁰ *Ibid.*, 4.

process.¹¹ He acknowledges that people of different cultures mapped their world differently. This shows that there is something imaginal about mapping, and that “imagined geographies” are in essence the object of all mapping practices. Being highly imaginative, the pre-modern map, unlike its modern counterpart, does not reveal the same meanings universally to its viewers, but allows for interpretation of multiple meanings.¹² Winichakul states that “to understand the space and the map, one has to understand its concept (its grammar) and its symbolism (its morphemes).”¹³

In Matthew Edney’s study of the mapping and creation of colonial India, he asserts that modern understandings of geography cannot reconcile mapped space, which does not connect to the greater context of the earth, using latitude or longitude. By contrast, pre-modern mappings engaged and represented all aspects of life on earth as well as life after death, in their conceptions of space. Colonials, in their cartographical enterprise in India, created a consolidated India in the eyes of the Indians, or posed as the “intellectual masters of the Indian landscape.”¹⁴ The trigonometrical survey of India conducted and drawn by the British, the first graphic interpretation, was made available for viewing by the Indian and British citizens to demonstrate the extents of the lands which signified the continent of India in its entirety. According to Edney, this cartographical process also occurred in other colonised territories, such as parts of British and Dutch Southeast Asia, whereby territory indicated on map enabled the conception of a region.¹⁵

James Corner’s work, together with Charles Waldheim and Mohsen Mostafavi, in its review of the map in the contemporary context, has led to new disciplines of study

¹¹ Winichakul, Thongchai. 1994. *Siam Mapped: A History of the Geo-Body of a Nation*. USA: University of Hawai'i Press, 13. See also Jumsai, Sumet. 1988. *Naga: Cultural Origins of Siam and the West Pacific*. Singapore: Oxford University Press; Lieberman, Victor. 2003. *Strange Parallels: Southeast Asia in a Global Context, 800-1830*. 2 vols. Vol. 1: Integration on the Mainland. Cambridge. For an alternative non-Western case and point of view of the role of mapping in the fifteenth century in China see Menzies, Gavin. 2002. *1421: The Year China Discovered the World*. London: Bantam Books.

¹² Ibid., 21. See also Wheatley, Paul. 1961. *The Golden Chersonese: Studies on Historical Geography of the Malay Peninsula Before AD1500*. Kuala Lumpur.

¹³ Ibid., 28.

¹⁴ Edney, Matthew. 1997. *Mapping an Empire: The Geographical Construction of British India 1765-1843*. Chicago: University of Chicago Press, 16. As a product of Enlightenment thinking with regard to correctness and accuracy, this spatiality of India was a creation of history and events. See also Carter, Paul. 1987. *The Road to Botany Bay: A Spatial History*. London: Faber and Faber, xv.

¹⁵ Ibid., 3. See also Emerson, Donald K. 1984. "Southeast Asia: What's in a Name?" *Journal of Southeast Asian Studies* no. 15:1-21. Until post Second World War there was not an understanding of the Southeast Asian region until it was able to be recognised in colonial maps. Bacus, Elizabeth, Vincent Piggot, and Ian Glover. 2006. *Uncovering Southeast Asia's Past: Selected Papers from the 10th International Conference of the European Association of Southeast Asian Archaeologists*. Singapore: NUS Press.

and a new form of practice known as Landscape Urbanism.¹⁶ Critically assessing notions of maps and mappings has revealed new ways of designing, where mappings of data actively contribute to and sometimes participate in design outcomes in both landscape and urban designs, rather than being solely design tools. For Cosgrove and Corner, the process of mapping can act as a prism through which to view the changing nature of urban environments. Contemporary mappings are projected interactively into the design method. New types of spatialities are motivated around greater connectedness in urban environments physically and metaphorically, and then implemented through socio-cultural practices.¹⁷

Unlike pre-modern times, the map today is utilised predominantly as a documentary and design tool. It is used more as an “instrument” rather than a “story,” revealing the socio-cultural and religious dispositions of the peoples which inhabit mapped space.¹⁸ To what extent has this shift in the role and understanding of the map reflected similar changes in the evolution of our built environments? Historically, the creation of cities have occurred over vast tracts of time, responding to different technologies as they become available, and to changes in thinking about the way peoples should dwell and inhabit space. Typically, pre-modern cities grew organically and mappings of their physical spaces and buildings occurred retrospectively. This chronology of events occurred for a variety of reasons, from invasion to colonisation to creating registers of land holdings and entitlements. It is only in modern times that cities and their evolution have been completely dependent upon maps for the layout of key buildings, roads and other infrastructure, dwelling sectors and public spaces, which all occur prior to the creation of the city, and entirely in a premeditated and highly articulated fashion. Thus gaining insights into the historical production of the map will provide us with clues to understanding the changing nature of the city’s urban qualities.

¹⁶ Mostafavi & Najle, 2003, 5.

¹⁷ Cosgrove, 1999b, 5.

¹⁸ *Ibid.*, 2. For the reductive nature of the modern map from the socio-political perspective see Scott, James C. 1998. *Seeing Like a State: Why Certain Schemes to Improve the Human Condition Have Failed* (The Institution for Social and Policy Studies at Yale University) New Haven: Yale University Press. For mapping insight and the revealing potentials of the map see Hall, Stephen. 1992. *Mapping the Next Millenium: The Discovery of New Geographies*. New York: Random House.

Research Parameters: Space and Time

Space

In pre-modern times, maps were culturally specific. In an attempt to illustrate the cultural specificity of the pre-modern map and mapping processes, the study focuses on the example of Southeast Asia as a non-Western cultural context. For the purpose of this study, the region of Southeast Asia includes the following countries: Burma (Myanmar), Thailand, Laos, Cambodia, Malaysia, Philippines, Vietnam, Indonesia, Singapore, Brunei Darussalam, Timor Leste, and Malaysian Borneo. *The History of Cartography* volume on Southeast Asia excludes some of these countries in its definition of the region, due to their cartographical influences being more closely aligned with countries, such as China in the case of Vietnam.¹⁹ However, in the context of this study I do not support such exclusions as the countries within the region enjoyed many influences typically based upon religious belief systems, such as Theravada Buddhism, Islam, Hinduism, and Christianity. These influences most commonly came as a result of early trade and travellers from China, India, and the Middle East.²⁰ The region of Southeast Asia is a modern phenomenon and bears little significance as a concept or a conglomeration of territories for pre-modern Southeast Asian peoples, but rather served as a convenient way to identify the group of islands and different countries in the region in post-colonial times for the ruling hegemonies.²¹

Not only was Southeast Asia as a region and group of countries not acknowledged in pre-modernity, but other concepts such as boundary and territory also had quite different meanings between cultural groups.²² Western ideas about maps indicating boundaries and territory were thrown into disarray as the very basic knowledge and

¹⁹ Woodward, David. 1994. "Preface." In *The History of Cartography: Cartography in the Traditional East and Southeast Asia*, edited by J. B Harley and David Woodward, xxiii-xxvii. Chicago, USA.: The University of Chicago Press Pty. Ltd, xxiv.

²⁰ See Reid, Anthony. 1993. *Southeast Asia in the Age of Commerce*. 2 vols. Ithaca, for an exhaustive analysis of trade, economic activities which prompted increased urbanisation in the region. Also for accounts of the role of the Chinese in European views of the world through maps, see Menzies, Gavin. 2008. *1434: The Year a Magnificent Chinese Fleet Sailed to Italy and Ignited the Renaissance*. London: Harper Collins.

²¹ Winichakul, 1994, 14.

²² See Pellow, Deborah. 1996. *Setting Boundaries: The Anthropology of Spatial and Social Organisation*. USA: Bergin & Garvey, for an analysis of different understandings of the concept of boundary between indigenous peoples and Western interpretations.

signs which constituted a map were challenged by local peoples.²³ The notion of boundary in contemporary thinking has become more aligned with a permeable concept of pre-modernity, unlike early colonial conceptions.²⁴ Western assumptions about the form of the map were also undermined as archaeologists revealed temple architecture and other three-dimensional structures displaying cartographic signs to explain the passage of life from birth to death. Some examples included Hindu temples, which represented the first visual display of cosmographic ideas dating from the seventh century in Java. On the whole, though, map-like images were still not common, only appearing in temples from twelfth and thirteenth centuries. The frequency of appearances of temple mappings is not known.²⁵ Buddhist temples portraying similar information go back to the eighth century.²⁶ While medieval Christian world was highly cosmological, for Southeast Asian peoples the significance of space on earth was intrinsically linked to the after-world. This meant that their ideological positioning motivated more musings about a connectedness to whatever lay beyond the earthly world than a purposeful investigation of further earthly territories. Mappings were in life and death socio-cultural and religious representations of pre-modern Southeast Asian ideas. They explored ideas in both cartographic media, as well as other constructions, such as rock maps, verbal itineraries, stick charts, sand mandalas, and mythical stories. In many ways, pre-modern Southeast Asian mappings grappled with complex and timely transitioning between worlds of life and death, metaphorically and physically. Therefore the breadth of territory to map may be considered as more highly conjectural or ambitious than any European equivalent. Amongst the variety of these early attempts at understanding the world that Southeast Asians inhabited as well as the realm they would pass to after death, their immediate physical neighbours and associated territories were not viewed with the same urgency for attaining knowledge.

²³ Winichakul, 1994, 68. Winichakul highlights many misunderstood examples of boundaries in his “clashes of conceptions of boundaries”.

²⁴ Cosgrove, 1999b, 4.

²⁵ Schwartzberg, Joseph E. 1994b. "Introduction to Southeast Asian Cartography." In *The History of Cartography: Cartography in the Traditional East and Southeast Asian Societies*, edited by J. B Harley and David Woodward, 689-700. Chicago: The University of Chicago Press, 695.

²⁶ *Ibid.*, 693 & 695.

Time

Historically, the time frame of the study extends from pre-modernity to post-modernity. A few prehistoric examples and ideas are discussed due to their significance and contribution to the main aims of the study. While pre-modernity in Southeast Asia may be said as having extended until colonisation, yet colonial practices did not dominate local cartography until around the nineteenth century. Thus the temporal borderline that separate pre- from early modernity is somewhat blurred. The sixteenth century corresponded with the great age of exploration for western societies, and thus European voyages prompted many changes in cartographical representations for indigenous and non-indigenous peoples.²⁷ Printing and copying processes reflected the progress of earlier exploration in interpretations of geographical and socio-cultural qualities of non-European societies, discovered by sea in early modernity or late in the sixteenth and early seventeenth centuries. These altered ideas of foreign places filtered into the mapping genre, which encouraged mapmakers in their refining and sharing of information.²⁸ Although Southeast Asian countries were colonised at different times, some, like Siam, retained their sovereignty. The influence of Western practices in cartography began to filter throughout the region due to its perceived accuracy and sophistication of method.

Pre-modern Southeast Asians utilised different modes and approaches to convey ideas about space, some examples were visual like cosmologies and sand *mandalas*. Other conceptualisations were verbal and in literary forms, while some were sculptural and three-dimensional in the form of sacred architecture. These methods remained largely unchanged until they gradually shifted and were reflected in cartographic works from post-nineteenth century perspectives. Southeast Asia offers a geographical and temporal frame within which to differentiate between Western and non-Western mappings prior to the nineteenth century.²⁹

²⁷ Black, Jeremy. 2000. *Maps and History: Constructing Images of the Past*. New Haven, London: Yale University Press, 6. Maps could be more easily reproduced and there were also more maps to refer to in creating revisions. See also Menzies, G. 2002 1421: The Year China Discovered the World. London: Bantam Books, 11, for an account on how China had made significant and accurate maps of new worlds prior to the Europeans in the mid-fifteenth century.

²⁸ *Ibid.*, 6.

²⁹ Woodward, 1994, xxiv.

The study also looks at significant changes which took place in early modernity in Europe as a result of modern science developments, which affected mapping and cartographic practices. In one seventeenth century example, maps began to play a specific role in European societies, whose judiciary relied on them in land entitlement disputes.³⁰ In addition, as a graphic reference, they became significant in historical and secular knowledge relating concepts of space to a place, while maps also offered the possibility of demonstrating space, historically, in an objective manner.³¹

The seventeenth century also signified changes in the relations of time and space which had implications for the reading and understanding of both geography and history. As conceptualisations of space changed in Europe due to scientific innovations in optics, measurement of longitude and latitude, triangulation techniques, and the measurement of time, techniques of modern mapping also evolved. These developments were not unilaterally transferred to non-European nations, but affected Dutch cartography, for example, by requiring a greater degree of realism or topographical accuracy to be achieved by the mapmaker.³²

While the focus of the study is on pre-modern and early modern developments in mapping, it also looks at how these changes and innovations in mapping affected conceptualisations of urban environments which resonated into the twentieth century and to current practices. For example, the modern movement adopted the map developed from Enlightenment technologies as a source or a tool with which to rationalise space. The mantra of “form follows function” synonymous with modernism supported these principles into the design process, and ultimately into the created environment.³³ By contrast late twentieth century practices, such as Landscape

³⁰ Black, 2000, 6. See also Fletcher, D H. 1995. *The Emergence of Estate Maps. Christ Church, Oxford c. 1600-1840*. Oxford: Oxford University Press.

³¹ Black, 2000, 7. This was also due to the influence of humanism with literal interpretations of texts over the allegorical aspects of religious writings. See also Burke, P. 1969. *The Renaissance Sense of the Past*. London: Edward Arnold.

³² Ibid., 8. See also Alpers, S. 1983. *The Art of Describing: Dutch Art in the Seventeenth Century*. Chicago: The University of Chicago Press. Chapter “The Mapping Impulse in Dutch Art.”

³³ “Form follows function,” although adopted as a phrase by the modernists was first mentioned by American sculptor Horatio Greenough, who in 1852 was relating it to the organic principles of architecture. The American architect Louis Sullivan, who admired rationalist thinkers like Greenough, Thoreau, Emerson, Whitman and Melville - used it, in 1896, in his article *The Tall Office Building Artistically Considered*. Here Sullivan actually said “form ever follows function”, but the simpler (and less emphatic) phrase is the one usually remembered. Louis Sullivan's phrase “form (ever) follows function” became a battle-cry of Modernist architects after the 1930s. Form follows function implied decorative elements, or any type of external feature or “ornament,” were superfluous in modern buildings. http://en.wikipedia.org/wiki/Form_follows_function viewed 20.03.12

Urbanism shifted to prioritise mapping as a process, denying the map its previous stasis and rationalism, focussing on flows of information and the dynamic nature of space, and questioning how that might be reinterpreted in the creation of contemporary urbanities.

Method

Sources

The methodology of the study is based on archival research, examining textual and visual materials. The topic requires selection, collating, and examination of sources from interdisciplinary fields, including geography, cartography, social science, anthropology, urban studies, urban design, urban history and theories, architecture and landscape architecture, all of which influence mapping practices and processes. This approach highlights the intrinsically complex characteristics of the map, and its interdisciplinary nature, while shifting the conventional focus from its technical properties to its socio-cultural, religious, and intellectual qualities.

The primary sources used in this study are both historical and theoretical. They include the *History of Cartography* with the Southeast Asian and East Asian volumes being consulted for the most part.³⁴ *Early Modern Mapping in Southeast Asia* by Thomas Suárez is included as it features some indigenous maps, which have not been previously published and were sourced from private collections.³⁵ In addition, Ralph Ehrenberg's pictorial *Mapping the World* presents an insightful graphic study of some key European maps.³⁶ All sources are in English and by predominantly Western-educated authors. Although some indigenous materials are included, this study is limited to those works which have been published in the English language. Each of the sources has been selected for its insight and influence within its given field, and its use of original archival material. Where appropriate, I have attempted to identify and acknowledge biases and weaknesses of each source, especially with regard to dealing with original indigenous sources.

³⁴ Harley, J B, and David Woodward. 1994. *The History of Cartography: Cartography in the Traditional East and Southeast Asia*. 2 vols. Vol. 2, Book 2, *The History of Cartography*. Chicago, USA: The University of Chicago Press Pty. Ltd.

³⁵ Suárez, Thomas. 1999. *Early Mapping of Southeast Asia*. Singapore: Periplus Editions (HK) Ltd.

³⁶ Ehrenberg, Ralph E. 2006. *Mapping the World: An Illustrated History of Cartography*. Washington D.C.: National Geographic Society.

The selected studies on Southeast Asian urban history and mapping, such as *The History of Cartography*, as well as *Early Mapping of Southeast Asia* are considered exemplary in their collation of descriptions and interpretations of indigenous and non-indigenous mappings, thereby enabling access to pre-modern and early modern maps. They identified the extent of the surviving corpus of published Southeast Asian maps, and outlined the difficulties of studying historical material of another culture and time period, as well as problems with interpreting it within the realm of our modern conceptions of space and maps. Mapping material was sometimes prepared by indigenous peoples at the request of Europeans, as in the eighteenth century case of the Burmese assisting an Englishman named Hamilton.³⁷ There were also other problems of storage and preservation of archival information, for example, in Thailand where the concept of cleansing and purification (*Chamra*) governed archival management and has affected access to original copies. *Chamra* has a long history and is considered an important practice in Thai culture.³⁸ It may refer to a mild alteration of the document, such as correcting grammatical errors, modernising the spelling or updating titles of individuals.³⁹ More radical alterations include filling in blank areas of manuscripts, rewriting of materials and removal of some documents from circulation. *Chamra* is a continuous process and as ideas change over time so does *Chamra*. Therefore, Thai manuscripts cannot be viewed as stable entities.⁴⁰ The difficulties involved in this mapping practice range from determining authorship and authenticity of original material to interpretation of pre-modern cartographical signs.

Secondary sources for this study include texts which offer insights on critical interpretations of mapping, maps and cartographic, as well as urban history. This group of texts have provided a theoretical and analytical frame through which to read the primary sources. They have also enabled an informed understanding of how the changing role of the map through early modern history has critically affected the creation of human urban habitats and ideas about settlement. To this end, authors such

³⁷ Schwartzberg, 1994b, 699. See also Fell, R T. 1988. *Early Maps of South-East Asia*. Singapore: Oxford University Press Pty Ltd, for the European perspective on Southeast Asian mappings. In addition a study by Phillimore, Reginald Henry. 1956. "An Early Map of the Malay Peninsula." *Imago Mundi* no. 13:174-79.

³⁸ *Ibid.*, 698. See also Wilson, Constance. 1982. "Cultural Values and Record Keeping in Thailand." *CORMOSEA [Committee on Research Materials on Southeast Asia] Bulletin* no. 10 (2):2-17, 4-6.

³⁹ *Ibid.*

⁴⁰ *Ibid.*

as Denis Cosgrove, James Corner, and Françoise Choay have enabled the positioning of this study to analyse the data and material provided in the historical body of the thesis.

Denis Cosgrove's edited book *Mappings* entails a series of essays, highlighting contemporary thinking and critical analyses around the changing nature of the map.⁴¹ Cosgrove expands on the initial definitive work of Brian Harley, who challenged the triumphalist nature as well as assumptions about the accuracy of information the map might portray.⁴² Cosgrove accords contemporary interest in mapping processes and the map to the rapidly changing nature of post-modern society compared with that of modernity. Twenty-first century culture connects closely and often simultaneously via data networks, with the global sphere and thus the fixing of space to certain boundaries has taken on different meanings in today's society. There is now a greater focus on theorising space from dynamic and interconnected perspectives. Deleuze and Guattari view space from a socio-political perspective associated as highly structured and "arborescent," or of the "rhizome type" which is neither structured nor hierarchical but more sporadic and unplanned in reference to the nature of rhizomic connections and movements of contemporary society.⁴³ In summary, Cosgrove and others question the very assumptions upon which mappings have typically been based and any implied stasis associated with space, which may be mapped, conceived, and therefore understood.

James Corner speaks of the "agency of mapping" and acknowledges the benefits of such a process in reshaping ideas about mapping as well as the map itself.⁴⁴ Corner in this case does not dwell on the power relations of the map but rather adopts its

⁴¹ Cosgrove, Denis. 1999a. *Mappings*. London: Reaktion Books Pty Ltd. See also Starling, Roger. 1998.

"Rethinking the Power of Maps: Some Reflections on Paper Landscapes." *Ecumene* no. 5:105-8; Söderstrom, Ola. 1996. "Paper Cities: Visual Thinking in Urban Planning." *Ecumene* no. 3:249-81.

⁴² Harley, J. B. 1987 "Maps, Knowledge and Power." In *The Iconography of Landscape: Essays on the Symbolic Representation, Design and Use of Past Environments*, edited by Denis Cosgrove and Stephen J Daniels, 277-312. Cambridge: Cambridge University Press. 278. Opposing the binary oppositions set up in mapping i.e. accurate and inaccurate, objective and subjective, Harley highlights maps always have sets of values. See also to compare Wolff, Janet. 1981. *The Social Production of Art*. New York: New York University Press, chapter "Art As Ideology."

⁴³ Deleuze, Gilles, and Felix Guattari. 1986. *Nomadology: The War Machine*. Translated by Brian Massumi. New York: University of Minnesota Press. Original edition, Mille Plateaux, Paris, Editions de Minuit, 13.

⁴⁴ Corner, James. 1999a, 213. See also Corner, James. 1999b. *Recovering Landscape: Essays in Contemporary Landscape Theory*. USA: Princeton Architectural Press, chapter "Operational Eidetics in Forging New Landscapes."

liberating capacity for designers of urban space.⁴⁵ The practice of mapping enables the re-making of space and territories, each time the space is recreated through a mapping. A copied map or what Corner calls “tracing” does not permit such possibilities.⁴⁶ Corner suggests that maps are “analogous-abstract” in nature and offer up both the calculated surface of the geographic context in question, which is subsequently projected onto the graphic representation, in addition to an abstract quality of context—that is the information which is not relayed via the mapping.⁴⁷ It is inherently a selection process and therefore a degree of abstractedness results. So Corner states his focus is not on the finished, complete product of the map, nor its meaning, but rather on what the product does to or for the design creative process.⁴⁸ I explore this perspective in my study, and the final chapter looks at some contemporary practitioners in this area.

Françoise Choay’s work *The Rule and the Model* focuses upon written theoretical foundations of concepts of the urban environment.⁴⁹ Although written accounts of human environments and ideas of space date back most notably to ancient Chinese texts, Choay’s focussing on the theoretical, argues that the “creation of an autonomous discourse” on theories of spatial configurations is a Western preoccupation.⁵⁰ Choay highlights that in non-Western contexts, and in societies without writing, “the organisation of built space is interconnected with the whole of social practices and representations, without there having to be a word in the lexicon dedicated to reflection on the idea of spatial arrangement.”⁵¹ Choay attributes the origins of urban theory in Western discourse to the first architectural treatise of the fifteenth century, namely Leon Battista Alberti’s the “*De re aedificatoria*.”⁵² The treatise identifies a set of rational rules, with its basis in developments of mathematics and physics of the period, with the “explicit aim of developing an autonomous

⁴⁵ See in Corner, James. 1992. "Representation and Landscape." *Word & Image* no. VIII (3):243-75.

⁴⁶ Corner, 1999a, 214. See also Deleuze, Gilles, and Felix Guattari. 1987. *A Thousand Plateaus: Capitalism and Schizophrenia*. Translated by Brian Massumi. Minneapolis: University of Minnesota Press, 12.

⁴⁷ *Ibid.*, 215. See also Harley, J. B. 1992. "Deconstructing the Map." In *Writing Worlds*, edited by Trevor J Barnes and James Duncan, 231-47. London: Routledge; Harley, J. B. 1987 "Maps, Knowledge and Power." In *The Iconography of Landscape: Essays on the Symbolic Representation, Design and Use of Past Environments*, edited by Denis Cosgrove and Stephen J Daniels, 277-312. Cambridge: Cambridge University Press.

⁴⁸ *Ibid.*, 217.

⁴⁹ Choay, Françoise. 1980. *The Rule and The Model*. Edited by Denise Bratton. English Translation ed. USA: The Massachusetts Institute of Technology. Original edition, Editions du Seuil. Reprint, 1997.

⁵⁰ *Ibid.*, 3. Whereby the term “urbanism” was coined in 1867 by Ildefonso Cerda.

⁵¹ *Ibid.*

⁵² *Ibid.*

conceptual apparatus in order to conceive and build new and unknown forms of space.”⁵³ It is the authorship of this text that Choay identifies as the period in Western history of urbanism, where there is a shift from non-theorised contexts to theorising text in relation to the built environment. In effect, “*De re aedificatoria*” established another means by which to conceptualize, draw one’s world, or map it.

The third group of sources are the studies, which are close to aspects of my work, yet also different, include Matthew Edney, Thongchai Winichakul, and again James Corner. The latter author is mentioned twice as this study adopts his critical perspective to mapping in urban history and urban design. Matthew Edney’s major work *Mapping the Empire* looks at the great trigonometrical survey of India.⁵⁴ Although the work is about the British colonisation of India, the relevance of the argument presented regularly refers to the Southeast Asian context for comparison and to demonstrate what the British were doing with their evaluation of geographical data in their other colonies, such as Malaysia and Singapore.⁵⁵ Edney also offers insights into the technical strategies, which were available to colonisers for achieving their geographical visions.⁵⁶ The power of the map is asserted, as a result of these studies, as a great tool of psychology. For the Southeast Asian condition, whilst earthly geography was not extensive and connected in mappings, indigenous thoughts beyond the immediate realm of the village did most convincingly extend to greater realms of spatial considerations. Cosmological considerations extended spatial dimensions and understandings of the world beyond. Southeast Asian concepts of physical space may not have aligned with Western pre-modern understandings, yet cosmological and temple mappings seem to suggest that indigenous spatialities were typically both projective and retrospective spaces, rather than just a translation of a physical place.

Another source that is substantially referenced in this study is the work of the Western-educated Thai scholar, Thongchai Winichakul, *Siam Mapped: A History of*

⁵³ Ibid., 6.

⁵⁴ Edney, 1997. See also Wright, Gwendolyn. 1991. *The Politics of Design in French Colonial Urbanism*. Chicago USA: The University of Chicago Press.

⁵⁵ Note: British Malaya (18th century-1946), a loose collection of British-controlled states. Modern term post independence Malaysia.

⁵⁶ Anderson, Benedict 1991. *Imagined Communities: Reflections on the origin and spread of nationalism*. Revised second edition ed. London, New York: Verso. Anderson suggests that both Thailand and Indonesia seemed to adopt imaginings with regard to their countries prior to the colonial era, 163, 174-78.

the Geo-Body of a Nation.⁵⁷ In this work, one third of the references are translated from original Thai sources. Yet one of the most valuable contributions of the work is the idea of “geo-body” and the way it is constructed to permit a legitimate and viable retrospective and projective analysis of the subject matter. This proposition allows the study of the history of Thailand as a theoretical concept and as a given territorial entity, using the author’s notion of geo-body. Winichakul does not present a linear history but prioritises other understandings of space, proposing it as a guise to consider pre-modern Thai history. In effect the geo-body of Siam reflects geographical area on a map as well as the characteristics which make-up the “life of a nation.”⁵⁸ It is this very understanding of the complexity of pre-modern versus modern interpretations of space that make this text useful for my study. Winichakul highlights the dilemma of whether territory exists before or sometimes only on the map.⁵⁹ For this reason it is important to open up our conceptions of mappings because they are not always focused on territory *per se*. By the same token, Winichakul champions Mongkut, who was part of the Siamese aristocracy (later became King Rama IV, r.1851-1868) for accurate predictions of geography and topography based on indigenous astrology and modern astronomy.⁶⁰ These interpretations of geography apply to the specificity of the Thai case as it remained independent in the colonial era. Siamese map makers had freedom, unlike other colonised countries, to choose to follow traditional or modern methods or combinations of the two in their spatial interpretations. Winichakul’s text is highly persuasive in its delivery of the ideas that whatever the achievements of modernity, most studies on non-Western contexts appropriated historical cultures and misrepresented them according to their own subjective views and interests. The acceptance of a degree of bias in any composition is an important aspect in the exchange of human knowledge, and this study does not claim to be free from such bias in the views of every reader.

Limitations and Contributions

This is an interdisciplinary study that bridges across three major fields: urban history, urban design, and history of cartography. The three fields are large, their literatures

⁵⁷ Winichakul, 1994.

⁵⁸ Winichakul, 1994, 17.

⁵⁹ *Ibid.*, 56. Edney concurs with this idea in the context of India.

⁶⁰ *Ibid.*, 37.

are extensive, and consequently many limitations confine this study. In addition, the study is utilising insights from other disciplines, most notably geography, anthropology, architectural and landscape architectural history, to trace other facets of meanings in settlement formation. Thus the study can only deal with a small sample of selected literature from each field to construct the thesis and sustain the core arguments. Yet, it is in this interdisciplinary research that the main contributions of the thesis lie. The thesis derives insights from many strands of literature, across a multi-faceted field of research, bringing them together to bear on urban design issues. The cross sectional depiction of human settlement, viewed through the lens of mapping over a long historical span and in three major fields, has enabled this study to present fresh insights into the field of urban design, which rarely engages in such protracted historical and theoretical explorations. By examining the role of the map at a conjunction of urban history, urban design, and history of cartography, the study is able to show how people in medieval Europe and South East Asia conceived of and mapped their spaces of habitation, how the European Enlightenment's rational mapping proliferated into the non-Western world, how the production of urban space shifted from a socio-culturally motivated style to a highly theorised framework, how the concept of the modern city was born alongside the emergence of modern urban planning, how the emergence of modern thinking about the city corresponded with new ways of designing, and how theorists reacted to the modernist urban design rationalism, which was anchored in the authority of scientific mapping. Through this new path of enquiry the study is also able to uncover some of the lost meanings and functions of the map, and to examine new approaches to dealing with the loss of quality and identity in today's urban environments. It is in the construction of this narrative from a multi-faceted, historically-based theoretical perspective that the study delivers its strands of contributions.

Such an interdisciplinary study involves some inevitable conceptual and methodological problems and challenges. Southeast Asia has only been recognised as a region since post-World War II, therefore the grouping of the countries in the region is a modern phenomenon, which inherently creates a conflict between modern conceptions and pre-modern conditions.⁶¹ Thus the task of selecting sources on

⁶¹ See Wallace, Andrew Russel. 1962 (1869). *The Malay Archipelago*. New York: Dover Publications. for the term "Malesia" (and later Malaysia 1963), based on bio-geographical references for flora and fauna studies

Southeast Asia as the most authentic poses some challenges. There are also difficulties associated with the research as far as making generalisations due to the grouping of different socio-cultural contexts into regions, for example, not only in the case of Southeast Asia but also for the European conditions. Sources utilised in this study are predominantly written in English by Western authors, thus it is legitimate to question their reliability in representing indigenous views.⁶² Accessing original sources proved difficult predominantly because of language limitations, where a working knowledge of Thai, Bahasa, Mandarin, Taglog, Mandarin, Vietnamese, Lao, and/or Hindi is required. The scope of the work has thus been restricted to the sources mentioned above. These limitations are only relevant to the first part of the thesis, however, which looks at historical texts dealing with the Southeast Asian condition and its mapping history. As regards this aspect of the study, the main contributions this study makes lie not so much in the historical material itself, but in the ways in which these historical insights are made relevant to, and brought to bear on, contemporary practices. They lie in the ways in which urban history is read together with urban design, an interdisciplinary reading that allows the conventional understanding of maps and mapping to be seen in a new light. In tracing the role of the map through the Enlightenment and the significant changes associated with it during this period, the study provides a new lens to re-view the role of the map as an instrument for design purposes.

Thesis Layout

The thesis begins with the historical collation of information followed by a critical analysis of the findings, summing up with some alternative and contemporary practices, which demonstrate how notions of maps and mapping are being revisited in an urban design capacity in early twenty-first century practices. The thesis structure consists of three main parts. Part I: Maps and Settlements examines how and in what form pre-modern mapping existed and survived; Part II: Mapping and Modernity

based in the Malay archipelago. See also Bellwood, Peter. 1997. *Prehistory of the Indo-Malaysian Archipelago*. Honolulu: University of Hawai'i Press Original edition, 1985. Reprint, 1997, for the term of prehistory "the Indo-Malaysian Archipelago."

⁶² See Kien, Lai Chee. 2010. "Southeast Asian Spatial Histories and Historiographies." *The Journal of the Society of Architectural Historians, Australia and New Zealand* no. 19 (2):82-105, who presents an interesting overview of Western-based and English sources, from the point of view spatial construction in Southeast Asia. See also Chen, Kuo-wei. 2002. Meaning in Architectural and Urban Space of the Penang Kongsi Enclave. Paper read at The Penang Story - International Conference 2002, at Penang Malaysia.

identifies the key influences upon mapping from the Enlightenment to modernity; Part III: Mapping and Modern Urbanism examines some examples of mapping in urban design from the rationalist approach utilised for the creation of twentieth century modernist designs. It also examines some examples of contemporary mapping practices and movements which ultimately arose as reactions to the modern movement.

Part I utilises each of its three chapters to investigate the breadth of maps of pre-modernity, which embraced both cosmological as well as cartographical concerns. Chapter one reflects upon various ways pre-modern cultures conceived their world through drawing, and how these drawings differed from mappings in their embrace of certain cartographic signs. While revealing and discussing the idiosyncrasies of pre-modern conceptions of space linked to sacred and profane geographies, this chapter, in turn, demonstrates the interconnected nature of pre-modern understandings of cartography and cosmography. Extrapolating on these ideas of representation, chapter two identifies five different themes of mappings typical to pre-modern and non-western worlds. Chapter three explores mapping in its relationship to pre-modern ideas about settlement. Focussing on Southeast Asian urban conditions, tracing evolution of settlements also uncovers the complexities in reading archaeological findings retrospectively. This dilemma is further elaborated in contemplating how pre-modern geographies and settlements were represented, many of which were combinations of sacred and earthly spaces.

To illuminate the significance of the transition, from conceiving settlement for sacred and socio-cultural purposes, to our modern scientific understanding, Part II, and firstly chapter four, focuses on Enlightenment developments. The European Enlightenment, signified shifts in mapping practices due to developments in cartography, geography, and other sciences which made way for our modern way of seeing the world. This shift in conceptualisation also paralleled the Second Great Age of Exploration whereby first hand encounters produced conflict with previously assumed religious and geographic knowledge. Religious and scientific thinking became incompatible, as the geographical archive was prepared by European powers for colonial motivations. Colonial locations including surrounding areas in Southeast Asia provided opportunities to put Enlightenment thinking into practice. New ideas and

developments, stemming from the rationalised and reasoned Enlightenment processes, in mapping and settlement design were implanted into new colonial territories. A context removed from entrenched European socio-cultural and religious considerations, perhaps permitted a less contentious transition to modern settlement formation. Also as dominated peoples, Southeast Asian sacred and profane conceptions of space were misunderstood by Europeans. This lack of understanding also facilitated a generally disregard by Europeans for indigenous conceptions of space, in addition to local peoples presenting little physical or psychological opposition to the new hierarchy. The emergence of modern mapping was more easily projected and enacted due to colonisation around the eighteenth and nineteenth centuries. However, chapter five highlights how the disjunction between colonial ideas of mapping and the indigenous views of space were exacerbated in maps, whilst also noting the lack of immediate traction of Enlightenment technologies to be adopted in the colonies. In addition to the problems associated with mapping new lands, there were the cross-cultural misunderstandings of mapping practices and its purpose.

Finally, Part III of the thesis, consisting of chapter six and seven, expands on the Enlightenment project and the results of ultimate rationalised spatial understandings which ignited utopian gestures of the modern movement. Again through technological developments, but this time due to the Industrial Revolution, prompted new ways of thinking about modes of production of human environments. Mapping was instrumental in this new mode of production, as it relayed rationalised space and conceptual principles clearly and concisely in representations of the survey and master plan. Yet the modern movement was deemed by critics to have failed in its delivery of its utopian ideas around the overthrow of the woes of the industrial city. Thus the shift from an intrinsic relationship between meaning instilled in socio-cultural space to a projective, supplanted, highly planned and designed spatial realisation proved problematic. Chapter seven then evaluates some movements, ranging from the Situationists to contemporary practitioners of ecological urbanism, to show how they too have revisited maps and mapping processes to provide other methods for achieving projective design.⁶³ Many of whom embrace the potentials of

⁶³ Kusno, Abidin. 2000. "Imagining Regionalism, Re-Fashioning Orientalism: Some Current Architectural

mapping processes with aims to use the agency of the map for connecting the fields of urban history and urban design. It is the intention of this interdisciplinary study, that it acts as a starting point, in its overview of mapping processes, and also aids future theoretical investigations into these fields of inquiry.

Discourses in Southeast Asia." *Journal of Southeast Asian Architecture* no. 4:45-61. See Kusno for critical assessment of Southeast Asian understanding of region. He examines Banister Fletcher, Spiro Kostof, Sumet Jumsai, Tay Kheng Soon and Ken Yeang's theoretical positioning in the debate on regionalism as a reaction against modernism.

**PART I: MAPS AND SETTLEMENTS: AN
HISTORICAL OVERVIEW**

Chapter 1: Pre-modern Mapping

From ancient civilisations to pre-modernity graphically representing one's world has taken many forms. It has not always been clear what a map entails and what distinguishes a drawing. It is only in modern times maps clarified such ambiguities with codes and techniques to attempt universal understandings. In pre-modernity maps were highly integrated with earthly and heavenly narratives or depictions. Maps constructed geographies for purposes ranging from travel, pilgrimage, military encounters to understanding the passage of life and death. Pre-modern geographies were preoccupied with geo-political and geo-religious concerns and practices, which sustained their imaginal nature of representation. Whilst in the Christian tradition placing biblical stories in a geographic context permitted comprehension of an actual history, an event in a time and place. Mapping harnessed the imagination graphically correlating cosmographical and religious ideas. Mapping presented a physical reality of the sacred and profane by visually translating it to a picture plane. Pre-modernity rendered earthly and heavenly space inseparable and often indistinguishable on maps.

1.1 Drawing One's World

A fascination for drawing the world, representing it graphically, or conjuring its visual or textual "image" has characterized civilizations for millennia. Yet "drawing" remains a complex concept with more than sixty definitions for the word "drawing" in the English language alone.⁶⁴ The same can be said about the terms "map" and "mapping," whose meanings are closely connected with those of drawing. Generally, drawing means marking or representing, using lines, figures, symbols, or other graphic elements. When culturally coded, these marks or drawings convey shared meanings visually through an understood correspondence with what is being drawn. The "map" emerges in this culturally coded visual correspondence that loads a particular drawing with information about one's world, be it natural or constructed. This process of cultural codification can be seen as the only defining difference between what may be considered a map and a drawing. Drawing also means delineating spaces through the construction of an image, depicting or representing,

⁶⁴ Simpson, J A, and E S C Weiner. 1989. The Oxford English Dictionary In *The Compact Oxford English Dictionary*, edited by Editorial Board Members. Oxford: Clarendon Press, 475.

recording, and framing or composing (in text or pictures). “I thought it necessary to *drawe a treatyse* for myself,” is a quotation from a sixteenth century pilgrim, which shows the close connection between drawing and writing in making sense of one’s world.⁶⁵

Our modern conception of a geographical map is one which is tied to the use of techniques such as scale, orientation, a variety of forms of measurement and delineation of topographical features, such as ground level relative to sea level and distance between geographical locations. All of these techniques contribute to our modern understanding of space and are demonstrated in drawing rather than writing. They are also techniques intrinsically linked to our modern conceptions of space, it is difficult to understand or relate to spatial representations, in their absence. Reading a map and drawing to scale are taken-for-granted activities, by many today. Basic concepts of scale, such as proportional reduction of the size of an object to be portrayed on paper at, for example, one hundred or fifty times smaller (1:100, 1:50), are widely shared conventions across many fields. Also widely practised is the use of the scale ruler, where dimensions are indicated as a translation between reality and its scaled equivalent. Using the 1:100 scale side of a ruler, for example, one can easily work out that twenty metres measure twenty millimetres on the ruler with no calculation required.

The act of mapping in our contemporary context has also taken on a very broad perspective. As a verb, “mapping” is one method of representing or charting a large collation of data for analysis. The mapping process is significant in that the resultant product, be it a chart, table, diagram, or map, acts as an *objective* tool in framing and guiding decision-making. The data collated does not need to relate solely to elements of space, but can reference a vast array of subjects from body parts to genealogy of a species. In addition, modern spatial maps have also diversified in their ability to convey spatial relations from fixed two-dimensional representations to the multi-dimensional computer animated models. However, the map remains a form of codified abstract representation, which organises, structures, legitimises, simplifies, highlights, constructs, and re-evaluates knowledge and assumptions about the

⁶⁵ Simpson, J A, and E S C Weiner. 1989, 475.

information being mapped. In one form, it can act as an important tool for visualising the degrees of complexity in the terrain of any given geographical location, yet in another it can offer insights into socio-cultural practices of a region through the use of vignettes or statistical data and records.

Generally speaking, mapping to convey spatial relations—the intended product being a map—is to give an understanding of the target context’s extents, highlight significant features, propose limits, which may also reveal the emotive nature of a place as well as its physicality. The format of contemporary mapped information varies between that, which is intended for mass production to independent commissions, or maps for a specific purpose, from thematic maps to three-dimensionally constructed space and computer generated views. Often, data collection of physical characteristics of environments results in two-dimensional interpretations. Specifically designed for consumer markets, such mapped space is an understood and expected phenomenon within contemporary society. Increasingly though, with the advent of three-dimensional technology for the mass market, such as Google Earth, it is now inexpensive and convenient to attain three-dimensional projections.

Maps can be used to construct routes through complex amounts of information, which are now available to us, in order for us to evaluate in a structured way, make sense of, read and respond to our contemporary living environments. By contrast, drawing does not necessarily structure information, using the same codification principles of mapping to convey a message. Drawings are permitted to be more abstract, offering multiple readings that are meaningful among cultural groups. Although maps can offer some of these attributes, not all maps do. The common topographical survey, for example, offers only a limited and select spectrum of technical information.

Unlike pre-modern maps, modern maps are consulted authoritatively, given their depiction of space to scale, and to a compass orientation, as well as inclusion of details and measurements of space. Codification systems of modern mapping act without the additional support of written treatises, but rely on a legend or key as well as common and assumed understandings of cartographic signs. The distinction between drawing and writing in the pre-modern world was not as precise. Historically, words often essentially accompanied drawings and maps, or in the case

of Ancient Greek architects, such as Ictinus and Kallikrates, buildings and urban spaces were constructed via “detailed descriptive specifications which included dimensions,” independently of drawings per se.⁶⁶

The following discussion, traces the evolution of drawings in the forms of maps from the earliest known example, and examines the notion of “drawing” in the context of texts and records in order to address questions such as, how did different communities and groups view or imagine the world and record their observations visually? What did they see and map? Can one civilisation be differentiated from another by its established drawing/mapping practices, and how?

Drawings as maps

According to Ralph Ehrenberg in “Mapping the World,” pre-modern mapping practices were evident in three main geographical world regions, Asia, the Middle East, and Europe, from the seventh century B.C. to the end of the fifteenth century A.D. Broadly speaking, pre-modern mapping practices were specific to these regions until around the end of the fifteenth century, when there was an heightening of information exchanges among peoples of different civilizations. Aesthetically, maps of these regions may be differentiated by their styles and artistic qualities, such as those of Chinese landscape drawings, Islamic miniatures, or Europeans illumination.⁶⁷ Orientation was a key difference between cultures and regions, with early Christians, and thus European maps, orienting their views east toward Jerusalem, which was typical of *mappaemundi*. The Islamic map-makers opted instead for a focus on the south, which was the direction of Mecca and Medina. Portolan charts did not always indicate orientation, whereas Asian accounts typically indicated south at the top of the page.

The oldest known world map dates back to a Babylonian clay tablet example from sixth century B.C, and writing, drawing, and surveying are accorded with both Babylon and Egypt as early as the third millennium B.C.⁶⁸ The Babylonians are

⁶⁶ Hewitt, Mark. 1985. "Representational Forms and Modes of Conception: An Approach to the History of Architectural Drawing." *Journal of Architectural Education* no. 39 (2) 2-9, 2. See also J, Coulton J. 1977. *Ancient Greek Architects At Work*. Ithaca, NY: Cornell University Press.

⁶⁷ Ehrenberg, 2006, 17.

⁶⁸ *Ibid.*, 21.

renowned for developments and practices, such as constructing irrigation canals, surveying property lines as well as representing their urban communities. In addition, the Babylonians also utilized key cartographic concepts—scale and orientation—to convey a sense of the physical surroundings, the parameters of their urban environments, and the cosmological beliefs which linked the physical with the metaphysical.⁶⁹ Egyptian drawings of a similar period were characterized by embellished portrayals of everyday life, together with a cross-over into the imaginary.⁷⁰

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Figure 1. Oldest World Map Circa 600 B.C.
Babylonian World Map incised on clay tablet, 4.8 x 3.1 In the British Museum, London, England.
(Source: Ehrenberg, 2006, 20)

Asian mapping traditions embodied, in a manner similar to the Islamic tradition, functional and scientific ideas represented in the *Yu ji tu*, a remarkably accurate map of China from the twelfth century. In addition, there are spiritually influenced maps,

⁶⁹ Ehrenberg, 2006, 21.

⁷⁰ Ibid., 9.

such as a 1364 Buddhist pilgrimage map of the “Five Indies,” which display religious influences in the region.⁷¹

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Figure 2. Landscape image from a bronze fitting of a chariot canopy.
From Dingxian Hebei province drawing, c. 2nd–1st century *bc*, Western Han dynasty; in the Hebei Provincial Museum, Wuhan, China. (Source: from www.britannica.com/EBchecked/topic-art/640677 viewed 10the May 2010).

Paper was invented in China in the second century A.D. but was not used in Europe as a map-making medium until the eleventh century. Representation practices typical to Asian map-making at the time included painting, calligraphy, and rubbings. Rubbings were the earliest form of copying or mass-producing images. Therefore, with the invention of paper, images could be transferred from a master document, typically stone etchings, by rubbing the image on the transportable medium of paper. Other media utilised by Asian mapmakers to portray their representation also included animal hides and silk. Chinese landscape painters undertook beautiful mapped renditions of space, and a separate speciality trade emerged for the creation of Chinese sea charts.⁷²

Ancient Chinese representations of the world ranged from incorporating map elements, such as direction, distance and terrain, but utilising them through text in accompaniment of the drawing, to mural paintings, capturing a sense of space through

⁷¹ Ehrenberg, 2006, 17. See also Temple, Robert R. 1998. *The Genius of China: 3000 Years of Science, Discovery and Invention*: Prion.

⁷² *Ibid.*, 17. See also Acker, William Reynolds Beal. 1954-1974. *Some T'ang and Pre Tang Texts on Chinese Painting*. Translated by W. R. B. Acker. 2 vols. Vol. 2.1. Leiden: E. J. Brill.

the artistic conventions of landscape painters of the Qin and Han dynasties (221 B.C. – 220 A.D.).

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Figure 3. Map of Ningcheng, Han Dynasty.
This is a copy of map discovered in a Han tomb at Horing, Inner Mongolia. Original size 129 x 159cm. Wenwu Chubanshe, Beijing. (Source: Harley & Woodward, 1994, 148).

The purpose of these Chinese works ranged from purely artistic appreciation and spiritual connection to a place to military and strategic political policies.⁷³ Yet such examples, as that of the Han Dynasty, demonstrate the close connection between maps and paintings of this period. The use of variable perspectives to relay as many details of the scene as possible is not uncommon in other known archival examples.⁷⁴ In fourth century B.C., Chinese documents recall the use of the “south point” as the preferred direction. The early Chinese compasses were constructed of lodestone, which had magnetic properties to attract iron, consistent with *Feng Shui* beliefs, and used as tools for orientating buildings and graves. While Chinese sailors were

⁷³ Ehrenberg, 2006, 9.

⁷⁴ Harley and Woodward, 1994, 147. For a detailed discussion on the connections between Chinese painting and drawing techniques see March, Benjamin. 1931. "Linear Perspective in Chinese Painting." *Eastern Art* no. 3:113-39; Rowley, George. 1959. *Principles of Chinese Painting*. Princeton: Princeton University Press.

orienting their sea voyages by the south point in the thirteenth century, it was not until the end of the thirteenth century that the compass was perfected by the Italians.⁷⁵

Western cartographical constructions of space are largely based on ancient Greek concepts dated from fifth century B.C., such as Pythagorean notions of a spherical earth. While by second century A.D. Greco-Egyptian geographer/astronomer Claudius Ptolemy collated theories of earlier thinkers to produce works that influenced future representations of the world for ten or more centuries. It was the Romans, however, who focused on methods of practically recording aspects of physical geography and topography, as well as the art of map making itself.⁷⁶ Ptolemy's developments in cartographical thinking were not rediscovered by the western world until the fifteenth century. Christian philosophers, after the collapse of the Roman Empire, had the dominant influence over pictorial understandings of the world and the relapse to a flat interpretation of the earth.⁷⁷

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Figure 4. Circa 630 Ecclesiastical World Map
By St. Isidore, Bishop of Seville illuminated manuscript from a French Cosmography, circa 1220, 10.6 x 6.6 IN. Walters Art Museum, Baltimore Maryland. (Source: Ehrenberg, 2006, 26).

⁷⁵ Ehrenberg, 2006, 18. See also Aczel, Amir D. 2001. *The Riddle of the Compass: The Invention That Changed The World*. New York: Houghton Mifflin Harcourt.

⁷⁶ Ibid., 9. See also Lieberman, Victor. 2003. *Strange Parallels: Southeast Asia in a Global Context, 800-1830*. 2 vols. Vol. 1: Integration on the Mainland. Cambridge.

⁷⁷ Ibid., 10. See also Campbell, Tony, and Marcel Destombes. 1987. *The Earliest Printed Maps 1472-1500*. Edited by International Geographical Union Working Group on Early Maps. London: British Library.

In the Islamic world, however, Ptolemy's work was translated into Arabic around the ninth century, which produced two traditions of mapmakers. The first emerged in the tenth century and was represented by the school of - al-Balkhi, which focused on Islamic religious traditions and the Islamic world.⁷⁸ The second was represented by the school of al-Idrisi, who was influenced particularly by Ptolemy's treatise and ancient Greek cartographical traditions. Al-Idrisi also utilised Persian and Indian geographical ideas in his interpretations. These stylized views of the world at the same time acknowledged Islamic practices and socio-cultural values of Islamic society.⁷⁹ Although mapping sacred directions was common-place between Asia, Europe, and Middle East traditions of map making, it was only Islamic maps which presented a consistent object imbued with religious significance. Islamic maps honoured the direction and location of the holy Ka'ba, the religious shrine in the great mosque of Mecca.⁸⁰

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Figure 5. 1154 Map of North Africa.
(Climate 3 Section I) By Abdu Abdallah Muhammad Ibn Muhammad Al-Sharif Al-Idrisi.
Illuminated Manuscript copy by unknown hand in late 14th century. 12.5x18.7 IN. Bodleian
Library, University of Oxford, England. (Source: Ehrenberg, 2006, 34-35.)

⁷⁸ Ehrenberg, 2006, 35. See also Ahmad, S Maqbul. 2005. "Kharita." In *The Encyclopedia of Islam: New Edition*, edited by C E Bosworth and et al. Brill Academic Publishers

⁷⁹ Ibid., 10. See also Snyder, John P. 1993. *Flattening the Earth: Two Thousand Years of Map Projections*. Chicago: University of Chicago Press; Thrower, Norman J. 1996. "Maps and Civilisation: Cartography in Culture and Society." In. Chicago: University of Chicago Press; Whitfield, Peter. 2010. "The Image of the World: 20 Centuries of World Maps." In. London: The British Library.

⁸⁰ Ibid., 39. See also King, David A. 1999. *World Maps For Finding The Direction and Distance to Mecca: Innovation and Tradition in Islamic Science*. Edited by H Daiber and D Pingree. Vol. xxxvi, Islamic Philosophy Theology and Science. Leiden, The Netherlands: Brill.

In Europe, several styles of drawing and ways of conceiving and representing space emerged and were practised up until the end of the fifteenth century. They included way-finding road maps drawn around 335 A.D. by the Romans, medieval Christian representations indicated in the tri-partite *mappaemundi*, and portolan charts of the thirteenth century, which were essentially used for seafaring purposes. In addition, there was the cross-over of these traditions in Cresques Abraham's map of 1375, where religious and geographical information coexisted.⁸¹

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Figure 6. Road Map of Rome and Region circa 335.
From a larger strip of the Roman world, copied from a 4th century map, twelfth century manuscript on parchment, 12.8 x 23.1 IN. Osterreichische National Bibliothek, Vienna Austria (Source: Ehrenberg, 2006, 24-25).

Ptolemy's geographical works were circulated more widely by the fifteenth century with the invention of the printing press, and the Western world again looked to interpreting the world through a new mode of scientific cartography. By mid to late sixteenth century, the cartographical centre of Europe shifted from Italy, to Belgium, and the Netherlands and Ptolemaic principles, which were subsequently abandoned for the Mercatorial world view.⁸² Gerardus Mercator's map of 1569 was published in Abraham Ortelius' atlas of 1570 as well as portrayed in Edward Wright's 1599 engraving. As a tool for navigation, Mercator's projection served to facilitate the ease of determining your position on one compass setting. From a geographical

⁸¹ Ehrenberg, 2006, 16.

⁸² Ibid., 11. See Whitfield, Peter. 2010. "The Image of the World: 20 Centuries of World Maps." In. London: The British Library, for discussions and large graphic images of the many configurations of these mapping styles of the sixteenth century.

perspective, the projection presents a widely distorted view of the world, Africa although roughly fourteen times larger than Greenland, appears to be a similar size with Mercator's view and this misconception was subsequently conveyed to generations of school children.⁸³

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Figure 7. 1599 World Chart on Mercator's Projection.
Attributed by Edward Wright and Emery Molyneux in the *Principal Navigations* by Richard Hakluyt. Copper plate engraving, 25 x 16.5 IN. Newberry Library, Chicago Illinois. (Source: Ehrenberg, 2006, 110-111).

The commonalities between Asian, Middle Eastern, and European traditions of the pre-modern period include the often abstract nature of these maps—not adhering to an exact scale, and the often deliberate distorted/symbolic representation of geographic features. In some examples, certain features of the landscape may be highlighted with colour and text, as was the case with Portolan charts, while in other examples a variety of viewing perspectives was adopted to convey a scene.⁸⁴ Roads, lakes, boundaries may be depicted in two dimensions while mountains and buildings often

⁸³ Ehrenberg, 2006, 111.

⁸⁴ See also on Portolan charts Howse, Derek, and Michael Sanderson. 1973. *Sea Chart*. UK: David & Charles PLC.

adopted a three-dimensional projection. The level of abstraction of mappings transcended many cultural groups.

1.2 Maps and Mapping Practices

In many pre-modern societies, both European and non-European, maps were produced for different purposes and through different techniques. They were also drawn in a variety of forms and employed for an equally varied number of uses. The activities and records of early explorers and traders, European, Arab, Chinese, or Indian, reveal that maps of their regions had existed but were often constructed in impermanent mediums. Travellers and pilgrims often travelled without the use of a map by our conventional standard, but either using their experience or the experiences of others through narrative geographies and verbal accounts of places as way-finding mechanisms.⁸⁵ Verbal accounts extended ideas about a place beyond the notions of mere geography. In addition, the traversed space of pilgrimage also offered an alternative spatial conception, which was consistent with embodied religious and cosmographic concepts and symbolism. In pilgrimage, symbols, statues, and temples, together with myth and ritual practices, provided the dimensions of physical space.⁸⁶ Methods for conveying these ideas included textual mappings as outlined below.

Christian Jacob, in his essay “Mapping in the Mind: The Earth from Ancient Alexandria,” studies ancient Greek texts and demonstrates that there existed records of the role of small-scale maps in this society. According to Jacob, “the result of such research [establishing the precise limits of maps, from a visual, intellectual, and pragmatic perspective], in ancient Greece, clearly suggests the very limited functions and diffusions of maps in this society.”⁸⁷ Utilisations of maps in ancient Greece were not necessarily related to pragmatics, such as finding one’s way, as often the format and kinds of representations of the period were not suited to such technical uses. Discourse, narrative, text, and human memory supplanted the role of the map in

⁸⁵ Ehrenberg, 2006, 31. See also Yee, Cordell D K. 1996. *Space and Place: Map-making East and West : Four Hundred Years of Western and Chinese Cartography*: Saint John's College Press.

⁸⁶ Winichakul, 1994, 29.

⁸⁷ Jacob, Christian. 1999. "Mapping in the Mind: The Earth from Ancient Alexandria." In *Mappings*, edited by Denis Cosgrove, 24-49. London: Reaktion Books Ltd., 26.

constructing geographies for purposes such as travel, trade, colonial encounters and exploration. Jacob states:

one should be aware that categories such as vision, audition, memory and imagination do not escape the variations of culture and of history, and that in a precise cultural surrounding, listening to geographical description could create for the listener mental forms as vivid and efficient as a world map.⁸⁸

Jacob bases his assessment of the role of maps in early Greece on first millennium authors, such as Strabo, and his volumes named “Geography,” where no graphic images of maps prevail throughout, only textual descriptions of earlier treatises and maps.⁸⁹ Strabo is important as he notes details of the mapping process, the organization of the collated knowledge, and divides it into, firstly, the traveller’s perspective and their recount of their journey/itinerary, which Strabo referred to as “the conception of *akoé* (hearsay).”⁹⁰ Another aspect to hearsay, which Strabo also acknowledged, was that the transfer of information was typically relayed in “discourse” about the event, which added another dimension to the conceptualizing of the place experienced by the traveller and then imaginatively re-constructed by the geographer. The second major act of the geographer revolves around collated information being processed into both an empirical and mental diagramming of the world.

The first Greek maps were not created out of a desire for a precise geography but rather to deliver some opinions about a larger intellectual enterprise. Answers to some of the following questions may have been entertained in ancient mapping. What was the extent of the cosmos? How might we account for genesis? What was the nature of the world? How did humans arrive on earth? Anaximander of Miletus, a sixth century B.C. scholar, wrote his view of the world from a geo-religious perspective, as opposed to the conventional view of the time of “mytho-poetical tales of Homer and Hesiod.”⁹¹ Anaximander presented an interesting and holistic notion of the world, formed from geometrical metaphors to astronomical observation and calculation to give his

⁸⁸ Jacob, 1999, 26.

⁸⁹ Ibid., 27.

⁹⁰ Ibid., 33. See also Arnheim, Rudolph. 1969. *Visual Thinking*. California: University of California Press, for other conceptions of cognitive mapping.

⁹¹ Ibid., 27. See also for a general overview of sources for these genres of cartography Dilke, O. A. W. 1998. *Greek and Roman Maps*. London: Johns Hopkins University Press.

audience some explanations for natural phenomena. Accordingly, pre-modern Greek geography is a collaboration of knowledge based on mythical lands and tribes. It is also understood within a cosmological frame dependent on the sun's passage across the sky for the different seasons, together with observations of the natural world, in addition to incorporating aspects of myth, language, and a cultural narrative from poetry.⁹² Even this early type of mapping provided tools for scholars to conceptualise the world in alternative ways to Homer. Despite the detail associated with thinking about space, being predominantly literary, such maps presented a format to order knowledge about places independently from discussions of itineraries. Jacob also claims that map-makers were typically philosophers and scientists. Individual maps were the result of one's own view of the world free from stipulations of political or social controls.⁹³ Controls eventually originated from the cartographers as part of a discipline, in that as they accrued more information for their mapping practices from their predecessors and contemporaries, certain signs and rules became commonly practiced. Cartography, therefore, became part of the mathematical sciences and removed from everyday life, while descriptive and imaginative geographies continued to be a part of the realm of historical studies and writers.

1.3 Imaginative Geographies

Geography has not always and everywhere been seen as a static object. In pre-modern times, geography was not seen purely as objective reality that can always be mapped in the same manner and with the same outcome, nor was the mapmaker seen as a self-conscious observer independent of the mapped subject. Although it can be argued that geography is always constructed imaginatively, this was particularly so in the pre-modern period. The fact that people of different cultures mapped their world differently shows that there was something intrinsically imaginal about mapping, and that "imagined geographies" were in essence the object of all mapping practices. Being highly imaginative, the pre-modern map, unlike its modern counterpart, does not reveal the same meanings universally to its viewers, or as Denis Cosgrove

⁹² Jacob, 1999, 28. Kahn, C H. 1960. *Anaximander and the Origins of the Greek Cosmology*. New York: Hackett.

⁹³ *Ibid.*, 29.

suggests, the map is exposed to “inescapable contextual influences which shape the outcome of such transfers [of information].”⁹⁴

Imaginative geography is not just the product of mapping, nor is it restricted to the pre-modern periods. The arrival of British colonists to Australia, and their believing it was an unpopulated land is an example of imagined geographies. Of course, this was not true as Aborigines had inhabited the Australian continent for centuries prior to the invasion of colonizers. Although the notion of “imagined geographies” can be discussed from many angles, as Edward Said’s, Derek Gregory’s and Gayatri Chakravorty Spivak’s pioneering works on cultural studies and post-colonialism indicate, it is the cultural and religious perspectives which are the focus in this study.⁹⁵ This is predominantly due to their role in pre-modern times, having the greatest effect on the ways in which geography was viewed, understood, and mapped.

Pre-modern perceptions of geography present vastly different understandings of space compared with ours in modern times, as notions of the sacred and the profane were integral to coming to terms with one’s place in the world. Pre-modern geography was understood primarily in terms of an overlap of its geo-political and geo-religious implications. Therefore, maps were not generally commissioned with sole political preoccupations but rather with divine and political agendas interwoven.⁹⁶ Two examples of imaginational and sacred spatial principles are elaborated below.

Geo-Piety and Fada’il: Sacred Terrains

Religious conceptions of space dominated many pre-modern cultures, and combinations of spatial experiences, visions, as well as socio-religious imagery conveyed through recitals and readings of religious texts created imaginative

⁹⁴ Cosgrove, 1999b, 3.

⁹⁵ Gregory, Derek. 1994. *Geographical Imaginations*. Cambridge MA & Oxford UK: Blackwell Publishers, and see also Said, Edward W. 1979. *Orientalism*. New York: Vintage. Spivak, Gayatri Chakravorty. 1999. *A Critique of Postcolonial Reason: Toward a History of the Vanishing Present*. USA: Presidents and Fellows of Harvard College.

⁹⁶ Often the King as the head of state, was also the closest earthly representative of divinity. Therefore decisions about mapped territory had a number of layers of meaning, and thus it follows maps were open to many levels of interpretation and intended for a number of different audiences. See reference below: Steinhardt, Shatzman Nancy. 1998. "Mapping the Chinese City: The Image and the Reality." In *Envisioning the City - Six Studies in Urban Cartography*, edited by David Buisseret, 181. Chicago: The University of Chicago Press Ltd.

mappings of the world.⁹⁷ Mapping practices based upon these descriptions formed a broader corpus of work than our modern understandings of mappings provide. In the pre-modern world, religion motivated a certain reading of spatiality and a means through which to appreciate that experience, whereas in modern society socio-cultural signs and practices play a greater role in aiding our spatial experience and realizations of our immediate territory.⁹⁸ One example of conceptual mapping from the pre-modern Arab-Islamic context is the one anchored in the religious concept of *fada'il*. Although the concept of *fada'il* predates Islam, “it is used mainly as an adjective in panegyric literature to denote the virtues and merits of certain texts, individuals, cities, monuments or times.”⁹⁹ *Fada'il* writings in the beginnings of the Islamic religion contained comments associated with the Prophet and his companions. Through the identification of certain landmarks of religious significance, *fada'il* bestows these built forms within the socio-religious landscape with “spiritual, cosmological and eschatological significance.”¹⁰⁰ In turn a type of mapping occurs, by which the *fada'il* in its narrative sets the scene and creates a particular spatial experience for faithful followers of the scriptures. Therefore, in its construction of certain geography of divine significance, the concept of *fada'il* promotes an imagined spatiality and view of the world, authorized by God and openly conveyed for his believers.

Imaginative geographies were also present in ancient Chinese culture, through the royal desire to represent their kingdom in its ideal state. According to Nancy Shatzman Steinhardt, this idealism originates in Chinese rulers' commitment to following a passage in a classical text of late first millennium B.C., which called the *Rituals of Zhou*, which “offers a prescription for an ideal state capital.”¹⁰¹ This text appears to be the recommendations of the Zhou people through until the middle of the third millennium B.C. which lists essential criteria for a royal capital. Among the technical principles listed there were also other necessary requirements, such as the skills of a geomancer to orientate development as well as a temple to house the “ruler's ancestors on the east, altars for sacrifices to soil and grain on the west.”¹⁰²

⁹⁷ Akkach, Samer. 2002. "Religious Mapping and the Spatiality of Difference." *Thresholds* no. 25 (Sacrosanct):69-75, 69.

⁹⁸ *Ibid.*, 71.

⁹⁹ *Ibid.* See also Tibbetts, Gerald R. 1979. *A Study of the Arabic Texts Containing Material on South-East Asia (for the Royal Asiatic Society)* London: E. J Brill.

¹⁰⁰ *Ibid.*, 73.

¹⁰¹ Steinhardt, 1998, 1-2.

¹⁰² *Ibid.*, 2.

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Figure 8. Wangcheng (Ruler's City) 1676.

Nalan Cheng-de, ed. *Sanli tu* [Illustrated Three Ritual Classics, including Rituals of Zhou]. (Source: Steinhardt, 1998, 2.)

This may seem utilitarian enough except that excavated sections of parts of the walls of cities from the Zhou and other dynasties, such as the Han (206 B.C. to 220 A.D.), indicate that there is little similarity between the Rituals of the Zhou and the physical nature of Chinese royal cities.¹⁰³ In essence, the accolades of pre-modern Chinese map lay not in the agency of its medium, the reputation of its creator, nor its technical or aesthetic qualities, but in “the regal system it symbolized in which there was always a place for a ruler to sit facing south in the centre.”¹⁰⁴ Therefore, the map was the ideal and imaginal space, whereas the physical city was something different.

Steinhardt goes on to compare the imaginative geographies of the ancient Roman cities with those of early Chinese dynasties. Specifically, Steinhardt considers the idealised nature of the city of the King of Zhou as well as a town founded by Romulus. Romulus represents a town of antiquity which was based on a highly

¹⁰³ Steinhardt, 1998, 3. See also Wu, Liangyong. 1986. "A Brief History of Ancient Chinese City Planning." *Urbs et Regio* no. 38.

¹⁰⁴ *Ibid.*, 30. See also Hsu, Mei-Ling. 1978. "The Han Maps and Early Chinese Cartography." *Annals of the Association of American Geographers* no. 68 (1):9-17.

conceptualised model.¹⁰⁵ These comparisons contribute to the concept of the imagined geography in their submission to the concerns of “myth, and ritual as opposed to economics or hygiene in founding of a city.”¹⁰⁶ The Romans and the Chinese believed the role of the geomancer and the orientation of the city was crucial to its eternal fate. Although the divining tools were unique between cultures, with the Romans using a liver and a process called *haruspex*, while the Chinese used the bone of any of the following available animals, sheep, cow, or pig, or even a tortoise shell, and the process was known as *scapulimancy* or *plastromancy*.¹⁰⁷ Mappings conveyed cultural preoccupations with adhering to ritual practice over the conveying of actual geographical space.

Geo-religious belief systems were paramount in pre-modern Chinese and Roman cultures for determining one’s place in the world. Yi-fu Tuan argues, through the concept of “geopiety,” that the spiritual connection with place was inscribed in religious canons across many cultures.¹⁰⁸ In pre-modernity for the Chinese, geopiety, as a belief system, intrinsically linked to an individual’s imaginative conception of space, dictated every aspect of earthly life.¹⁰⁹ The notion of piety covers relationships between people with the land, human beings and their god/s, as well as human beings with nature. “*Hsiao*”, the Chinese term for piety, translates as “filial piety” or “filiality,” hence the duty of care for parents and one’s ancestors are a dominant aspect of pious Chinese.¹¹⁰ The notion of *Hsiao*, from the Confucian text *Hsiao Ching* (ca.350-200 B.C.), implies that there is duty of care from a “ruler to subject, parents to children, for without reciprocity there cannot be harmony.”¹¹¹ In accordance with the ancient text, rulers served heaven by in effect being pious to their fathers and then

¹⁰⁵ Rykwert, Joseph. 1976. *The Idea of a Town*. New Jersey: Princeton, 27. Rykwert explains that unlike today, in antiquity there was not necessarily one meaning per one word, and similarly with the construction of a town, it was the result of ceremonial practices constituted by words and actions which gave sacred meaning to the place. The site was further celebrated with annual festivals, entrenching its meaning and significance in future generations.

¹⁰⁶ Steinhardt, 1998, 9.

¹⁰⁷ *Ibid.*, 10.

¹⁰⁸ Tuan, Yi-Fu. 1976. "Geopiety: A Theme in Man's Attachment to Nature and Place." In *Geographies of the Mind: Essays in Historical Geosophy*, edited by David Lowenthal and Martyn J Bowden, 11-39. New York: Oxford University Press, 11-39.

¹⁰⁹ *Ibid.*, 11-12. “‘Geopiety’ is a term borrowed from John K. Wright to stand for a complex of relations between man and nature. ‘Geo’ means earth; earth refers to the planet, the globe or its surface vis-à-vis heaven; it is also the soil and, by extension, land, country, and nation. ‘Piety’ means reverence and attachment to one’s family and homeland, and to the gods who protect them.”

¹¹⁰ Tuan, 1976, 12.

¹¹¹ *Ibid.*, 14.

served the earth by being pious to their mothers, which in turn related to all of the spirits being appropriately satisfied and equated to an harmonious existence.

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Figure 9. Divining the capital at the Jian and Chan Rivers, 1906.
From Sun Jianai et al, *Shu jing tu shuo* [Illustrations and notes to the *Shu jing* [Book of History]].
(Source: Steinhardt, 1998, 3).

In pre-modern Chinese tradition there was a distinct opposition between heaven and earth. In the Chinese language, *t'ie*, heaven, and in its relationship to *ti*, earth, is considered more of a counterpart although of marginally lower status, and *t'u* (soil), is given lower status again. In both Chinese and European cultures, chthonian gods were superior to sky deities, therefore created landscapes and architecture, from tombs to altars of worship and sacrifice, of this period reflected such relationships.¹¹² Socio-cultural relationships between mother and father also responded to this belief system with the mother being the nurturer (earth), and the father commanding honour, affection and reverence (heaven). Sacrificial rites for both heaven and earth were only open to the emperor based upon his position in society, whereas princes of feudal states were allowed to make offerings within their own jurisdictions to earthly

¹¹² Tuan, 1976, 15.

spirits.¹¹³ Mappings conveyed the complexities of these spiritual relationships and often acted as illustrations of the required modes of religious practices to achieve fulfilment in earthly life.

Tuan suggests that in modern Chinese culture geopiety occurs because human beings possess a deep emotional bond with nature. Tuan suggests that modern concepts have attempted to emulate past socio-cultural practices and meanings associated with place, such as environmental activism, “giving back to nature,” are connected to “profound human experiences” which were predominantly played out in religious practices in ancient worlds.¹¹⁴ In the absence of entrenched socio-religious meanings and connections with place of pre-modernity, the modern concept looks to other forms and practices to achieve socio-cultural links to space and reason for how it may be used. Also, it is a distinctively modern conception where there exists awareness that human existence has a reciprocal arrangement with nature and therefore needs to be nurtured. It is a type of spiritual acknowledgment of the land associated with modern times rather than a direct religious association.¹¹⁵

By contrast, places in the landscape for ancient Greeks and Romans had different degrees of holiness, and were termed *loca sacra* pertaining to an area set aside by the state for a deity and *loca religiosa* equated to local shrines or burial grounds for certain families.¹¹⁶ These sites had great religious and cultural significance for the community and were not to be encroached upon. Even travellers, armies, citizens passing by these sites, for example, if they were rivers, made sacrifices to appease the spirits and by so doing thus participated in aspects of the imaginative geography of local peoples. Tuan states for the case of ancient Greece:

Centaur's were originally spirits of mountain torrents... Nymphs were almost everywhere: they dwelt in mountains, cool caves, groves and meadows and by springs... The ancient

¹¹³ Tuan, 1996, 17. See also Needham, Joseph. 1954. *Science and Civilisation in China* Vol. 3. Cambridge: Cambridge University Press.

¹¹⁴ *Ibid.*, 13.

¹¹⁵ This may be seen as an example of projective mapping, which is elaborated on in chapter one.

It demonstrates a motivation for designing a particular environment for particular peoples in the absence of pre-modern connections to lived space.

¹¹⁶ Tuan, 1996, 17.

landscape was full of *numina* or local powers; the topographical ensemble itself had power and so did its parts.¹¹⁷

In effect human beings of pre-modern China, Greece, and Rome were surrounded by divinity and the semi-divine in that their ancestors as well as their parents had spiritual implications for their lives.

Paradise and Biblical Mapping

Catherine Delano Smith, in her paper “Maps as Art and Science,” presents a study of biblical maps of the sixteenth century, highlighting the split between genres of biblical and geographical information in mapped European representations. Delano Smith uses the example of Peter Planicus’ 1590 Dutch folio bible, whereby

the historical (biblical) content was now divorced from the geographical. Instead of showing each event in its proper geographical place on the map (indeed, *as* the map) the biblical scenes are encased within vignettes and set at the edge of the sheet. The geographical outlines are left in the centre, ‘pure’ and uncluttered by historical narrative.¹¹⁸

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Figure 10. The First Bible Map.

“The Position and Borders of the Promised Land.” A woodblock printed in the 1528 version of W Vorsterman’s edition. (Source: Delano Smith, 1990, 67.)

¹¹⁷ Tuan, 1996, 18.

¹¹⁸ Delano Smith, Catherine. 1990. "Maps as Art and Science: Maps in Sixteenth Century Bibles." *Imago Mundi* no. 42:65-83, 73. See also Nebenzahl, Kenneth. 1987. *Maps of the Bible Lands*. London: Times Books, plate 37, 100-1. Whereby the number of vignettes are adjusted from two to fifteen in representing the Garden of Eden.

Although this act of splitting religious imagery from geography may appear insignificant, it meant that future bible maps into the seventeenth century utilized this imagery as mere decoration and therefore trivializing the socio-religious message of the map to the periphery. Another point upon which Delano Smith dwells is the issue of meaning in the biblical maps, as the extent to which imaginative geography was permitted, and thus to what extent did its construction become a problematic issue for theologians of the Christian church? Much of the writings associated with any visual biblical representations were supposed to be read aloud and absorbed in addition to the images on the page. Therefore, the orator would construct a particular frame within which to direct the message; this in turn would be reinforced by the images and be open to the reader's interpretation. "In the case of bible-reading in the sixteenth century," Delano Smith explains, "either for Catholics or for Protestants, such freedom was dangerous; it would (and did) lead to nonconformity."¹¹⁹ Prior to the Reformation it was more customary for the Priest to read a select group of passages from the Bible and then offer their comment and explanation of the word of the Lord. Also, bibles were not readily available to the masses until the late sixteenth century, which was also paralleled, with a degree of "standardization of religious thought...[which] operated not only through the approved verbal text but also through the visual."¹²⁰ As religious symbolism was also well established in the Christian traditions by the sixteenth century, it was often the invisible which conveyed the message more convincingly, than what appeared for the map reader. The use of allegory was already well understood by Judeo-Christians. The "exegetic structure" depicted between Old and New Testaments were recognizable with the use of historical vignettes surrounding the bible maps.¹²¹

¹¹⁹ Delano Smith, 1990, 78.

¹²⁰ Ibid. Mappings were used to appropriate religious thought. The world was categorised and identified in controlled ways by the religious hierarchy, and thus representations portrayed controlled interpretations of religious rhetoric. See also N, Goodman. 1968. *Languages of Art: An Approach to a Theory of Symbols*. New York: Bobbs-Merril, 31-2. It is suggested by Goodman, representation is proposed as an interpretation rather than an imitation of objects. In my study this thinking underlies the difference and many variations between mapping and planning processes.

¹²¹ Ibid., 79. See also Hindman, S. 1977. *Text and image in fifteenth century illustrated bibles*. Leiden: E. J. Brill, 28ff.

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Figure 11. Garden of Eden and the Expulsion from Paradise.
The author was a humanist and expressed a desire for his images to delight all. (Source: Suárez, 1999, 71.)

Literal interpretations of bible maps was also important to the Protestant religion in the publication of Dutch texts in the fifteenth century with the use of geography to present each biblical event where and when it officially occurred.¹²² Therefore, bible maps were utilized as profound instruments in convincing the reader of both historical and geographical facts. Martin Luther, was a key figure in promoting the individual's experience of scripture. To aid this process, Luther selected appropriate visual imagery and thematics, typically replicated in the form of bible maps for his German-language bibles. So for sixteenth century European Christians, the geo-religious experience was a carefully crafted production by the map-maker and religious instructor to achieve the paradoxical—conformist imaginative geographic space.

¹²² Delano Smith, 1990, 79. See also Christensen, C. C. 1970. "Luther's theology and the uses of religious art." *The Lutheran Quarterly* no. 22:147-165, 156-9.

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Figure 12. Archbishopric of Salzburg, by Johann Baptist Homann.
Homann led the revival of German cartography in the early eighteenth century. The vignettes were perhaps intended to instruct a spiritual connection with geography. (Source: Ehrenberg, 2006, 130-131.)

Locating Paradise

Alessandro Scafi, in his essay “Mapping Eden: Cartographies of Earthly Paradise,” elaborates on medieval European views of the world loaded with theological discourse in understandings of notions of space and time. Medieval maps based on views presented by western Christianity, represented the Garden of Eden as one of the worldly events amongst other everyday happenings. Scafi states:

a map which shows Paradise as part of the world implicitly acknowledges, by the leap of imagination involved, the limits of human action...It is once a confession of the transcendent craft of God operating on terrestrial space, and of the limits of human reasoning.¹²³

¹²³ Scafi, Alessandro. 1999. "Mapping Eden: Cartographies of the Earthly Paradise." In *Mappings*, edited by Denis Cosgrove, 50-70. London: Reaktion Books Pty Ltd, 51.

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Figure 13. P. Planicus' rearrangement of the Map of Eden.
The Bible information is clearly separated from the geographical information. (Source: Delano Smith, 1990, 77.)

Scafi successively negotiates the complex questions associated with the narrative of the Bible, in analysing scholarly and popularly held beliefs about the thinking and nature of the Garden of Eden. For example, was it a “real” or imagined place? Did it bridge the dichotomy of heaven and earth and exist somewhere between these theological places? In addition, however, the graphic translation of these theological dilemmas about the location of Eden are reproduced on a map, using religious imagery and concepts which may not be as easily understood in text alone.¹²⁴ The paradoxical notion of juxtaposing of Eden on a world map, suggested a graphical type of evidence for what was presented in the writings of the scriptures and also giving greater credence of one’s path to Paradise. However, there were many adversaries to these conceptual graphical depictions of Paradise, ranging from poets to biblical scholars.¹²⁵

¹²⁴ Scafi, 1999, 53. See also Plaut, A. 1984. "Where is paradise? The Mapping of A Myth." *The Map Collector* no. 29:2-7.

¹²⁵ Ibid., 52. See also Dorling, Daniel, and David Fairbairn. 1997. *Mapping: Ways of Representing the World*: Prentice Hall.

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Figure 14. Psalter Map, Garden of Eden. c. 1265.
(Source: Whitfield, 2010, 18).

It was difficult for both cartographers and scholars of theology to grasp a reality lying beyond the limits of what they were able to perceive on earth. Yet to a certain degree for the map-makers, through this process of grappling with depicting a realm outside of their physical experience, this meant that what was previously an imaginative geography, when mapped, became a possible reality. Scafi states, “depiction changes the phenomenon depicted. It can make real something previously unreal.”¹²⁶ Through the cartographic placement of the Garden of Eden and its visibility on the map, there is a distance between this previously conceptual idea and, say, the city of Jerusalem. It is no longer the figment of one’s imagination by simply being drawn.

¹²⁶ Scafi, 1999, 53. See also Caird, G B. 1988. *The language and imagery of the bible*. London: Duckworth. Where there are six different understandings proposed for the term “meaning,” for the context of meaning of imagery in bible scenes. Harley, J. B. 1983. “Meaning and ambiguity in Tudor cartography.” In *English Map-making 1500-1650*, edited by S Tyacke, 22-45. London: The British Library.

Yet in the process of drawings there is an element of artistic license in the representation of the Garden of Eden. It does not share the same geographical merits of experienced space. Theologians have not been able to ascertain the dimensions or details of this sacred landscape even from within the textual descriptions of Scripture. There are a few known elements contained within Paradise, such as the tree of knowledge and the tree of life, but a three dimensional conception remains absent.¹²⁷ Therefore, indicating a place of no known spatial dimensions presents the first cartographic paradox. The second conundrum is by indicating the Earthly Paradise on a map, it is in effect bridging the spatial continuum believed to exist between earth and heaven. For theologians, Earthly Paradise represents the boundary between eternity and time, so it is a zone where human time and space mix with notions of divine time and space, according to medieval orthodoxy.¹²⁸ Access to Paradise is achievable for humans through their belief and worship of Christ, so there is an inference that a spiritual journey is possible into this geographical space of Eden as long as one does the right thing in the human world. Scafi states:

Paradise is at once present and absent, and a point of transition. Situated in this world, it nevertheless belongs to a different dimension; its presence on maps is thus only a footprint, a physical expression of absence.¹²⁹

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| 1. | | 2. |
| Figure 15. | (1) Earthly Paradise from the Hereford Cathedral map.
c. 1285. (Source: Scafi, 1999, 61). | |
| Figure 16. | (2) Details showing Earthly Paradise from a world map.
c. 1490. woodcut. (Source: Scafi, 1999, 62). | |

Why were notions of imaginative geographies integral to the conceptual constructions of space in pre-modern cultures? One of the reasons behind this is the conceptual

¹²⁷ Scafi, 1999, 55.

¹²⁸ Ibid., 57. See also Scribner, R. 1981. *For the sake of the simple folk. Popular propaganda for the German Reformation.* Cambridge: Cambridge University Press, 186.

¹²⁹ Ibid., 59.

relationship between cartography and cosmography which blurs the boundary between the visible and the invisible, the concrete and the imaginary. These relationships changed radically in modern times, and consequently the nature of modern map and its role in society have been irreversibly changed.

1.4 Cosmography and Cartography

Unlike modern cartography, earthly and heavenly geographies were represented in ways that did not clearly differentiate between these spaces. Biblical paradise is a case in point. Cosmographic ideas as well as ways of seeing and understanding earthly existence were integrally related to holistic conceptions of the world. Harley and Woodward's volumes, dedicated to the study of the *History of Cartography*, presents comprehensive insights into many pre-modern societies and their mapping practices. In addition, it highlights the inherent connections between cosmography, cosmology, and cartography, and shows the ways in which prevailing religious beliefs had influenced the nature and production of maps in pre-modern times.

The difference between cosmography and cartography requires some clarifications. Generally speaking, cartography refers to the visual representation of earthly terrains as well as to the conceptualization and production of such visual representations in the form of maps. Cosmography, by contrast is concerned with the visual representation of the cosmos as conceived and described through the science of cosmology. Thus cosmography describes as well as maps the known cosmos, including heavens and earth (and their equivalents in non-western cultures) as well as other planets and cosmic spaces. Cosmology, by comparison, deals with the philosophical and scientific aspects of the universe: its order, structure, and laws with a specific focus on space and time.

Although cosmographies differ from culture to culture, there were some shared grounds with regards to direction and alignment. The division of the circle into four parts, according to B. L. Gordon, was said to be the result of astronomical observations of prehistoric man, where the North Star and the midday sun establishes

the north-south coordinates.¹³⁰ Then this hypothesis was dismissed based on the irregularities associated with directions and latitudinal variations, which occur between seasons. The alternative hypothesis is the relations of the human body, its symmetry and the possibility of dividing it into four parts—front, back, left and right. The concept of azimuth was then extrapolated with the one of the four points located on the horizon, and perhaps another point fixed on an astronomical object.¹³¹ In many cultures, the four cardinal points seem to be associated with more than just solely geographic position and location.¹³²

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Figure 17. Madaba Mosaic Map, c. AD 550.
(Source: <http://198.62.75.1/www1/ofm/mad/sections/section11.html> viewed on 24th May 2012).

European traditions also gave precedence to direction in their cosmographical understandings. Directional importance in the Jewish Old Testament was illustrated with the division of the horizon into four parts, and this division also appeared in the mythical landscapes, which were imagined beyond earth. As an example, “four winds

¹³⁰ Gordon, B. L. 1971. "Sacred Directions, Orientation, and the Top of the Map." *History of Religions* no. 10 (No. 3):211-227, 211. See also Atkinson, T D. 1955. Points of the Compass. In *Encyclopedia of Religion and Ethics*. New York, 88.

¹³¹ *Ibid.*, 212.

¹³² For a detailed study of this point in the Islamic tradition, see Akkach, Samer. 2005. *Cosmology and Architecture in Premodern Islam: An Architectural Reading of Mystical Ideas*. Edited by Seyyed Hosein Nasr, *SUNY series on Islam*. Albany, USA: State University of New York Press.

blow in heaven—supposed by the ancients to be located in the stars of Pleiades—and four rivers flow through paradise.”¹³³ East was considered the sacred direction for Jews, as the Holy City of Jerusalem was based upon an idealised map, where directions had positive and negative connotations. By comparison north had “evil” associations for pre-modern Jews,

the spirit lifted me up between the earth and the heaven, and brought me in the vision of God to Jerusalem, to the door of the inner gate that looketh toward the north; where was the seat of the image of jealousy, which provoketh to jealousy.¹³⁴

Most synagogues today are aligned from west to east, and the Ark is situated to enable worshippers to face Jerusalem.

Early Christians revered the east, with worshipping the rising sun as part of typical practice. By contrast, the west had satanic associations with the setting sun and assumptions about evil events or practices occurring after dark. Yet by the fourth century and with the victory of Constantine in Rome, Christians were no longer permitted to revere the sun, nor even look at it. This view was not consistent with the creation of the interior spaces of church architecture in the fifth century, typically the choir assumed a location to the east. The interior of the church was divided into four parts, reflecting the four cardinal directions, and metaphorically recalling the universe. The altar, located to the east was said to be paradise. By the eighth century the configuration of interior space had changed to permit the congregation to face east while addressing the altar. How did these religious alignments and beliefs resonate with and relate to cartography? Roman and Greek cosmographers started drawing their cosmographical plans to relate to their belief of earth being a flat disk of land with a surrounding sea. Similarly to the orientation of church architecture, maps were drawn with the sacred easterly direction to the top of any world maps. The Madaba Mosaic from around A.D. 550 is the earliest known example of Byzantine cartography with east at the top.¹³⁵

¹³³ Gordon, 1971, 212.

¹³⁴ Ibid., 212-13.

¹³⁵ Ibid., 217.

Larissa Bonfante, in “Etruscan Boundaries and Prophecy,” highlights the connection between cosmography and religious beliefs of pre-modern Etruscan peoples through notions of boundaries. Boundaries possessed sacred significance in addition to their metaphorical and abstract qualities for the Etruscans.¹³⁶ The Etruscans were located in central Italy ca. 800—500 BCE, and considered themselves to be sophisticated and wealthy urban dwellers.¹³⁷ Archaeological evidence of this European period, includes remains and indications of lives of the Etruscans, which were characterised by extravagant private houses and lavish burial tombs. The Greeks were present in this region after 800 BCE and brought their alphabet, Greek mythology, and their monumental architecture.¹³⁸

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Figure 18. Etruscan bronze model of a sheep’s liver from Piacenza.
2nd century BCE. (Source: Bonfante, 2005, 156.)

Yet the Etruscans held onto their religious, traditions and rituals as well as their language. The Romans passed on technical aspects of city building to the Etruscans such as surveying and measuring land areas and forming physical boundaries between properties, while the Etruscans were appreciated by the Romans for the craftsmanship and aptitude for building. Specific Etruscan rituals, concerning the positioning and orientation of building, through practices such as divination, which aided the

¹³⁶ Bonfante, Larissa. 2005. "Etruscan Boundaries and Prophecy." In *Structure and Meaning in Human Settlement*, edited by Tony Atkin and Joseph Rykwert, 153-163. Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology, 153.

¹³⁷ BCE. Refers to Before the common era.

¹³⁸ Bonfante, 2005, 153. See also Cornell, T J. 1995. *The Beginnings of Rome*. London Routledge.

appeasement of the gods, were also acknowledged by the Romans. The notion of boundaries which were traversed during these practices included cosmic, earthly and the “*saecula* or boundaries of time,” all of which were vitally important to Etruscans’ understandings of their worldly existence.¹³⁹

Etruscans believed the sky god presided over all earthly boundaries. According to Etruscan philosophy, the sky gods ordered boundary stones be erected on corners of allotments as men could not be trusted to abide by any other form of identification of territory other than physically defined spaces. This prophecy was said to have dated back to ca. 90 BCE, and highlights a clear relationship between the role of the gods and men as well as the divine significance of the notion of boundary. Roman records identify the Etruscan prophecies associated with concepts of boundaries as also putting forward ideas about geographical area as distinct from religious notions of space. This geographical area gave peoples of the region, or those which had any kind of association with the land, an identity as being from a certain place. Previously, identity reflected as being part of a religion or speaking a particular language.¹⁴⁰ Therefore the Romans attributed communications between gods and the people, on subjects such as spatial boundaries as the talent of the Etruscans. According to the Roman author Seneca,

[t]he difference between us and the Etruscans is... that, while we believe lightning is released as result of a collision of clouds, they believe that clouds collide so as to cause lightning. For since they attribute everything to the gods’ will, they believe, not that things have a meaning in so far as they occur, but rather that they happen because they *must* have a meaning.¹⁴¹

Other boundary demarcations important to Etruscans were those between the living and the dead. Stone markers usually identified a grave site or family tomb, as well as the sex of the inhabitants, or as to whether it was an individual, a couple, or family group. The demarcations were explicit in their representation of the sexual organs of the inhabitants.¹⁴² Such demarcations also acted as the thresholds between earthly existence and an underworld existence. The representational form was significant for

¹³⁹ Bonfante, 2005, 153-154.

¹⁴⁰ Ibid., 155. See also Harris, W. V. 1971. *Rome in Etruria and Umbria*. Oxford: Oxford University Press.

¹⁴¹ *Quaestiones Naturales* 32.2 in Bonfante, 2005, 155.

¹⁴² Bonfante, 2005, 158.

the after-life experience but they were also important boundary markers. Therefore it follows that the transition between earthly existence and a presence in an afterlife would also be the focus of Etruscan philosophy.¹⁴³

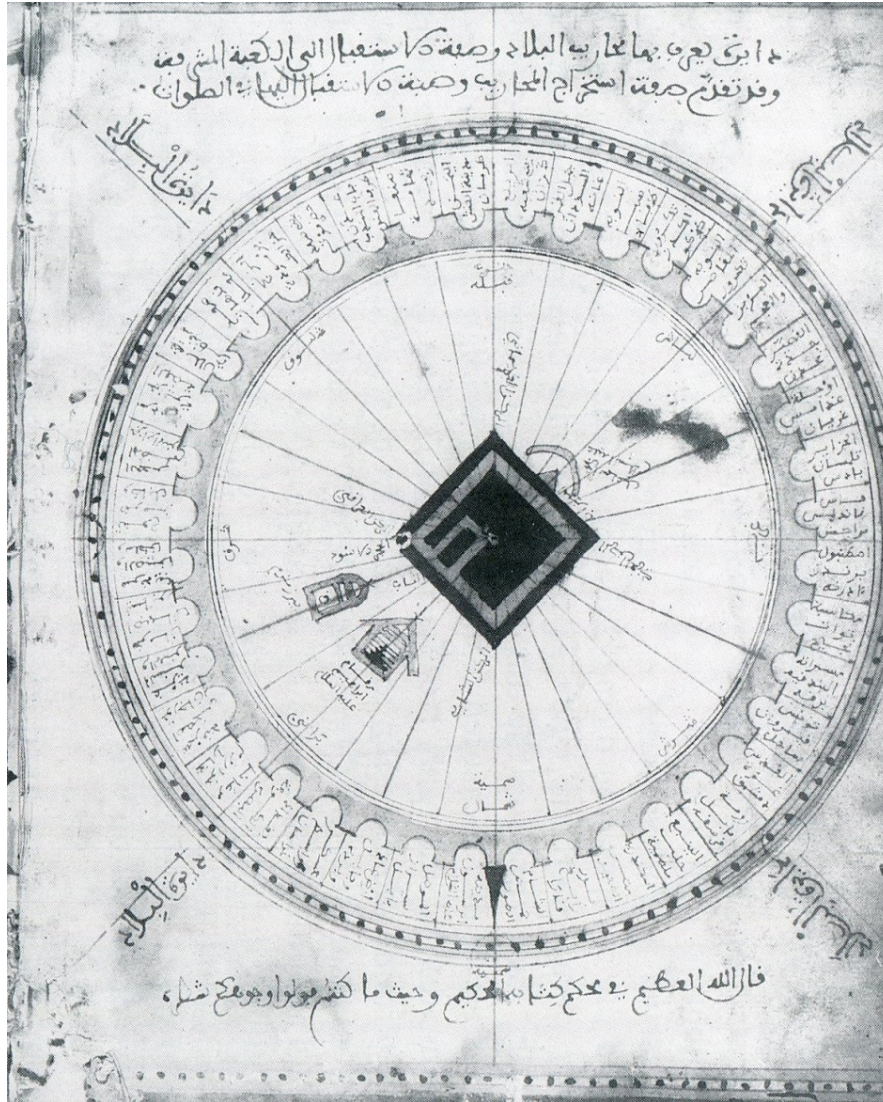


Figure 19. A diagram of the world divided into two sectors about the ká ba. (Source: King, 1999, 55).

B. L. Gordon indicates that geographic symbolism becomes more complicated when considering Muslim practices.¹⁴⁴ Gordon suggests that directions are important for Muslims, which is recognised in the direction of prayer being toward the *qibla*, as

¹⁴³ Bonfante, 2005, 159. Plato in *Timaeus* describes humans as being created by both the material of the cosmos, and it is implied they also have a soul. Cosgrove believes these ideas relate to the understanding that, “[t]he form and spirit of the cosmos are mapped into our material being.” Therefore, by focussing on the role of humanity, the field of cosmography incorporates a geometric dimension. If earth is at the centre, with humans as observers of movements of the cosmos and planetary circulation occurring around the earth, then earth acts as a theatre for human existence.

¹⁴⁴ Gordon, 1971, 214.

well as in words, such as “azimuth, “zenith,” and “nadir,” which came to the English language from Arabic.¹⁴⁵ The Prophet Mohammed had also prayed to the holy city of Jerusalem before his revelation, which prioritised Mecca over Jerusalem. Many reverent practices of this period are still current for today’s Muslims. For example, any animal slaughtered for its meat must have its head turned toward Mecca; the *qibla* is always faced in prayer. Any practices such as spitting or toileting in the direction of the *qibla* are forbidden. While east was considered the most sacred direction for Christians, south predominated at the top of the map for medieval Muslims.¹⁴⁶ The determination of the sacred direction (*qibla*) toward the *ka’ba* in Mecca was a problem for Muslim scientists and scholars of the sacred law of Islam (*fuqahā*) for centuries.¹⁴⁷ Folk astronomy, stemming from the seventh century, is now understood for determining the *qibla*. One theory has each sector of the world around the *ka’ba* related with the segment of the perimeter of the edifice.¹⁴⁸

Ahmet T. Karamustafa, in “Introduction to Islamic Maps,” identifies the complex nature of the different cartographical traditions of pre-modern Islam. In his view there were two main schools of thought from A.D. 700 to 1850, stemming from either a theoretical perspective or an empirical type of cartography.¹⁴⁹ Greek philosophical influence was most important to Islamic cartography by the end of the tenth century. The majority of Greek scientific works had been translated into Arabic and, according to Karamustafa, appropriations of these ideas within the Islamic scientific context had a profound effect on the emergent Islamic civilization.¹⁵⁰ In addition, the majority of pre-modern Islamic maps were part of larger manuscripts. Therefore, the relationship of text to understandings of the mapped information was paramount in the Islamic context and lead Karamustafa to question to what extent in pre-modern Islamic traditions was there an independent cartographic discipline.¹⁵¹ This reveals a hierarchical arranging of cartographic examples from a level where the text and narrative dominates the visual imagery to where the text informs but is not crucial to

¹⁴⁵ Gordon, 1971, 218.

¹⁴⁶ Ibid.

¹⁴⁷ King, 1999, 47.

¹⁴⁸ Ibid.

¹⁴⁹ Karamustafa, Ahmet T. 1992. "Introduction to Islamic Maps." In *History of Cartography Volume 2, Book 1: Cartography in the Traditional Islamic and South Asian Societies*, edited by J B Harley and David Woodward, 3-11. Chicago: The University of Chicago Press, 3.

¹⁵⁰ Ibid., 4.

¹⁵¹ Ibid., 5.

deciphering the story of the map. As was often the case in other pre-modern societies, interpretations, readings, and the study of cartography was solely the domain of the literati, highly educated scholars and philosophers.

Karamustafa notes that there are clear gaps in the study of pre-modern Islamic maps in that there is seemingly little explanation as to why mathematical, celestial, and geographic knowledge evident to scholars of the time and denoted in historical texts was not represented in cartographic terms.¹⁵² In addition, by comparison to European examples of the pre-modern period, there is a distinct difference in the absence of iconographic figures in Islamic maps. Although Oya Pancaroğlu believes that medieval images were referenced frequently in Islamic texts on cosmography, and the “ultimate value of images...is a means to understand God.”¹⁵³ Pancaroğlu, however, suggests that images were adopted to evoke emotional as well as intellectual responses in order for the reader to arrive at a life lesson.

Chinese cosmographic conceptions and notions of direction were at odds with the European traditions, as the latter was concerned with east-west alignments.¹⁵⁴ By contrast, alignment of axes north-south was the predominating approach for the Chinese.¹⁵⁵ Although both directions were valued, southwards reflected the orientation of the gods and also the logic behind the southward pointing compass for the Chinese.¹⁵⁶ Worshippers therefore, would face north and in burial, the deceased’s head would be positioned to the north. It was not until the thirteenth century, when a Mongol Emperor and conqueror, who was influenced by Muslim mapmakers, stated maps should have south to the top, that this practice was adopted in China.¹⁵⁷ Up until the end of the twelfth century maps of Chinese authorship were always indicated with north to the top.

¹⁵² Karamustafa, 1992,7.

¹⁵³ Pancaroğlu, O 2003. "Signs in the Horizon: Concepts of Image and Boundary in a Medieval Persian Cosmography." *Anthropology and Aesthetics, Islamic Arts* no. 43 (Spring 2003):31-41, 32.

¹⁵⁴ Gordon, 1971, 218. See also Henderson, 1994, suggests the most controversial cosmographical model in classical China was the *Luo Shu* (Luo River Writing) in addition to *Hetu* (Yellow River chart). These were not applied directly to physical spatial models, but the *Luo Shu* was regarded as the original source of the magic square model and were also interpreted as the base to all *tu*, the term applied to all forms of Chinese graphic representations. Accordingly, the *Luo Shu* were at the core and the predominant source of what the ancient sage kings defined as the order of the world. Again, however, as there are only a few examples remaining of such concepts, and only from the post-Song era, their precise cosmographic form is widely debated.

¹⁵⁵ Gordon, 1971, 218.

¹⁵⁶ *Ibid.*, 218.

¹⁵⁷ *Ibid.*

Pre-modern China did not have the same preoccupations with the cosmos as the West. John B. Henderson in his study, “Chinese Cosmographical Thought: The High Intellectual Tradition,” states “that China comprised ‘all under heaven’ (*tianxia*)” may have been a reason for not being concerned with cosmography and with representing the world as whole.¹⁵⁸

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Figure 20. Chonhado World Map (Map of All Under Heaven).
Circa 1700 Woodcut. A Korean version of the vision of the world as a disk which referred to Daoist and Confucian traditions, as well as Chinese geographical ideas. (Source: Ehrenberg, 2006, 124.)

Traditional Chinese cosmography typically took the form of charts and represented more of a localized view of the world. Elements represented on the charts included agrarian concerns, architectural features, and urban dimensions of cities, but not the shape of the world nor its imagined extents. The charts did, however, presuppose connections between localized issues and the macrocosm of the world but they were not often graphically represented. Textual accompaniment to Chinese cosmographical

¹⁵⁸ Henderson, John B. 1994. "Chinese Cosmographical Thought: The High Intellectual Tradition." In *The History of Cartography: Cartography in the Traditional East and Southeast Asian Societies*, edited by J B Harley and David Woodward, 202-227. Chicago: The University of Chicago Press Ltd, 203.

charts was also vital from the Song era (960-1279).¹⁵⁹ Graphic depictions were subordinate to narrative. The Book of Changes or *Yi jing* implies perhaps earlier cosmographical works had a different emphasis between text and drawings, yet as there is not sufficient evidence remaining to substantiate such implications it has not been confirmed by scholars.¹⁶⁰ Due to the lack of physical artefacts from the pre-Song era, Henderson states that the majority of his study uses verbal accounts of Chinese cosmographical thoughts in the Han era (206 B.C.- 220 A.D.).¹⁶¹

The conventional cosmographical model of the Han era was a square divided into nine equal smaller squares, presenting a three by three grid. This diagrammatic form was the base for many architectural, agricultural, political, astronomical, and urban concepts and plans. Henderson suggests, “[t]his form was as least as important and ubiquitous in pre-modern Chinese cosmography as the circle was in Greek, medieval European, and Islamic cosmography.”¹⁶² The basic square divided in this way represented the basis to all order and proportion for Chinese culture during the Han period. The rectilinear geometries were also a feature of earlier dynasties than the Han, as artefacts such as pottery display rectangles as decoration. Yet the square cosmographical charts with a clear systematic division of space did not appear until the Han era. The origins of the magic square system are not known by Sinologists, and possibilities include that an ancient sage king, Yu the Great, saw the pattern on a back of a turtle and thus adopted it from the natural world.¹⁶³ Most notably, however, the magic square was conceived for practical applications rather than just an image of a cosmographical view of the world. It was envisaged that an arrangement of proportion and order would benefit human experience and society through architectural, medical, and agrarian practices. The applications in agriculture included the “well-field system” and for the architectural sector there was the “nine-palace formation,” the former being to ensure good harvests and the latter to maintain

¹⁵⁹ Henderson, 1994, 203. See also Sullivan, Michael. 1984. *The Arts of China*. 3 ed. Berkeley and Los Angeles: University of California Press.

¹⁶⁰ Ibid.

¹⁶¹ Ibid. Schuyler, Cammann. 1961. "The Magic Square of Three in Old Chinese Philosophy and Religion." *History of Religions* no. 1 (Summer 1961):37-79.

¹⁶² Ibid. The magic square also formed a basis for geo-political landscapes within China, dating from the Han era. A series of nine regions based on the eight cardinal directions and the centre, were documented in a first century text, *Li ji* (Records of rituals) which states “within the four seas, there are nine regions, each a thousand *li* squared.” Therefore, there was the central royal capital surrounded by concentric squares of regional areas, a structure that formed a complete geometrization of the classical urban Chinese landscape in the Han period.

¹⁶³ Ibid., 204.

harmony in the imperial kingdom.¹⁶⁴ The well-field system was the basis for groups of eight families to have a portion of land each with the middle portion of land assigned as a shared allotment for the benefit of all. Throughout Chinese history, Confucian scholars have called for its reintroduction on the basis of its being central to social rights, as everything is measured and distributed equally. The well-field system also became a feature of Japanese agricultural arrangements.

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Figure 21. Diagram of nine units that form a well.
This diagram shows the nine-palace version of the well-field. (Source: Henderson, 1994, 204).

There was also another conceptualization of cosmographical concepts to achieve what was known as the “field-allocation,” or *fenye* system, which achieved more of a macrocosmic view. Heaven and earth were connected, whereby each of the nine regions related to a celestial field. By the Han era, the *fenye* system had developed into an astrological process whereby regions on earth became directly related to regions within the heavens. Initially, nine regions related to nine celestial fields, but later Han documentation suggests there was an extension of astronomical data, with “twenty-eight lunar lodges, the twelve stations of the Jupiter cycle, and the nine paths of the moon.”¹⁶⁵ The implications of these astronomical regions in relation to earthly regions, meant measurement of the boundaries of each were required. As in the other

¹⁶⁴ Henderson, 1994, 204-205.

¹⁶⁵ *Ibid.*, 209.

cosmological systems mentioned, *fenyue* also had practical applications. Any untoward changes in the cosmos, such as the appearance of comets, meant there were direct consequences on earth. For example, the region relating to the celestial territory containing the comet might signal the end of political control by that leader.

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Figure 22. Diagram of the field allocation of twenty-eight lunar lodges.
The main purpose of this diagramming is for astrological purposes. (Source: Henderson, 1994, 208).

Feng Shui: Cosmography and Cartography

An aspect of cosmography in ancient China was geomancy, or *feng shui* (literally wind and water). Two schools of thought in geomancy developed in the Song era, the first being closely aligned with cosmological concepts such as *yin* and *yang* and *wuxing* (five phases), while the second was associated with topographical nature of the landscape.¹⁶⁶ Chinese cosmographical influence extended most particularly to the realization of urban forms around the end of the Han era. Classical Beijing was built around cosmographical concepts, such as the alignment of its rectilinear plan, its walls, and the gates within its walls with the points of the compass.¹⁶⁷ Adjustments to

¹⁶⁶ Henderson, 1994, 219. See also Meyer, Jeffrey F. 1978. "Feng-Shui of the Chinese City." *History of Religions* no. 18 (November 1978):138-55.

¹⁶⁷ *Ibid.*, 211.

the ideal city plan were made based on geomancing requirements, accommodating the existing built structures, as well as allowing for numerous topographical limitations. Chinese urban models based on cosmography extended also to pre-modern Korea and Japan. The former school of thought depended on a geomantic compass, whose readings were utilized in relation to applicable measurements of space and time.

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Figure 23. An image of a geomantic compass.
“The innermost circle is called the ‘celestial pool’ and is divided in half by the magnetic needle.”
(Source: Henderson, 1994, 217.)

All of these readings and analyses, leading to a form of mapping and layout of site and buildings, were the specialisation of a professional geomancer. The latter approach relied less on issues of the cosmos and more on topological characteristics of the terrain in question. Practitioners of this school made schematic topographical mappings of the site, which also indicated where the main energies or *qi* of the landscape lay. Metaphors were also drawn between features of the landscape and

mythical characters, parts of the human body as well as celestial regions. Henderson states,

Cosmologically, the *feng shui* spot is the meeting place of the heavenly *qi* and the earthly *qi*, where the *yang* and *yin*, or male and female influences, are most closely intertwined and most intensely concentrated.¹⁶⁸

Geomancy and landscape painting may be related to the development of cartography in China. However, a conflict between principles of geomancy and pure geometric cosmography, in achieving a completely conformist classical imperial Chinese city, existed.¹⁶⁹

In summary, pre-modern mappings aligned sacred and profane worlds, and in many graphic interpretations of these spaces there was little distinction between physical and spiritual worlds. Cosmographical and cartographical representations were typically accompanied by text and narrative to explain trajectories of existence for peoples of pre-modern societies. These maps convey sets of relations and values pertaining to pre-modern peoples discernibly different to modern mappings.

¹⁶⁸ Henderson, 1994, 217.

¹⁶⁹ Ibid. See also Smith, Richard J. 1991. *Fortune-Tellers and Philosophers: Divination In Traditional Chinese Society* (Westview Special Studies on China): Westview Press.

Chapter 2: Forms of Pre-modern Mapping

Pre-modern Southeast Asian cartographic and cosmographic practices were heavily influenced by their trading partners in the region, and to a lesser extent the Middle East and Europe. This chapter shows that the scope of different mapping genres, which have surfaced in the Southeast Asian region, was due to its rich and diverse cross-cultural interactions. The commonality derived from this broad spectrum of types seem to relate to issues of quality and meaning brought to the lives of peoples who witness or utilise the teachings of these often elaborate representations. As Schwartzberg notes, Yuan shi (History of Yuan), an official Chinese history compiled in 1369-70 by Song Lian and others, writes about a military campaign in Java in the thirteenth century whereby one of the leaders, Raden Vijaya, of the state of Kediri, in surrendering the battle handed to the enemy a map and census record of the invaded country.¹⁷⁰ This is the first written notice known of the existence of a Southeast Asian map. On the whole, the surviving corpus of pre-modern Southeast Asian maps is slim. The limited remaining collections does not necessarily equate to a lesser importance or degree of use of Southeast Asian mappings, but rather that climatic conditions, mapping materials, and techniques placed restrictions on their longevity.

From extant accounts by travellers, traders, and religious pilgrims, it is evident that Southeast Asian mappings provided a valuable socio-cultural component to everyday life. Thomas Suárez, historian and antique map collector, divides Southeast Asian maps into four general categories:

Those which are purely cosmographic (in this context meaning ‘metaphysical’ or ‘spiritual’) in nature, or otherwise non-geographic.

Those which symbolically represent actual geographic features for religious or cosmographic purposes.

Those which attempt to record true geography, whether by report or empirical observation.

Itineraries, which might be written, memorized, or committed to song, that served to construct a mental image of time and space, direction and position, topography and landmarks.¹⁷¹

¹⁷⁰ Schwartzberg, Joseph E. 1992. "Introduction to South Asian Cartography." In *The History of Cartography: Cartography in the Traditional Islamic and South Asian Societies.*, edited by J. B. Harley and David Woodward, 295-331. Chicago: University of Chicago Press Pty Ltd, 697.

¹⁷¹ Suárez, 1999, 33.

These categories, although not completely distinct, nor universal, demonstrate how maps and mapping processes were central to Southeast Asian life experiences from the magical to the mundane.¹⁷² The following discussions focus on some key examples of these maps in order to show the qualities they brought to quotidian existence for peoples of the region. The holistic nature of Southeast Asian methods of historical mapping practices, from the making to the realization of the map, depict rich socio-cultural, religious, and geographical understanding and visualisation.

2.1 Styles, Techniques, and Material in Mapping

Styles, techniques, and materials of Southeast Asian maps were highly variable. Due to the predominant influences of traders from India, China, Europe, and the Middle East craftsmen, traditions, and religious practices also made their way to the region. As a result of their preoccupation with imaginal, cosmological, and religious realities, pre-modern Southeast Asian maps were characterized by their lack of precision and accuracy. The key pragmatic traits which differentiated Southeast Asian maps from their European counterparts included, firstly that they were almost never drawn to a recognisable scale, secondly that their projection differed, thirdly, that they lacked the geographic grids of latitude and longitude, and fourthly that orientation varied by region. Also legends were not indicated, and dates of production were not stated.¹⁷³ The names of map maker/surveyor/artist were also typically omitted and almost no maps demonstrated neatly constructed lines.¹⁷⁴

Style of an Ideal City

Early Vietnamese mapmakers were influenced by ancient Chinese cartography, whereby map makers were employed to create a ruler's ideal for a city or kingdom. Therefore, graphic depictions presented to the king ranged from future expectations

¹⁷² Suárez, 1999, 33. See also Hall, Kenneth. 1985. *Maritime Trade and State Development in Early Southeast Asia*. Honolulu: University of Hawai'i Press.

¹⁷³ Schwartzberg, Joseph E. 1994e. "Conclusion to Southeast Asian Cartography." In *History of Cartography: Cartography in the Traditional East and Southeast Asian Societies*, edited by J B Harley and David Woodward, 839-842. Chicago USA: The University of Chicago Press, 841. Burmese maps used grids corresponding to pre-modern Chinese models. "...conventional map signs such as for settlements, rivers, coastlines, and lakes [were] almost always drawn planimetrically, whereas others, especially for mountain and hill ranges, vegetation and prominent edifices (stupas, temples, monasteries, etc) [were] generally drawn in frontal perspective."

¹⁷⁴ *Ibid.*, 841-2.

for his sovereignty to examples of sheer “mythology, fantasy, or forgery.”¹⁷⁵ The mapmaker was typically a painter, skilled in both calligraphy and poetry. They were encouraged to maximise artistic license and to manufacture maps for purposes, be it military, mercantile, or glory.¹⁷⁶ In essence, throughout the mapping process there was little emphasis placed on conveyance of a sense of truth or reality.

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Figure 24. This diagrammatic representation of an ideal Chinese geometry.
The incorporation of the magic square is also significant. (Source: Henderson, 1994, 211.)

Peoples, from caravaners to pilgrims, travelled without conventional maps, instead utilising their experiences, as a type of narrative geography, to negotiate landscapes.¹⁷⁷ Typically, from personal observations, conveyed through spoken words, songs, or poetry, information about places was often colourfully distributed. This method of translation extended ideas about a place beyond the notions of mere geography. Verbal mappings were one of the early mapping methods, which produced associations with place that were ideologically and imaginatively removed from our contemporary notion of a map.

¹⁷⁵ Steinhardt, 1998, 9.

¹⁷⁶ Ibid., 16.

¹⁷⁷ Suárez, 1999, 31.

Cosmological City Style

Pre-modern Asians had differing concepts of reality between cultural groups. For example, there was not a shared understanding of critical concepts of boundary and territory. For Southeast Asians the centre-periphery notion of a kingdom was central to the understandings of territory, compared with Europeans concepts which considered territory as bounded space demarcated by borders. The *mandala* or “contained core,” represented a sacred schematic of the cosmos in Indian philosophy.¹⁷⁸

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1. 2.
Figure 25. (1) **Thai Cosmos with sixteen lower heavens rising above Mt Sumeru.**
(Source: Suárez, 1999, 35.)
Figure 26. (2) **Burmese Palm Leaf Cosmography.**
(Source: Schwartzberg, 1994b, 724.)

The transmigration of the soul, from an earthly existence to a continual cycle of rebirths, which was where transcendence occurred, a realm characterised by a vertically organised hierarchy of earth and series of heavens. This meant that souls were able to locate themselves within the universe, until they find their *nirvana* (Buddhism) or ultimate release from this cycle.¹⁷⁹ Cartographically, the visual representations of this process were typically in two-dimensions but revealed a multi-dimensional universe, demonstrated expansively in the vertical plane. These maps displayed the passage of souls as well as the passage of the universe which moved through similar phases. Time from a spatial dimension as well as temporal dimension addressed very large periods. For example, a Brahman was expected to live for over

¹⁷⁸ Hall, 1985, 9. See also Lach, Donald F., and Edwin J. van Kley. 1993. *Asia in the Making of Europe, Volume III. A Century of Advance. Book Three Southeast Asia*. Vol. III. Chicago and London: The University of Chicago Press.

¹⁷⁹ Schwartzberg, 1992, 334.

300 million years and, therefore, time and space had particular relevance for each ethnic group.

Natural features of each cosmos were often portrayed in mappings. Often trees, of outstanding proportions became synonymous with particular continents, and located centrally in space, such as the *jambū* tree of India.¹⁸⁰ Shapes were also incorporated into cosmography to convey mountain ranges, which were represented by concentric rings or wedge-like forms depending on the view captured by the cosmography. The universe and earth was typically centred on an axis where Mount Meru, or Mount Sumeru (in the case of Southeast Asian examples), was at the centre of existence. The characteristics of this sacred mountain varied dramatically between each of its graphic cultural interpretations, but in all instances it was deemed physically too high for any human to ever attempt to reach its peak.¹⁸¹ Unlike other cosmological mountains, Meru was conceived as having distinct layers where different supernatural existences may be accommodated.

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Figure 27. Northern Thai Itinerary Map.
Consisting of an itinerary relating to religious sites as well as Indian cosmography. (Source: Suarez, 1999, 26.)

Itinerary Mapping Styles

Another method used was the graphic itinerary, which explained routes for traversal between holy spaces and temples. The breadth of religious influences to the region

¹⁸⁰ Schwartzberg, 1992, 335.

¹⁸¹ *Ibid.*, 335.

came to Southeast Asia through many different avenues over time, with each set of religious teachings never being replaced in totality. Instead, the previous religious teachings were built upon to reflect new belief systems. The graphic translation of layered religious ideas was demonstrated with icons, statues, and textual mantras infiltrating representations of space.¹⁸²

Techniques and Materials

Common processes of production in map-making included the use of paper, silk, wood, and stone to convey mapped information. In East Asia, silk was used as a map media due to its elegance, resilience as a material, as well as its weightlessness. On the other hand, it was very expensive to produce and a product sought after by painters and calligraphers. Thus it was abandoned in the mass production of Chinese maps.¹⁸³

Stone was also a common medium, as it was a permanent means of recording information. Stone mappings were usually undertaken in three stages: firstly with the draft of the mapped information on another surface, such as paper or bark, secondly the transfer of drafted information to the stone surface, and thirdly the chiselling of the mapping into the surface as a permanent record.

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Figure 28. Parts of a long itinerary map from Southern Thailand.
On a paper background but sectioned in a concertina format. (Source: Suárez, 1999, 39.)

¹⁸² For example, even though there was a sense of the sacred and the profane, these notions were conceptually blurred and not endemic to one particular religion.

¹⁸³ Yee, D K, Cordell. 1994. "Chinese Cartography among the Arts: Objectivity, Subjectivity, Representation." In *History of Cartography: Cartography in the Traditional East and Southeast Asian Societies*, edited by J. B. Harley and David Woodward, 128-169. Chicago: University of Chicago, 137.

The latter stage involved two processes, the first being the outline chiselling followed by the final incision of the image and text. The stone image resulted in what is coined as “intaglio,” producing a white-on-black image. Paper was utilised to make a reproduction of the image by being pressed over with an ink-soaked cloth onto the stone engraved surface. These techniques, along with reproducing images from woodblocks, stem from eighth century image production in China. By comparison to the production of an image using stone, wood block carvings were known as “carved in relief,” resulting in the image being black in outline on white paper.¹⁸⁴

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Figure 29. **Detail of a map of Chang’an, 1080.**
Photograph of the map courtesy of Cao Wanru, Institute of the History of Natural Science, Academia Sinica, Beijing (Source: Yee, 1994, 140.)

Each of these techniques served specific purposes in that paper reproductions were intended for temporary use, and the method of reading was to be horizontal. By comparison stone carvings were intended for an inter-generational audience and read

¹⁸⁴ Yee, 1994, 137. See also Xiacong, Li. 2004. “A Descriptive Catalogue of the Traditional Chinese Maps Collected in the Library of Congress.” edited by Library of Congress: The University of Virginia.

vertically, so the reading, the message, and the technique of creation were geared to a different point of view. For the Chinese, the latter form of mappings, recounted stories of cultural heritage, and such maps were important transmitters of information, and the physical labour and dedication involved in creating such maps reflected how highly regarded and necessary the message was for future Chinese generations. Stone blocks were too weighty to transport, and rubbings of their maps was time-consuming and more complex than reproduction by woodblocks

Woodblocks enabled a greater level and ease of reproduction due to their portability. They were also relatively simple to alter with the insertion of wood plugs to reconstruct and amend the image. Wood was in good supply and therefore not expensive. The initial intention of a woodblock mapping was not to convey the detail and fine line-work of their stone equivalents, nor did they have the compositional attention to detail in the quality of drawing or image layout. Often, woodblock mappings relied upon a textual backdrop to convey the full extent of the message.

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Figure 30. Woodblock map of the seat of local government at Jizhou.
In present day Hebei Province, reproduction courtesy of the Harvard-Yenching Library, Harvard University Cambridge. (Source: Yee, 1994, 142).

Techniques of mapping and painting in pre-modern East Asia have been considered historically comparable. Generally, however, there has been a lack of map artefacts to draw a complete study of comparison. Since the discovery of some Han artefacts, the comparison between painting and mapping has been established through the notion of geography. Yee suggests, “it is perhaps connected etymologically to land configuration.”¹⁸⁵ Landscape painting has been considered in China, since around the Song dynasty, as one of the most important genres of painting. Thus it is interesting and significant to note that maps by renowned artists Zhang Heng and Pei Xiu feature in Zhang Yanyuan’s catalog of paintings of the Tang period. There is one style of painting namely, *jiehua*, which translates as ruled-line painting that can be closely associated with the drafted technique of map-making. It is the only traditional style of Chinese painting, which utilises additional tools to the brush. For example, artists of this genre used calibrated rulers as well as drafter’s squares, compasses, and other instruments, which aided accuracy in surveying and building measurements, such as a plumb line. This style of drawing seemed to be most common in the Song period, although using rulers and compasses for the purpose of recording types of representations to scale dates back to antiquity.¹⁸⁶ This technique did rely on producing images to scale, so it usually meant pictorial scale was prioritised over the natural scale of depicted objects. The intent of the representation was to alert the viewer to an emphasis of an object within the design of the picture, and if that were at odds with the natural dimensions of the object, it was typical practice to sacrifice the realistic dimensions. This attitude of Chinese map-makers to prioritising the pictorial nature of their compositions over the natural continued into the Ming and Qing dynasties (1644-1911). Yee notes that there is a broad similarity between the way Chinese painters and map-makers conceived of notions of space but on the other hand, such views were distinct from European cartographers of the period.

The experience of space was dynamic and fluid, intimately related to one’s experience of time. Space, emptiness, was regarded almost as an entity in itself—as such it was boundless and unlimited. Objects could be measured and defined; space could not be so fixed, since it changed with vantage point and time. As a result, no abstract geometrical system governed

¹⁸⁵ Yee, 1994, 139. See also Soper, Alexander C. 1941. "Early Chinese Landscape Painting." *Art Bulletin* no. 23:141-64; Acker, William Reynolds Beal. 1954-1974. *Some T'ang and Pre Tang Texts on Chinese Painting*. Translated and annotated by William Reynolds Beal Acker. 2 vols. Vol. 2.1. Leiden: E. J. Brill.

¹⁸⁶ *Ibid.*, 142. See also Sullivan, Michael. 1962. *Birth of Landscape Painting in China: Volume 1 of California studies in the History of Art*. Vol. 1: Routledge Kegan & Paul.

space, and points within it were not definable or delimitable in any absolute terms...[whereas the European view of space included]—a conception that defines space abstractly, as an entity that is bounded static, and therefore organisable and measurable.¹⁸⁷

During the Renaissance of Europe where a diminishing ground plane was utilised to convey perspective in a static composition, the comparative dynamism of Chinese maps was achieved by multiple as well as variable view-points, in addition to several ground planes incorporated per object. This enabled the portrayal of a sequence of scenes within one scroll, in what we may understand as an action cartoon sequence, each image was revealed to the viewer as the scroll was unravelled.¹⁸⁸

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Figure 31. A Jiehua which illustrates a dragon boat race.
Also translates as A Ruled-Line Painting, on the Longchi River, 1323. (Source: Yee, 1994, 138-9.)

According to an anthology of maps produced by the court of the Kangxi emperor (1654-1722), what defined a geographic map was an image which recorded a real place as opposed to an imaginary one. Therefore a landscape painting assumes the artist greater artistic license than the map-maker would otherwise possess. The degree to which each artist is permitted to stray from what is considered “reality” is not at all clear in such explanations of each craft.¹⁸⁹ A geographic picture *tu* in Chinese, as well as the term *dili tu*, which refers to an additional definition of traditional Chinese cartographic practices, there is inferred the idea of “siting.” This notion of siting, or *qi*, suggests a connection between traditional Chinese art and science, whereby “maps often depicted ideal siting configurations.”¹⁹⁰ Therefore the process for the Chinese mapmaker which was recorded in an examination of a study of Qing hydrological works stated,

¹⁸⁷ Yee, 1994, 144-145. See also for the Chinese world view based on organisms, Needham, Joseph. 1954. *Science and Civilisation in China* Vol. 3. Cambridge: Cambridge University Press.

¹⁸⁸ Ibid., 146. See also for European influences on Chinese painting, Cahill, James. 1982. *The Compelling Image: Nature and Style in Seventeenth-Century Chinese Painting*. Cambridge: Harvard University Press.

¹⁸⁹ Ibid., 153.

¹⁹⁰ Ibid., 154. See also Bennett, Steven J. 1978. "Patterns of the Sky and Earth: A Chinese Science of Applied Cosmology." *Chinese Science* no. 3:1-26.

A map, like a painting, is not just a record, but is a product of the mapmakers' intuitive sense of underlying form—mapmaking involves abstraction of external details into something internal, a “mindscape.” A cartographic image can thus represent not only physical appearances, but also the mapmakers thoughts and reflections.¹⁹¹

Therefore the map offered a connection between emotive experience and gaining knowledge about the world. According to Yee, in Chinese aesthetic theory there is a fusion of the physical and psychological worlds. This overlay of the subjective and the objective was accentuated with maps being inscribed with text or poems. The appreciation of the viewer and the reader was on two levels, whereby the map engages at a heightened emotive level when accompanied by text.¹⁹²

2.2 Temporal and Permanent Mapping

Temporal mapping refers to the representation of space which can be based on psychological and non-tangible associations, and may relate to changing conditions under various natural or supernatural influences. Temporal mapping extends to magical beliefs, relations between systems, cosmological, astrological or socio-cultural practices that are open to different modes of interpretations. Temporal mapping, in the context of influences from China, included notions of ideal cities. Once these conceptions were realised on the ground, the urban form did not necessarily reflect original ideal intentions. Pre-modern itinerary mappings constructed sacred space for pilgrims through the linking of religious sites and temples; as such they are another example of temporal, imaginative space, whilst including some permanent built structures in their representations. The transition from temporal to permanent can be seen in the mapping processes of land ownership and accrual through certain socio-cultural customs.

¹⁹¹ Yee, 1994, 158. See also Sullivan, Michael. 1974. *The Three Perfections: Chinese Painting, Poetry and Calligraphy*. London: Thames and Hudson; Fu, Shen C. Y. , and et al. 1977. *Traces of the Brush: Studies in Chinese Calligraphy*. New Haven: Yale University Press.

¹⁹² *Ibid.*, 162-163.

Mapping the Astrological and Imaginal

One example of temporal mapping is the ancient Brahmans conception of the cosmos as a “tortoise,” with “its arched shell the heaven, its flat underside the earth.”¹⁹³ The origin of this concept is dated to approximately mid-first millennium B.C. but it evolved in the later *Purānas* around the sixth century A.D. The concept of the tortoise featured in astrology and also found its way into important works of South Asian astronomy.

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Figure 32. A Puranic conception of divisions of the globe.
Around the mid-first millennium A.D. (Source: Schwartzberg, 1992, 338.)

Although some of the data around this concept was tied to actual geographical knowledge of the time period of its construction, it does not plausibly lead to an explanation of the ancient topography of India, which Schwartzberg pragmatically suggests is due to the dilemma of reconciling the actual geographical map of India by physically placing it into the shape of a tortoise, and subsequently making any sense of it.¹⁹⁴ Pictures of magical animals and objects as well as letters and numbers associated with astrology also guided practitioners of divination. Yet divination in India is still commonly practiced from the perspectives of all socio-economic groups

¹⁹³ Schwartzberg, 1992, 337.

¹⁹⁴ *Ibid.*, 338.

within society. It is usually accompanied by directions of almanacs “containing diagrams with terrestrial spatial referents.”¹⁹⁵

On the whole there appears to be no clear delineation between imaginative, conceptions and reality in Indian cosmographies. Although it was understood between Jainism, Buddhism, and Hinduism that earth was only a small part of more complex understandings of the greater universe. However, details and ideas about these remote other worlds were represented with a degree of vagueness.¹⁹⁶

Jains’ conceptions of their universe were far more complex than Hinduism, although they shared some similarities with vertical depictions of spaces, such as hells, heavens, earth, and netherworlds. Series of universes only filled a portion of cosmic space for the Jains. Void-space within the universe was critical to the Jains as both matter and souls were deemed impenetrable. According to the Jains, our universe was composed of a series of netherworlds above and below the world of man in Jain philosophy. Each of the heavens and hells within the universe had its own peculiarities, which meant some were envisaged in the form of a figure of a man or woman.¹⁹⁷

Mapping Miniatures: Temporal and the Natural

Vietnamese mappings predominantly adopted the style of Chinese cartographical traditions.¹⁹⁸ The Vietnamese word for “map” is *đồ*, meaning “illustration, drawing, plan and by extension map—*bản- đồ*.”¹⁹⁹ However, the terminology closest to describing Vietnamese spatial representations is the term for country, “*non-nuớc*” which equates to “mountain and water.”²⁰⁰ Mountain and water have symbolic qualities for the Vietnamese, in that they are used to convey temporal or supernatural

¹⁹⁵ Schwartzberg, 1992, 339. See also Sircar, D. C. 1971. *Studies in the Geography of Ancient and Medieval India* India: Motilal Banarsidass.

¹⁹⁶ Ledyard, Gari. 1994. "Cartography in Korea." In *The History of Cartography: Cartography in the Traditional East and Southeast Asian Societies*, edited by J. B Harley and David Woodward, 235-345. Chicago: University of Chicago Press, 341.

¹⁹⁷ *Ibid.*, 342.

¹⁹⁸ Whitmore, John K. 1994. "Cartography in Vietnam." In *The History of Cartography: Cartography in the Traditional East and Southeast Asian Societies*, edited by J. B Harley and David Woodward, 478-508. Chicago: The University of Chicago Press, 479.

¹⁹⁹ *Ibid.*, 479.

²⁰⁰ *Ibid.* See also Taylor, Keith Weller. 1983. *The Birth of Vietnam*. Berkeley and Los Angeles: University of California Press.

stories as well as portray natural dimensions of landscape. Both magic and fertile stories are essential to Vietnamese conceptions of themselves in the world.

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Figure 33. Vietnamese Cosmography, indicates patterns of water and mountains.
This drawing is of a miniature garden in the temple of *Trần Vũ*, Hanoi in the 1940s which reflects stories of pre-modern cosmographies. (Source: Whitmore, 1994, 480.)

Ancient Vietnamese temple complexes, house miniature ponds and mountains, which are intended to act as scaled-down representational models of the universe. Tenth- and eleventh-century royal birthday rituals entailed mountains built out of bamboo, called “mountain of the South, *Nam Sơn*,” being cast out on a boat in the middle of the river.²⁰¹ There were five peaks with one central (possibly Mount Meru), and amongst the four outer peaks was coiled a dragon. Similarities may be seen with cosmic ideas represented in Burmese and Cambodian temple complexes.

Mapping the Seen and the Unseen

The religious nature of pre-modern conceptions of space meant understandings of the world extended from the seen to the unseen. The seen world was available to everybody, whilst the unseen was that, in which one must believe, and strive to learn about through the teachings of the Prophet, and abiding by the Quran. As Samer Akkach states for the case of Islamic teachings,

²⁰¹ Whitmore, 1994, 479. See also SarDesai, D. R. 1994. *Southeast Asia Past & Present*. Boulder and San Francisco: Westview Press.

The Quran stresses this polarity, describing God as “the Knower of the unseen and the seen” (13:9) and to him “belongs the unseen of the heavens and the earth” (16:77). The Quran repeatedly reminds the Muslims that no one knows the unseen except God: “And with him are the keys of the unseen. None but he knows them” (6:59).²⁰²

The unseen is the realm of the spirits and thus an imaginal space, whereas the seen is part of the natural world where understanding and perception is achieved through the senses. Analogy and metaphor are essential for teachings about the spiritual world, and key to connecting the divine with modes of human existence.²⁰³ Mappings and cosmographies of pre-modern Islamic world gave context to spiritual imaginings as well as connecting these ideas to the human existence on earth.

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Figure 34. Islamic World Map Circa 1086.
From Ibn Al-Wardi’s – “The Unbored Pearl of Wonders and the Precious Gem of Marvels.”
(Source: Ehrenberg, 30.)

Ibn Hawqal’s world map in the eleventh century, for example, shows Ptolemy’s earthly world as a circle surrounded by mountains, and the sea is enclosed beyond this circle. The map has the Ka’ba and Mecca at its centre, which reflects the religious view of Islam at the time. South is oriented at the top of the map. As Mecca and

²⁰² Akkach, 2005, 29.

²⁰³ Ibid.

Medina were considered the centre of the religious world, there were no lands indicated beyond this sphere.²⁰⁴ Although a highly stylised representation of predominantly the Islamic world, with major cities acknowledged with circles and mountains at the periphery in green, with rivers in blue except for the Nile and another major tributary shown in red, it demonstrates the shift from the temporal, unseen notions of spiritual lands of Mecca, to giving the town and space a physicality on the map.

Mapping Ownership

Mapping was not always considered a literal translation of a bounded space into a representation of that reality. In the following case, mapping is seen more as a process of establishing space through taking physical ownership over it.

In early Muslim towns, ownership of land played a key role in determining one's allocation of space. There was a series of strategies one had to carry out to establish ownership of land in particular in the early Muslim garrison towns. The first stage was occupying the land; the second was passing it on to another prospective owner through a sale, or by gift of the land parcel. Then the final act of ownership was to pass it onto the next generation through inheritance.²⁰⁵ The occupation of land in the establishment of early towns was the most common form of determining ownership as land was typically plentiful and therefore caused little dispute as to whom was the entitled landholder. However, as townships expanded the system described above was the source of debate amongst Muslim jurists in the town. Land which was not claimed or used was designated and believed to be "dead" (*mawāt*) land. Such land parcels were defined in this way if no building or cultivation had occurred, no burials had been undertaken, nor were there any common uses, such as pasture for the village animals or source of materials such as timber.²⁰⁶ In due course, these lands could be revived by cultivating or building on it, and the people responsible would subsequently become its owners.

²⁰⁴ Ehrenberg, 2006, 31.

²⁰⁵ Akbar, Jamel. *Khatta and the Territorial Structures of Early Muslim Towns*. Dammam, Saudi Arabia: King Faisal University, 22. [unpublished]

²⁰⁶ Akbar, unpublished, 22-23. See also Hakim, Besim Selim. 1986. *Arabic-Islamic Cities: Building and Planning Principles*. 1st ed. London: Kegan Paul International Ltd. Original edition, 1979. Reprint, 1988.

Demarcation (*ihtijār*) of land parcels or allotments was one method of reviving “dead” lands. This process referred to the “marking out” of a piece of land either due to the claiming of a land parcel by an individual or it being bestowed by a ruler, which effectively entitled a person to use the land rather than owning it. This land was entitled for use for three years by those given land in this way. Arabic words associated with these practices often had numerous meanings, and therefore historically have sometimes been interpreted out of their intended context. Jamel Akbar suggests “*khatt*” is one such word, which has complicated and confused historians’ understandings of this process of land ownership. *Khatt* literally translates as “line.” Yet a fourteenth century lexicographer, Ibn Manzur, states the definition of the noun *al-khattu* is equivalent to the “rectangular shape of a thing,” such as the rectangular shape of an allotment of land, as well as its meaning “road.”²⁰⁷ There is also no direct translation into English for the verb “*khatta*.” It can refer to marking out, outlining with the use of walls, straight lines and making rectangular things. In the majority of cases *khatta* precedes the stage of building on the land. The term *khittah* suggests the notion of marking out a line with the intention of occupying a lot of ground, which in effect becomes the site, which is also known as the “pitch or holding.” This definition combines ideas around the verb *khatta*, implying action, and the noun *khitta*, known as site development.²⁰⁸ Understandings of the terms are important when differentiating between who made the decision to undertake the demarcations. For example, *khatta* implies the party decided for itself, whereas *aqta’a*, means the decision was made by someone else usually a ruling authority.

The *khitta* was typically expanded or increased depending on the size of the tribe being accommodated on the site. In other words it was not used as a fixed planning unit but responsive to the needs of its inhabitants. Roads were usually defined by the central authority, and land between the major roads was not always organised into equal parts. Often tribes would then subdivide their own *khitta* to suit the needs of the tribe. The only imposed external authority criteria was that dwellings should not exceed three storeys for privacy between tribal neighbours.²⁰⁹ Thus within the *khitta* there was sub *khittas* and these degrees of subdivision did not have to receive built

²⁰⁷ Akbar, unpublished, 23.

²⁰⁸ Ibid. Nasr, Seyyed Hosein. 1966. *Ideals and Realities of Islam*. London: George Allen and Unwin Ltd.

²⁰⁹ Akbar, unpublished, 29.

space to their entirety. Open space was accommodated and ownership was not contested as a result. This was also a proviso for the expansion of the *khitta* to include relatives, which may move there from elsewhere. When land allocations did not permit expansion within the *khitta*, some inhabitants would move to join relatives in another location and newcomers would either be welcomed or follow their relatives to new lands. Shared space, which included cul-de-sacs, squares, streets, forecourts were all collectively owned and operated within the *khitta*. Akbar suggests that the morphology of these early Muslim towns then came about by a multitude of decisions made on the micro scale by the inhabitants.

2.3 Textual and Figurative Mapping

Textual and figurative styles of mapping may be seen to overlap with the examples given under other themes of this chapter, and thus is indicative of the nature of the variety of influences and types within the Southeast Asian mapping genre. Textual and figurative geographies constructed space in a highly imaginative way, with the former reliant on written rather than drawn representations, and the latter indicating an imaginative element through its abstraction of figures on the map.

Textual Mapping

The textual recount of Zhang's rhapsody, cited below, contained phrases which may have been informed by maps, or in itself being a non-conventional depiction process: a verbal mapping of place.

The first capital of the Han house
Lay on the banks of the Wei River...
To the left, there are...
The double defiles of the Yao and the Han
The barrier of the Taolin,
Connected by the Two Hua peaks...
To the right, there is...
The gap of Longdi,
Which partitions China from the barbarian lands...
At its southern front, there are
Zhongnan and Taiyi,
Twisting upward tall and stately...

At its northern rear, there are
High hills and level plains...
In the distance, there are
Nine peaks and Sweet Springs.²¹⁰

These descriptions of context placed the reader within the landscape and an imaginational construct similar to the way in which pre-modern maps tends to construct a perception of a place.

The regular appearance in Han dynastic literature of the form of *fu* (rhapsody) was typically related to subjects of a geographic nature. A number of these literary sources also refer to aspects of surveying, forms of measurement, and maps.²¹¹ A direct correlation existed for the Han Chinese, between the rule of the law as well as the notion of measurement, which was also the philosophical position of Han texts. “Law is the rule and measure of the empire, and the level and the plumb line of the ruler.”²¹² In effect, it suggests that a ruler may not be swayed or indicate any bias when passing the rule of the law, just like a suspended plumb line always remains true.

Political and literary uses of maps may be inferred from author Zhang Heng’s rhapsody. In accordance with Zhang’s descriptions of the creation of ancient Chinese cities, the emperor would refer to patterns, or *cai*, of other capitals when organising the physical planning of his own city centre. It is not clear, however, whether those patterns were maps or verbal interpretations of places. There have been discoveries of maps, which have been dated prior to the record of Zhang’s descriptions uncovered in burial tombs.

Figurative Mapping

Urban life and layouts of urban centres feature in other types of Southeast Asian media also considered mappings. The predominant remaining corpus stems from Burmese origins, whereby the maps cover subjects such as neighbouring centres and towns, amongst other topics.

²¹⁰ *Wen xuan*, 4.13a-b; the translation is that of Knechtges, *Refined Literature*, 1:339 (note 13) in Yee, 1994, 132.

²¹¹ Yee, 1994, 131.

²¹² Huainanzi (ca 120 B.C.) attributed to Liu An (d. 122 B.C.), in Huainanzi zhu (Commentary to Huainanzi, third century), ed. Gao You, chp 9, see the modern edition (Taipei: Shijie Shuju, 1962), 140 all in Yee, 1994, 132.

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Figure 35. Detail of a large Burmese Military Map of Ayutthaya.
Pre-modern Thai capital, 1767. (Source: Schwartzberg, 1994c, 797).

One example is a military map of the Thai capital Ayutthaya from 1767, which was painted onto white *parabaik* where a number of features of military purpose are identified. The map was probably obtained for the purpose of invasion, which occurred in the year the map has been dated. Notwithstanding cosmographies this would be the oldest surviving Burmese map. The map contains little detail of the central and most grand compound, which was most likely the palace, but is quite elaborate in its examination of other features, such as temples, residences of high officials, and other administrative buildings.²¹³ The original map is elaborate in style and colourful in its depiction of housing, vegetation, and roads. At the same time the figurative nature of the map has also been exploited in the abundant use of wildlife,

²¹³ Schwartzberg, Joseph E. 1994. "Southeast Asian Geographical Maps." In *Cartography in the Traditional East and Southeast Asian Societies*, edited by J B Harley and David Woodward, 741-827. Chicago: University of Chicago, 798.

ranging from crocodiles to elephants. These figurative elements are exaggerated in scale, if the crocodile is compared with size of the huts, and the vegetation is also highly stylised. To a certain degree, the stylisation suggests an emphasis on features and aspects of the space portrayed on the map. For example, with crocodiles entering the canal of the city, presumably it is a space reserved for marine vessels and as a trading route, perhaps a source of sea/river food, rather than a swimming hole for the locals. In addition, the siting of rudimentary huts on stilts along the canal, suggests a fairly modest element to the population, typically this style of housing in Southeast Asia is consistent with a fishing village.

2.4 Descriptive and Poetic Mapping

Narrative, descriptive and poetic mapping traditions, from East Asian, South Asian, European, and Middle Eastern influences, were another means of prompting imaginal elements to be employed by the reader or observer, within the landscape described. Literary and cosmographical route mappings offered conceptions of space, familiar to local peoples as these ideas formed a part of everyday practices and teachings by community and spiritual leaders.

Literary Mapping

A Chinese poet Tao Qian (365-427), through his poetry, expressed his belief in realities conveyed by maps. This level of detail presented in maps of Chinese antiquity was highly convincing to its readers, and it is understandable that Tian Qian had such conviction as to its representation of a reality. After reading the *Shanhai jing* (Classic of mountain and seas), his first poetry series suggested that after perusing some maps of mountains and seas he felt that he completely comprehended the universe. Tian Qian did not question the accuracy of the illustrations with which he was confronted. An extent of the material in the *Shanhai jing* was typically considered the subject of myth rather than reality. However, the contents of the present text of the *Shanhai jing* elaborated in detail about the hydrography, minerals, fauna and flora pertaining to specific Chinese mountainous regions.²¹⁴

²¹⁴ Yee, 1994, 133.

Literary theorist Liu Xie (ca. 465-522) drew the connection between verbal, literary, and graphic depictions of landscape.

Recently literature has been valued for verisimilitude [*xingsi*]. Writers perceive the true form of landscape, and penetrate the appearance of grass and plants... Thus this technique of apt expression for form can be likened to the ink used for imprinting seals, for an impression made reproduces the seal to the smallest detail without further carving and cutting. Thus we can perceive appearances by looking at words, or know the season from the graphs.²¹⁵

Liu Xie verifies the significance of language in conveying or representing reality, and proposes language offers a “way of seeing.”²¹⁶ The essence of reading the written word in Chinese languages is closely connected to the visual arts through the practice of calligraphy. While Chinese characters are also visual representations of what is being conveyed through written and spoken language. Arts of Chinese poetry, calligraphy, and painting are known as the “three perfections,” where the three disciplines are interconnected.²¹⁷ Learning the craft of Chinese painting required expertise in the art of calligraphy. Proportion and composition as well as the practical skill of coordinating the flow of the brush, were deemed essential attributes of a painter. Language and painting were considered equal in their power to represent both myth and reality, a connection which evolved from the Han period where concepts of representation relate to physical as well as the spiritual and cosmological world. This level of interconnectedness of the Chinese arts extended to the delivery of the physical representation. The notion of “breath-resonance,” or *qiyun*, meant the “breath” was necessary in delivering, via the painted image, the innerness of the represented objects or composition, as well as the innerness of the artist.²¹⁸ The lack of “breath-resonance,” according to some critics, restricted the quality of the work and the ability of the artist to achieve the best possible formal representation. Map-makers also heeded such advice in their compositions.

²¹⁵ Liu, Wexin diaolong yizhu, chap 46. (2:341-45) (note 23) in Yee, 1994, 133-134.

²¹⁶ Yee, 1994, 134.

²¹⁷ Ibid.

²¹⁸ Ibid., 135. See also Cahill, James F. 1960. "Confucian Elements in the Theory of Painting." In *The Confucian Persuasion*, edited by Arthur F. Wright. Stanford: Stanford University Press; Reynolds, Craig J. 1976. "Buddhist Cosmography in Thai History, with Special Reference to Nineteenth-Century Culture Change." *Journal of Asian Studies* no. 35:203-20.

Cosmographical Route Mapping

Burmese cosmographies, dated around the nineteenth century, proposed itineraries for pilgrims as well as informing the viewer of relations of cosmographical principles. For example, they depicted typically the location of twelve places on earth and their relation to Bodh Gaya (the place in northern India where the Buddha obtained enlightenment). The teachings of cosmographical mappings highlighted the blurring of existence between spatial relations on earth with the after-life for Southeast Asian peoples, and how this transcendental path may be achieved followed.

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Figure 36. **Burmese painting of the Cakkavāla.**
19th century Burmese cosmological manuscript (Source: Schwartzberg, 1994, plate 35.)

Although this corpus of maps, geographically, is typically inaccurate, their layouts are by no means arbitrary and their textual accompaniments in the manuscripts indicate intent for their audience to make their way to these shrines in pilgrimage.²¹⁹ Route maps, non-conventional from European understandings, contributed to the spiritual and intellectual knowledge of Southeast Asian inhabitants. The detail of the discussions of the cosmographical manuscripts, according to Thai scholar Sommāi Premčhit, included instructions on how to construct stupas (*chedi*) in the style of the

²¹⁹ Schwartzberg, 1994d, 777.

Mahābodhi Temple at Bodh Gaya in India.²²⁰ The manuscripts contain diagrams, one of which identifies the holy places within proximity of Bodh Gaya. This particular diagram is known as a *yantra* (sacred visual charm) which was supposed to have originated from a powerful ancient monk who was reportedly from India around third century B.C.

The diagram consists of a square made up of nine smaller squares (three by three). Of the nine squares, the middle one represented as the “Buddha’s throne” (at Bodh Gaya), is said to be the “centre of all cities in the universe,” while six others (all but the lower-centre and lower-right squares, which show nothing but “sacred words”) include the names, within triangles, of the principal sacred places in Champu Dipa...associated with the Buddha in their (spatial?) relationship to Bodh Gaya.²²¹

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Figure 37. Portion of Lanna Thai Map.
Believed to relate to places of pilgrimage visited by a long-resident Thai pilgrim in India. (Source: Schwartzberg, 1994, 778.)

There is not any absolute hypothesis about the purpose of this map. Perhaps it is only a mythological itinerary as there is not any consistency between travel distances and actuality. Sometimes the number of hours or days to reach a sacred site is accurate, and alternatively for other sites the time to achieve traversal is inaccurate, and there is no reasoning evident as to why or how this is so. There is also a suggestion that this was the itinerary of Buddha himself. These inconsistencies are not necessarily the problem of the map-maker, but may be the lack of contextual knowledge in

²²⁰ Schwartzberg, 1994d, 777. See also Brown, Robert L. 1988. "Bodhgaya and South-east Asia." In *Bodhgaya: The Site of Enlightenment*, edited by Janice Leoshko, 101-24. Bombay: Marg Publications.

²²¹ *Ibid.*, 777 & 781. Acknowledging Thongchai Winichakul and David Wyatt of Cornell University's translation of Thai scholar Sommāi Premchit's work.

interpretation. The difficulties of interpreting such historical artefacts required a large amount of conjecture to establish meanings.

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Figure 38. Small Portion of a very long Thai Route Map.
An area between Nakhon Si Thammarat and Songkhla on the Malay Peninsula. (Source: Schwartzberg, 1994c, 784).

The map above is known as “Small Portion of a very long Thai Route Map of an area between Nakhon Si Thammarat and Songkhla on the Malay Peninsula.”²²² Notably the town named in the title does not appear within the extents of the map. The map dates from late seventeenth to early eighteenth century, and it is part of text referring to the Malay Peninsula, an area in the southern part of Thailand. This route map is oriented to the east and toward the Gulf of Thailand, and this section of the map was part of forty folios, of which there were possibly more. The route indicated is a combination of both a land and sea journey. One of the main intentions of the map was to indicate the rice fields, which relate to the temple Wat Phra Kho and those which belong to civilians. The dominant features of the map include temples, *chedis*, as well as other religious buildings. Also identified with ovals and squares are presumably a number of small and large settlements *en route*. As most of these lie in proximity of roads, yet sometimes what appear to be roads may also be streams or rivers with sporadic images of crocodiles and fish indicated. Vegetation is also indicated but as is often the case with Burmese maps, according to Schwartzberg, the variety of vegetation is not necessarily representative in the figurative styles adopted by the map-makers. Trees are usually indicated individually rather than as a forest and often are laden with fruit, with the odd appearance of a monkey or bird.²²³

²²² Schwartzberg, 1994d, 784.

²²³ *Ibid.*, 785.

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Figure 39. Shan map relating to a border dispute. Dispute between (British Burma) and China along the Nam Mao River.” By permission of the Syndics of Cambridge University Library. (Source: plate 40 in Schwartzberg, 1994.)

Another route map titled here as “Shan map relating to a border dispute between (British Burma) and China along the Nam Mao River” dated around the mid-nineteenth century, where the text is in Chinese Shan, but there are other inscriptions on the map that are in Burmese.²²⁴ It is found in the Scott Collection and covers an area extending approximately fifteen miles west-southwest direction to east-northeast direction, on either side of the Nam Mao River.²²⁵ The yellow section and the northern part of the map, which is situated in China reads “all this is Mōng Mǎo territory,” whereas the red section which is located as part of Burma reads, “[t]he red is all Namkhan territory.”²²⁶ The influence of the British desire for identification of territorial control was expressed in the plethora of colours, which were also indicated on this map. Schwartzberg states that the map is relatively accurate in its conveying of geographical entities such as the river-scape, as the modern version of the Nam Mao River and its path compares very similarly to the nineteenth century map.

The only examples, which Schwartzberg could source and which relate to the genre of geographical maps, are some images which have been compiled on bamboo.²²⁷ These

²²⁴ Schwartzberg, Joseph E. 1994c. "Cosmography in Southeast Asia." In *The History of Cartography: Cartography in the Traditional East and Southeast Asian Societies*, edited by J B Harley and David Woodward, 725-740. Chicago: University of Chicago, plate 40.

²²⁵ Fifteen miles equates to approximately 24.1 kilometres.

²²⁶ *Ibid.*, 794.

²²⁷ *Ibid.*, 795.

are only some of the artefacts which have been obtained from West Malaysian tribes known as the Negrito tribes. One of the tribal groups, called the Sakais, who survived on fishing, hunting, and gathering, as well as supplementing partially with slash and burn subsistence, produced engravings on musical instruments or *tuang-tuang*.

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Figure 40. Sakais engravings on musical instruments or *tuang-tuang*. A tribal piece from West Malaysia with cartographic elements. (Source: Schwartzberg, 1994c, 796).

Ceremonies were conducted using the magical powers of these instruments to achieve rainfall for their crops or protect them from evil spirits. Other practical applications required of these magical instruments were to assist in the location of housing materials. The cartographic elements on these instruments Schwartzberg describes as “highly abstract and far from obvious in meaning to an outsider.”²²⁸ However, their meaning was specific to the Sakais and aided their negotiation of elements within

²²⁸ Schwartzberg, 1994d, 795. See also Pandya, Vishvajit. 1990. "Movement and Space: Andamanese Cartography." *American Ethnologist* no. 17:775-97.

their everyday lived environment. For example, swamps, agricultural clearings, areas of a specific crop, locations of fish traps, anthills or areas consisting of deadly snakes, house sites and numerous other items and features integral to their existence in their local landscapes.²²⁹ The variety of media utilised for recording mapped information, and the extents of specificities of socio-cultural practices displayed have eluded many earlier cartographical studies.

The descriptive and poetic nature of Southeast Asian mappings addressing themes ranging from literary accounts to itineraries suggest a socio-cultural investment in the making and utilising of a broad of mappings to progress everyday life. These forms of mappings contributed to the religio-cultural conditions of Southeast Asian lived space, and in each type of mapping there was an intrinsic purpose, which in turn gave meaning to the intangible and tangible qualities of human environments.

²²⁹ Schwartzberg, 1994d, 795.

Chapter 3: Mapping Settlements in Southeast Asia

Forms of settlement are embedded in our psyche, they impact on our understandings and conceptions about dwelling as well as our social and cultural make-up. When we draw or write about settlement it has to include something other than just settlement itself. Maps and illustrations speak graphically, about specific qualities of the built environment, whether they are non-urban or urban. In this chapter, we examine the relationship between mapping and settlement, both viewed as cultural practices. Pre-modern mappings, as shown in Chapter 2, contribute to the community by aiding the relay of information about belief systems, cultural practices, and expectations of the settled society. Geography is also an important aspect of pre-modern settlement, not only due to natural topographical features for pragmatic reasons, but due to the sacred qualities associated with features, such as mountains in the natural landscape. Mappings of pre-modern geographies highlight these aspects of sacred space, which also affect settlement morphology. Some Southeast Asian representations of pre-modern space, attempted to convey techniques, materials, sacred space, as well as socio-cultural rules and mythic practices to produce settlement. However, each site within the region and dominant ethnic group brought a diversity of different values to the production of lived space and representations of these spatial qualities attempt to convey these differences. As far as is discernible from the primary sources of this study, pre-modern Southeast Asian settlements were typically not planned or conceived in their entirety prior to their construction.

The notion of settlement may be understood here as a process which begins “through cognitive appropriation and modifications of our surroundings and the conveying of this information to others.”²³⁰ In terms of structure, it is “made up of explicit spatial and temporal relationships that define human existence.”²³¹ As for settlement forms, they “provide culture with physical continuity and a setting for the individual within the community... Like language, the shapes, forms, and relationships we gather from our environment and society create a way of thinking and apprehending the world.”²³² In terms of producing human environments, this process may be seen as the rules of

²³⁰ Atkin & Rykwert, 2005, ix.

²³¹ Ibid.

²³² Ibid., See also Fung, Stanislaus. 2005. "The Language of Cultural Memory in Chinese Gardens." In *Structure and Meaning in Human Settlements*, edited by Tony Atkin and Joseph Rykwert, 123-134. Philadelphia: University Pennsylvania Museum of Archaeology and Anthropology.

production of settlement which are encoded in some way, and this codification of settlement practices may be played out through customs such as geomancing or the Law of Indices or through “analogic understandings of literary works.”²³³ These understandings go some way toward revealing the complex relationships which coexist between settlement forms and patterns, socio-cultural practice, and landscape features that contribute to the milieu and idiosyncrasies of different societies.²³⁴ Southeast Asian settlement sitings appear to derive from these codes of understanding, with locations of built structures being specified as a result of the verbal instructions of the geomancer or royal ruler, conceived via ritual or festival, not as result of a mapped or illustrated representation.

3.1 Society, Culture, and Settlement

Mapping in pre-modern Southeast Asian society helps us to understand how citizens saw their role within the greater societal framework as well as their existence in earthly and non-earthly realms. These mappings also enable us to conceive of the importance of the relationship between physical and spiritual places in the world for Southeast Asian peoples. As most of the surviving corpus of these representations do not pre-date the seventeenth century, and are not specifically urban mappings, other archaeological evidence (such as temple inscriptions) are utilised to confirm earlier motivations behind settlement locations and formations in ancient Southeast Asian societies. Evers differentiates between the main urban settlement types in pre-modern Southeast Asian society these include: royal and sacred cities of inland states, commercial cities located as nodes in the trading network, as well as key smaller intermediate settlements which were both provincial capitals and involved in trade.²³⁵ Different maps influenced different settlement types in a myriad of ways. O’Connor successfully demonstrates, in his archaeological studies, that societal characteristics particular to Southeast Asian peoples have a long history in informing the complexities of settlement. These characteristics are based on established codes and rules of everyday practice, which vary between ethnic groups within communities. Under the following themes of sanctity, centre, boundary and geography, the

²³³ Atkin & Rykwert, 2005, 12.

²³⁴ Ibid.

²³⁵ Evers, Hans-Dieter, and Rudiger Korff. 2000. *Southeast Asian Urbanism: The Meaning and Power of Social Space*. Germany/USA: Lit Verlag/St Martin's Press, 30.

discussion looks at how these attributes and ordering principles contribute to forms of Southeast Asian settlement.

Sanctity

Sanctity was an important aspect of life for most pre-modern Southeast Asians, yet it affected the form of cities predominantly in the inland regions which were often the base of ancient royal cities.

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Figure 41. Chao Phraya River from the former Thai royal capital Ayutthaya. 1752 in Abbe Provost's *L'Histoire Generale des Voyages.*, past the small trading post of 'Bankok,' (Bangkok) to the Gulf of Thailand. Menam, or Mae Nam, literally means 'river.' (Source: http://www.geographicus.com/mm5/merchant.mvc?Screen=PROD2&Store_Code=AntiqueMaps&Product_Code=Bangkok-bellin-1749 viewed 17th June 2012).

Some of these cities included Mandalay (Burma), Ayudhya (Siam), Angkor (Cambodia), Ava and later Bangkok, which were characterised by being strong capitals, propagating heavenly relations and practices, having tectonic markers such

as temples, palaces and sacred space within their walls, with their settlement forms reflecting ancient Indian and Chinese urban concepts.²³⁶ The main temple and/or palace represents the cosmological centre of the capital of territorial control and administration, with the king to coordinating the secular and sacred organisation of the city.²³⁷ Although, there must have been aspects of planning which go into the creation of these cities it is not evident from the remaining corpus of maps, that it was a completely pre-conceived process. Temple inscriptions and cosmologies convey the spiritual meanings and messages associated with settlement formation, but do not represent implicitly the settlement itself.

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Figure 42. Siam, called Juthia. Plan of the old city.
Original hand colouring. 1764.
(Source: http://www.themaphouse.com/search_getamap.aspx?id=7316&ref=SEAS3380 viewed 17th June 2012).

The following example describing the creation of Bangkok, highlights other ordering principles for realising human settlement other than using the map. Instead, practices consisting of a series of rituals and the establishing of hierarchical relationships of elites within space contribute to the form and layout of this city.²³⁸ Appeasement of

²³⁶ Evers, 2000, 30-1.

²³⁷ Ibid., 27. See also Quartich-Wales, H. G. 1931. *Siamese State Ceremonies: Their History and Function*. London: Bernard Quartich.

²³⁸ Wheatley, Paul. 1983. *Nagara and commandery: Origins of the Southeast Asian Urban Traditions*. Chicago, Illinois, USA: The University of Chicago, 4-6.

the gods with ceremonial undertakings assisted the specific site, orientation and key axial relationships of built form within the new city.

Bangkok, the capital of Siam, was planned via cosmological concepts, with the existing sacred temples integrated into the overall form of the city. The three main constructions which contributed to the city were the city pillar, the royal chapel and the *Thung Phramen* or large public square. These three structures form a triangle of independent focal points within the city. To determine the location of the pillar, the gods had to be made aware of the proposal, and a ceremony which re-stages the “founding of the world by Brahma,” had to be undertaken to allocate a position for the guardian deity.²³⁹ The royal temple represents the centre of the country as it houses the most auspicious symbol of Buddhism, which is an expression of the King as the main supporter of Buddha.²⁴⁰ The third component is *Thung Phramen* representing the world mountain, typically used for cremations as well as other public rituals. These three spaces and forms represent in order, the guardian deity which has power over secular space, the royal temple symbolising morality and harmony between earth and the cosmos, and the public square which symbolises the king as the conductor of ceremonies of state and the connection between the supernatural world and earth.²⁴¹ Another ritual includes the swinging ceremony which enacts processions through these spaces to connect the Brahmin temple and the main royal complex, forming the main road and axis of the city of Bangkok and also the main path for future festivals.²⁴² Quite contrary to physical mapping, these ceremonial processes of engagement of the citizens and hierarchy of the city, determine the sacrality of space as well as constructing and defining the transition of rural to urban space through ritual.²⁴³

²³⁹ Evers, 2000, 82-83. Urbanism is a concept which, enmeshed in a web of semantic ramifications, has persisted for some five millennia as a means of denoting sets of qualities possessed by certain of the larger, and usually more compact, clusters of settlement features that at any particular moment in time have represented centroids of continuous population movements....But no city, no urban tradition, indeed, has survived for more than a fraction of the time during which the concept has been in existence. One of the first urban settlements to fall under the “urban process” of “urban generation,” in the sense of it being one of the only examples of documented settlement by both archaeological and literary sources, was Fu-nan (present day Vietnam).

²⁴⁰ Ibid., 82. See also Siulak, Sivarska. 1985. *Siamese Resurgence. Asian Cultural Forum Development*. Bangkok: Sukhsit Siam.

²⁴¹ Ibid.

²⁴² Ibid., 83.

²⁴³ Ibid. See also Goh, Ban Lee. 2004. *Urban Planning in Malaysia: History, Assumptions and Issues*. Malaysia: Delta Editions.

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Figure 43. Jain Chart of the World. 15th century.
Centred around Mt Meru, this map's circular structure may be derive from the cyclical vision of time. (Source: Whitfield, 2010, 31).

Centre

A blood distinction between rulers and commoners in communities determined the beginnings or original centres of urbanisation for pre-modern and ancient Southeast Asian cities.²⁴⁴ Urban areas would then flourish around the recognised ruling elite and become the point of difference between city and village. There was also a distinction between the centre and the periphery for some Southeast Asian cultures, in terms of which polity would be destined as a capital and therefore would be hierarchically situated above any of its neighbouring towns.²⁴⁵ These ideas are prevalent in cosmographic mappings, originating in South Asia, such as the *mandala*, with Mount Meru at its centre.²⁴⁶ However these mappings of concentric circular space were essentially diagrammatic and did not necessarily operate as literal translations of spatial ordering systems.

²⁴⁴ O'Connor, Richard, A. 1983. A Theory of Indigenous Southeast Asian Urbanism, Research Notes and Discussions Paper No. 38. Singapore: Institute of Southeast Asian Studies, 23.

²⁴⁵ Ibid., 71. Also referred to as "urban-centred" social hierarchy.

²⁴⁶ Ibid., 53-55. See also Reid, Anthony. 1980. The Structure of Cities in Southeast Asia, 15th-17th Centuries. *Journal of Southeast Asian Studies* 11:235-250.

Different understandings of the notion of centre occurred between Southeast Asian cultures. O'Connor suggests that for the Malays the ruler or (*raja*) was the most important central figure, whereas for the Javanese it was the palace (*kraton*), and for the Thais and Burmese, the city (*muang, myo*) occupied the centre.²⁴⁷ Accordingly, a settlement was not considered a significant entity as a city (*kota, bandar*) without the presence of a *raja*. If the residing *raja* died, tradition ensured that his palace was abandoned and for the incoming *raja* a new palace was built, altering the urban form of the settlement. By contrast the traditional Javanese polity centred on the palace (*kraton*), with the palace, capital, and kingdom going by a single name. The whole of society was organised around this centre in concentric circles. The first circle contained the capital city or *nagara*, followed by the *pasisir* or coastal provinces on the periphery. Javanese did not have any precise terms for city or town, and these concentric urban configurations were essentially the palace at the centre surrounded by series of villages.²⁴⁸ Thais and Burmese words for towns, did not reference rulers or palaces. Typically in the Thai case the settlement had a capital and then four concentric cities.²⁴⁹

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Figure 44. Map of Malacca at the time of the Achenese siege of 1629.

Showing the wooden palisade encircling the whole town, from Antonio Bocarro, "Livro das Plantes de Todas As Fotalezas, Cidades, e Povoacoes do Estado da India Oriental. (Source: <http://khleo.tripod.com/oldpics.htm> viewed 17th June 2012).

²⁴⁷ O' Connor, 1983, 62. For the Malays, having a *raja* was the most important aspect of a state and according to Milner, "the raja was 'the only institution', 'organising the principle of the Malay world.' "

²⁴⁸ Ibid., 62-63.

²⁴⁹ Ibid., 63. See also Evers, Hans-Dieter. 1977. "The Culture of Malaysian Urbanisation: Malay and Chinese Conceptions of Space." *Urban Anthropology* no. 6 (3):205-16.

Geography

Geographic qualities of the Southeast Asian regions also played a large part in settlement formation. Royal cities were typically located inland for a number of factors, but a major reason was for defensive purposes. Often the urban form of these cities was walled, if they were stationed in highland areas. A close proximity to the coast was perceived as a threat from pirates as well as foreign invaders coming by sea. Many royal or sacred cities were also connected to belief systems which empowered sites of natural geographical features such as mountains and water. There were also exceptions such as in the Burmese situation where the king and dynasty have the importance over the geography. The location only became important and acted as a centre of control if the king remained there, thus shifting the capital may occur between dynasties.²⁵⁰

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Figure 45. Map of Malacca town and fortress from a Dutch map of 1750.
(Source: <http://khleo.tripod.com/oldpics.htm> viewed 17th June 2012.)

²⁵⁰ Evers, 2000, 75.

For the case of the commercial cities, Evers refers to cities such as Malacca, which existed as important nodal ports within a global trading network.²⁵¹ Malacca's geographical location on the coast, in addition to it being accessed from inland territories for the delivery of resources, spices and textiles from inland villages, ensured its commercial success. Perhaps also its multi-ethnic community meant aspects of cosmology, religion and ideology were deemed less important than economic priorities.²⁵² Malacca's urban form changed to represent European planning models, around the early sixteenth century with colonisation by the Portuguese. (See Dutch map, figure 45 of Malacca's township adjacent to the Portuguese fort).

The third type of urban formation identified by Evers, includes the intermediate and smaller cities, which were of local importance.²⁵³ Again geographic location and topography was crucial as they were nodes within trade networks and stationed between royal cities and commercial cities. Some examples include Pegu (see figure 46 for seventeenth century map of Pegu) and Syriam in Burma, with their main purpose being to serve the main urban centre, but given these cities contained both trade and provincial controls they were a challenge to political power of the centre.²⁵⁴

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Figure 46. Pegu, Burma by cartographer Petrus Bertius 1616.
Descriptio Arachan et Pegu. (Source:
http://www.themaphouse.com/search_getamap.aspx?id=107207&ref=SEAS3913 viewed 17th June 2012).

²⁵¹ Note: The Malay spelling is Melaka.

²⁵² Evers, 2000, 30.

²⁵³ Ibid. See also Wertheim, W F. 1980. "Changing Southeast Asian Societies: An Overview." In *Sociology of Southeast Asia: Readings on Social Change and Development* edited by Hans-Dieter Evers, 8-24. Kuala Lumpur: Oxford University Press.

²⁵⁴ Ibid.

3.2 Settlement and Sacred Geography

Embraced in Southeast Asian cosmographical representations, geographical features of the natural landscape gave meaning to everyday space. From sacred principles, mountains and water acted as places of pilgrimage, refuge, and sites of festivals, which in turn guided the proximity of settlements. Whilst physical features of the geographical landscape provided pragmatic opportunities for settlements to prosper by means of rivers or oceans for trade and transporting goods, for growing crops, both the hinterland and coastal regions, suited these aspects of Southeast Asian life differently based on their different microclimates. Geography has significance for settlement, from the perspectives of the sacred as well as the physical. This was evident in all forms of mappings from the cosmographical to sea charts and route maps, whilst sacred architecture represented constructed sacred geographies.

Cosmographies

Historically, broad and diverse arrays of cosmographic conceptions coexisted with religious and cultural diversity within the Southeast Asian region.

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Figure 47. Local Map of the Eastern Bank of Songkla Lagoon, c.1600s.
South of Siam. (Source: Winichakul, 1994, figure 3, vii.)

Buddhism and Islam may be considered the predominant religions but also Hindus and Christians have had a strong presence. Space for pre-modern Southeast Asians thus presented a complex set of relations involving cosmographic principles, places of

sacred significance, and religious concepts and symbolism. One religious practice, which gave space sacred meaning, was pilgrimage. Shrines and temples were plotted on maps as sacred sites to encourage visitation by pilgrims. A seventeenth century example, depicting Songkhla Lagoon situated on the Gulf of Siam, indicated the eastern bank of the lagoon with sixty three temples.²⁵⁵ This Songkhla lagoon map blended sacred geography with actual buildings on the earth's surface.

Records of traversal between earthly worlds and metaphysical realms and mappings of imaginative space are not unique to the Southeast Asia. Other pre-modern cultures, which had geo-religious concepts to aid conjectures of imaginative landscapes, also influenced the Southeast Asian context. Islam's concept of *fada'il*,²⁵⁶ the Chinese notion of geopiety, as well as pilgrimage associated with Christian faiths, which influenced local monks and missionaries, were some techniques for constructing imaginative space.²⁵⁷

In Joseph Schwartzberg's study of Southeast Asian tribal cosmographies and the Ngau Dayaks of Kalimantan, he explains how different readings of the *Traiphum* extend ideas and imaginings of geography for pre-modern peoples. Ngau Dayaks imagined spatialities of an Upperworld and Underworld, utilising imagery such as the "village of the dead" and the "soul boat" to transport people from one form of existence to the other. Priests used imagery as cues in their chanting, to aid transition from one existence to another. Females descended to the Underworld while males

²⁵⁵ Winichakul, 1994, 29.

²⁵⁶ Akkach, 2002, 73. Through the identification of certain landmarks of religious significance, the *fada'il* bestows these built forms within the socio-religious landscape according to Akkach, with "spiritual, cosmological and eschatological significance." In turn a type of mapping occurs by which the *fada'il* in its narrative sets the scene and creates a particular spatial experience for faithful followers of the scriptures. Therefore, in its construction of a certain geography of divine significance, the concept of *fada'il* promotes an imagined spatiality and view of the world, authorized by God and conveyed and open only for his believers.

²⁵⁷ Tuan, Yi-Fu. 1976. "Geopiety: A Theme in Man's Attachment to Nature and Place." In *Geographies of the Mind: Essays in Historical Geosophy*, edited by David Lowenthal and Martyn J Bowden, 11-39. New York: Oxford University Press, 12-15. Geo-religious belief systems were paramount in pre-modern Chinese and Roman cultures for determining one's place in the world. Yi fu Tuan highlights through the concept of "geopiety," this spiritual connection with place was inscribed in religious canons across these cultures. In turn, geopiety as a belief system being intrinsically linked to an individual's imaginative conception of space, dictated every aspect of earthly life. The notion of piety covers relationships between people with the land, human beings and their god/s, as well as human beings with nature. "*Hsiao*", the Chinese term for piety, translates as "filial piety" or "filiality," hence the duty of care for parents and one's ancestors is a dominant aspect of pious Chinese.

ascended to the Upperworld. Successful transitioning was achieved over a designated time-frame of several nights, with priests chanting to end the respective journeys.²⁵⁸

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1. **Figure 48.** (1) Ngau Dayaks' Upperworld. 2.
2. **Figure 49.** (2) Ngau Dayaks' Underworld.
(Source: Schwartzberg, 1994b, 704 & 705 respectively).

Hans Schärer, a Swiss Protestant missionary, who studied the Ngau Dayaks in the 1930s, describes the imaginative geography of the Upperworld, which amongst other features exhibited the primeval mountain—domain of Mahatala, supreme diety (a hornbill)—giant Trees of Life laden with bountiful fruits, and everything found in the Middle world (human world), but of greater and more beautiful proportion.

²⁵⁸ Schwartzberg, 1994c, 703.

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Figure 50. Bamboo engraving of a Ngau Dayak cosmography.
(Source: Schwartzberg, 1994b, 707.)

By contrast, the Underworld or “primeval waters” is presided over by the Goddess Jata (a water snake).²⁵⁹ Access is achieved to the Underworld at the joining of rivers and deepest sections of water. Imagery of this realm included fish caught in fish-traps—the food source of the Upperworld—as well as Jata’s crocodile attendants. As Ngau Dayaks traverse between worlds of existence from physical space to their sacred village to worlds of other nationalities their ritual behaviours also change.²⁶⁰ Perhaps this demonstrates the close connection between imagined, sacred geographical space and physical repercussions of cosmological experiences for the Ngau Dayaks. As a highly localised version of passage between life and death, the Ngau Dayaks’

²⁵⁹ Schwartzberg, 1994c, 704.

²⁶⁰ Schärer 64-65 (note 5) in Schwartzberg, 1994c, 710.

practices reflect the variety of interpretations originating from Indian cosmology portrayed in mappings.²⁶¹

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Figure 51. The Four Continents Around Sumeru.
Map of the Earth and the Thai Cosmos. (Source: Schwartzberg, 1994b, 725).

Views of the world for pre-modern Southeast Asians, and hence mappings, incorporated a representational merging of physical, metaphysical, and spiritual realms an example in Thai Buddhism is the painted bark-paper manuscript, “The Four Continents Around Sumeru.” Its illustrations conveyed a sense of the close relationship between earthly and non-earthly existence in Thai culture.²⁶² The *Traiphum*, or “Three Worlds’ Cosmography,” perhaps the most referenced Buddhist cosmological series, dating from the fourteenth century, is significant in Thai culture as it depicts pre-modern spatial conceptions as well as resonates and influences ideas about time and space in modern times.²⁶³ Thongchai Winichakul, in his book “Siam Mapped,” notes the paradoxical nature of the text:

²⁶¹ Schwartzberg, 1994e, 840.

²⁶² Schwartzberg, 1994c, 725. “Its composition included Mt Sumeru where earth was perceived as a horizontal disk with Mt Sumeru at the centre, ... the seven surrounding mountain ranges and seas, the four principle continents inhabited by humans, each with its distinctive shape, and multiple tributary continent nearby.”

²⁶³ Day, Tony, and Craig J Reynolds. 2000. “Cosmologies, Truth Regimes, and the State in Southeast Asia.” *Modern Asian Studies* no. 34 (1):1-55, 8.

Space in the *Traiphum* was the qualitative manifestation of imagined existence. Yet all surviving *Traiphum* texts give concrete descriptions of various worlds, particularly the human one, as well as account of the movements of the sun and the moon and seasonal changes.²⁶⁴

It is debatable to what extent the *Traiphum* was intended to convey a sense of “real-worldliness.” In the case of the *Traiphum*, “[i]f one concedes that a map does not have to be a representation of the earth’s surface, but can depict other relations of space, it is easier to understand this set of pictures [dated from 1776, the manuscript has no title, but the one given to it later, *Samutphap traiphum chabap krung thonburi* (Pictorial Manuscript of the Traiphum: Thonburi Verison)].”²⁶⁵

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Figure 52. (1) *Traiphum* Panels 1, 2, 3, 4 (top left to right).
Figure 53. (2) *Traiphum* Panels 7, 8, 9, 10 (bottom left to right).
(Source: Suárez, 1999, 42-43.)

Versions of Three World’s Cosmography, according to Day and Reynolds, in its initial compilation resulted from more than thirty Buddhist texts and was accredited as the oldest work of Thai literature.²⁶⁶ The text was again reworked against “Pali sources between 1783 to 1802 by the order of Rama I.”²⁶⁷ Most of the surviving manuscripts which date from the sixteenth century contain by contrast very little text. Over subsequent centuries the *Traiphum* addressed ideas about the geography of the

²⁶⁴ Winichakul, 1994, 20-21.

²⁶⁵ Ibid., 26.

²⁶⁶ Schwartzberg, 1994c, 720.

²⁶⁷ Day & Reynolds, 2000, 8.

time and evolved under changing scientific as well as religious ideas. Graphic interpretations of the *Traiphum* text were painted over the walls of Thai monasteries by the nineteenth century, with the intention of spreading both the “faith and knowledge” of the studies of Theravada Buddhism.

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Figure 54. Coastal map panel 1 of the *Traiphum* series.
(Source: Winichakul, 1994, figure 4 vii.)

Variations of conceptions of *Traiphum* space were evident in its numerous artistic impressions. According to Winichakul, differences of interpretation were largely reflective of the school of painting rather than altered concepts of space or extent of geographical knowledge.²⁶⁸ There are instances in the *Traiphum* narrative where earth geography and *Traiphum* space relate, although they are different. For example, the inclusion of the coastal map in the *Traiphum*, based on Chinese coastal charts, indicating indigenous knowledge about the earth’s surface, was not always removed from scientific information.²⁶⁹ The coastal map related to an actual geography, rather than cosmological space, in its depiction of places along a coastal itinerary. Imagery

²⁶⁸ Winichakul, 1994, 24-5.

²⁶⁹ *Ibid.*, 30. See also Mills, J. V. 1953. "Chinese Coastal Maps." *Imago Mundi* no. 11:151-168.

of the *Traiphum* also was intended to educate its viewers about the social order of Thai society as well as portraying the cosmos. Rama I played an instrumental part in reorganising aspects of Thai social order evident in earlier versions of the manuscript, by relocating mankind to the middle order. Earlier manuscripts conveyed different pre-supposed levels of existence from lowest to highest. As the human representative of divinity, Rama I justified his re-ordering of the text, fostering the Buddhist moral order and exerting control over imaginative space of the *Traiphum*.²⁷⁰

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Figure 55. Possibly the Nicobar Islands a detail of two panels in the *Traiphum*.
(Source: Suárez, 1994, rear cover.)

Highlights of these preserved sections of *Traiphum Thonburi* manuscript include illustrations of the three worlds, representing an imaginative geographical interpretation of Southeast Asia and the Indian Ocean.²⁷¹ The physical form of the manuscript is made of a thick indigenous bark-like paper, which is stuck together in an “accordion-style” format.²⁷² The Thonburi manuscript with all 272 leaves stretches to 50.9 metres long.²⁷³ If read from left to right it indicates the sacred Buddhist Indian temples, the Bo tree, believed to be Buddha’s birthplace, then his mother’s town,

²⁷⁰ Schwartzberg, 1994c, 721

²⁷¹ Ibid.

²⁷² Ibid. See also Reynolds, Frank, and Mani B. Reynolds. 1982. *Three Worlds According to King Ruang: A Thai Buddhist Cosmology*. Berkeley: University of California

²⁷³ Ibid. See also Boisselier, Jean. 1976. *Thai Painting*. 1st ed: Kodansha America, Inc.

followed by the Bo tree under which he achieved enlightenment. This part of the map indicates many sacred sites within close proximity of one another. As the viewers' eyes traverse the map to the right there is an element of transition in descending from the metaphysical to earthly realm of Siam. At the most central point of the map northern Thai towns, are depicted such as Chang Mai and Sukhothai. Again travelling to the right more towns are indicated until Bangkok and the southern peninsula is reached, then the graphics of the map changes to record timelines of days between towns. To the west, serpents surface in the Narai River near Rangoon and Burma. "They ask Buddha to leave his footprint upon the land, which would be a holy and fortuitous occurrence."²⁷⁴ At the bottom border of the map, where the monkey (aka King Rama's knight) is indicated overlooking islands, there is land linking the large island which is Ceylon, which recalls the legend of the Ramayana. The Ramayana is an Indian epic, where King Rama goes to rescue his captured wife held in Ceylon and runs along this land bridge, to reach her. Buddha also used this bridge to achieve enlightenment, where he left his footprint on Adam's peak, also indicated here. The island conveying two naked people is said to be the Nicobar islands, although not located according to true geography, that is, north of Sumatra.²⁷⁵

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Figure 56. Another impression of the Traiphum story, 1776.
Anonymous artist. (Source: Suárez, 1999, 46-47).

Winichakul qualifies that this is not an inaccuracy or misjudgement on the behalf of the mapmaker, but rather the *Traiphum* records places in accordance with the "description about Buddhism in Suwannaphum," not relative to the earth's surface.²⁷⁶

²⁷⁴ Suárez, 1999, 42.

²⁷⁵ Ibid.

²⁷⁶ Winichakul, 1994, 27.

Thus cosmological messages of the *Traiphum* triumph over “actual” geographic information within the manuscript.

Other ways in which indigenous thoughts on geography incorporated notions of the transcendental, the physical, and the empirical aspects of life, was through conceptions of temporality.²⁷⁷ Maps were often considered mediums of impermanency to fulfill short-term objectives, be it for religious ceremonies or invasion strategies. For example, Buddhist *mandalas* demonstrated the belief in the impermanence of life, as they were painstakingly created in elaborate detail and then swiftly erased after their role was fulfilled in one ceremony.

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Figure 57. Constructing a sand mandala.
Monks may work for up to a week on this sand creation. (Source: Schwartzberg, 1994a, 611).

Sacred Architecture

Sacred building complexes not only designated types of settlements but also informed their citizens of sacred practices and proposed expectations for citizens within the society. These designations served as socio-cultural and religious mappings as well as teachings, of the role one should play in society, whilst also laying out the citizen’s destiny as long as they subscribed to cultural rules. Former temple complexes of around early ninth century have been accorded in Javanese archaeological records associated with the *Śaivite* dynasty, and were set amidst a landscape of sulphur lakes

²⁷⁷ Suárez, 1999, 27.

and volcanic craters. Stone staircases which enabled worshippers to access the temple as well as foundations of nearby temples have been found intact.²⁷⁸

“Indianised” areas of early Southeast Asia, consisted of residents directly from the subcontinent and therefore “served to confirm and consolidate the emergent notion of western Southeast Asia as an integral part...of the South Asian, principally Hindu, cultural milieu.”²⁷⁹ The result of which, in terms of a settlement pattern, was a well-defined urban morphology as well as a relatively well-functioning, internal organisation and quality of life, which Wheatley accords, with a “new level of socio-cultural integration.”²⁸⁰ The Khmer temple, Angkor Wat represents a sacred, constructed three-dimensional mapping and representation of space and time, demonstrating ancient and pre-modern principles of spatial planning.²⁸¹ If we consider Angkor Wat Temple as a representational media, we understand that a map, by definition, may be broadly conceived not as a representation of the earth’s surface, but a depiction of spatial relations.²⁸²

Angkor Wat temple, as a three-dimensional exhibition of complex Indic cosmological design elements displaying detailed documentation of cosmological painted imagery within its walls, impressively constructs another type of spatiality. The visitor, as they traverse the temple site, is rendered as a participant in the Golden Age of Indic cosmology. Travelling certain paths within the complex, as well as immersion in artistic portrayals of cosmological events, encourages engagement at both spatial and spiritual levels. The divinity of the King, who presided over the construction of the temple, is prioritised in the design using seasonal day-light to illuminate statues, suggesting a royal presence within the building. Eleanor Mannikka, in her book, *Angkor Wat: Time, Space and Kingship*, describes an imaginative geography where the notion of time is played out in the visitor’s spatial experience of this twelfth century Khmer temple. Distances traversed at the entrance and then upon leaving the central temple equate to 1728 cubit lengths, which also relates in time measurements to the duration of the Golden Age.²⁸³ Therefore, a complex set of relations exists

²⁷⁸ Wheatley, 1983, 238.

²⁷⁹ Ibid., 420.

²⁸⁰ Ibid.

²⁸¹ To return to the notion of representation with regard to settlement, another definition for the former coined by the Compact Oxford English Dictionary, includes “[a] material image or figure; a reproduction in some material or tangible form...”

²⁸² Winichakul, 1994, 26.

²⁸³ Day & Reynolds, 2000, 5.

within the temple grounds, between spatiality and time as well as architectural form and metaphor. Sacred Mt. Meru and ascension to a higher cosmological plane is also referenced in the physicality of the tallest central tower.

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Figure 58. Angkor Wat temple, Cambodia.
(Source: <http://www.mekongdeltatours.net/Cambodia-Tour/Phnom-Penh-to-Siem-Reap-Tour/ambodia-tour-from-Phnom-Penh-to-Siem-Reap/59/Travel-from-Phnom-Penh-to-Siem-Reap.htm> viewed 23.03.12)

This temple represents a glorification of the reign of the King Suryavarman II, who commissioned it, and demonstrates the journey into another kind of existence, a metaphorical construction of an imaginative time and space. Temple design uses daylight at particular times of the day for maximum effect to achieve different moods within constructed allegorical space. As an example, the passage to immortality regarded as the Churning requires all subjects of King Suryavarman II to live in harmony. The Churning is emphasised by the rising sun at the beginning of the day, and as seasons change and light diminishes, alternate deities are illuminated on the temple walls. Time in the design was dictated by the clock of nature. Winter casts a shadow over gods and highlights the king, while the reverse occurs in summer. However, it is a combination of all knowledge systems integrated into the temple design, from its orientation to its adherence to astronomical patterns which delivers its

powerful impression upon scholars and believers. Physical form also symbolises cosmological ascendancy in the temple. The central tower is the representation of both the central peak of Mt Meru as well as the home of God, Visnu. To reach Visnu's house, a climb of equivalent distance to thirty three units, also reflects the universe as a whole.²⁸⁴

In complementary terms, the total vertical length of all four corner towers...symbolises a complete *mahayuga* period of 4,320,000 years. As a consequence, the four towers arranged around the central tower can symbolise both the real cycle of the stars and planets around the north pole as well as the four *yuga* cycles... As the north celestial pole, Mt Meru remains immobile while time forever flows around it in an eternal movement.²⁸⁵

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1. **Figure 59.** (1) Angkor Wat Temple, view of the central tallest tower.
(Source: http://www.trekearth.com/gallery/Asia/Cambodia/West/Siem_Reab/Angkor_Wat/photo1125678.htm viewed 23.03.12)
2. **Figure 60.** (2) Detail of an Angkor God.
(Source: http://www.trekearth.com/gallery/Asia/Cambodia/West/Siem_Reab/Angkor_Wat/photo592995.htm viewed 23.03.12)

However, for pre-modern Southeast Asians, local territory was familiar and to a certain degree assumed knowledge, as well as its relationship to other kingdoms. The greater geographical and astronomical picture was an issue for the realm of cosmology. Therefore, different kinds of space coexisted within pre-modern geography and by the same token there are an infinite number of messages which may be derived from such representations of space. The variety of messages are linked to the knowledge-base of the viewer, therefore the process of viewing enables a shift from the imaginary to the real. Indigenous views of space linked to the sacred and profane permitted meaning in the act of conceiving of space. Spatial concepts were appreciated and understood based on sets of knowledge principles whether they were

²⁸⁴ Day & Reynolds, 2000, 6.

²⁸⁵ Moron, Eleanor. 1977. "Configurations of Time and Space at Angkor Wat." *Studies in Indo-Asian Art and Culture* no. 5:217-261, 249.

religious or cosmological. Both the *Traiphum* and Angkor Wat provided two different realms in which to explore these geo-religious spatial concepts, and gave the participator certain theoretical tools and sets of relations with which to negotiate sacred, constructed, and physical geographies.

3.3 Settlement and Natural Geography

Natural geography and settlement in pre-modern Southeast Asia were intimately connected for different peoples. The relationship was often cosmological, but the origins of this thinking also reflected the pragmatic need for human survival. Therefore settlement positioning although cosmologically conceived was ultimately driven by practical needs. Coastal and inland regions were the two key areas of the most significant forms of settlement, with intermittent smaller villages stationed between.

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Figure 61. Bantam a coastal trading city of Java in the Sunda Strait. Suárez suggests this is a semi-fanciful impression of the place. 1598. (Source: Suárez, 1999, 179).

The physical nature of these two types of cities has been touched upon, but noted here is the significance in settlement formation of the natural components of water and mountains. Firstly if, we further examine the royal city of Angkor Wat, the connections between water and mountains are both cosmological but also intertwined as a required part of the social and religious structure of the city for the ancient Khmer population. Inland royal cities were able to re-create the significance of these natural elements of life within their urban forms, in symbolism and for pragmatic purposes. Secondly, coastal cities such as Bantam in the Sunda Strait, were seen by the Dutch traders in the sixteenth century as useful ports for access to the markets of Java, and were a key source of spices.²⁸⁶ The ocean location of Bantam in the two images provided prioritises the sea view, as this was the focus of colonisers as well as the local populations.

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Figure 62. Extensive water channels of Angkor.
The entire area is criss-crossed by irrigation channels, now thought to have supported intensive rice agriculture. A recent computer graphics image taken from the satellite imaging, to uncover these anomalies of the ancient civilisation at Angkor. (Source: http://news.bbc.co.uk/2/hi/in_pictures/6946012.stm viewed 17th June 2012).

Water

Angkor Wat demonstrates the design of sophisticated irrigation networks within its grounds.²⁸⁷ Ancient India had water featured in its cosmologies, and similarly at

²⁸⁶ Suárez, 1999, 191.

²⁸⁷ Meister, Michael W. 2000. Mountains and Cities in Cambodia: Temple Architecture and Divine Vision. *International Journal of Hindu Studies* 4 (3):261-268, 263. See also Coomaraswamy, A. K. 1993. *Yaksas: Essays in the water cosmology*. Edited by P. Schroeder. Delhi: Oxford University Press.

Angkor, there are a series of moats around the temple which serve to place the temple in a symbolic “ocean of cosmic creation.”²⁸⁸ There are also temple-tanks and lakes which also relate to this notion of the cosmological importance of water. The temple of Neak Pean reflects the heightened cosmic relationship between water and building as it is set on circular terraces, in a square water tank with water flowing beyond into a series of pools and irrigation channels.²⁸⁹ Groslier writes:

This tower-sanctuary, representing paradise floating on the primaeval ocean, rises on circular foundations in the middle of a square basin. Water from the main basin flows down to four smaller tanks round from fountains in little shrines. It is the symbol of a miraculous lake in the Himalayas where all illnesses were cured....The waters of Neak Pean, judiciously redistributed by canals, flowed towards the four points of the compass and there transformed the rivers and liquid arteries of Angkor into as many magic streams.²⁹⁰

These canals’ earthly purposes included irrigating the Khmer populations fields and sources of food, whilst symbolising the recreation of a celestial city on the ground.

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Figure 63. Bantam, part of the Kingdom of Sunda, c. 1724.
(Source: <http://upload.wikimedia.org/wikipedia/commons/9/92/Banten-city-Java-1724.jpg> viewed 17th June 2012).

²⁸⁸ Meister, 2000, 263.

²⁸⁹ Ibid.

²⁹⁰ Groslier, Bernard Philippe. 1962. *Indochina: Art in the melting-pot of races*. London: Methuen, 181-82.

The physical nature of Bantam's settlement has not been well documented but the top engraving suggests, an established settlement. The Chinese source, *Chu-fan-chi*, written around the thirteenth century highlights that Srivijaya still ruled Sumatra, the Malay peninsula, and western Java in the Sunda Strait. The source identifies that the people worked in agriculture, and their houses were built on wooden poles (*rumah panggung*).²⁹¹ If this was the case, the account suggests a different building typology between towns on the coast and those of the hinterland in this region. The significance of water in the connection between hinterland and the sea is also evident in the illustration below.

Mountains

Mountain geography was crucial to conceptions of Angkor Wat, firstly as it was situated in the hinterland away from the coast, but it also incorporated the symbolism of sacred mountain geography into its constructed space. Mount Meru the central mountain of the sacred schematic of Indian cosmology was a part of the spiritual cosmological mapping of Angkor Wat.²⁹² The central temple complex of Angkor was where the fertility of the earth and spiritual powers joined. Mountain geography was so important in every aspect of Southeast Asian life as a primary form of the physical and spiritual associations with landscape. From the sovereignty of the king, mountains were tied to in physical and symbolic terms to every aspect of life.²⁹³ "Mountains were the source of spiritual life; they were also the origin of the 'other' element of the world, rivers and were thus the source of physical life as well."²⁹⁴

The connection between mountainous geography and water sources is also evident in the map shown below of the Sunda Strait and the township of Bantam. Although coastal areas are typically near to sea level and characterised by plains, this depiction of the landscape shows hills bordering the township. Even though a scale is indicated it is difficult to get a sense of the topographical relationships. However, the first image of Bantam above does suggest a clear connection and proximity of a river

²⁹¹ Soekmono, R. 1988. *Introduction to the History of Culture Indonesia* 2nd ed. New York: Publishers Canisius. Original edition, 1973. Reprint, 5th, 60.

²⁹² Suárez, 1999, 24.

²⁹³ *Ibid.*, 34.

²⁹⁴ *Ibid.*

system with the mountain range beyond, thus reinforcing the importance of these aspects of natural geography to settlement location and formation.

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Figure 64. Sunda Strait and the coastal town of Bantam, Java.
(Source: Suárez, 1999, 191).

3.4 Settlement and Representation

Illustrations and maps relay specific qualities of the built environment, and these may be urban or non-urban, yet their contribution is instrumental to the holistic impression of the place. As we have seen, pre-modern maps perform a visual reporting role on integral aspects of everyday life from the religious and mythical, to determining sanctity, routes and patterns all of which affect settlement. Our understandings of pre-modern maps has shifted to embrace three-dimensional mappings and sacred architecture as a means of conveying spatial concepts, time and space relevant to pre-modern Southeast Asian societies. Yet many of the pre-modern geographies presented in this study, display a malleable quality whereby each new narrative enables a reinvention of the previous geographical conception. Pre-modern maps tell us about critical aspects of human environments, about belief systems and cultural values.

Regalia

In pre-modern Southeast Asia, Malays and Javanese peoples associated royal regalia as denoting an important person. For example, if the regalia was removed so was the person's and the city's significance. Regalia may be a map of sacred significance as outlined below. Thais and Burmese by comparison focussed their concerns on Buddhist relics and images, which were city-centred. Royal regalia, such as weapons, musical instruments, royal insignia, would protect the polity and bring it prosperity. By contrast Buddhist relics and images which oversaw the operations of Thai and Burmese cities, were comparatively impersonally and passively activated.²⁹⁵ Often cities were imagined or recognised by their most outstanding relic or religious monument. Thus irrespective of who ruled the city, the image of the relic related to both the current ruler as well as the city.²⁹⁶ In Thailand and Burma, a *coup de tat* would involve seizing the king's palace, not the relic or image associated with the city. In the Indonesian case, sacred regalia, if seized, would assert the thief's status and confirm their self-pronouncement of king. By the nineteenth century when there were a number of landless or displaced *rajas*, where rulers lost their kingdoms, the royal peoples themselves were still important despite their uprootedness and loss of a significant physical place within society with their regalia intact. By comparison, the Burmese kings if they lost their palace they consequently would lose their status, and in addition any previous recognised power.²⁹⁷

“Central Portion of the Sacred Map of Timbanganten,” is an example of a “sacred relic” or *pusaka* and is housed in Ciela, a village of the Garut District from the Sundanese region of Java.²⁹⁸ The image indicated here is only one portion of the map which is a large work, detailed in its construction on a cloth background. Ciela is located sixty five kilometres southeast of Bandung, at the base of a volcano, Cikuray. Timbanganten, refers to the minor seat of the chiefdom located in the village of Ciela, which existed prior to the breakup of the Sundanese Hindu kingdom of Pajajaran

²⁹⁵ O'Connor, 1983, 34. See also Heine-Geldern, Robert. 1956. *Conceptions of State and Kingship in Southeast Asia*. Ithaca: Cornell University Southeast Asia Program.

²⁹⁶ Ibid., 64. Naerssen, F. H. 1976. "Tribute to the God and Tribute to the King." In *Southeast Asian History and Historiography: Essays presented to D. G. E. Hall*, edited by C. D. Cowan and O W Wolters. Ithaca: Cornell University Press.

²⁹⁷ Ibid., 65-66.

²⁹⁸ Schwartzberg, 1994d, 767.

which occurred in the 1570s.²⁹⁹ The break-up was instigated by the Sultan of Bantam, who had embraced Islam earlier in the 1500s, and force was used to convert all in the chiefdom to Islam. The beginning of the Javanese's conversion to Islam did not eventuate until 1525. The map-maker recorded his connection with a prince “*sunan Lawas Jaya*” of whom is not known in history, and was a Muslim who commissioned the map to determine the extents of his kingdom.³⁰⁰

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Figure 65. Central Portion of the Sacred Map of Timbanganten.
(Source: plate 38 in Schwartzberg, 1994d, and related discussion on 767).

Text on the map indicates that there were seventy-eight (*kampongs*) villages, which made up the kingdom, and which were distributed firstly into three sections and then sub-divided further. The orientation is to the south, although not consistently adhering to that direction, it also attempts to cover approximately 40,000 square kilometres, but actually indicates the chiefdom of Timbanganten at an exaggerated scale. The notable qualities are the cartographic aspects relating to the actual geography of that part of Java, such as its interpretation of drainage features and topographic patterning of the

²⁹⁹ Schwartzberg, 1994d, 768. See also O'Connor, Richard, A. 1983. *A Theory of Indigenous Southeast Asian Urbanism, Research Notes and Discussions Paper No. 38*. Singapore: Institute of Southeast Asian Studies.

³⁰⁰ Ibid.

landscape.³⁰¹ Given the map's sacrality it is kept under the surveillance of a *kuncen*. This position is held by a widely respected person in the village.³⁰² Holle writes in his account of experiencing the map:

That this map is greatly revered can be seen on Friday eve. Then, the *kuncen* unwraps it so the population can view it. Then, a brazier is lighted with incense, and the *kuncen* mutters an Arabic prayer, which only she is allowed to pray, and which she repeats continuously. The population lingers around the house, taking in eagerly the sounds of prayer, although it is inaudible to them, and watch with equal respect the sacred cloth which is equally obscure to them. The thought that it once belonged to their former rulers, and that it was even made by a powerful *dalem* [ruler], leaves them in their worshipful mood.³⁰³

Paradoxically, regalia from Malay and Javanese cultures heightens the importance of the role of the map if it happens to have sacred significance, but diminishes the priority of settlement tied to a particular place.

Patterns

Intrinsic to spatial organisation, patterns shape understanding of concepts from cosmological concerns to human behaviours. For pre-modern Southeast Asians patterns demonstrated by cosmographies defined time and space as well as seasonal variations in agricultural practices in addition to principles of sacred architecture. Patterns are synonymous with ordering principles and practices of Southeast Asia such as *Feng Shui*, *mandala* diagramming, *fenye* agricultural systems, tectonic symbols of the sacred and so on, which are necessary to visions and creations of settlement.

The patterning employed in the following batik map is very dense, the main motif, which is a series of squares with three-pointed rooves, is believed to be the Puri gates or traditional entrances to Javanese Hindu temples.³⁰⁴ It does not display any text and neither the date, creator nor the location of the geography depicted are clear.³⁰⁵ It is a colourful composition in pale blue and orange, with gold foil inlay against a

³⁰¹ Schwartzberg, 1994d, 769.

³⁰² Ibid. See also Fisher, Charles A. 1964. *South-east Asia: A Social, Economic and Political Geography*. London: Methuen.

³⁰³ Holle, "De kaart," 171-172 (note 54) in Schwartzberg, 1994d, 770.

³⁰⁴ Ibid., 772.

³⁰⁵ Ibid., 771.

background of dark indigo. The rectangles within each of the square motifs are thought to be representative of villages, with wavy patterns around them, which may symbolise either world oceans or the lakes around Mount Meru. The vast majority of the intense line-work may represent rice fields and terraced agricultural patterns practiced in Indonesia, which in addition implies an ascending and descending sets of contours to the landscape.³⁰⁶ Possibly this map was produced in order to represent a traditional Hindu Javanese pattern known as the *Moncâ-pat*. Discussed in 1918 by Dutchman van Ossenbruggen,

Moncâ-pat in middle Java points to a unit of a desa [locality] with its four neighbouring desas, which one should think of as being arranged according to the four cardinal points. This unity of desas extends further, including even more distant areas, and is connected with the old Javanese system of unity of which, even today, traces can be found in the law of the princely states.³⁰⁷

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Figure 66. Detail of batik map from either eastern Java or Bali.
(Source: Schwartzberg, 1994d, 771).

³⁰⁶ Schwartzberg, 1994d, 771. See also Hall, Daniel George Edward 1968. *A History of South-east Asia*. 3rd ed. New York: St Martin's Press.

³⁰⁷ F. D. E. van Ossenbruggen, "De oosprong van hat Javaansche begrip Montjâ-pat, in verband met primitieve classificaties" (The origins of the Javanese concept of *Moncâ-pat* in connection with primitive classifications), *Verlagen en Mededeelingen der Koninklijke Akademie van Wetenschappen, Afdeling Letterkunde*, 5th ser., pt. 3 (1918):6-44, esp.6. in Schwartzberg, 1994d, 772.

There is no direct evidence to suggest that these spatial relationships were reconstructed in later evolutions of settlement in Indonesia or Java, but the principles perhaps had greater application in an earlier era. This system of ordering village space was to give villagers a sense of ownership and thus responsibility to prevent crime and disorder. Villages were organised outwardly in the cardinal directions from the main capital. Over time, such systems of control broke down with land expansion. Although highly conjectural this possibility of an urban patterning system is amongst the only example of structural urban space conveyed in Southeast Asian maps.

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Figure 67. Map of the Vale of Manipur.
Showing the route of King Alaungpaya's invasion of 1758-59. (Source: Schwartzberg, 1994c, plate 37.)

Journey

Graphic representations of journeys, through cartographic signs revealed many unknown aspects of space and culture to pre-modern peoples, including distances between villages, urban expanse and numerous other relationships of comparison with peoples within close proximity. The predominant group of non-cosmographic maps fall into the following categories: route maps, large-scale maps of reasonably small areas, large scale maps of cities, and, at a larger scale still, architectural plans,

typically of temple architecture and other prominent city buildings. Each of the following maps demonstrate attributes which are important for settlement, which includes connection between geographical elements to relationships between places and cultural groups.

“Map of the Vale of Manipur showing the route of King Alaungpaya’s invasion of 1758-59,”(figure 67) possibly indicates settlement patterns of the different ethnic minorities of the area with different colouring codes. For example, Burmese settlements are yellow, where Manipur settlements are represented by the use of lavender or tan colours. The suggestion therefore that lavender may represent Hinduised Manipurs as opposed to the yet to be converted Naga tribes. Also a contrast in the dominance of pagodas (more than a dozen) indicated on the Burmese side whereas there is only a single Hindu temple indicated in Manipur to represent the location of the capital Imphal.³⁰⁸ This Shan Burmese map, offers a detailed interpretation of Manipur, as well as the north-eastern neighbouring region of India and some parts of northern Burma. It is most probably Indian muslin and it is in two pieces which were sewn together. Most likely this map was drawn from hearsay.³⁰⁹ For the Burmese geographic information was accrued for revenue surveys and organised census activities.³¹⁰

Route maps give a context to each settlement in that they define their isolation or close proximity to neighbouring cultural groups. In the “Map of the country of North Ava,” (figure 68) compared with the previously discussed example, yet an important aspect of these maps is that there is a record of distances between places. These distances are noted either as days of travel or in a measure of Burmese leagues (*dain*), which are equitable to 2.2 British miles, enabling one observing these maps to establish a degree of scale. The routes between places are indicated with dashed lines, which are ruled and an intervention by Francis Hamilton.³¹¹

³⁰⁸ Schwartzberg, 1994d, 754.

³⁰⁹ Ibid., 753.

³¹⁰ Hall, Daniel George Edward 1968. *A History of South-east Asia*. 3rd ed. New York: St Martin’s Press, 585.

³¹¹ Schwartzberg, 1994d, 748.

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Figure 68. Map of the country north from Ava.
(Source: Schwartzberg, 1994, 748).

The main features of an 1861 map, “Small excerpt from a large Burmese Map of much of the Eastern Shan States,” (figure 69) are the details and efforts expended in representing the mountain ranges and vegetation for environmental management, where notes in Burmese on the map state, “woodcutting forest” as well as “woodmaking forest.”³¹² The notes accompanying the map go so far as to state that the woodcutters should come from a specific town. Other cartographic developments include significant and insignificant water courses, noted as well as two different units of measure for distances between towns.³¹³

³¹² Schwartzberg, 1994d, 756.

³¹³ Ibid. See also Kusmiadi, Rachmat. 1977. A Brief History of Cartography in Indonesia. Paper read at Seventh International Conference on the History of Cartography, 7-11 August 1977, at Washington D. C.
Harvey, P. D. A. 1980. *The History of Topographical Maps: Symbols, Pictures and Surveys*. London: Thames and Hudson.

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Figure 69. Burmese map of much of the eastern Shan states.
Map described in Schwartzberg as “Small excerpt from a large Burmese map of much of the eastern Shan states.” (Source: Schwartzberg, 1994d, 757).

Concluding Remarks

Pre-modern mappings for Southeast Asians illustrate specific socio-cultural ways of seeing the world. However maps only occupy part of the narratives, of which there are many, in the conception of settlement. Unlike modern spatial relations, Southeast Asian understandings of human environments extend beyond the limitations of the map. Practices such as sacred regalia determining persons of power rather than places of power highlights physical settlement means different things to different peoples. The idea of journey mappings construct spatialities relative to one another and thus the concept of settlement has meaning relative to one’s neighbours. Patterns in socio-cultural practice and behaviour both in earthly and spiritual realms deliver certain sets of ordering principles to human environments. All of these qualities are dynamic in their relation to settlement geography. The emergence of modern science prompted desires for making sense of geography and a more literal translation of spatial concepts.

PART II: MAPPING AND MODERNITY

Chapter 4: Mapping and Enlightenment

Late medieval/early modern mapping reflected a transition in thinking from a predominantly religious outlook to a combination of scientific and religious concerns. Developments in surveying and mapping techniques throughout the early modern period aided this transition in the western world. Further refinement of cartographical processes and technologies for the production of surveys, route maps, and settlement planning by the eighteenth century, signified a heightened requirement for geographical realism. Forms and techniques of representation reflected these aspirations whereby the city view was superseded by the ichnographic plan making way for our modern way of depicting settlement. However, despite the changes in representing and viewing the world, a recurring debate about religious views and how to reconceive paradisaical space in light of the geographical discoveries of the Enlightenment continued. Colonial ventures meant new territories were able to be exposed to new ways of mapping and thinking about the world, put forward by the projective and rational view of the Enlightenment.

4.1 In Transition: Old World, New Vision

Transitioning to Enlightenment conceptions of space and representations was a gradual experience. Many drawing and mapping techniques and shifts in conceptualisation of space and geography were evident in the medieval period. A few key aspects of medieval origins, which reflect the changing nature of mapping processes leading into the Enlightenment include: concepts of time and space, religious narrative versus scientific thinking, and the emergence of the survey.

Time and Space

Medieval maps often conveyed historical events which occurred chronologically in time, but would arrange vignettes of these events within the same frame, for example subjects such as great battles as if they occurred sequentially. Therefore medieval illustrations indicated static landscapes where time stood still, and different events were shown as occurring within the same scene, which created a conflict between time and space.



Figure 70. The Hereford *Mappa Mundi*, circa 1300. Hereford Cathedral, England. (Source: http://en.wikipedia.org/wiki/File:Hereford_Mappa_Mundi_1300.jpg viewed 20th April 2012).

David Woodward, in his essay “Reality, Symbolism, Time, and Space in Medieval World Maps,” suggests these were some of the ways in which medieval mapping media were compromised in terms of its perceived inaccuracies. Map-makers of the medieval European world intended their works to demonstrate “blended concepts of both time and space as a context for understanding the Christian life.”¹ Therefore medieval maps may be considered objects of merit in their record of geographical data as well as vestibules of multiple layers of historical ideas and events. The large corpus of medieval world maps or *mappaemundi*, which include an extensively diverse extent of material, have both technical and ideological constraints in their resultant forms. Any major divergence of design in *mappaemundi* production was

¹ Woodward, David. 1985. "Reality, Symbolism, Time, and Space in Medieval World Maps." *Annals of the Association of American Geographers* no. 75 (4 Dec 1985):510-521, 511. See also Holt-Jensen, A. 1980. *Geography: It's History and Concepts*. London: Harper and Row.

restricted by the projection of Christian historical traditions within a geographical framework.²

According to Jeremy Black, in his book *Maps and History*, this sense of placing events in a geographical context and time-frame was not appreciated in Europe until around the fifteenth century. Black recounts another example of this shift in thinking given maps were not usually included in storytelling, where Benedictine monk, Thomas Elmham, used a plan of the Isle of Thanet to illuminate a medieval legend about receipt of lands by St Augustine's monastery.³ This development meant mapping was used to enable the past to be differentiated from the present.

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Figure 71. Cresque Abraham, circa 1375. Panels 1 & 2 of Mappamundi.
(Source: Ehrenberg, 2006, 45).

The Strasbourg edition of Ptolemy's *Geography* was published in the early sixteenth century, which ensured printed distinction between ancient and modern maps, also verified the need for addressing historical time. This reconsidering of Ptolemy's ancient texts also contributed to the already changing concepts of space around the sixteenth century. Ptolemy's theories proposed methods for representing a three-

² Woodward, 1985, 514. Hindman, Sandra. 1977. *Text and Image in the Fifteenth Century*. Leiden: E. J. Brill.

³ Black, 2000, 6. See also Tyacke, S. 1983. *English Map-Making 1500-1650*. London: British Library Publishing Division.

dimensional and spherical earth. Black believes this changing notion of history in the late sixteenth century lead to the beginnings of what he describes as, “the emergence of a quasi-modern secular historical awareness, deriving from both the Renaissance’s sense of typology and progression of historical eras (Classical-medieval-modern).”⁴ These events in Europe were also linked to religious changes in thinking. The divide in the Christian church lead to distinguishing thought, before and after Reformation. According to Black, the main shift in translation of ideas and thus representation of scriptures and the Classics was an emphasis placed on the literal rather than the allegorical.⁵

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Figure 72. Claudius Ptolemy’s world map - *Geography* c. 1500s.
(Source: Short, 2003, 53).

Historical maps were increasingly published as parts of texts even though they did not reflect all of the developments in cartography driven by the age of European exploration. Writers of history, such as John Norden (1548-c. 1625) and William Camden (1551-1623) used maps to convey contextualisation of place, indicating place names and nominal distances, which resulted in the first forms of historical atlases.

⁴ Black, 2000, 6.

⁵ *Ibid.*, 7. See also Burke, P. 1969. *The Renaissance Sense of the Past*. London: Edward Arnold. See also Short, John Rennie. 2003. *The World Through Maps: A History of Cartography*. Toronto, Ontario, Canada: Firefly Books.

The importance of linking maps to historical narrative is the desire by both writers and readers of history to relate time and place.⁶

Black states in the European case,

The relationship between time and space is complex, but there are signs of important shifts in interest and perception in the seventeenth century...Book readers sought a history informed by a precise cartography and a cartography that was in turn historically accurate.⁷

For the reader of history, whereas previously generic pictures of places such as popular views of Paris or London were associated with historical narratives, in the absence of any more precise renditions of urban context. So these changing notions of time and space meant such depictions were inappropriate.

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Figure 73. Frederick de Witt's 1668, Baroque twin hemisphere map.

This map reflects the divorce of content around the periphery from the cartographic depiction. Although there are no sea-serpents, demi-gods, ships, compasses or rambling texts the geography is just as minimal in its representation. (Source, Whitfield, 2010, 95).

By the seventeenth century in Europe, relating textual accounts to place took on a new relevance but also there was a shift in conceptions about the notion of time. Two main understandings of time resonated for Renaissance theorists. Firstly, Copernicus' ideas

⁶ Black, 2000, 7. See also Mendyk, S. 1989. *Speculum Britanniae: Regional Study, Antiquarianism and Science in Britain to 1700*. Toronto: University of Toronto.

⁷ *Ibid.*, 7-8. See also Harvey, P. D. A. 1994. *Maps in Tudor England*. London: University of Chicago Press.

on terrestrial motion and the earth's rotation around the sun, was the scientific theory to explain night turning to day, days of the year passing and so on. Secondly, the idea of psychological experience and time not necessarily being connected to spatial movements of earth, cited in John Locke's "Essay Concerning Human Understanding" published in London 1690. Locke's work gave insight into "constructed time as a psychological experience of duration."⁸ In terms of historical depictions of place, maps constructed a space of the past, in which it could be read differently and separately to the present. In addition, ways of seeing and reading these graphic representations was also altered with developments in optics. These new understandings in ways of seeing the world were seventeenth century Dutch scientific innovations, in an artistic and cartographic sense, were expressed through media of paintings and maps.

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Figure 74. World Map 1630 by Henricus Hondius.
This map displays the decoration of the period but it also is finely gridded with latitude and longitude lines. (Source: Short, 2003, 20).

As a result of developments in ways of seeing, there was in turn an emphasis for Dutch cartography to convey a sense of geographic reality. Therefore imagery associated with historical narratives had shifted, from being mere decoration and the

⁸ Black, 2000, 8. See also Alpers, S. 1983. *The Art of Describing: Dutch Art in the Seventeenth Century*. Chicago: The University of Chicago Press.

“conjuncture of time and space” to separating these two components. This affected a sense of the past and motivated new historical cartographies.⁹

Religious narrative

The spiritual narrative overrode issues of geography or place, such as the need for an “accurate” or precise record of geographic elements.

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Figure 75. A world map which has been plotted with a north polar projection. The borders are illustrated with biblical scenes. This multi-faceted map was to be bound with bibles by the London publisher Joseph and James Moxon, 1691. (Source: Whitfield, 2010, 105).

Artists of *mappaemundi*'s prime responsibilities included emphasising religious teachings over and above other knowledge systems. Quite by contrast to representations of geography, spiritual histories were carefully organised and

⁹ Black, 2000, 9. See also Delano-Smith, Catherine, and Elizabeth Morley Ingram. 1991. *Maps in Bibles 1500-1600: An Illustrated Catalogue*. Geneva: Librairie Droz.

displayed chronologically from Creation to the Last Judgement.¹⁰ Woodward states that “the logical inseparability of history and geography is thus vividly illustrated by *mappaemundi*.”¹¹

Whilst the notion of sight had cartographical ramifications it was also emphasised from a religious perspective. Sight enables God to reveal his ideas about creation and mankind, and therefore reaching his believers was achieved through graphic renditions of Bible scenes.

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Figure 76. A Medieval Picture Book Illustrates a Biblical Story.
Biblical story in 1 Samuel 2. “Spirited scenes, richly detailed and coloured, each appear as one page in a medieval Bible picture book that was probably created by Parisian artists for a French king or queen.” (Source: <http://members.bib-arch.org/publication.asp?PubID=BSBR&Volume=1&Issue=3&ArticleID=15> viewed 20th April 2012.)

The age of exploration and testimonies of first hand encounters then also began to bring home archaeological evidence of the existence of human life, which contradicted the religious view. Scientists who chose to follow this route of thinking were accused of atheism, supporting witchcraft, sceptics and adhering to pre-adamite heresay.¹² Walter Raleigh and Thomas Hariot, for example, were ostracised and

¹⁰ Woodward, 1985, 515. See also Tobler, W. R. 1966. "Medieval Distortions: The Projections of Ancient Maps." *Annals of the Association of American Geographers* no. 56:351-60.

¹¹ *Ibid.*, 520.

¹² Livingstone, David N. 1990. "Geography, Tradition and the Scientific Revolution: An Interpretative Essay." *Transactions of the Institutes of British Geographers. New Series* no. 15 (3):359-373, 365.

arrested when they investigated the origins of Indian peoples in Virginia.¹³

Livingstone highlights how contentious relations between religious beliefs and geographical exploration resulted in a strand of geography during the seventeenth, eighteenth and into the nineteenth centuries, known as physico-theology.¹⁴ A number of writers embraced this subject and a publication which emancipated such views was amalgamated in “Trace on the Rhodian” by Clarence Glacken.

Whether depicting the evolution of the world’s landforms, tracing the historical spread of Christian civilisation, itemising the boundaries of nations, scrutinising regional diversities of people and places, or mediating on the mysteries of the hydrological cycle, the physico-theologists believed that the investigation of the world’s design led inexorably to belief in an omnipotent divine agent...an argument postulating that the belief in God could be rationally inferred from foundational propositions.¹⁵

Believers of the school of physico-theology, sought out examples which they felt reinforced religious principles, in addition to supporting scientific knowledge.

Divinity was associated with design, as both European and non-European architecture had its origins in sacred principles, and through the proliferation of religious built form as part of typical urban language, legitimised the coexistence of religion and this new science.¹⁶

Experience over authority

Sixteenth and seventeenth centuries prioritised “experience over authority,” and principles of evaluation were introduced to assist in presenting what was considered a “rational” perspective.¹⁷ Principles such as “objectivity, consensus, inductivism, experimentation, empiricism”¹⁸ replaced traditional understandings and substituted them with an empirical perspective. Tradition dictated views based on observation, faith, revelation, together with reasoned thought. By contrast empirical knowledge resulted from experimentation and critical observation, rejecting all of the premises of

¹³. Livingstone, 1990, 365. See also Glacken, C. 1967. *Traces on the Rhodian shore. Nature and culture in Western thought from ancient times to the end of the eighteenth century.* Berkeley: University of California Press.

¹⁴ Ibid., 366. See also Livingstone, David N. 1992. *The preadamite theory and the marriage of science and religion.* Philadelphia: American Philosophical Society.

¹⁵ Ibid.

¹⁶ Ibid., 366-7.

¹⁷ Ibid., 360.

¹⁸ Ibid. See also Vickers, B. 1984. *Occult and Scientific Mentalities in the Renaissance.* Cambridge: Cambridge University Press: Webster, C. 1982. *From Paracelsus to Newton: Magic and the Making of Modern Science.* Cambridge: Cambridge University Press.

traditional thought. At the same time, as science became an important field in the cultural make-up of society in sixteenth and seventeenth centuries, it also did not directly resume the status of modern day scientific thinking within the community. Acclaimed scientists such as Johannes Kepler, Tycho Brahe, and Francis Bacon were also fascinated by astronomy, and Brahe actually discovered a new star. Brahe's astrological readings predicted this star as the cause of political upheaval in northern Europe in the sixteenth century.¹⁹ Astrological beliefs were not abandoned in favour of science but rather a repositioning occurred, instead of a rejection of either scientific or astrological thinking. Such examples demonstrate that there was not a straight-forward transition from pre-modern scientific thought to modern scientific principles.

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Figure 77. Antonio Saliba's 1582 cosmological chart.
This map also references Tycho Brahe's comet in the eight circle. This cosmic model of concentric rings was derived from Ptolemy and Aristotle. This view of the earth represents a cross-section of sixteenth century understandings from physical, spiritual and conceptual. (Source: Whitfield, 2010, 71).

Geography also followed the path of science and transitioned from pre-modern modes of thinking to modernity. At the early stages of this cycle, geography was linked to

¹⁹ Livingstone, 1990, 361

cosmography, as can be seen in, for example, William Cunningham's "The Cosmographical Glasse," which was published in 1559, and also considered navigation and hydrography within its subject field. The main intention was to introduce readers to concepts of latitude, longitude, triangulation, surveying as well as terminology related to these practices. In addition, however, it recalled social science relationships put forward by ethnographers, therefore tying attributes of cultural behaviours to a place and context.²⁰

Similarly, John Dee, a mathematician and scholar, as well as a map-maker and a manufacturer of instruments in the late sixteenth century, made notable contributions in the field of geography. Unfortunately, during his lifetime his hypotheses were typically scorned due to his beliefs in occult practices.²¹ Through his study and subsequent translation of Euclid's *Elements and Geometrie*, he defined geography from the perspective of location and a subject which encompassed the totality of a situation of a town, city or village.²² Another discipline which was intimately connected with this notion of geography was chorography, or the study of a specific place. Dee's ideas of geography were connected through mathematics to astrology, numerology and celestial relationships. Therefore his theses of human affairs being interrelated with celestial phenomena, bridged the microcosm of the human world and the macrocosm of the greater cosmos.²³ So in effect as these two scientists above demonstrate, the emergence of modern scientific thought grappled with intellectual theorisations of the human and cosmic interfaces. It was a very problematic path of rationalisation, which scientists were required to take to make any sense of it all. Therefore, with Columbus' expeditions to the Antipodes, and what were first hand geographic recounts of what he proved earlier views put forward by Ptolemy's theorisations of the same places to be invalid on some accounts. Columbus, by

²⁰ Livingstone, 1990, 361. See also Livingstone, David N. 1988. "Science, Magic, and Religion: A Contextual Reassessment of Geography in the Sixteenth and Seventeenth Centuries." *History of Science* no. 26:269-94.

²¹ Ibid., 362. Seymour, I. 1989. "The Political Magic of John Dee." *History Today* no. 39:29-35; Cosgrove, Denis. 1985. Geography and the mathematical arts: considerations on humanism, the occult and geography in the late Renaissance. Paper read at Annual Conference of the Institute of British Geographers, at University of Leeds.

²² Ibid. See also Clulee, N. H. . 1988. *John Dee's Natural Philosophy: Between Science and Religion*. London and New York: Routledge

²³ Ibid.

challenging classical narratives of geography, is often seen as a precursor to the age of rationalism of the Enlightenment.²⁴

Emergence of the survey

Geography was the core science in new ways of seeing the world and the function of the map facilitated this new understanding through representation. The survey in its process of rationalisation aided the delivery of a particular view of the world.

Developments in instrumentation contributed to this rationalism in attempting to portray a highly empirical type of mapping, with the *truths* of certain projections established due to the logic of mathematical calculations, and instruments which were deemed to read a reality.

Many surveying instruments came out of medieval innovations and were further refined for Enlightenment practices. The compass, however, has earlier origins whereby the Chinese were credited with its invention in the third century B. C., and around the eleventh century the Chinese utilised orientations with the south pointing needle. In earlier centuries, the north point had prevailed, yet the southerly direction was utilised once the Chinese were conquered by their Mongol invaders. Once Muslim travellers came into contact with this technology, courtesy of the Chinese, possibly mid-thirteenth century, they also adopted the south point as the prevailing orientation. In turn, the Muslims passed the concepts of the compass to the Europeans and they assumed the northerly aspect as their priority. However examples exist of maps commissioned and prepared by Europeans in the fifteenth century which also indicated south at the top, with Christian maps still typically indicating east at the top.²⁵ However, the lodestone appeared also to swing to either direction just easily, that is north or south,²⁶ whilst for portolan charts it has been argued that the compass with north at the top, it was easier for the chart-maker to determine rhumb lines.²⁷

²⁴ Livingstone, 1990, 364-5. See also Pagden, A. 1986. "The impact of the new world on the old: the history of an idea." *Renaissance and Modern Studies* no. 30:1-11.

²⁵ Gordon, 1971, 223. See also Shu-hua, Li. 1956. "The South-pointing Carriage and the Mariner's Compass." *Tsing Hua Journal of Chinese Studies* no. 1 (1), 64.

²⁶ Lodestone (or also loadstone) which means literally way-stone from the use of the magnet in guiding mariners. It is a piece of rock of pure magnetite, with magnetic qualities which would naturally align with the poles, either north or south, and was used as a primitive compass. Simpson, J A, and E S C Weiner. 1989. *The Oxford English Dictionary*. In *The Compact Oxford English Dictionary*, edited by T J Benbow. Oxford: Clarendon Press, 987.

²⁷ *Ibid.*, 1393. A portolan is a book of sailing directions, describing harbours, sea coastlines etc. Charts within this log also illustrate this information hence the portolan chart reference. (See rhumb line definition in footnote p. 150).

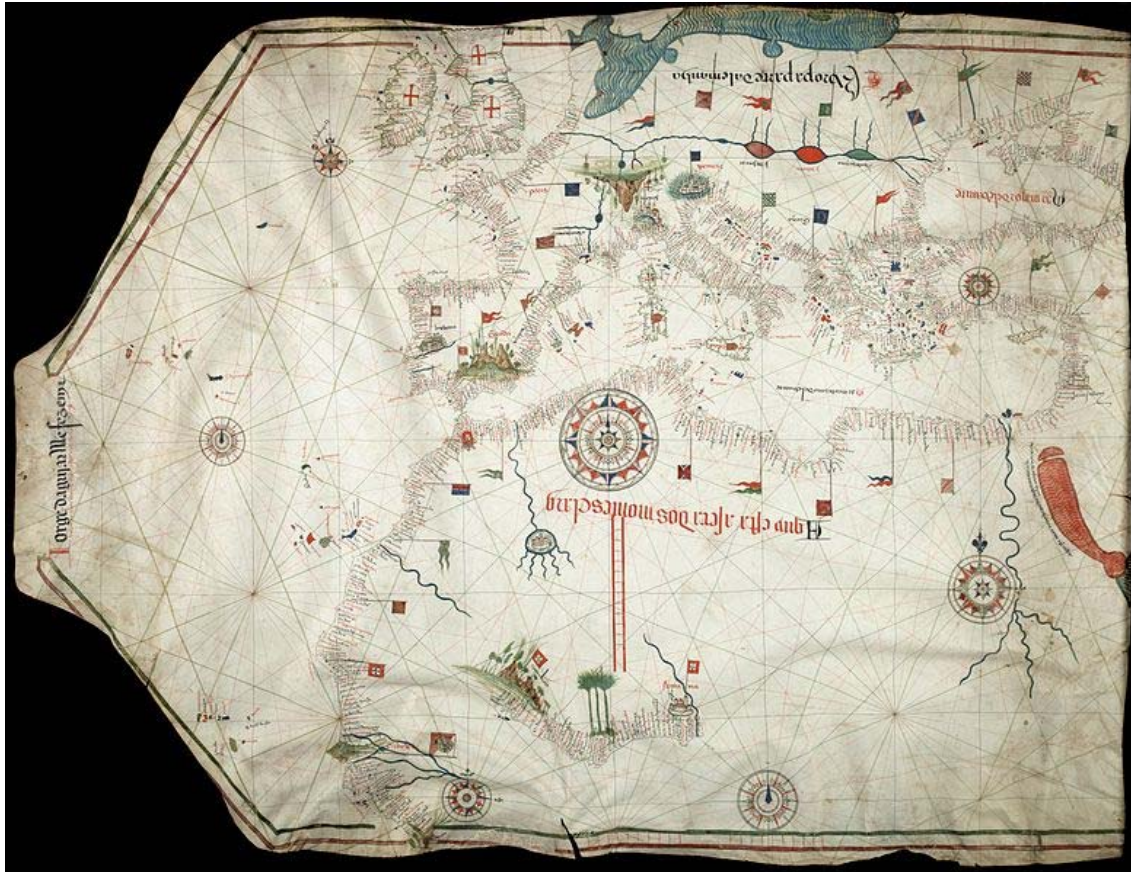


Figure 78. Portolan chart by Jorge de Aguiar, 1492.
 The oldest known signed and dated chart of Portuguese origin (Beinecke Rare Book and Manuscript Library, Yale University, New Haven, USA).
 (Source: http://en.wikipedia.org/wiki/File:Jorge_Aguiar_1492_MR.jpg viewed 20th April 2012).

During the Middle Ages and Early Renaissance, there was technology available, to obtain measured distances in surveying by both direct and indirect methods. For example, in the layout of buildings on a site or determining property boundaries, a system of premeasured rods and cords were employed. These rods or knots in the cords were the units of the measurements. For greater distances, larger sized measuring implements would be utilised. There was a large element of error as rods or cords would stretch, sag, and so on in the process of measuring. Especially for larger distances the customary method would be to pace out the distance, or, if it was a too greater space, to carry out this procedure, employ a method of riding or walking at a fixed rate.

Rhumb is “the line followed by a vessel sailing on one course. Any one of the set of lines drawn on through a point on a map or a chart and indicating the course of an object moving always in the same direction.” Simpson, J A and E S C Weiner, 1989, 1585.



1.

Figure 79. (1) Astrolabe quadrant, England, 1388.

(Source: http://en.wikipedia.org/wiki/File:Astrolabe_quadrant_England_1388.jpg viewed on 20th April 2012).



2.

Figure 80. (2) A 16th-century astrolabe, showing a tulip rete and rule.

(Source: <http://en.wikipedia.org/wiki/File:Astrolab.JPG> viewed on 20th April 2012).

The shadow scale of an astrolabe²⁸ together with the alidade,²⁹ were instruments which were considered the most accurate tools to work out simple trigonometric calculations during this period.³⁰

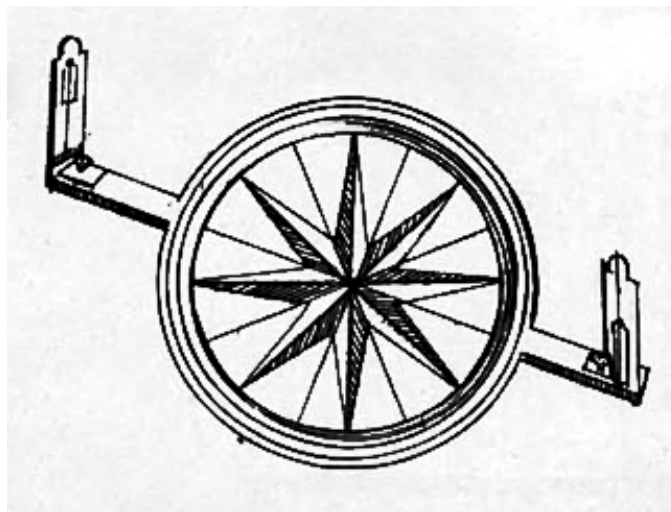


Figure 81. An example of an alidade on a circumferentor.

Taken from the Table of Surveying, Cyclopaedia, Volume 2, 1728. (Source: http://en.wikipedia.org/wiki/File:Circumferentor_Table_of_Surveying_Cyclopaedia_Volume_2.jpg viewed 20th April 2012).

²⁸ “An astrolabe is an instrument formerly used to take altitudes and to solve other problems of practical astronomy.” Its form varied but one form was a planisphere representing the circle of the heavens in the plane of the equinoctial, with movable sights. Historically used by astronomers, navigators, and astrologers. Its many uses include locating and predicting the positions of the Sun, Moon, planets, and stars, determining local time given local latitude and vice-versa, surveying, triangulation, and to cast horoscopes. It was used in classical antiquity, through the Islamic Golden Age, the European Middle Ages and Renaissance for all these purposes. In the Islamic world, it was also used to calculate the Qibla and to find the times for Salah, prayers. Simpson, J A, and E S C Weiner. 1989., 82.

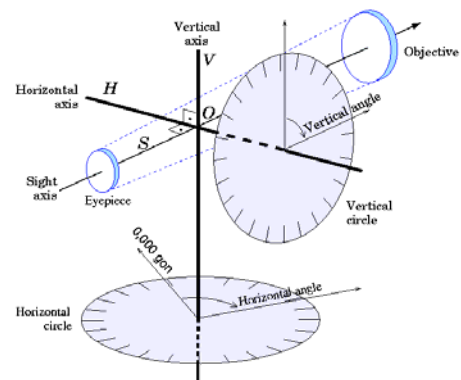
²⁹ “An alidade (archaic forms include alhidade, alhidad, alidad) is the revolving radius of a graduated circle. The index of an astrolabe, quadrant or other graduated instrument, carrying the sights or the telescope, and showing the degrees cut off on the arc of the instrument. In the astrolabe it revolved at the back and was called by Chaucer the rule.” Ibid., 35.

³⁰ Schulz, Juergen. 1978. "Jacopo de' Barbari's View of Venice: Map Making, City Views, Moralised Geography Before the Year 1500." *The Art Bulletin* no. 60 (3):425-474, 434.

If the heights of distant buildings were known, then these instruments could establish the distance at the ground between the observer and the tall building. Although these measurement exercises were possible at this point in history they were not commonly adopted. Treatises of the Early Renaissance suggest these distances were often of relevance in military campaigns where calculations were required to establish whether gunners could reach their targets.

As accurate measuring was necessary for the production of survey maps for the cases of building or property claims architect and engineer L. B. Alberti in the fifteenth century, who in his mathematical treatise detailed the construction of a hodometer.³¹ Whilst Leonardo da Vinci, although in his early sixteenth century drawings, studied the construction of both the hodometer and pedometer,³² he actioned the measurement of distance with the tradition of the time, that is, pacing them out on foot.³³

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1.

Figure 82. (1) Holland Circle.
(Source: <http://americanhistory.si.edu/collections/surveying/enlarge.cfm?recordnumber=747373> viewed 20th April 2012).

2.

Figure 83. (2) The axes and circles of the theodolite.
(Source: http://en.wikipedia.org/wiki/File:Theodolite_vermeer.png viewed 20th April 2012).

³¹ Hodometer also refers to the surveyor's wheel and odometer, see the following definition. Measures the distance traversed by a wheeled vehicle, consisting of a clockwork arrangement attached to the wheel or bearing which measures the number of revolutions. Simpson, J A, and E S C Weiner. 1989, 1200. See also "The odometer of Vitruvius was based on chariot wheels of 4 feet (1.2 m) diameter turning 400 times in one Roman mile (about 1400 m). For each revolution a pin on the axle engaged a 400 tooth cogwheel thus turning it one complete revolution per mile. This engaged another gear with holes along the circumference, where pebbles (*calculus*) were located, that were to drop one by one into a box. The distance travelled would thus be given simply by counting the number of pebbles." <http://en.wikipedia.org/wiki/Odometer> viewed 20th April 2012.

³² A pedometer is an instrument for measuring the number of steps taken and thus approximately measuring the distance travelled on foot usually somewhat resembling a watch in size and appearance, having a dial plate marked with numbers round which a pointer of index-hand travels. Simpson, J A, and E S C Weiner. 1989, 1297.

³³ Schulz, 1978, 435.

By the middle of the sixteenth century surveyors were measuring distances with chains, which were pre-measured and composed of links—that is the units of measuring. In the case of larger distances and to establish bearings a graduated circle was used. In conjunction with an alidade to determine the point to be located, the surveyor would look across the graduated circle, in relation to the reference mark, which had been drawn on the circle, to correspond to a landmark in the field.

The number of units between the reference mark and the line of sight provided an angular value that could be exactly reproduced in a drawing. One laid the circle upon the paper, aligned its reference mark once more with the chosen landmark or direction as represented on the paper, and counted off the number of units observed in the field.³⁴

This instrument in the seventeenth century was known as the “Holland Circle,”³⁵ and the principles behind its determining of bearings are employed in the theodolite³⁶ of modern day. Principles of triangulation, although not in common use until the eighteenth century to establish bearings on a plot, were understood by Alberti in his fifteenth century treatise.³⁷ For its time, surveying was considered an appropriate and the most precise or scientific method available to determine geography and thus one’s place in the world and one’s relations to others.

4.2 Enlightenment and Geographical Realism

A search for a new geography, one which conveyed a sense of realism equated to it being transparent and legible to all. The new geography involved replacing the mythical for a representation of the perceived truths of geographical space. Leading into the Enlightenment, map-makers and philosophers looked to past conceptions of the world, such as the ancient representations of Ptolemy, to review how to interpret

³⁴ Schulz., 1978, 435-6.

³⁵ “In the late 16th century, a Dutch scholar and instrument maker named Gemma Frisius suggested that a good surveying instrument could be made by attaching a magnetic compass to the back of an astrolabe. Building on this idea, Jan Dou designed an instrument with two pairs of fixed sights attached to a graduated circle, and another pair of sights attached to either end of a movable alidade. Dou published an account of this instrument in Dutch in 1612, and the form became popular with surveyors in the Netherlands. The name Holland Circle was coined in the 19th century. The Holland Circle is similar to but easily distinguishable from the common theodolite.”

<http://americanhistory.si.edu/collections/surveying/type.cfm?typeid=12> viewed on 20th April 2012.

³⁶ A theodolite is a portable surveying instrument originally for measuring horizontal angles, and consisting essentially of a planisphere or horizontal graduated circular plate, with an alidade or index bearing sights. Simpson, J A, and E S C Weiner. 1989, 2039.

³⁷ Schulz., 1978, 436.

and thus represent new ideas about space. Geography, of the seventeenth and eighteenth centuries was one of realism and an exact science.

New geography

Around 1570, another publication also grappled with the changing nature of geography utilising elements of cosmography to produce cartography. Flemish cartographer and humanist Abraham Ortelius produced *Theatrum Orbis Terrarum*, which presented geographical information with images accompanied by a textual supportive account. The information within the atlas resembles a systematic combination of cosmography, geography, and chorography. According to Cosgrove, *Theatrum* does not respond in detail to previous works, such as Sebastian Munster's *Cosmographia*, and his ideas around mathematical cosmography, but rather attempts the most current view of global geography via a "spatial narrative."³⁸ However, Ortelius' added as an appendix to later publications of the *Theatrum*, a separate section devoted to "Sacred and Ancient Geography."³⁹

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Figure 84. From Ortelius' *Theatrum Orbis Terrarum*, Southeast Asia.
This map reveals a detailed knowledge of the spice islands of Southeast Asia. Java and Sumatra appear much bigger than Japan or India reflecting their trading importance to the Dutch. (Source: Short, 2003, 123).

³⁸ Cosgrove, Denis. 2003. "Globalism and Tolerance in Early Modern Geography." *Annals of the Association of American Geographers* no. 93 (4):852-870, 855-856.

³⁹ Ibid, 856. See also Mangani, G. 1998. "Abraham Ortelius and the hermetic meaning of the cordiform projection." *Imago Mundi* no. 50:59-83.

This series of maps and imagery which was known as the *Parergon*, clearly demonstrated Christian religious thinking, in its references to the New Testament and its influence on medieval scholarship and cartographic interpretations of the world. Instructively, the *Parergon* illustrated a map of a journey paralleled in one of Rome's literary epic tales, Virgil's *Aeneid*, which dramatizes the ascent of Aeneas, the founder of the Roman race.⁴⁰ Aeneas carries out his work amidst both a cosmic and earthly landscape, therefore suggesting the existence and connection between two kinds of reality, one related to the broader, global universe and the other at a local and more intimate level.

Near the end of the sixteenth century, a European tradition of reading the universe and the globe from a number of philosophical perspectives was well established. Scientific, literary, artistic, and spiritual interpretations of global space were typical. In addition, however, Cosgrove highlights that the individual's role and understanding within the complex world theatre, is related to the greater context of the cosmos.⁴¹ Thus for a human being to realise their destiny, it involved an appreciation of their moral position in the world, and of their relative insignificance in the context of the expanse of the cosmos. Most conceptual connections between cosmography and geography remained to some extent in the seventeenth century but were largely separated by the eighteenth century. A separation between notions of the divine and the sovereign or state together with a shift in Enlightenment mapping practices ensured the beginning of our modern way of rationalizing and viewing the world.

The seventeenth and eighteenth centuries affected utilization of certain forms of cartographic representation over others, as there became an increasing need of readers of history and geography to relate time to place.

Book readers sought a history informed by precise cartography and a cartography that was in turn historically accurate – by contrast, for example, to the many early-modern illustrative woodcuts that used generic images of 'a city' to represent Paris, Nuremberg, Venice, etc., at any date.⁴²

⁴⁰ Cosgrove, 2003, 859. See also R, Jenkyns. 1998. *Virgil's Experience: Nature and History: Times, names and places*. Oxford: Clarendon Press, Oxford University Press, P., Hardie. 1986. *Virgil's Aeneid: Cosmos and imperium*. Oxford Clarendon Press, Oxford University Press.

⁴¹ *Ibid.*, 862.

⁴² Black, 2000, 8.

Drawing

Scientific developments in optics emphasized the value of being able to sight the world clearly. In painting and cartographical terms this equated to relaying the world to the viewer with a sense of “geographical realism.”⁴³

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Figure 85. Excerpt from the Turgot/Bretez map of Paris, 1739.

In this city view drawing, the city is carefully spread out which invites pleasure in the detail and spaces of Paris. (Source: Short, 2003, 150).

Drawing techniques such as the production of the modern two-dimensional plan or ichnographic view were preferred by the end of the sixteenth century.⁴⁴ It was not until the eighteenth century that it was adopted as a common form of cartographic representation. The city view, consisted of a three-dimensional skewed perspective

⁴³ Black, 2000, 8.

⁴⁴ Ichnography is a term which was defined by Vitruvius (i.2) “as the ground plan of the work, i.e. the geometrical projection or horizontal section representing the plan of any building, taken at such a level as to show the outer walls, with the doorways, windows, fireplaces, etc., and the correct thickness of the walls; the position of piers, columns or pilasters, courtyards and other features which constitute the design, as to scale.” (Source: <http://en.wikipedia.org/wiki/Ichnography> viewed on 20th April 2012).

drawing, permitted a relatively easily interpreted, albeit inaccurate, depiction of urban space, but was also considerably more legible to the generally uneducated public who might attempt to interpret a map of the city. In addition, the expense, time, and preparation involved to deliver an ichnographic plan limited its commissioning and subsequent mainstream distribution.⁴⁵

Barbara Naddeo, in her study of eighteenth century Italian cartography, uses the example of the *Mappa Topografica* to highlight the shift in ichnographic language to convey specific information about the urban form of Naples. Any ichnographic form of representation unlike earlier city views of Naples, could not sustain a dialogue of the social fabric of the city, the urban units appeared to extend into the countryside's plots, and the imposing city walls were not distinctive above the overall urban planimetric profile. Therefore an aspect of decline and reality of the physical limits of a great city were implied in the ichnographic representation. By comparison with the city view which conveyed a story of grandeur, density and expanse of the city fabric, and history of the architecture and presence of the city as opposed to its limitations.⁴⁶

Therefore, the Enlightenment's reasoned thought and observation highlighted the importance for collaboration between all aspects of society, to convey a useful interpretation of context and laid the foundation for our modern conception of the map as a universal tool.⁴⁷ By graphic implication and as a precursor to our modern plan view, the ichnographic form enabled certain functional relationships, such as urban expanse and limitations of a city to be determined and displayed, which were

⁴⁵ Pinto, John A. 1976. "Origins and Developments of the Ichnographic City Plan." *The Journal of the Society of Architectural Historians* no. 35 (no. 1):35-50, 50. See also Cosgrove, 2003, 69.

⁴⁶ Naddeo, Barbara Ann. 2004. "Topographies of Difference: Cartography of the City of Naples 1627-1775." *Imago Mundi* no. 56 (Part 1):23-47, 38. "the *Mappa topografica* not only recorded the total area encompassed by the structural islands of the city, but made plain that those islands were significant as units of occupied land; it connoted that the city could not accommodate further construction and by way of implication, was an exporter of future growth. The only alternative signs within the city were the floor plans of institutions, old and new, which had established Naples as a highlight Grand Tour and evidently deprived it of civic space. While the omnipresence of ecclesiastical floor plans made a visual argument for a paucity of secular space, those of loyal royal institutions accented the two-dimensional depiction of the city with an expansive centrifugal rhythm, situated as they were at the peripheral heads of the major axes of the eighteenth-century capital."

⁴⁷ Edney, Matthew H. 1999. "Reconsidering Enlightenment Geography and Map Making: Reconnaissance, Mapping, Archive." In *Geography and Enlightenment*, edited by Charles W J Withers and David N Livingstone, 165-198. Chicago USA: The University of Chicago Press, 190. Unfortunately, however, probably due to the sheer volume of material, "the conceptual unity of that [Enlightenment] archive was undermined by the unavoidable messiness of the archive's actual implementation. The archive contained a wide variety of materials housed in many different physical locations." The process of translation of collated information was an inherent problem in the Enlightenment, as it is also a problem today.

not able to be ascertained in the city view. Eighteenth century projections still differed from the modern map in that they persisted with “multiple representational strategies and spatial constructions to enumerate and describe the world.”⁴⁸

Mapping and Reconnaissance

The evolution of the map metamorphosed in a century from an accepted yet ambiguous socio-cultural construct to a passive representation measured by “exact science.”⁴⁹ The “Second Great Age of Exploration” was for the virtue of scientific discovery instead of only military and mercantile motivations.⁵⁰ Therefore, the eighteenth century was also the period when geographers became connected with maps via the mapmaking process. Two practices enabled the creation of the geographic archive, firstly, *reconnaissance*, and secondly, *mapping*. Reconnaissance reflected Europe’s colonial desires whereby expeditions would result in detailed narrations of places and routes. By the eighteenth century these narrative accounts were quite different to earlier versions of descriptive geography. The act of reconnaissance during the Enlightenment was carried out by a variety of individuals of varying degrees of expertise, ranging from merchants, engineers, surveyors and scientists.

The art of reconnaissance was crucial to the age of colonial exploration and expansion. Although reconnaissance maps ranged in their graphic and discursive presentation, they were a valuable form of archive to colonial powers. Formats included narrated directions, in the form of distances and lists of dot point directions to essays of descriptive text capturing the geographers’ presence within a visually overwhelming landscape. Both textual accounts together with graphic imagery, from sketches to cartographic measurements, contributed to the overall construction of the recounted space and environs. The method by which information was selected for inclusion in the discussion of the spatial environment was dictated by the geographer’s reasoned judgement and evaluation of worth. Unlike modern geographical accounts, Enlightenment reconnaissance was not particularly analytical in its discussion of space, but primarily descriptive.

⁴⁸ Edney, 1999, 193.

⁴⁹ Suárez, 1999, 27.

⁵⁰ Edney, 1999, 167-8. See also Goetzmann, William H. 1986. *New Lands, New Men: America and the Second Great Age of Discovery*. New York: Viking.

By contrast, the process of mapping may be considered the opposite to that of reconnaissance. The reigning definition of a map in the 1700s was “the drawing together and presentation of the relations and hierarchies between phenomena. The space in which these phenomena are related was initially geographical.”⁵¹ But by the middle of the century there was a shift where mapping was not necessarily or solely related to geographical space, but maps were connected to taxonomies of knowledge, for example “the mapping of nature.”⁵² Therefore, maps of the Enlightenment were primarily regarded as a means of ordering knowledge, as constructs which negotiated information from reconnaissance together with accumulated data and which were then displayed in a graphic format. As an example, Edney recounts Tobias Mayer’s *mappa critica Germaniae* of 1753 was intended,

to advertise the lack of firm, reliable geographical locations in central Europe and to demonstrate the resultant variability of geographical outlines. Of the two hundred towns in his map, there were observed latitudes for only 33 and observed longitudes for none. Like all other geographers, Mayer had to define the positions of towns from reconnaissance accounts, wither by geodetic calculations or by plotting routes between known points in the graticule.⁵³

To aid understandings of past processes of mappings, geographers of the eighteenth century recounted in their memoirs methods of teasing out geographic knowledge from other peripheral information. These memoirs served as documents legitimising a geographer’s life work, assumptions, reasoning behind inclusion of material, and therefore would often accompany the resultant maps.⁵⁴

⁵¹ Edney, 1999, 186. See also Edney, Matthew. 1994. "Mathematical Cosmography and the Social Ideology of British Cartography 1780-1820." *Imago Mundi* no. 46:101-16.

⁵² *Ibid.*

⁵³ *Ibid.*, 186.

⁵⁴ *Ibid.*, 187. See also Pedley, Mary Sponberg. 1995. *Commode, complet, uniforme, et suivi!*: Problems in Atlas Editing in Enlightenment France. Paper read at Editing in Early and Historical Atlases: Paapers Given at the Twenty-ninth Annual Conference on Editorial Problems, at University of Toronto, Canada.

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Figure 86. Tobias Mayer's *mapa critica Germaniae*.
(Source: http://www.raremaps.com/gallery/detail/1748RB/Germania_atque_in_ea_locorum_princip_aliorum_mapa_critica_ex_latitudinum/Mayer.html viewed 21st April 2012).

Technology developed further into the late eighteenth and early nineteenth century to shift to more accurate processes of surveying such as triangulation. Triangulation also aided the process of observation in its reconciling the landscape with mapped space to a far greater degree than was achievable with the graticule. Through the organisation of a mass of control points across the landscape to be surveyed, it was possible to achieve far larger and more accurate surveys than observational latitude and longitude were ever able to do.⁵⁵ Although the degree of accuracy achievable with triangulation were obvious in the late eighteenth century, due to the cost and laborious nature of implementing the technology, European countries did not really embrace such technologies until the mid-nineteenth century.

⁵⁵ Edney, 1999, 191.

4.3 Where was Paradise? Sacred Geography Re-Mapped

Charles Withers, in his study “Geography, Enlightenment, and the Paradise Question,” draws a comparison between “early modern botanic gardens,” which were perceived as extensions of the Garden of Eden and heavenly paradise of the Christian faith.⁵⁶ The botanic gardens were considered important reference points for early modern science, and their association with gardens of paradise reflected the Enlightenment predicament and apparent conflict between sacred understandings and reasoned thought.

To the churchman, if not the exegetical philosopher, paradise was textual truth, a spiritual state, and a celestial place. Belief in the first at least demanded a geography for paradise.⁵⁷

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Figure 87. Garden of Eden from Fra Mauro 1457.
(Source: Whitfield, 2010, 13).

For pre-modern Christians, notions of earthly and geographical space were inseparable from ideas around paradisiacal space. During the Enlightenment, such understandings transferred to cartography, established a conflict between imaginative and literal ideas around space, and geographical representations of these concepts. For Christians to accept Paradise as a place, Withers argues, that there had to be a

⁵⁶ Withers, Charles W. J. 1999. "Geography, Enlightenment, and the Paradise Question." In *Geography and Enlightenment*, edited by David N. Livingstone and Charles W. J. Withers, 67-92. Chicago: University of Chicago, 67.

⁵⁷ Ibid.

geographical understanding or image linked to Paradise, and for the question to be posed, “Where was Paradise?”⁵⁸ A number of options existed for the response to this question, the first being that paradise had been lost and therefore the fall of a well-established Christian culture to a less significant existence had occurred. The next possibility for consideration was that the Flood had forsaken Paradise and therefore through a process of geographical enquiry, exploration, and discovery, its whereabouts would be revealed. Generally speaking, however, Paradise was believed to lie to the east, a prevailing view of the early medieval period represented in *mappaemundi* representations. The four rivers of the Tigris, Euphrates, Pison and Gihon were typically indicated in these maps as originating from Paradise. However, such representations created confusion when the positioning of the real rivers Tigris, Euphrates, Ganges and Nile could not be determined geographically.

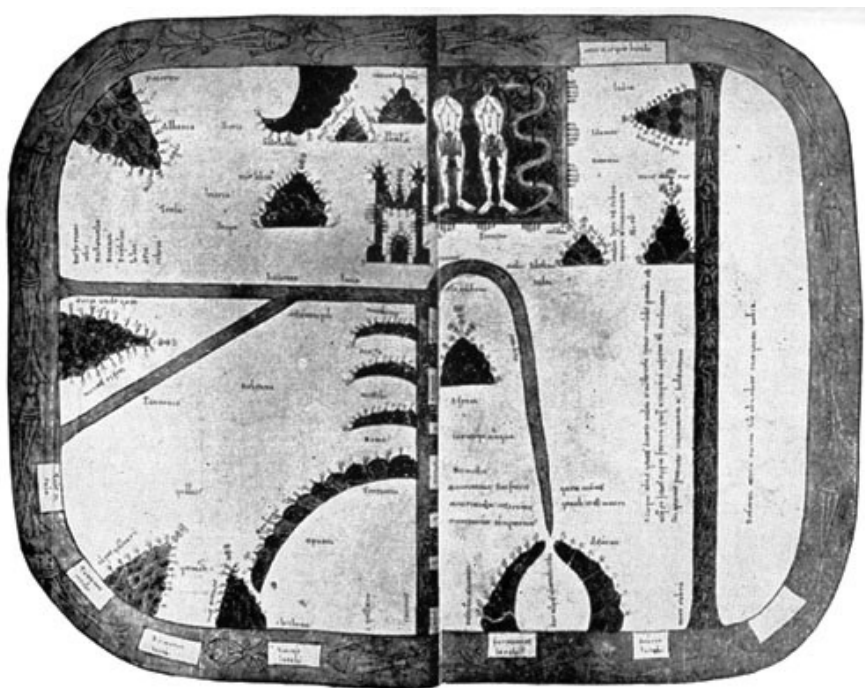


Figure 88. Spanish-Arabic world map from 1109 AD with Eden in east (at top). (Source: http://en.wikipedia.org/wiki/File:Spanish-Arabic_map_of_1109.jpg viewed 20th April 2012.)

On Columbus’ 1498 expedition, he heard from his men that they had seen four rivers at the top of the Gulf of Paria, and they equated that with the description of the rivers of paradise.⁵⁹ Until the advent of technological improvements in surveying and

⁵⁸ Withers, 1999, 69.

⁵⁹ Ibid., 70. See also Prest, John. 1981. *The Garden of Eden: the Botanic Garden and the Re-creation of Paradise*. New Haven: Yale University Press.

mapping with what is known as the geographical age of discovery, it was not possible to empirically prove the existence of Paradise. The promise of attaining such evidence of Paradise to verify long-standing beliefs of the Christian world motivated many expeditions in particular those of the Portuguese.

Therefore, another belief in Paradise resonated for explorers in the seventeenth century, those of whom travelled to the New World, as qualities of Paradise were no longer possibly imagined for an established Europe. Utopian ideas were transferred to a new stomping ground for the empire builders of the European powers, where “pastoral paradise” replaced the “imperfections of western civilisation.”⁶⁰ Mapping provided an opportunity to explore these differing ideas and sites of paradise. During the sixteenth century, the Bible displayed maps of paradise or Eden in celestial and cosmographical forms.⁶¹ While post Reformation, the centre of paradise was considered the city of Jerusalem as the symbolic centre of the Christian world.⁶² On the other hand, different map-making European centres portrayed earthly paradise in a number of different geographical locations. Catalan maps of the fifteenth and sixteenth centuries, bestow anywhere between East Africa and India as the virtuous location, whilst the Portuguese identified South America for its possible siting. By the seventeenth century degrees of scepticism arose in the cartographic community as to an actual geographic location on earth, as theories of the location of the Garden of Eden become increasingly more elusive to prove empirically. Representations of paradise shifted in the mid-seventeenth century from being part of cartographic material to reverting to decorative imagery and series of vignettes on the borders of maps.⁶³

In the Enlightenment, the view of Paradise changed from being a possible geographical discovery to being a phenomenon which had been wiped out by the Flood implying a failure on the part of explorers to uncover its geographical location. Despite a lack of geographical evidence, the view persisted of an earthly paradise’s

⁶⁰ Withers, 1999, 70. See also Plaut, A. 1984. "Where is paradise? The Mapping of A Myth." *The Map Collector* no. 29:2-7.

⁶¹ Ibid., 71

⁶² Ibid. See also Delano-Smith, Catherine, and Elizabeth Morley Ingram. 1991. *Maps in Bibles 1500-1600: An Illustrated Catalogue*. Geneva: Librairie Droz.

⁶³ Ibid., 72. Duncan, James. 1972. *Milton's Earthly Paradise: A Historical Study of Eden*. Minneapolis: University of Minnesota Press.

existence, and did not quash enthusiasm for other methods of discovery to be employed.

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Figure 89. Jerusalem conceived in Münster's publication *Cosmography*, 1544.
(Source: Short, 2003, 109).

Nathanael Carpenter, in his "Geography Delineated Forth in Two Bookes" (1625), proposed a combination of empirical, divine readings and faith. Also referencing theories put forward by his contemporaries, in addition to recounting ancient belief systems to verify Paradise on earth. From an empirical viewpoint, it was impossible for paradise to be located on the top of a mountain as it would impede the path of light from the sun; it would also be too obvious to the "eyes and knowledge of men;" and lastly it would be appear more significant or "over-poize" earth. In conclusion, Carpenter asserted paradise had been lost somewhere in Mesopotamia given that there was no other conceivable place where all of the sacred rivers would meet.⁶⁴

The alternative view argued in Thomas Burnet's account, "Sacred Theory of Earth," published in 1684, proposed the whole of earth as Paradise. This textual series of four books have been equated as some of the most influential early Enlightenment theories

⁶⁴ Withers, 1999, 73.

on the relationship between ideas behind origins of natural history and tensions of biblical belief systems.⁶⁵ Burnet stated his method as follows:

We may in the mean time observe...how preposterously they go to work, that sets themselves immediately to find out some pleasant place on earth to fix *paradise* in, before they have considered, or laid any grounds, to explain the general conditions of it, wheresoever it was. These must be known and determined, and we must take our aim and directions from these, how to proceed further in our enquiries after it; otherwise we sail without a compass, or seek a port and know not which way it lies.⁶⁶

Therefore Burnet's work is based on the sacred texts being true and his work understanding the origins of nature set about explaining those so-called truths. Only when scriptures could not explain his findings, were secular authors consulted to further validate his ideas. The search for earthly paradise continued into the mid-eighteenth century for many authors, although even the clergy acknowledged the inabilities of empirical geography to determine an actual site of existence. "Many learned Men of ancient times, very able in other respects," Bishop Huet wrote, "have been very ignorant of Geography...The old geography is not very certain."⁶⁷

As Withers points out these works identified views changing from concern about a present sacred geography to the search for a past geography of Paradise. Therefore, there was not an enduring concern for the failure of geography to determine a paradisaical place, but rather that exploration determined by observation and account, that the Garden of Eden did not exist on earth which was therefore a triumph for geography.⁶⁸ By the eighteenth century, quite another question emerged with regard to concerns of Paradise, and that was about the type of language which was spoken. Therefore, the notion of Paradise endured despite lack of geographical certainty about its physical location, to the point of enquiry as to social cultural characteristics of the place, which by default suggested its existence. Fields of geographical enquiry

⁶⁵ Withers, 1999, 75.

⁶⁶ Ibid., 75-76. Butlin, Robin A. 1992. "Ideological Contexts and the Reconstruction of Biblical Landscapes in the Seventeenth and Early Eighteenth Centuries: Dr Edward Wells and the Historical of Geography of the Holy Land." In *Ideology and Landscape in Historical Perspective*, edited by Alan R. H. Baker and Gideon Biger. Cambridge: Cambridge University Press.

⁶⁷ Ibid., 77.

⁶⁸ Ibid. Comito, T. 1971. "Renaissance Gardens and the Discovery of Paradise." *Journal of the History of Ideas* no. 32:483-506.

together with the history of language, culture and evolution of peoples of different races became a focus of this period of the Enlightenment. This expansion of scientific thought to bridge cultures and countries prompted thinking about ordering knowledge in a universal way for shared understandings of the findings. Structuring knowledge via taxonomies or universal signs and symbols, enabled a common scientific language to evolve and be interpreted by peoples who conversed in languages of different linguistic origins, were many of the motivations of Enlightenment thinking.⁶⁹

Bridging cultures and countries through graphic communication systems was topical given the colonial cartographic undertakings of the Enlightenment.

4.4 Mapping and Colonial Desires

The colonial administration in their desire for control, re-mapped indigenous territories, and in effect recreated the geographies of colonial spaces. The cartographical enterprise which followed as a result of the Second Great Age of Exploration possessed new territories where these fields of geographical enquiry could implement the most current Enlightenment principles. The structuring of knowledge through taxonomies was one such principal readily embraced in order to establish a legible and comprehensive archive from indigenous plants and foods to the ethnic diversity of the colonies. Heinrich Berghaus' map (figure 90) shows one example of an attempt to reveal a European-centred view of the ethnic divisions of race. The information associated with this map also communicated information about diet, population density, life expectancy and so on.⁷⁰ Therefore the map may be seen as a visual taxonomy, as well as conveying geographic space.

Archiving and Bureaucracy

The French excelled at the colonial enterprise of preparing an archive of their colonial territories. The British, Dutch, Spanish and Portuguese were all composing the data of their colonial conquests, but it was the French who appeared to have the most comprehensive bureaucratic machine, allocated to constructing their Enlightenment archive.

⁶⁹ Withers, 1999, 78.

⁷⁰ Whitfield, 2010, 120-1.

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Figure 90. European-centred Racial Map. Heinrich Berghaus, 1852.

This map was intended to contribute to all aspects of man and environment of the region. This map was also an attempt at presenting a theme in cartographic form. (Source: Whitfield, 2010, 120-21).

The French entered the colonising role wholesale in the seventeenth century. One example of their meticulous archiving and bureaucratic agenda was in the area of medical services, crucial to both French ex-patriots and colonial citizens surviving exposure to new foreign sicknesses. To combat wholesale outbreaks of disease the French government in the eighteenth century prioritized training naval doctors for service in the colonies. Research into the health of its citizens at home and abroad motivated experimentation with cooking with seawater, (such as making bread) and preserving fresh water while at sea.⁷¹

However, controlling and maintaining colonial space was more than merely maintaining a vigilant stance on the health of its citizens. Surveillance and control of the seas surrounding the colonies were prioritised, in addition to paying close attention to developments in the sciences such as astronomy, cartography, and geodesy to gain greater insight into all aspects of colonial space. This approach

⁷¹ McClellan, James E. III, and Francois Regourd. 2000. "The Colonial Machine: French Science and Colonization in the Ancien Regime." *Osiris, Nature and Empire: Science and the Colonial Enterprise* no. Vol. 15 (2nd Series):31-50, 34.

prompted the establishment of collaborations between institutions such as the Academie des Sciences, the Observatoire Royal (1667), and the Academie de Marine (1752).⁷² The Academie des Sciences motivated improvements in the determining of longitude at sea with the development in the 1760s of John Harrison's marine chronometer. Generous prize money sponsored by the Academie in its program of 1714 bequeathed money to marine and surveying research. Prior to this innovation, sailors at sea used astronomical observations and calculations to determine their position. Yet cartography remained a keen preoccupation of the French and like other colonial powers, they took the surveying of colonial space and the building of cartographical information very seriously. The French created the Depot des Cartes et Plans within in its Naval ministry in 1720, in order to compile an archive of hydrographical and mapped information.⁷³ An engineering corps as well as army and naval surveyors performed surveying duties in the colonies.

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Figure 91. Missionary Map of the Colonial Territories, 1822.

This map charts the colonial enterprise in parts of the world where missionaries were working. This map is by an unknown author but was probably produced c. 1822. The colour coding charts the different religions present in colonial territories. (Source: Whitfield, 2010, 116-117).

⁷² McClellan & Regourd, 2000, 36. See also Konvitz, Josef W. 1987. *Cartography in France, 1660-1848: Science, Engineering and Statecraft* Chicago: The University of Chicago Press.

⁷³ *Ibid.*, 39. See also Sobel, Dava, and H. Andrewes. 1998. *The Illustrated Longitude* New York: Walker.

In addition, detailed taxonomies were prepared in detail of the natural phenomena of the colonies, such as scientific notes of the flora and fauna native to each of the locality. Missionaries often provided such data from the field in collaborations with indigenous monastic activities.⁷⁴ As the colonies became more established, this tracking and recording of natural history shifted toward a process of economical production of plants, which would be useful for food and other purposes and thus signaled the introduction of exotic species to colonial regions. Spices such as cinnamon, nutmeg, pepper and clove were introduced to the West Indies, after raids on the Dutch East Indies and the Philippines were conducted by the French in the 1750s solely to steal spices. Coffee trees were also introduced to the French West Indies and transformed the production of this commodity, a strategy which has resonated even into modernity.⁷⁵ The motivation of French authorities to organize a bureaucratic force behind colonial endeavours was clearly a response to the mercantile and economic benefits of colonial expansion. The purpose of mapping (figure 91) was to represent the Enlightenment archive and to communicate the European model of society. Mapping claimed to chart objectively, and on a semi-scientific basis (in the case of thematic maps), information such as the five degrees of civilization proposed by Clark in 1822, “savage, barbarous, half-civilised, civilised, enlightened.”⁷⁶ The reality of these maps shows the complete cultural subjectivity of such propositions, and demonstrates that Enlightenment mappings also moved to communicate non-geographical ideas.

Imaginal Re-mapped

Imaginative and mythical mappings of geography, specifically associated with pre-modern peoples, that were part and parcel of indigenous understandings of land and settlement, were erased in the new mapping enterprise undertaken by colonial powers. Again all colonisers participated in these processes, but it is particularly evident in Britain’s surveying of India. Essentially the production of the British colonial archive was achieved by “the conquest, rule and administration” of the subcontinent

⁷⁴ McClellan & Regourd, 2000, 41.

⁷⁵ Ibid., 42. See also McClellan III, James E. 1992. *Colonialism and Science: Saint Domingue in the Old Regime* Baltimore and London: The Johns Hopkins Univ. Press.

⁷⁶ Whitfield, 2010, 116.

of India.⁷⁷ According to Kalpagam, collation of the colonial archive was undertaken through a series of investigative operations, which were referred to as modalities.

These modalities were the historiographic, the observational/travel, the survey modality, the enumerative, the museological, the surveillance and the sanitary modalities.⁷⁸

These modalities undertaken during the colonial period, in particular those which achieved cartographic outcomes, contributed to modern representations of India. In the case of India, it was an enormous task to survey and map such a large land mass, and during the colonial period mapping operations occurred gradually as new states came under British control. Administration from the mother country demanded the fixing and demarcation of boundaries to be as accurate as possible in particular for the raising of revenue through land taxes, as well as the identification or extent of jurisdiction of political powers.⁷⁹

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Figure 92. India in the eighteenth century.
(Source: http://images.nationmaster.com/images/motw/historical/colbeck/india_1760.jpg viewed on 16th June 2012).

⁷⁷ Kalpagam, U. 1995. "Cartography in Colonial India." *Economic and Political Weekly* no. 30 (30):PE87-PE98, PE 87.

⁷⁸ Kalpagam, 1995, PE 87. See also Cohn, Bernard S 1988. *The Anthropology of a Colonial State and Its Forms of Knowledge*. Paper read at Wenner-Gren conference on Tensions of Empire: Colonial Control and Visions of Rule, Spain.

⁷⁹ Ibid.

The first modern map of India was prepared by a French geographer in 1751-52 which was accompanied by the detailed descriptions of the process in Memoir D'Anville. The map essentially was based on travel routes and writings as well as coastal charts which were fairly rudimentary. Once the British achieved colonial rule over Indian territories after the Battle of Plassey in 1757, surveying commenced on a dramatic scale in the conquered lands.⁸⁰ Surveying was often accompanied by the memoirs of the surveyor to highlight the decision making as well as difficulties negotiated in arriving at the survey data. Information ranging from each state's military capabilities to opportunities for revenue collection, were included in memoir rationalisations. These studies and notes far surpassed any geographical requirements.⁸¹ Memoirs might describe and account for geographic features, positions of places, the family histories of ruling classes, relationships between neighbouring ruling states, history of conflicts, any existing assets of the state and rulers, but may not be limited to only these points.⁸²

Possibly the most contentious form of surveying was the revenue surveys, as they brought to the forefront different understandings of space between the British and indigenous peoples. One path of alleviating this struggle was instigated by Alexander Read who had been sent to conduct revenue settlement after the British defeated the Tippu Sultan in 1792, whereby he employed locals to undertake the surveying tasks. On some occasions, accruing information was prohibitively difficult in that Read and his men would be locked out of a village as mistrust of the colonial power infiltrated many regions.⁸³

Another essay, which seeks to understand the colonial project, is Alex Tickell's paper "Negotiating the Landscape: Travel, Transaction and the Mapping of Colonial India", which states intentions to review:

⁸⁰ Kalpagam, 1995, PE 87.

⁸¹ Ibid., PE 88. Dirks, Nicholas. 1993. "Colonial Histories and Native Informants: Biography of an Archive." In *Orientalism and the Postcolonial Predicament: Perspective on South Asia*, edited by Carol Breckenridge and Peter Van der Veer. Philadelphia: University of Pennsylvania Press.

⁸² Ibid.

⁸³ Ibid., PE 93.

and foreground ways in which the colonial map can be read as the product of cross-cultural negotiation or translation, rather than an unproblematic, descriptive tracing...in particular...the way these texts betray the ideological instability of cartography at the same time as they contribute to what Gayatri Spivak has termed the 'far-flung' and heterogeneous project to constitute the colonial subject as Other.⁸⁴

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Figure 93. Map of India indicating colonial powers.
(Source: http://images.nationmaster.com/images/motw/historical/ward_1912/india_british_dominion.jpg, viewed 15th June 2012).

Therefore, the production of colonised space and in turn resultant cartographic representations reflects the layers of conflict and negotiation which produced that space. The Great Trigonometrical Survey, which was both an exercise in cartographic representation as well as documentary texts, fairly comprehensively reflected

⁸⁴ Tickell, Alex. 2004. "Negotiating the Landscape: Travel, Transaction and the Mapping of Colonial India." *The Yearbook of English Studies* no. 34 (Nineteenth Century Travel Writing):18-30, 20.

Enlightenment ideologies. Mapping this colonial space of India also brought to the fore the domination of the British as a political power. Through the mapping process, in its collection, navigation of information to put into the map, it also “neutralised the threat of its cultural and physical difference and, in turn, presented the authoritative ‘position of the [European colonial] subject as fixed and unchangeable.’”⁸⁵ Therefore, obligation and pressure for Everest the surveyor, was to collect the “right” information and ensure its accuracy as well as conveying the appropriate political message. So the survey represented more the relationships which were negotiated to achieve its construction, that is, between all contributors ranging from the colonisers to the colonised, rather than any topographical study it claimed to demonstrate.⁸⁶ Everest’s journal account of his progress across Bengal indicated his frustration with attempting to achieve elevated points in the landscape as points of bearing. Everest’s assumption to a certain degree was that he would be measuring an un-inscribed landscape but in actuality Indian temples dotted the Bengal region as well as other parts of India and often they were the most elevated points. Unlike his counterpart Lambert, who utilised these religious highpoints to bear off, Everest constructed his own towers at great expense so as not to impose upon the local religious structures. These colonial towers in effect became entwined in local traditions either through being disassembled as unsavoury marks on native territory, to according the towers with magic and inclusion in local native ceremonies. Therefore an imposed spatiality of colonisation began to enmesh with the local spatiality.⁸⁷ In practice, these surveying projects involved large teams of people, with some of the party always ahead of the main group which created problems of passing information between groups. Leader groups might face hostile locals and then some subversion of information may have taken place, or simply by the time the remainder of the group caught up to the leading party, the data may have been revisited. Any number of situations or discrepancies were possible, given the length of time these surveys took to achieve. The sheer daunting task of covering so much ground, the negotiation of hostile villagers were all complicating elements affecting the final outcome of the survey.

⁸⁵ Tickell, 2004, 20.

⁸⁶ Ibid., 22.

⁸⁷ Ibid., 24. See also on colonial space, and agency of the colonized. Yeoh, Brenda S. A. 1996. *Contesting Space: Power Relations and the Urban Built Environment in Colonial Singapore*. New York: Oxford University Press.

The complex nature of translation of landscape elements into an intelligible survey was inevitably fraught for all parties involved in the mapping process. For example some landscape elements may have had long associations and therefore levels of meaning to the locals, whereas to the British surveyors they existed merely as a landscape feature and thus a mark on a map. The surveyor Francis Buchanan reported his problems of cultural translation in Bengal.

The geographers of Europe are apt to be enraged, when in tracing a river they find that an inconsiderable stream falling into the grand channel changes its name, and thus sources of this smaller stream is obstinately considered by the natives as the source of the river, either having being the first to which they had access, or having at one time been the largest.⁸⁸

This cross-cultural predicament no doubt occurred frequently. The locals unwilling to concede generations of historical verbal accounts as incorrect, with the colonisers requiring a preciseness or accuracy from the locals' knowledge but at the same time may often cast doubt on any colonial aspersions.⁸⁹ In a less assertive manner, but which may also be interpreted as the reconfiguring of the colonial space, Everest records instances in his journal where locals treat the surveyors' interruption into their social space as a spiritual experience. Surveying instruments and practises of the colonisers were considered by some of the local infirmed community as an opportunity to engage with objects of "miraculous powers."⁹⁰ Tickell suggests such acts by the native locals may be considered a recasting of the trigonometric points within the site as another cartographic reading, such as an opportunity for a spiritual pilgrimage, which also forces a re-evaluation of the intended cartographic representation.⁹¹

Concluding Remarks

From medieval conceptions, a new vision of geographic space from its slow transition to a new conceptual vision of the world, from sixteenth century to nineteenth centuries, highlights critical changes in Western cartography and eventually non-

⁸⁸ Edney, 1997, 331.

⁸⁹ Tickell, 2004, 26.

⁹⁰ Ibid., 27.

⁹¹ Ibid. See also Low, Setha M., and Denise Lawrence-Zauaniga. 2003. *The Anthropology of Space and Place: Locating Culture*. Malden, Massachusetts: Blackwell Publishers.

Western geography. A recasting of geographic understanding to an empirical conception of the world, meant these ramifications were expressed and transformative in maps. Geographic science was integral in reshaping all conceptions of space from socio-religious to humanist views. The recasting of socio-cultural and traditional spatial understandings was the predominant procedure to operations when occupying colonial territories. An exposition of this colonial re-mapping enterprise follows in the next chapter.

Chapter 5: Re-Mapping the World

The Enlightenment meant modern science desired and constructed a more literal interpretation of geography. The modes of production of mapping also equated to a much narrower use of the map, as well as a very small spectrum within which maps were normally read. This new way of seeing and conceptualising the world, from early modernity to the Enlightenment, prompted an enormous investment in the Western cartographical enterprise, from developments in instrumentation to exploration and colonisation. These technologies and practices enabled a revisiting of mapping with the endeavour of producing accurate and precise representations of space on maps. Motivations for an accurate geography on a global scale, ranged from providing reliable information for sea passage in exploration to mapping territory for imperial expansion. At a domestic level, empirical and quantitative mappings were perceived necessary for land ownership, revenue raising, infrastructure purposes, judicial disputes and generally the ordering of settlement. These desires were largely a preoccupation of the West, and slowly manifested into Southeast Asian societies around the nineteenth century. A re-mapping of the world occurred because the Enlightenment signified a whole new way of seeing and thinking about geographic space.

5.1 Mapping and the Scientific Gaze

Enlightenment mapping processes were defined by their structuring of space and their representation of observation.⁹² Generally, these maps were widely regarded as:

a dialectic of experience and reason: it is experience, usually visual in nature, which produces information about the world, but it is reason which refines and structures that experience and gives it meaning.⁹³

⁹² Tickell, 2004, 27. See also Pedley, Mary Sponberg. 1995. 'Commode, complet, uniforme, et suivi': Problems in Atlas Editing in Enlightenment France. Paper read at Editing in Early and Historical Atlases: Papers Given at the Twenty-ninth Annual Conference on Editorial Problems, at University of Toronto, Canada.

⁹³ Edney, 1999, 175. See also Laxton, Paul. 1976. "The Geodetic and Topographical Evaluation of English County Maps, 1740-1840." *The Cartographic Journal* no. 13:37-54.

Despite the emphasis on attaining empirically derived mappings, in actuality the Enlightenment approach always produced “highly idealized” representations in the “reasoned manipulation of data.”⁹⁴

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Figure 94. *City of Amsterdam map in Brauns' Civitates Orbis Terrarum.*
This map demonstrates the detailed qualities of the bird's eye view, which depicts the mercantile nature of the city, building forms, public space and socio-cultural conditions characteristic of sixteenth and seventeenth century views of settlement. This mapping reflects the civic pride of the map maker, and also may be considered an idealised representation. (Source: Short, 2003, 133).

Eighteenth century geographical knowledge was not limited to the map, but included observations about the physical world which constituted the mapped space. These factors ranged from the material, like architecture and socio-cultural forms to environmental characteristics like landforms and climate.⁹⁵ However, this information was charted in a two-dimensional format, rather than represented in the pictorial method demonstrated above (figure 94) in the seventeenth century projection of the bird's eye view of Amsterdam. The geographical process in the seventeenth and eighteenth centuries was also one of comparison, whereby an existing mapped region

⁹⁴ Edney, 1997, 190. See also Cook, Andrew S. 1985. More By Accident Than Design: The Development of Topographical Mapping in India in the Nineteenth Century. In *Eleventh International Conference on the History of Cartography*. Ottawa, Canada.

⁹⁵ *Ibid.*, 42. See also Gunn, Geoffrey C. 2003. *First Globalisation - The Eurasian Exchange, 1500-1800*. Edited by Mark Selden, *World Social Change*. Maryland, USA: Rowman & Littlefield Publishers INC.

would be analysed against a newly mapped region. The chart below (figure 95) is an example drawn as a result of comparisons, determined by the astronomer, Halley.

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Figure 95. World Variation Chart, 1702, by Edmund Halley.

Halley, an astronomer drew this map as a result of his findings as well as the work of the Dutch East India Company. Halley was also commissioned by the British navy in 1698 to determine longitude. (Source: Short, 2003, 149).

According to Barbara Stafford observations of comparison were conducted from two different perspectives.⁹⁶ The “scientific” gaze compared with the “picturesque” gaze, dealt with different perspectives, and thus had different objectives for the collation and representing of data.⁹⁷ The Enlightenment period was said to be characterized by the blending of aesthetics with scientific reasoning, each of which were “embedded in its own cultural constructs.”⁹⁸ European mapping practice was dominated in the eighteenth century, by mapping undertaken by reconnaissance (experience and geographical narrative) as well as locating objects in space through the empiricism of latitudinal and longitudinal (see Halley’s map in preceding figure). Therefore, Enlightenment mapping was considered for its time, a most precise of scientific methods available to determine one’s place in the world and one’s relations to others.

⁹⁶ Stafford, Barbara Maria. 1984. *Voyage into Substance: Art, Science and the Illustrated Travel Account, 1760-1840*. Cambridge, MA: MIT Press. 5.

⁹⁷ Edney, 1997, 54.

⁹⁸ Gunn, 2003, 140. See also Goetzmann, William H. 1986. *New Lands, New Men: America and the Second Great Age of Discovery*. New York: Viking.

Zürner's map (figure 96) is a comprehensive example of this shift to a modern way of thinking and illustrates the transition of mapping from an artistic concept of the seventeenth century to a "newly conceived image fitting the Age of Enlightenment."⁹⁹

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Figure 96. Part view of Adam Frederich Zürner's World Map c.1710.
This view represents a "visual encyclopedia of eighteenth century geography and astronomy. The map highlights geographical and scientific information in textual and graphic forms, whilst vignettes indicate volcanoes, winds, rain and rainbows. Climatic zones, ocean currents and the voyages of discovery are all charted on the double hemispheres. (Source: Whitfield, 2008, 106-7).

⁹⁹ Whitfield, 2010, 106-107.

Science

The scientific gaze, involved observing what was perceived as the facts and individual characteristics of the landscape in detail. Among the scientific innovations which impacted upon conceptions of mapping included visual and mechanistic ways of seeing. The *camera obscura* technology of the mid-1600s had been embraced as the main method of recording images of the world. The top right hand image in figure 97 champions the perspective view produced by the *camera obscura*.



Figure 97. Title page of book by Samuel Purchas published in 1624.

A book of travel and exploration and a series of historical ideas, with this title page, images included: significant European explorers, conqueror's Noah, the first shipbuilder, peoples of worldly and spiritual influence. It is a conceptual seventeenth-century Jacobean view of the world with soldiers and merchants as the important members of society.

Johnathon Crary in his analysis of the role of the *camera obscura* in “Techniques of Viewing,” suggests the viewer becomes abstracted from the scene viewed.¹⁰⁰

However, “linear perspective” through the lens of the camera was legitimised as the main premise for visual records.¹⁰¹

Of all the senses, sight was the most mechanistic, least sensuous, and hence was closest to the truth. Sight’s almost exclusive privilege as the means by which to know the world was only reinforced by the use of artificial technologies of vision. In addition to the *camera obscura* itself, telescopes and microscopes underscored the mechanical character of vision by enhancing human faculties and so allowing more of creation to be seen and examined.¹⁰²

Sight was also able to be further quantified with the use of measuring equipment such as graduated rulers and less tangible components of the environment could also be measured like temperature with the advent of thermometers. Enlightenment observation which attempted to reveal the “truths” of the scene, by “...observing rules, codes, conventions and practices. Observation is guided vision; the observer looks at the world in a controlled manner.”¹⁰³ The premise by which vision could be considered a reliable method for accounting for geographical facts, came about through the second aspect associated with Enlightenment thinking and that was using the power of reasoning. Reason enabled observers to make sense of things hinging on the capacity of the human brain to evaluate, the circumstances and contributing factors of objects of study. Therefore the limiting aspect for an individual in developing these thinking processes was the extent of their education. Typically, the model for Enlightenment thinking was developed through western education systems.

An understanding of rational thinking during the Enlightenment was based on some of the following theorisations: Bernard de Fontenelle’s 1699 “*esprit géométrique*,” also editors Denis Diderot and Jean d’Alembert’s, *Encyclopédie* (1751-65) proposed a process of observation whereby objects were compared and all of their individual characteristics evaluated and measured against one another. In addition, taxonomies

¹⁰⁰ Broglio, Ron. 2008. *Technologies of the Picturesque: British Art, Poetry, and Instruments, 1750-1830*. USA: Lewisburg Bucknell University Press, 58.

¹⁰¹ Edney, 1997, 46-47.

¹⁰² Ibid., 48. See also Crary, Jonathon. 1990. *Techniques of the Observer: On Mission and Modernity in the Nineteenth Century*. Cambridge, MA: The MIT Press.

¹⁰³ Ibid. See also Bowen, Margarita. 1981. *Empiricism and Geographical Thought From Francis Bacon to Alexander Humboldt*. Cambridge: Cambridge University Press.

developed by botanists such as Linnaeus (Karl von Linné), also served as examples of how to organise and group geographical data.¹⁰⁴ Further influences came from the field of natural history and the development of systems of evaluations which would delimit observations. The method undertaken to observe these systems was by comparison and flexibility whilst guided by the objects individual attributes and character. By the eighteenth century another practice of systemising occurred whereby a broader spectrum of difference was permitted, observed and recorded. Projects for classification would then extend beyond “vegetable, animal, and mineral worlds into the realms, for example, of analytical geometry, mechanics, linguistics and natural society.”¹⁰⁵

The Enlightenment’s collective archive, was connected to conceptions of cartography, as a result of the evaluations of objects which needed to be cited within a physical space or location. This space then needed to be identified relative to other geographical spaces or locations in order to revisit it or measure the validity of assumptions about it. Cartographic metaphors featured in Linnaeus’ taxonomic systems and Michael Adanson’s, method for accruing knowledge. Maps were recognised in assisting the ordering of observed material in order to create knowledge.¹⁰⁶ Measuring apparatus’ evolved substantially by the late eighteenth century, and enabled mathematical modelling of many observations from the field. Therefore post-1750 the sciences of cartography and geography had come to rely on the empiricism associated with the recording of data by instrumentation of all varieties. However, the premise—observation achieved the truths of the observed, which subsequently were rationalised through processes of comparison and a further reconciling of those observations—endured as a credible evaluation process throughout the Enlightenment. One of the main reasons for its endurance being that the process of reasoning was considered sufficiently flexible to explain any anomalies of observation.¹⁰⁷

¹⁰⁴ Edney, 1997, 49. See also Home, Robert. 1997. *Of Planting and Planning: The Making of British Colonial Cities*. London: Spon.

¹⁰⁵ Ibid., 50. See also Foucault, Michel. 1970. *The Order of Things: An Archaeology of the Human Sciences*. New York: Random House.

¹⁰⁶ Ibid., 51. Yeo, Richard. 1991. "Reading Encyclopedias: Science and the Organisation of Knowledge in British Dictionaries of Arts and Sciences, 1730-1850." *Isis* no. 82:24-49.

¹⁰⁷ Ibid.

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Figure 98. Gerard van Keulen's world map, c.1720.

Van Keulen was the most senior hydrographer with the Dutch East India company. A position which involved all navigational data collected by Dutch seafarers and edited to update charts. This chart used the Mercator projection and thus became an unrivalled document into the eighteenth century with navigators at sea. (Source: Whitfield, 2010, 108-9).

The crucial consideration to recording the geographical archive in the eighteenth and nineteenth centuries was the necessary accurate citing of location. Defining particular locations on a map was achieved through the act of positioning—derived from longitude and latitude calculations as reference points—subsequently recording this data on a map.

The use of instruments to measure the positions of the planets and the fixed stars and so derive geographical locations exemplified the period's empiricism in that it entailed the observation of quite abstract phenomenon to derive concrete, quantified facts.¹⁰⁸

Latitude was recorded by observing the position of the sun at midday above the horizon or its altitude—the angular elevation of the sun above the horizon. This latitude measurement was achieved with calculations which recognised the position relative to the celestial pole. By comparison longitude measurements were somewhat arbitrary as no equivalent meridian to the celestial pole was apparent. A surveyor would measure longitude based on a universally agreed zero meridian. Yet this

¹⁰⁸ Edney, 1997, 85. See also Pratt, Mary Louise. 1992. *Imperial Eyes: Travel Writing and Transculturation*. London: Routledge.

interpretation opened the measurement of longitude to large errors. Longitudinal difference was related to time, and time differences related to three hundred and sixty degree equatorial circle. Therefore fifteen degrees equated to a twenty four hour time variation. In the seventeenth century, Galileo proposed the moons of Jupiter, given their regular and reliable observed movements, as the basis for the construction of time. By the eighteenth century in Paris and Greenwich there were published schedules of the predicted eclipses of Jupiter's moons. This meant the surveyor in the field could determine their longitudinal measurements either side of these observations.¹⁰⁹ For maritime navigation it was difficult to determine the position of Jupiter's moons with the heaving and lurching of a ship, so in the mid-1700s longitude became determined in marine navigation via the lunar cycle which was more regular than Jupiter's eclipses.¹¹⁰

The route survey remained the most popular form of mapping from seventeenth into the nineteenth century as it was fast and required only basic instruments. The accuracy and detail of the survey depended upon the skills and the equipment of the traveller. However the most simple route survey revealed a geographical narrative accompanied by time to travel between certain landmarks or villages, therefore an account of distance relative to direction of the sun. Direction was measured with a compass and a perambulator measured distance, or the time of travel was measured by noting a specific speed. As a linear mapping of the landscape, these surveys were inherently inaccurate, both from the inaccuracies presented from compass readings to the travel-time distance also being very subjective. The perambulator would also not keep a straight line, while its driver missed holes and crevices and other impassable objects.

Trigonometrical surveys by the eighteenth century became popular in aiding the surveying of large regional areas. Route surveys and linear calculations were viewed

¹⁰⁹ Edney, 1997, 87. See also Stafford, 1984.

¹¹⁰ Ibid. In addition the invention of the chronometer [refer marine chronometer] in 1760 meant a device which would keep fairly accurate time for long haul sea voyages. A navigator could then calculate longitude based on Greenwich time relative to the position of local stars and the sun. On the whole, however chronometers were limited in their general use due to their fragility for land travel and were too expensive for mass production and use in general surveying. Therefore the most common method which endured well into the nineteenth century, for the determination of longitude, was the observation of the eclipse of Jupiter's moons. The lunar tables prepared by Nevil Maskelyne were an adaptation of Tobias Mayer's (astronomer royal) 1754 lunar tables which enabled the "angular parallax in the moon's position as seen from Greenwich and from a ship would give the longitudinal difference."

as too inaccurate to be used as legitimate methods of representing large areas, therefore triangulation was embraced to gauge heights and distances applied with a triangulated grid laid plotted across the survey field. The grid was used in conjunction with astronomical observations at one or two points within this triangulated field to locate the survey frame on the greater earth's surface. Initially conceived for the field of geodesy and the measurement of the earth's size and shape, triangulation depended on the knowledge of certain benchmarks. The measurement of the size of the earth was crucial to Enlightenment's rational understanding of the world. Therefore attaining this knowledge was at the most sophisticated end of science during the eighteenth and nineteenth centuries. This structured and ordered method of viewing the world through triangulation meant that spatial characteristics were now being related to one another. Therefore errors were supposed to be more easily distinguished with a greater field of reference points to cross-correlate information and provide check points.¹¹¹

Aesthetics

By comparison to the scientific gaze, the picturesque gaze represented a more socially acceptable manipulation of landscapes viewed. In the 1800s the picturesque movement was understood as a combination of the themes of "Roman pastoral poetry with the style of Italianate landscape art."¹¹² The former idea formed an essential element of a proper Englishman's education, and the latter was understood from aristocratic travels around Europe, in particular Italy. The arrangement of picturesque spaces reflected stage-like scenes, with the foreground often in shadow as if it were being slightly obscured by the wings of the stage, and shadows cast by these features. Therefore the middle distance in the picture was often the focus which would display a city or an important village building such as church or castle. The background was also obscured due to the light cast by the horizon. The intent of these compositions as idealised constructs, was to evoke emotive responses from their viewers. Tourist maps and guidebooks enforced the existence of the picturesque in their recounting of landscapes where one might witness such emotive imagery. As idealised views of landscape, of course these views could not be recaptured. Yet there were instructions

¹¹¹ Edney, 1997, 108. See also Cook, Andrew S. 1985. "Alexander Dalrymple and John Arnold: Chronometers and the Representation of Longitude on East India Company Charts." *Vistas in Astronomy* no. 28:189-95.

¹¹² *Ibid.*, 57. Also Cook, 1985.

in guidebooks as to how one might achieve the same view or experience of the picturesque, listing details of the place to stand in order to attempt to grasp the colours and perspectives seen in popular paintings of the period.¹¹³

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Figure 99. *An English Autumn Afternoon, 1852-1855.*
Ford Maddox Brown's painting in the picturesque tradition (Source: Bermingham, 1987, plate 7).

Ann Bermingham states that people in picturesque images (figure 99) are absorbed into the landscape, as they appear oblivious of the beauty of the environment around them.¹¹⁴ By contrast, our appreciation of the surrounding beauty in its textures and colours, highlights our different spatial and visual experience to the subjects. In the same way this image illustrates a contrived and romantic view of the landscape, this tradition, transplanted understandings of the picturesque to the New World via European officers and government officials. They measured their view of these landscapes through eyes which were used to viewing landscape in a particular way. These images and creative representations were then forwarded sent back home which continued to perpetuate biased and idealised views of colonised landscapes. These practices were not necessarily noted as criticisms, but rather to highlight that bias and

¹¹³ Edney, 1997, 58.

¹¹⁴ Bermingham, Ann. 1986. *Landscape and Ideology: The English Rustic Tradition, 1740-1860*. Berkeley, California: University of California Press, 139. See also Prince, Hugh. 1988. "Art and Agrarian Change, 1710-1815." In *The Iconography of Landscape: Essays on the Symbolic Representation, Design and Use of Past Environments*, edited by Denis Cosgrove and Stephen Daniels, 98-118. Cambridge: Cambridge University Press.

subjectivity were considered typical and critical components of human assessment and evaluation.¹¹⁵

Paul Carter in his studies identifies the cross-over between geographical, travel and explorative narratives.¹¹⁶ Carter asserts that it was not possible to write a geographical narrative without being influenced by other literary accounts of the period.

Geographical records attempted a mechanical approach to observations, yet presented in text and maintained distance between the observer and the object under observation.¹¹⁷ Unlike the explorers' view of the world, the focus of geographical accounts were not discoveries, but everyday occurrences and to an extent the less interesting aspects of the landscape. There were inherent ambiguities associated with the social and personal aspects to viewing the landscape, as all observations are influenced by social practices and social beliefs. Therefore through observation and representations such as maps the landscape acts a social construct within these parameters.¹¹⁸ The similarity may be drawn with the modern map which exists as a social construct and also conveyed as if the landscape were seen from a particular point of view.

Stafford and others have identified the picturesque gaze and the scientific gaze as opposing one another, they also serve the purpose of providing different perspectives and an archive of information with which the geographical gaze could engage. The two genres of observation gave the geographer an overview and a spatial context to investigate which in turn facilitated the use of mapping. Mapping acted as the process within which the overview could be represented and where notions of spatial concepts were played out. Individual observations within the spatial construct enabled the geographer to locate objects within the frame of mapped space. They did not need to create a map themselves. By observing an object, locating it within a spatial frame, followed by being aware of its relations to other objects, then moving through the landscape, relations to the broader context resulted in a kind of mental mapping.¹¹⁹

¹¹⁵ See Said, Edward W. 1979. *Orientalism*. New York: Vintage, 159. Said, preferred to consider such subjectivity in the following light, as an intended and conscious power struggle, as he stated “[t]o be a European in the Orient, *always* involves being a consciousness set apart from, and unequal with, its surroundings.”

¹¹⁶ Carter, Paul. 1987. *The Road to Botany Bay: A Spatial History*. London: Faber and Faber, 65.

¹¹⁷ Edney, 1997, 66.

¹¹⁸ *Ibid.*, 72.

¹¹⁹ *Ibid.*, 64.

The geographer produced an archive of work which included both observation and narrative.

5.2 Exotic Lands, Colonial Encounters

The allure of the spice trade was one aspect that prompted European interest in the Southeast Asian region, but the “Age of Discovery” was really a symptom of complex intellectual, technical and political forces at the time.¹²⁰ European fifteenth and sixteenth centuries’ conceptions of what we now understand as modern Southeast Asia entailed exotic lands known as “the Indies” (figure 100 of Java).¹²¹ This understanding derived from a Hellenistic account from Antiquity, being all of the lands east on Indus. Ptolemy and Strabo revised such images with their maps, which were in turn replaced with geographical information supplied by the Portuguese. The naming of these lands remained as determined in the Ptolemaic map, *India extra gangem*, or the Indies outside of the Ganges, or all lands west which included Indochina and modern Indonesia.¹²²

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Figure 100. *Terra Java from the Vallard Atlas, 1547.*
This map has south up in this depiction. (Source: Suárez, 1999, 13).

¹²⁰ Whitfield, 2010, 36.

¹²¹ Owen, Norman G. 2005. *The Emergence of Modern Southeast Asia*. Honolulu: University of Hawai'i Press, 3.
See also Emmerson, Donald K. 1984. "Southeast Asia: What's in a Name?" *Journal of Southeast Asian Studies* no. 15:1-21.

¹²² Ibid.

As is evident from the part map of Java by van Keulen (figure 101), conceptions of the world had shifted dramatically in two hundred years, vignettes display characteristics of built form and the geography rather than a preoccupation with the native, whilst it also displays greater knowledge of topography and extents of the island.

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Figure 101. Part map of Java by van Keulen 1728.
(Source: Suarez, 5).

According to Norman Owen in “The Emergence of Modern Southeast Asia,” the eighteenth century denoted a significant shift in “the patterns of life of peoples living within the region.”¹²³ Southeast Asians had always been affected by natural characteristics of their climate, geography, river and ocean systems, rainforests and alluvial plains. Yet the eighteenth century was characterised by changes of geographical, territorial and spatial understandings whilst also subject to the

¹²³ Owen, 2005, 5.

undermining of many of the Southeast Asian natural resources, effecting changed socio-cultural relationships, political practices and modes of production of settlement.

Geography

Exotic lands were also deemed to have exotic and valuable spices, that traders from diverse cultural backgrounds sought as early as the thirteenth century. A key aspect of the Southeast Asian geography was its location relative to other trading partners by sea. The Malacca Strait enabled a strategic port for buying spices but also for breaking the long sea journeys from Europe. Geographic realities of Southeast Asia have always played a significant role in everyday life for its inhabitants and their realisation of settlement. The large annual rainfall in this tropical region provide optimal conditions for harvests such as rice in addition to palm oil, rubber, coffee, tea and pepper among other crops which also featured as strong exports (as well as being utilised for local consumption).¹²⁴ Aspects of climate and environment also affected locations of settlement and choices of transportation to and within Southeast Asia.¹²⁵ In earlier days of the spice trade in the Malacca Strait the monsoon winds ensured ships would dock at this port. It was not until the winds had shifted that ships could get back to complete their route of passage, for trading of spices and textiles. Again once steam power prevailed in the nineteenth century modern shipping was no longer impacted by the limitations of the prevailing wind direction. These changes in technology also impacted on the regularity of ships docking in the Malacca Strait. Another predominant environmental characteristic of Southeast Asia is their impressive river system which enabled pre-modern societies such as the Khmers from Cambodia to harness the flood waters of the monsoon, for farming during the dry season. Rivers such as the Mekong, Ayeyarwady (Irrawaddy) and Thanlyin (Salween) in Myanmar, in addition to Chaophraya in Thailand and the Red River in Vietnam supported food supplies and acted as vast arrays of transport corridors for the countries bordering them.¹²⁶ All of these geographical characteristics had implications for Southeast Asian urban environments, from location to morphological form, and were predominantly independent of mapping practice, until around the nineteenth century.¹²⁷

¹²⁴ Owen, 2005, 6.

¹²⁵ Ibid., 9.

¹²⁶ Ibid., 8.

¹²⁷ Colonisation and mappings were adopted at different times in different areas of Southeast Asia.

Territory

Southeast Asian territories traditionally were conceived by indigenous peoples through geographical landmarks, which in turn defined political allegiance. For example, in the seventeenth century the Vietnamese-Lao wars were mediated by the Le Vietnamese ruler and the Lao monarch through an agreement of “every inhabitant in the upper Mekong valley who lived in a house built on stilts owed allegiance to Laos, while those whose homes had earth floors owed allegiance to Vietnam.”¹²⁸ Therefore, lines on a map of a defined space were in effect superseded for “cultural preference” a traditional indigenous concept which no longer resonates for indigenous peoples of the twenty first century.¹²⁹

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Figure 102. Thailand and Burma caricature map. Frederick Neale, 1852.
This map was produced for some British officials to Thailand to explain a border dispute between then Siam and Burma, as one can imagine they did not know quite what to make of it. (Source: Suárez, 1999, 28).

For the Europeans geography and territory were intimately interwoven, as determining territory extents meant boundary demarcation was essential.¹³⁰ Europeans liked to identify boundaries in maps, in order to assimilate potential regions or countries to conquer. An understanding of the extent and limitations of geography

¹²⁸ Owen, 2005, 10.

¹²⁹ Ibid., 11.

¹³⁰ Edney, 1997, 1. Borges, Jorge Luis. 1964. "Museum: On Rigor in Science." In *Dreamtigers*, edited by Mildred Boyer and Harold Morland. Austin: University of Texas Press.

were important, as well as the peoples, their sites of habitation, sources of food, socio-cultural and religious practice. General knowledge as to whether the country or state was going to be a useful acquisition, was also important as was the determination of a viable entry strategy. In the context of contributing to the Enlightenment knowledge archive, graphically plotting this information gave another level of legibility and understanding.

For the case of the British in Southeast Asia, according to Owen,

Colonialism had many unintended effects in Southeast Asia, as it damaged destroyed, blended with, or was absorbed by local people and traditions in a complex, interactive process. In many cases, pre-colonial social practices (such as patron-client and family-centred politics) persisted through the colonial era and beyond. Others, like “strong-man” leadership ...like tributary diplomacy, disappeared more or less for good.¹³¹

From a mapping perspective the whole colonial region was fragmented into territories. There was great difficulty for the locals to comprehend, why lands were separated in such ways and for what reasons. For example, Sumatra fell under the auspices of the Dutch and therefore was splintered from the Malay Peninsula which was dominated by the British. Whereas Lao states had been closely aligned with the Siamese but were colonised by the French and thus governed similarly to Vietnam. Borneo was divided between the Dutch and the British. The western mainland became Burma with the British establishing its boundaries. The colonisation process then fractured the sense of coherence which had existed in Southeast Asia between countries and meant that the colonies now looked to their mother countries for political and economic processes rather maintaining support within the region. On the whole, from a colonial perspective, emphasising difference became a recognised programme of colonial rule in both spatial organisation of settlement as well as socio-politically within colonial society.¹³² Ethnicities became the focus of colonial organisation, indigenous and ethnic minorities were treated differently, as to whom were best suited and trusted with colonial tasks. Empowering some local groups over others created a hierarchical structure in society to serve colonial rule.

¹³¹ Owen, 2005, 78. See also Chattopadhyay, Swati. *A Critical History of Architecture in a Post-Colonial World: A View from Indian History* (v6n1.05) [internet]. Architronic 1997 [cited 27/09/2004. Available from <http://architronic.saed.kent.edu/v6n1/v6n1.05a.html>.

¹³² Anderson, 1991, 78.

The motivation to take control of the entire region occurred due to Europe and the United States growing tired of dealing with the remaining ruling entrepôts.¹³³ Borders of Southeast Asian countries were drawn up by their colonisers, and major intellectual and political processes occurred due to these actions. Traditionally power had derived from religious and sacred sources which then became tied to indigenous political authorities, but based on obligations and sacred blessings of spiritual leaders. In colonial Southeast Asia, new rulers were geographically remote, secular and appeared to be arbitrary political figureheads. Government authority rested in economical achievement over intentions of gaining respect and status. Therefore the colonised peoples grappled with the paradox of holding onto their religious beliefs and socio-cultural value systems derived from centuries of spiritual associations with their leaders to what were completely new institutions of governance. There was only one exception in this region which was the kingdom of Siam, amidst a rapidly shrinking physical sphere, the authority of the monarchy was able to hold onto its traditional form of governance and belief systems.¹³⁴ These moral, cultural and geographical disparities between colonial and locals were highlighted in mappings as borders of colonial spaces were completely incongruous with indigenous conceptions.

Space

The map in its physicality is important as a representation of space, and map-making processes are also vital in understanding the limitations and imaginations which have been graphically conveyed.

As with any other form of representation—graphic or textual, artifactual or ephemeral—meaning is invested in all aspects of cartography: in the instrumentation and technologies wielded by the geographer; in the social relations within which maps are made and used; and, in the cultural expectations which define, and which are defined by, the mapped image.¹³⁵

The British colonial approach for the Southeast Asian region, was generally not nearly as organised nor comprehensive as in India. Nonetheless confusion around

¹³³ Owen, 2005, 201.

¹³⁴ *Ibid.*, 203.

¹³⁵ Edney, 1997, 2. Nicolet, Claude. 1991. Space, Geography, and Politics in the Early Roman Empire. In *Jerome Lectures*. Ann Arbor: University of Michigan Press.

indigenous conceptions of space, as well the cultural diversity of the colonised, were universal problems of the colonisation process. In the case of James Rennell, Surveyor General to Bengal, due to his lack of understanding of the cultural diversity and socio-religious history of India resulted in naming it Hindoostan. Through the colonial mapping process, local space was completely misrepresented. A large percentage of the population were Hindus but Hindoostan was originally coined by Islamic invaders to the region. Rennell subdivided the country on his maps into Mughal suba provinces, based on seventeenth century distinctions achieved under the reign of Emperor Akbar, but at the same time did not distinguish the East India Company territory of Bengal. Rennell's maps conveyed the Mughal's as the predominant rulers over the whole subcontinent.¹³⁶

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Figure 103. Great Trigonometrical Survey of India.
Conceived as a true and accurate mapping of British colonial space. (Source: Short, 145.)

The geographical rhetoric of British India was so effective that India had become a real entity for both British imperialists and Indian nationalists alike. Both groups held "India" to be a single, coherent, self-referential geographical entity coincident with the bounds of South Asian subcontinent and the extent of British power which was nonetheless predated British hegemony.¹³⁷

¹³⁶ Owen, 2005, 11-12. Scheurleer, Pauline Lunsingh. 1996. "Rich Remains from Social Anthropological Work in Eighteenth-Century India." *Journal of the History of Collections* no. 8 (1):71-91.

¹³⁷ Edney, 1997, 15.

This perception of British colonised space depended on Enlightenment's philosophy as maps being designated as true and accurate representations of a geographic reality. Therefore there was unquestioning belief in the information conveyed in Rennell's graphic depictions of India. The framing of India was possible firstly with the view of Enlightenment knowledge and secondly with what was seen at the time a practical and scientific means of achieving a "true" reality of geography through methods of triangulation.¹³⁸ Technology culminated in the Great Trigonometrical Survey of India, which was believed by the British to be a comprehensive, accurate, ordered and concise archive of geographical knowledge. Critical understandings of geography were possible via the vehicle of the map, due to the expansion of mass production of printing processes. Both new print technologies, and the rise of humanist and proto-capitalist culture could be argued as critical to the propagation of the map as an essential and integral tool of geography.

5.3 Cross-Cultural Mappings

The main difficulties of mappings between Europeans and indigenous communities were largely related to contrary views of regions or boundaries, different styles of representation and purposes behind mappings.

Language

By the Enlightenment the scope of geographical analysis had expanded beyond the substantially narrow realms of "geo-graphy (earth-description) and *choro*-graphy (region-description)."¹³⁹ The judgements by which both the surveyor and the geographical observer took in the world were the eyes of mediation between what revealed itself and that which was accounted and recorded. It was not necessarily how accurately spatial characteristics were measured, but *what* was measured which shaped the graphic representation or the map.¹⁴⁰ Another process which made a substantial contribution to our modern understanding of the archive of cartographical

¹³⁸ Edney, 1997, 17.

¹³⁹ Ibid.

¹⁴⁰ Ibid., 95.

knowledge came about in the 1830s when William Morrison referred to a map's design and display of certain symbols and signs as consisting of a "language."¹⁴¹

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Figure 104. Map of the Caroline Islands based on indigenous data.
Interpreted by the missionaries from the Philosophical Transactions, 1721. (Source: Suárez, 1999, 33).

By acknowledging a language of symbols, then cartographic information could be rationalised and represented in a neatly comprehended fashion. All compiled data could be related through a framework which consisted of both latitude and longitude, laid within a format of graticules and meridians, and the remaining data situated within this frame. Information such as the translation of indigenous understandings of distance could be reduced to a standard European understanding of units of distance which may be universally applied in a very pragmatic way. Differences in conceptions of astronomical systems were evaluated and transferred to the limitations of the map. To explain the decision making processes around the resultant graphic depictions, cartographers used their memoirs as extensive narratives on their numerous and inevitable rationalisations. The detail and construction of the analysis

¹⁴¹ Edney, 1997, 96. See also Noyes, John K. 1993. "The Representation of Spatial History." *Pretexts* no. 4 (2):120-27.

presented by the cartographer contributed to the perceived authenticity and accuracy of the cartographic construct.

Informants

The main recognition of indigenous groups went to Filippino map-makers (refer figure 104), usually of Spanish origin but whom regarded themselves firstly as Filipinos. In addition Malays have been credited with assisting in the mapping of Borneo and the Sulu Sea in the eighteenth century. Much of the information ascertained by Europeans often included verbal accounts by indigenous groups of their experiences and knowledge passed down through the generations.¹⁴² The degree of European map-makers' exposure and first-hand experience of Southeast Asia and its peoples, was quite diverse. Some map-makers travelled extensively in Southeast Asia whilst others used secondary sources and data to produce their maps, never having travelled to the region. Some of the notable names from the former group included: Ferdinand Magellan and Francesco Pigafetta who produced one of the earliest maps of the Spice Islands. Then there was William Dampier in the early seventeenth century who charted many harbours, channels and islands in the region. Others include Alexander Dalrymple, John Crawfurd, Jean Marie Dayot and James Horsburgh all of whom lived and worked in Southeast Asia in mapping and charting capacities in the eighteenth and nineteenth centuries.¹⁴³

Cross-cultural mappings occurred for possibly three hundred and fifty years after the arrival of the Portuguese in Southeast Asia. Typically indigenous input in these cross-cultural encounters of cartographic processes was rarely recorded or attributed to their rightful owners.¹⁴⁴ Initially there were great delays in the transfer of geographical notes to the cartographers assembling the representations, generally because of the distance and time it took to reach Europe from Southeast Asia, as well as the high regard for secrecy to prevent other colonial powers seeking out new territories. The process of map-making at this time in Europe was also a labour intensive task with the creation of new types of woodblocks and copper plates to depict more accurately new information revealing itself within the Southeast Asian region.

¹⁴² Fell, 1988, 9.

¹⁴³ Ibid., 10-11.

¹⁴⁴ Ibid., 9. See also Pickles, John. 2004. *A history of spaces: Cartographic reason, mapping and the geo-coded world*. London: Routledge.

Institutions such as the East India Company recorded their observations of the Southeast Asian landscape and when this information found its way back to the mother country, it took on a very literal interpretation. Accounts provided in a sequential fashion enabled information about a range of topics from agricultural technologies to political observations. Translation of this information into legible graphic representations or textual accounts proved difficult, especially for those removed from the experience entirely.¹⁴⁵ Europeans on the ground often relied upon indigenous perspectives to further inform either ambiguous accounts of spatial contexts, that typically entailed conflicting or confused observations by European observers.

Territories which were outside of foreign control for example Siamese territories relied almost entirely upon information from a broad and diverse number of indigenous sources. In the accounts of the British geographers accruing details on Siam, the local informants were typically introduced in a way as to legitimize the surveyors' account. For example, they might assert the level accuracy of their instruments in the same way as they intended to justify the credible nature of their informant—"a reliable person of calibre superior to the typical local man." Typically any information then was subjected to the principles of Enlightenment thinking where reasoning and corroborating of different accounts of the same object or place were evaluated. Informants were often not named unless they were significant members of the Royal family or part of the local governing organisations. Evaluation of measurement in time also needed to be corroborated between local and European concepts. Time was not a universal concept, for example the Hindoo hour contained twenty four minutes, so if an itinerary was recorded with a certain number of days to reach the next landmark, then an adjustment of hours per day was required to rectify these discrepancies.¹⁴⁶

¹⁴⁵ Edney, 1997, 77. See also de Certeau, Michel. 1984. *The Practice of Everyday Life*. Translated by Steve Rendall. Berkeley: University of California Press.

¹⁴⁶ *Ibid.*, 84.

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Figure 105. Plan of Bangkok taken from a native sketch. Crawford, 1828.
(Source: Suarez, 1999, 31).

Another method for valuing the truth of certain data gathered by an informant over another, would come down to reputation of one informant's being superior to the others. Where informants were all on an equal reputation basis then the principle of reason would always be applied in that all information had an aspect of truth and through comparison the essence of truths would be revealed (figure 105). This process suggests the degree to which compilation of data, observation of objects and reasoning were so intertwined. By the end of the day, the geographer would record his reasoned judgement of his and others observations' which supposedly resulted in an evaluated as well as a considered set of conclusions about the field work. On the other hand this process may be equally evaluated as more a general portrayal of events rather than what may be conclusively indicated as the "actual" conditions under study. There were distinct hierarchical structures established between the European and the local informant. Despite all of the checks and balances the colonisers put in place, there was never complete trust of information conveyed by local peoples. At the earliest opportunity, European surveyors would discard local information in favour of

what their organisations considered more accurate and reliable sources, that is of European origin. Underlying the European scepticism of local abilities to conceive of European-type mapped spaces, were the natives commitments to religious beliefs and cosmological concepts of space.

Survey

Europeans considered their geographical beliefs to be rational, measurable, plausible and precise. Beliefs prevailed such as that of Adam Smith in his history of astronomy:

The reverence and gratitude, with which some of the appearances of nature inspire [the savage], convince him that they are the proper objects of reverence and gratitude, and therefore proceed from some intelligent beings...Hence the origin of Polytheism, and of that vulgar superstition which ascribes all the irregular events of nature to the favour or displeasure of intelligent, though invisible beings, to gods daemons, witches, genii, fairies.¹⁴⁷

Trigonometry permitted the production of a more homogeneous frame to geographical knowledge. It also set up a fixed field of operations within which errors could be resolved through mathematical means such as calculations. The process of triangulation enabled surveys to grapple with large amounts of information, even to the extent where large wall maps could not display every detail. Therefore maps were divided into structures reflecting latitude and longitudinal coordinates. These divisions were purely pragmatic inscriptions laid across the landscape for the purpose of “plane-table surveying.”¹⁴⁸ The shift from surveys in the field to office constructed surveys, the latter being the survey conceived through extensive mathematical computations, defined a new genre of mapping. Maps created through triangulation and trigonometric calculations reduced every spatial coordinate to an equivalence or uniformity. The surveyor was responsible for delivering the “truths” of the surveyed space, but the result was only a measured view of that reality. There is no other manipulation of reasoned or recorded peripheral data to achieve an understanding of space of the survey. This is the point where there is an epistemological shift in mapping processes and insight into how modernity’s view of the world came about.

¹⁴⁷ Cleaver, K C. 1989. "Adam Smith on Astronomy." *History of Science* no. 27:211-218, 212.

¹⁴⁸ Edney, 1997, 113. See also Hahn, Roger. 1989. "New Considerations on the Physical Sciences of the Enlightenment Era." *Studies on Voltaire and the Eighteenth Century* no. 264:789-796.

Although more of the colony could be mapped and thus seen on paper, through the means of triangulation, it was only from a single viewpoint.¹⁴⁹

The most inhibitive factor to the trigonometrical survey was the cost. The time required to conduct the field work, could take anywhere from weeks to months given the weather, visibility issues, terrain inhibiting sight lines. The list of interfering factors was extensive. There were also difficulties between the shift of mapping practice from the field to the office and the successful relaying of information to achieve a comprehensive understanding of the area under survey. Many issues such as costs could have been overcome if there were the required resources available to the colonial administrators, but typically funding proved inadequate.

Corpus

By comparison with European mappings of the region in the eighteenth century, the following indigenous maps continue to convey very different geographical conceptions. Only a very small number of remaining urban maps have been located by Joseph Schwartzberg in his studies of historical cartographies analysing indigenous maps from Southeast Asia. These maps are deemed to occupy the “cross-cultural” bracket simply because there would have been knowledge of Europeans cartographical practices. It is not obvious, however, whether any cartographical traditions were intentionally embraced in these representations. The extents of the map corpus on this subject were only found to relate to Burma and are only sixteen in total.¹⁵⁰

In figure 106 of the “Malay Chart of the Malay Peninsula and the Gulf of Siam” appears to be presented inaccurately, but the sequencing of places along the coast are correct with respect to inland landmark features. Inland areas do not reflect the same accuracies.¹⁵¹ Schwartzberg believes this map was not intended to convey solely a river route but rather a route which traversed parts of the river and parts of the land. Part of the land route was over the hills of the Cameron Highlands. Although sea routes were the least expensive and therefore the preferred mode of transport if goods were required to come via land given geographical limitations, then such routes also

¹⁴⁹ Edney, 1997, 115.

¹⁵⁰ Schwartzberg, 1994d, 796.

¹⁵¹ Phillimore, Reginald Henry. 1956. "An Early Map of the Malay Peninsula." *Imago Mundi* no. 13:174-79.

were made possible for traders. Another motivation for pursuing alternative routes to the sea was the prevalence of pirates particularly in the Malacca Strait. The purpose of this map is not entirely clear as it does not display or elaborate on sailing times and there is also an absence of any directional guides. Effectively for the local seamen who traversed the waters on a regular basis, most of the information conveyed on this map could easily have been remembered without need to cross reference with the mapped representation.

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Figure 106. Malay Chart of the Malay Peninsula and the Gulf of Siam.

This privately held eighteenth century work is drawn in black ink on tough locally made paper. The text is in Malay, written in the Arabic script. The map is a curious admixture of indigenous and European elements. Among the latter are the directional lines radiating outward from a hill, Bukit Pattani, a landmark near the port and Bay of Pattani to its left.” (Source: Schwartzberg, 1994c, 831).

By contrast, “The Map of Amarapura, Capital of Burma Before the Founding of Mandalay” (figure 107) mid-nineteenth century origin demonstrates another style of mapping with plan forms of the city coupled with different projections of landscape elements. The image here (figure 107) is a copy of the original, reputed to have been

replicated by the monks of Taung Lay None Monastery in Amarapura in the 1970s.¹⁵² The original mapping was in a four panel format on parabaik (sheets of local papers joined together and folded to form accordion-like books).¹⁵³ The map denotes both urban and non-urban features in an evocative style. An old royal walled city; monasteries and pagodas, the street layout as well as the hamlets and wards outside the royal city walls provide a relatively comprehensive plotting of city and context. Unusually compared with other Burmese maps of this era, this map is orientated toward the west. The royal city grid contrasts with the sprawling areas beyond, and extends to the mountain range in the background.

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Figure 107. Map of Amarapura, Capital of Burma prior to Mandalay.
This is a modern copy, executed by Burmese monks at the Taung Lay None monastery in Amarapura, where it is now held, of a mid-nineteenth century original. (Source: Schwartzberg, 1994c, 799).

¹⁵² Schwartzberg, 1994d, 798.

¹⁵³ Ibid., 840.

The intention behind the move of the capital from Amarapura to Mandalay was to give the Burmese citizens some reprieve from the crowded and dirty conditions of the former capital.¹⁵⁴ The map-maker was not included amongst the surveyors and engineers instructed to layout the capital. The construction of Mandalay began in 1857, and its mappings were said to have been completed in 1855.¹⁵⁵ No European has been referenced in connection with the construction of the capital, its design or the map making process, but Captain Fraser's work in Rangoon may have been an influence. If these dates are correct it may be an example of projective mapping practices in Southeast Asia. Certainly the Burmese King would not have been ignorant of the design and construction of Rangoon. There are a number of discrepancies between what exists on the ground at Mandalay and the undertakings as conveyed on the map. Spiritual references were considered of importance and a priority. The initial design of the building in accordance with the plans, where the perimeter of the royal compound formed a perfect square and in Burmese measurements equated to each side consisting of 600 tas (a Burmese yard). Then the total tas of the perimeter of the compound reached a distance of 2.06 kilometres or 2400 tas. This correlated with the number of years since the Buddha attained enlightenment.¹⁵⁶

The Royal Temple Complex at the Foot of Mandalay Hill (figure 108), which was possibly drawn around 1875, may also have preceded the temple construction. The buildings indicated in the plan include: Sandamuni Pagoda located between the royal garden and the interim palace grounds. The centre of the plan includes the larger structure being the Kyauktawgyi pagoda as well as a library to the left of this central building, including numerous rest houses indicated as small rectangles. The sacred Bodhi trees form the four points to mark the square in the larger pagoda. The upper left corner of the map indicates the location of the ordination hall or Pathana Sima.¹⁵⁷ These Burmese mappings suggest the beginning of a synergy between European and

¹⁵⁴ Tin, U Maung Maung, and Thomas Owen Morris. 1966. "Mindon Min's Development Plan for the Mandalay Area." *Journal of the Burma Research Society* no. 49 (1):29-34, 29, in Schwartzberg, 798.

¹⁵⁵ *Ibid.*, in Schwartzberg, 1994c, 799.

¹⁵⁶ Schwartzberg, 1994d, 799.

¹⁵⁷ *Ibid.*, 801-802. The process for surveying for the Mandalay capital was proposed as follows: "A certain amount of rough triangulation must have been employed to fix the positions of the islands and the villages in the Irrawaddy, and of its right bank. Otherwise all the control seems to have been the measurements along and offsets from the lines shown on the plan were completely traversed to fix the positions of the villages, canals, rivers, lakes, and the mountain foot, it would mean that considerably more than 1600 miles of line were measured, recorded, and plotted during the survey."

Southeast Asian mappings at a certain level. Yet Southeast Asian projections appear to hold on to some of their socio-cultural belief systems, through drawing style and emphasis upon religious forms.

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Figure 108. Royal Temple Complex at the foot of Mandalay Hill, CA. 1875.
This view includes a substantial portion of a rather detailed large-scale architectural plan of a cluster of temples and associated edifices (ordination hall, rest houses, library, and such) built sometime after 1857 but destroyed about 1890.” (Source: Schwartzberg, 1194c, 801).

5.4 Mapping Emerging Urbanity

Typically considered to demonstrate low degrees of urbanisation, Southeast Asia, from Laura Lee Junker’s research demonstrates that compared with Europe during the same period, was one of the most urbanised regions in pre-colonial times, given its low urban densities. Junker’s premise for Southeast Asian urbanism is based on the assumption that urbanism may be understood as “an index or ratio of concentrated “city” – or “town” – dwelling people versus the dispersed, rural component of the population.”¹⁵⁸

¹⁵⁸ Junker, Laura Lee. 2006. "Population Dynamics and Urbanism in Premodern Island Southeast Asia." In *Urbanism in the Preindustrial World: Cross-Cultural Approaches*, edited by Glenn R Storey, 203-232. Tuscaloosa, USA: The University of Alabama Press, 21.

Pre-colonial

A census recorded in 1900 led the European community to believe that the Southeast Asian region demonstrated some of the lowest populated urban centres in the world. Anthony Reid concurs with Junker's view and believes the colonising of Southeast Asia, from the seventeenth to mid-twentieth centuries, led to a period of de-urbanisation for Southeast Asian cities and towns.¹⁵⁹ This effect was brought about by colonial powers excluding indigenous populations from the new European commercial centres, where once there was booming trade relations between indigenous and global markets. Prior to the seventeenth century, Reid accounts for several Southeast Asia cities being larger than their European trading partners, for example: Thang-Long (Vietnam), Ayutthaya (Thailand), Pegu (Burma), Melaka (Malaya Peninsula), Makassar (Maluku), Mataram are among the cities which exceeded populations of between 100,000-200,000.¹⁶⁰ The structure of the pre-colonial inland Southeast Asian city often entailed a walled structure encompassing the royal family with related servants and had a relatively high urban density. The surrounding area was more dispersed and less tangible in that boundaries were not clearly defined. In the sixteenth and early seventeenth centuries Reid estimates that over the Southeast Asian region there were five percent of indigenous peoples living in urban centres. This figure was lower than Mughal India and Late Ming/Early Ch'ing China but larger than the majority of European centres.¹⁶¹ The urbanisation index is the greatest for port cities such as Melaka which catered for trade through the Malacca Strait to the Indian Ocean and South China Sea.

Both maritime trade and the resultant economic boom-time conditions prompted the rapid growth of populations of these port cities. These growing populations were assisted by large influxes of foreign slave workers who carried out work ranging from farming to entertainment as concubines and domestic servants. In addition, given that nobility in Southeast Asia was not so concerned with ties to landholdings but rather to proximity to trade centres and their alliances were with other wealthy patrons, and

¹⁵⁹ Reid, Anthony. 1993. *Southeast Asia in the Early Modern Era*. Ithaca: Cornell University Press, 63.

¹⁶⁰ Reid (1993, 68-73) in Junker, 2006, 212.

¹⁶¹ Junker, 2006, 212. "In 1511, Melaka was a city of 100,000-200,000, with a spectacular series of mosques and a walled royal core (with buildings for royal elephants, artillery, and the reception of foreign dignitaries) ruled by Muslim kings (Tome Pires 1944[1515])."

aristocrats who typically clustered around the trading cities.¹⁶² These nobles built their elaborate dwellings and large gardens in the suburbs surrounding the urban centre which then gave the visual impression of urbanity at a large scale to the early European observers.

Most architectural constructions of Southeast Asian cities were built out of perishable materials. Wood, bamboo and rattan were amongst the most common materials for houses which were often constructed off the ground, depending on the exact location within the Southeast region. There were the exceptions in Buddhist and Hindu cities where the centrally planned core of the city contained stone and other durable structures typically for religious purposes. Therefore these cities such as Pegu and Ava in Burma and Siamese cities such as Ayutthaya have archaeological remains which have assisted urban historians in piecing together the original urban fabric of these pre-modern cities. Given that many domestic structures were not located on the ground, archaeologists have found it difficult to determine definitive settlement patterns, and thus spatial concentrations of villages between regions.¹⁶³

Junker identifies Southeast Asian patterns of urbanisation as consistent with what cultural geographers and anthropologists call a “dendritic” settlement system.

Dendritic systems are characterised by the concentration of regional and political and economic control within in single primate centre, which exerts weakening authority over a series of linearly radiating settlements. . . . most occur in situations where long-distance trade plays a dominant role in the internal economy, concentrating economic advantage and political power with those settlements located favourably for external trade systems.¹⁶⁴

Constraints of geography, topography and accessible transport routes such as rivers or access to coastal ports means there is a linear relationship between the transport route and the trade centre or the core of urban development. This urban pattern results in a central wealthy, elite and politically powerful urban centre with a descending pattern

¹⁶² Junker, 2006, 215.

¹⁶³ Ibid., 218.

¹⁶⁴ Ibid., 223.

of wealth as the density of settlement deteriorates out to the periphery of the urban centre.¹⁶⁵

To prevent traders going directly to the upriver villages or providers of the goods such as spices, horn and other trade materials, alliances were formed between the rulers of the coastal cities and bureaucrats in these villages which were strategically situated on major river system. Jane Allen in her study of hinterland trade in seventeenth and eighteenth century Kedah, identified archaeological evidence of upriver stations which were significantly more populated than the typical upland village. In addition they were often fortified centres in contrast to neighbouring villages.¹⁶⁶

Compared with their neighbours like China and India, Southeast Asian urban development occurred quite differently historically. Many traditional Southeast Asian polities of organised administration and with an economic agenda, typically became one city. For example in Northern Java pre-modern cities such as Tuban, Demak and Gresik had their own political leaders as well as their own control of their economies. This was also true for Ayutthaya on the Chao Phraya River, which shared the socio-political practices established for sea side towns of Jambi in Sumatra and Mandalay in Burma.¹⁶⁷

Colonial

Many of these urban patterns continued into the colonial period for Southeast Asia. As an example, for both the Spanish and American period, Manila continued to be the capital of the Philippines. As in the case of Jakarta for the length of the Dutch reign, Rangoon served as the main distribution centre for the British and as a major political stronghold within the Southeast Asian region. These centres of politics and economics remained connected to indigenous outposts, as well as responsive to local, regional and global markets.¹⁶⁸ The enduring nature of these centres was a little uncertain in

¹⁶⁵ Kelley, K B. 1976. "Dendritic Central-Place Systems and the Regional Organisation of Navajo Trading Posts." In *Regional Analysis: Vol. I Economic Systems*, edited by C Smith, 219-254. New York: Academic Press, 221, in Junker, 2006, 223.

¹⁶⁶ Allen, Jane. 1991. "Trade and Site Distribution in Early Historic Period Kedah: Geoarcheological, Historic and Locational Evidence." *Indo-Pacific Prehistory 1990* no. 1 (Bulletin of the Indo-Pacific Prehistory Association No. 10. Indo-Pacific Prehistory Association, Canberra Australia):307-319, cited in Junker 226.

¹⁶⁷ Tagliacozzo, Eric. 2007. "An Urban Ocean: Note on the Historical Evolution of Coastal Cities in Greater Southeast Asia." *Journal of Urban History* no. 33 (6):911-932, 915.

¹⁶⁸ Ibid.

that they were entirely dependent on trade for their survival. In addition they were middle stopping ports along the trade route rather than the beginning or the end points.¹⁶⁹

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Figure 109. Prince of Wales Island or Pulau Pinang, 1807.
Laurie and Whittle. The British settlement of George Town is marked in red at the eastern tip of the island. (Source: Suárez, 243).

Other characteristics quite specific to how Southeast Asian commercial centres functioned innovatively in their political and economic exchanges were through notions of centre and periphery. The commercial centre was important for encountering and realising the trade, but typically the hinterlands were responsible for producing the valuable items for exchange. The Dayaks and Bataks of Borneo and Sumatra sourced hornbills, camphor and gold from their jungle outposts, which

¹⁶⁹ Tagliacozzo, 2007, 916.

passed through their commercial centre but were goods typically bound for China. Ethnic minority groups in the lowlands of Siam and Burma grew medicinal foodstuffs and animal horns for trade, which facilitated complimentary reliances between hinterland dwellers and the “middle-men” in the commercial centres. Outlying regions in turn gave political allegiance to the urban centre fostering the trade of their wares, despite the inaccessibility of the terrain to many villages, given the required economic ties with the urban centres. Through these mutual exchanges there were benefits for both parties. This in turn meant demands of the central polity, such as conversion to a preferred religion, may be agreed by outlying tribes based on the perceived need to maintain trade relations.

Colonial intervention into Southeast Asian urban space, through changing and increasing modes of production in manufacturing and infrastructure prompted, wholesale migration to the cities. By the eighteenth century, there were two main urban forms which dominated in Southeast Asia. These urban forms included coastal or port cities of the archipelago such as Batavia, Manila, Bantam, Makasar and Aceh which sustained economically large commercial enterprises within their settlements, as well as other mainland cities participating in maritime trade, such as Patheingyi (Bassein) in Myanmar, Hoi An (Faifo) in central Vietnam and Ayutthaya (Siam).¹⁷⁰ Siam was also considered a royal city. Royal cities dated back to pre-colonial Southeast Asian history and consisted of sites of both ceremonial as well as administrative centres but also bases for early manufacturing. Craftspeople were from both slave and free labour classes and undertook services such as gold and silver-smithing, black-smithing, leather work and furniture manufacturing. There were also all kinds of domestic workers for the palace as well as teachers, dancers, official scribes in Arabic, Latin or Indic scripts, advisors to the King and so on.¹⁷¹ In addition there were priests, monks, scholars, astrologers, poets and chroniclers. These cities which were governed by Europeans also operated and owned the printing presses. Anthony Reid states that the fifteenth to eighteenth centuries represented the “Age of Commerce” in Southeast Asian region while the nineteenth century reflected more of the “Age of Peasantry”, when wholesale agricultural enterprises predominated.¹⁷²

¹⁷⁰ Owen, 2005, 33.

¹⁷¹ Ibid., 33.

¹⁷² Anthony Reid in Owen, 2005, 33.

Wholesale production of the railway and road systems, were able to be achieved given the existence of a large labour workforce. Steam-power ensured there was more surveillance of migration and workers, which translated to knowledge of borders on land and sea which in turn legitimised territory on maps. This shift in the nineteenth century from transient populations to a new focus on fixing workers to a place and a state ensured different relationships between cultural groups throughout Southeast Asia. Traditional alliances to nation states also shifted as inhabitants were not always indigenous to the locality but rather stationed in a place for the purpose of making a living.¹⁷³ Therefore when workers moved between nation states they would be distanced from their traditional socio-cultural practices, life and work being focused on achieving a livelihood. As a new way of residing became necessary for foreign workers, it also signified transitioning to a modern, rational style of living had emerged. Religious and cultural requirements adapted and may be seen as falling secondary to socio-economic priorities.

In Ricardo Padron's article "Mapping Plus Ultra: Cartography, Space, and Hispanic Modernity", he reiterates the thoughts of Henri Lefebvre, that western production of space in its geometric and representational conception has been at the expense of the perceived or lived spatial experience.¹⁷⁴ Through mapping urbanity,

[t]raditional "representational spaces"—spaces as they are perceived—such as the hearth of the geography of the sacred, are correspondingly stripped of their authority. In this order of abstraction everything comes to be understood as either a location or an object within this space, and therefore becomes amenable to systematic understanding, commodification, appropriation, or subordination by a viewing subject.¹⁷⁵

In summary, the Enlightenment project foregrounded the rationalist thinking which was entrenched in map-making and other sciences by the nineteenth century. Colonial intervention in to Southeast Asian indigenous space ensured a transitioning from socio-religious and culturally focussed settlement forms to hybrid systems which embraced new geographies and concepts of space. A sense of sameness of urban

¹⁷³ Owen, 2005, 33-34.

¹⁷⁴ Padron, Ricardo. 2002. "Mapping Plus Ultra: Cartography, Space and Hispanic Modernity." *Representations* no. 79 (Summer 2002):28-60, 28.

¹⁷⁵ Ibid.

environments seemed to emerge which was the result of a number of factors but mapping also contributed to this condition.

PART III

MAPPING AND MODERN URBANISM

Chapter 6: Design and Rational Urbanism

As we have seen, particular modes of mapping reflected the different ways people interpreted their world at different times, and reflected particular qualities of the human settlement. The map in the Enlightenment shifted from being a product of socio-cultural, religious, and cosmographical concerns, and of a non-orthographic type, to a new rationalised, reductive, and planimetric format. The following discussion pinpoints another change in the nature of maps, a move to contemplating the world through theorised conceptions of space which also altered the map's influence in the production of urban environments. The forms of mapping which aided the translation of utopian ideas include the survey, master plan and model. Utopian ways of thinking about settlement have been characterised by a change from a retrospective mode of engagement with one's surroundings to the projective.

In her acclaimed study *The Rule and the Model*, Françoise Choay traces an important shift in the conceptualisation and production of human settlements. The shift was associated with the rise of modernity and marked by the emergence of written texts as a theorised mediation for the design and production of urban space. Until the dawn of modernity, she argued, there were no such texts:

It is easy to forget that religion and the sacred have traditionally been the major factors organising human space, either through the action of the spoken word or through the written word, which in the archaic world displayed commands of the gods on monuments for all to see. We have forgotten that in societies without writing, the organisation of built space is interconnected with the whole of social practices and representations, without there having to be a single word in the lexicon dedicated to the reflection on the idea of spatial arrangement.¹

Choay argues that the theorisation of, and associated written discourse on, urban space is both recent and part of the domain of Western culture. It was instigated on a broad scale mainly as a result of the Industrial Revolution, upon which Western cultures imposed or persuaded the wholesale adoption of theorised urban concepts

¹ Choay, 1980, 3.

due to their credibility premised on a scientific basis.² The trend highlighted is the introduction of “a rational foundation” for urbanisation and the texts, which assert the basis of rational urbanism. This trend assumes a scientific rationale while the authors of the theorised works convey a highly ideological position.³

The origins of the discourse on urbanism are traced to the treatise of Alberti, *De re aedificatoria*, published in the fifteenth century. Notably, Alberti does not refer to any religious reasoning for his method, although he highlights social activities of his era. Based upon mathematical ideas of the time and theories of perspective, “[i]n proposing a rational method for conceptualising and realising buildings and cities,” Choay writes, the treatise “successfully undertakes the task of establishing a relation to the built world unknown to Antiquity and the Middle Ages.”⁴ Alberti’s work can thus be viewed as having laid the foundation for the discipline of urban theory, or what was referred to by nineteenth-century intellectuals as “urbanism.”⁵

The groups of works contributing to conceptions of the built spaces are identified as “instaurational,” and further divided into sub-categories of “architectural treatises, utopias, and writings on urbanism.”⁶ These three divisions are key to understanding different ways of seeing, drawing, and mapping the world, and appreciating how rational urbanism came to the fore. Architectural treatises are defined by sets of principles and rules for arriving at built space. Choay dwells on the phenomena of literary utopias and their influence on built space, the focus here is the translation of utopian ideals into models and mappings, while analysing their impact on urban design. A general definition of a utopia would be an imaginary, ideal place, exemplifying perfection in social, political, and cultural practices. Utopias, exhibit “a

² Choay, 1980, 3. See also Brand, Diane. 2004. "Surveys and Sketches: 19th-century Approaches to Colonial Urban Design." *Journal of Urban Design* no. 9 (2):153-75, for a discussion of the colonial mandate of an empirical approach for the cases of colonial Adelaide and Wellington in the nineteenth century.

³ Ibid., 2.

⁴ Ibid., 4. See also Sinisgalli, Rocco. 2011. *Leon Battista Alberti : On painting : a new translation and critical edition*. Cambridge, New York: Cambridge University Press. A recent translation of Alberti’s ideas predominantly in painting but also related to concepts for urban environments.

⁵ Ibid., 6. For Alberti’s treatise see Alberti, Leon Battista 1404-1472. *On the art of building in ten books*. Translated by Joseph Rykwert, Neil Leach and Robert Tavernor. 1988 ed. Cambridge, Mass: MIT Press; Freart, Roland sieur de Chambray. 1707. *A parallel of the ancient architecture with the modern : in a collection of ten principal authors who have written upon the five orders* Second ed. London D. Brown, J. Walthoe, B. Took and D. Midwinter.

⁶ Ibid., 8. More, Thomas. 1524-1625 (2008). "Utopia." In. Adelaide: The University of Adelaide Library. Link to e-Resource: <http://ebooks.adelaide.edu.au/m/more/thomas/m83u/>.

critical approach to a present reality, and the modelling in space of a future reality.”⁷ Thomas More’s utopian literary version is the precedent, whereby the arrangement of space is achieved through modelling, and this methodological process unleashes numerous potentials for imagining and ultimately altering the natural world.⁸ More’s character Raphael, as the witness, firstly describes utopia to the readers to convince them, and then suggests that utopia is not only a place but also a prototype. Whereas the model or prototype aspect of utopia is that it appears “delocalised and reproducible.”⁹ It is a phenomenon solely focussed on the rules of an established human order as well as rigid system of socio-cultural practices.¹⁰ In terms of representation these rules may be relayed via master planning, diagramming or as a three-dimensional prototype. Finally, the group of texts known as “writings on urbanism” demonstrate how writings about concepts of rules and models have been transformed over time. Despite their limitations, reinterpretation and resistance to “the restructuring of knowledge, and bearing a meaning that transcends their content,” they survive to influence conceptions of built space even today.¹¹

The identification of a series of divisions in the theorisation of the built environment is in effect an exposition of the forms of rational urbanism associated with the advent of modernity. The analysis of urban theorisations extends to the concept of mapping and mapped representations of built space. Replacing non-theorised practices of spatial construction with highly conceptualised methods of building is the beginning of urban rationalism, which also signifies a distinct shift in mapping and conceiving urban space.

6.1 Retrospective and Projective Mappings

Retrospective and projective mapping refer to two related, yet distinct, ways of dealing with the mapped environment. One is descriptive and concerned with the past; the other is speculative and concerned with the future. All forms of pre-modern mapping discussed in earlier chapters were retrospective in nature; they were

⁷ Choay, 1980, 7-8.

⁸ Ibid., 137.

⁹ Ibid., 139. See also Fournier, Colin. 2001. Webbed Babylon. *Architectural Design* 71 (3).

¹⁰ Ibid.

¹¹ Ibid., 9.

produced to describe or narrate a story about an event, site, or idea. They were not maps for design purposes. Design maps are projective. They describe a future reality through conceiving, planning, and projecting for the purpose of implementation in the field. Retrospective and projective mapping, considered in the context of utopian thinking, may be seen as resonating with the “culturalist’ and “progressivist,” utopian approaches as proposed by Choay. The former suggests reverting to past modes of production, while the latter looks to the machine age for insight and motivations.

An historical study of the agency of the map, or what may be considered a retrospective mapping, looks back at the way of life of peoples, their socio-cultural practices, religious influences, technologies, in order to come to an understanding of how they described or constructed their worlds through maps. Creation of built environments happened spontaneously due to need rather than as a result of a preconceived holistic planning or design. In this context, pre-modern maps could not be considered as design tools, in the modern sense, nor integral to the design process. By contrast, when we use mapping as a projective device, the map becomes an instrument of design and is utilised with an understanding that there are a series of rules pertaining to the conception of settlements. For example in the process of surveying, maps are constructed by codes, instruments, and techniques which only create a representation of reality possible through those techniques.¹² Conditions put forward by this initial contact with the site are selected prioritised and others ignored to frame the design space.¹³

Typically, the design process involves looking retrospectively to be better informed about the context, within which the urban design will be realised. The point at which this process becomes contentious is the shift from the retrospective to the projective position. How does the designer employ traditional and historical knowledge of an environment to undertake a projective mapping of the new urban reality? The junction between the traditional and the contemporary is often uncomfortable and unexplained, as in this transition the designer usually views and interprets historical information from a perspective unrelated to any of the contextual or intellectual scenarios which gave that historical material meaning. Thus there is an inherent disjunction between

¹² Corner, 1999a, 216. See also Brand, D, 2004.

¹³ Ibid.

the retrospective and projective reading as well as mapping in the process of design. This disjunction in the design process has in many ways contributed to unsatisfactory design outcomes, which include the kitsch and pastiche.¹⁴

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Figure 110. Sitte's plan for the western end of Ringstrasse, Vienna, 1889.

According to Sitte this plan was an example of an urban design based on artistic principles.
(Source: Herscher, 2003, 213.)¹⁵

The focus of this study is to gain an understanding of the function of the map in urban design. Central to the emergence of rational urban planning was utopian thinking and its translation into a visual representation being centred on a map or a plan. If we view urban rationalism from the utopian perspective, while focusing on the map and mapping practices, three stages can be identified in the process of its development. Firstly, the transitional stage where utopian thinking was embraced by intellectuals from two differing perspectives—retrospectively and progressively. Nineteenth century utopian literary thinkers are grouped into “culturalist” (William Morris),

¹⁴ See texts such as, Solomon, Daniel 2003. *Global city blues* Washington [D.C]: Island Press.

¹⁵ Herscher, Andrew. 2003. "Städtebau as Imperial Culture: Camillo Sitte's Urban Plan for Ljubljana." *The Journal of the Society of Architectural Historians* no. 62 (2):212-227, 213.

which aligns with the concept of looking retrospectively, while “progressivist” approaches (Robert Owen, Charles Fourier) involve looking to the future for inspiration rather than the past. As far as authors and architects composing text for the explicit purpose of influencing urban and mapped space, Camillo Sitte was considered part of the “cultural organicity” of the utopian movement, while Le Corbusier, as a progressivist, focussed on “progress and rationality.”

The second stage in the development of urban rationalism involves the reduction of utopian progressivist concepts into design principles and rules. These parameters of design may also be considered as new forms of mapping. Two kinds of maps most affected by the rules stemming from utopian thinking are the survey and the master plan. The survey, as a representation of geographical data, relies on sets of decisions, observations, and interpretations to arrive at the data presented—a highly rationalised process. The greater the perceived accuracy, the greater its scientific merit leads to the distinction of the survey as a true representation of geographic reality and credible tool for analysing the site. The survey also became part of a greater mapping project, which symbolised the advent of modernity in the quest for empire expansion and the rise of colonial cities, as was discussed in Part II. The survey, according to James Corner, is considered “quantitative, objective and rational, it is also true and natural.” Therefore it actually aids in the production and marketing of the future design plans for the settlement. The master plan of human settlement is the other form of mapping, which is intended to represent utopian objectives in graphic form. This mapping specifies, through block sizes, orientation, set-backs from site boundaries, access routes, configurations zoning requirements, and built envelope parameters the type of development required to satisfy the new mandate for a new way of life. It is an assumption that the map’s role is to “objectively identify and make visible the terms” by which the new design proceeds.

The third stage in the development of the rationalism process highlights a metaphorical leap between conceived design principles and the physical design implementation. This is the realisation of the “model,” whereby “[i]t offers, on the level of the imaginary, a device for the a priori conception of built space.” The model represents yet a further reduction of progressivist utopian concepts due to its format as a physical representation. A model in the urban environment usually has three-

dimensional implications and, therefore, in every dimension there is less scope for interpretation and adaptation by those applying it in the field. The final stage of urban rationalism is the actual implementation of the model and rules of construction into a physical reality

Utopia: Projective and Retrospective

Jean Baudrillard suggests that to distinguish between what is *real* and what is *represented* is no longer meaningful.¹⁶ Corner believes to distinguish completely between “real world” and from the constructed one would not only be unimaginative but act contrary to human nature’s desire to “structure reciprocal relationships with its surroundings.”¹⁷

Utopianism is a key aspect of critical thought in regards to urban environments and living conditions. David Pinder argues that dissatisfaction and desire for change means utopian thinking is instrumental in “developing critical approaches to cities and processes of urbanisation.”¹⁸ As has been foregrounded by Choay, utopian thinking stimulated a new way of approaching ideas about urban environments. Pre-modern modes of production of built space involved established patterns of life based on socio-religious influences and practices, local technologies, and sets of culturally specific rules, with place-making occurring organically as a result of everyday practices. Compared with the emergence of modern urban practices whereby settlements are preconceived, using the advent of theorisations and premeditated plans for achieving a better way of living. The mapping of these new imaginings of space, via their reduction into rules of practice, signals the beginning of the rationalist turn. This turn, however, is not evident in early utopian writings, it is only when the thinking needs to be converted to something which is tangible, able to be drawn, or universally understood for implementation, that the utopian elements to the theorisations appear compromised.

¹⁶ Baudrillard, Jean. 1994. *Simulacra and Simulation*. Translated by Sheila Faria Glaser. Ann Arbor: The University of Michigan Press, 2. See also Baudrillard, Jean. 2006. *Utopia deferred : writings from Utopie, (1967-1978)* Translated by Stuart Kendall. New York Semiotext(e).

¹⁷ Corner, 1999a, 222.

¹⁸ Cordua, Christian Hermansen. 2010. "Prologue." In *Manifestoes and Transformations in the Early Modernist City*, edited by Christian Hermansen Cordua, 1-5. Surrey, GBR: Ashgate Publishing Group, 2.

Choay's definition of utopia of literary projections, describing the function of model society as follow,

the model society is opposed to a historically real society, and the criticism of the latter is indissociably linked to the description of the former; the model society is supported by *a model space, which is an integral, necessary part of it*; the model society is located outside of our system of socio-temporal coordinates, it is *elsewhere*; the model society is not subject to constraints of time and change.¹⁹

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Figure 111. Sitte's Master Plan for Olomouc, Moravia, 1889.
(Source: Herscher, 2003, 219).

Thomas More's *Utopia* is the foundational text in Choay's discussion, as the first writing to exemplify the above-mentioned characteristics. However, there were also different kinds of views purveyed within the genre of utopian writings. The group identified as culturalist or retrospective, identify with different values systems compared with those of the projective or progressivist group. The former include writers such as William Morris, A.W.N. Pugin, and John Ruskin, who aspired to past modes of production related to the craft movement, and advocated the rejection of the

¹⁹ Choay, 1980, 34.

machine and industrialisation.²⁰ Camillo Sitte, also promoted the quality of spaces of past traditional European cities, however, Sitte was realistic about the role of industrialisation and its impact on the city as “his aim was not a recreation of historic city patterns but the improvement of the grid and block system with minor displacements and additions.”²¹ Sitte in the master plan (figure 112), frames squares with borders to create smaller squares, which are aspects of traditional cities. However, a key aspect of this master plan by Sitte is its attention to detail and craft-like quality which may be argued, reflected the value systems he applied to urban space and in essence the culturalist approach. Sitte and Viollet-le-Duc share similarities in their writings and conceptions of the new utopian city in its social approach, rationalism, and pedagogy, as well as their criticism of the drawing board dominating the mode of production of urban environments, due to their preferencing of past urban morphologies.²²

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Figure 112. Camillo Sitte’s plan for a new section of Privoz, Silesia, 1895.
(Source: Herscher, 2003, 219).

²⁰ Pinder, David. 2010. "Utopian Urbanism: Ideals, Practices and Prospects." In *Manifestoes and Transformations in the Early Modernist City*, edited by Christian Hermansen Cordua. Farnham, Surrey GBR: Ashgate Publishing Group, 10.

²¹ Hanisch, Ruth. 2010. "Camillo Sitte: City Planning According to Artistic Principles, Vienna 1889." In *Manifestoes and Transformations in the Early Modernist City*, edited by Christian Hermansen Cordua, 125-136. Surrey, England: Ashgate, 128.

²² *Ibid.*, xiii.

Sitte was inspired by picturesque drawings and baroque planning traditions to influence his urban design solutions. The master plan (figure 112), highlights an arrangement of axial vistas to the cathedral, culminating with a public space in front of the monumental building. Sitte's urban design and representations may be seen as transitioning between classical space and modern space.

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Figure 113. Le Corbusier's plan for the Contemporary City.
With centre having the transportation interchange, surrounded by four towers of administration, then luxury apartments for the elite. Beyond the city centre were satellite towns for the workers. (Source: Fishman, 1977, see plates section of book).

Le Corbusier, by contrast represents the projective approach to utopia, with prioritising the machine and industrialisation in determining a new philosophy for the production of spaces for living. These values were evident in Le Corbusier's representations in their single clean lines, perspectival and axonometric projections as well as the monumental scale of his urban schemes. Projective utopian visions were typically based upon belief systems, which have faith in "the power of space to shape human activities and their projections of an ordered space become a means to contain social process and change, and to ensure harmony and stability."²³ Frank Lloyd

²³ Pinder, 2010, 20. See also Harvey, David. 2000. *Spaces of Hope*. Edinburgh: Edinburgh University Press, 160. Luckerman, F, and P Porter. "The Geography of Utopia." In *Geographies of the Mind: Essays in Historical Geography* edited by David Lowenthal and Martin Bowden.

Wright, Le Corbusier, and Ebenezer Howard were amongst the earliest of modernist utopian planning movement.²⁴ The rational style of modernism was first highlighted through philosophies put forward by the New Objectivity movement of European origin from the 1920s, also in their choices of projection for their large scale urban visions (refer figure 113).

Designs featured highly detailed yet simple forms with clean lines and devoid of any decorative or ornamental treatment. Steel and concrete were the materials of choice for architects such as Ludwig Mies Van Der Rohe, Walter Gropius, and others, as these austere materials reflected the “progress and prosperity” of the machine age.²⁵ These characteristics of modernism were transferred to realising urban environments in the creation of highly gridded and regularly arranged street systems in the master-planning of cities. This level of organisation of the infrastructure, parklands, vehicular, and pedestrian traffic for the city facilitated efficiency of movement, capital, and transport systems, maximising production and output. This in effect was the result of increasing industrialisation.

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Figure 114. Clarence Stein’s neighbourhood unit diagram.
(Source: Howard, 2003, 37.)

Howard Frederic Osbourne, Clarence Stein, Lloyd Wright, and others believed such regularisation of building and urban forms would bring about the demise of social

²⁴ Fishman, Robert. 1977. *Urban Utopias in the Twentieth Century: Ebenezer Howard, Frank Lloyd Wright, and Le Corbusier*. New York: Basic Books Inc. Publishers. See also Sandercock, Leonie. 1998. *Towards Cosmopolis: Planning for Multicultural Cities*. Chichester: Wiley. Sandercock, Leonie. 2003. *Cosmopolis II: Mongrel Cities of the 21st Century*. London: Continuum.

²⁵ Pinder, 2010, 166.

malaise, which had come to dominate urban environments from the inception of large-scale industrialisation.²⁶ Ebenezer Howard outlined planned steps to achieve his vision for the city, under the title of garden city movement. His model started out mapping social reform for cities but eventuated realising environmental reforms.²⁷ Le Corbusier and CIAM, established in 1928, went on to adopt the Athen's Charter as their and sets of design rules whilst they identified urban planning as,²⁸

“the cause of the anarchy that reigns in the organisation of cities and the equipment industry,” and in response demanded large-scale urban reconstruction and the insertion of new spaces based on strict zoning between functions.²⁹

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Figure 115. Ebenezer Howard's Garden City diagram.
The drawing styles reflects a rational approach yet it is quite different to later projective modernist drawings.³⁰ (Source: Howard, 2003, 30).

Thus utopian thought digressed from realising social reforms to issues of planning and regulating through sets of rules. The richness of historical readings as well as the complexity of utopian visions were reduced to patterns and rules as sets of design tools. To give the design outcome legitimacy, the process relies on conviction derived from theorisations. However, the projective process remained in actuality more or less a series of decisions around individual preferences. Le Corbusier's preferences for modernist living, involved unprecedented density and scale, and the impacts of these

²⁶ Hannigan. 1995. "Postmodern Architecture and Urban Design." *Current Sociology* no. 43:165-172, 167.

²⁷ Pinder, 2010, 19. See also Howard, Ebenezer. 1898. *To-Morrow: A Peaceful Path to Real Reform*. 2nd ed, *Garden Cities of To-morrow*. London: Swan Sonnenschein.

²⁸ CIAM is the acronym for *Congrès Internationaux d'Architecture Moderne* (International Congresses of Modern Architecture) founded in 1928 and disbanded in 1959. The main objective being to spread the principles of the Modern Movement focusing on the main domains of architecture, landscape architecture, urbanism, industrial design and others. <http://encyclopedia.thefreedictionary.com/Congr%...>

²⁹ *Ibid.*, 19. See also Corbusier, Le. 1973. "The Athens Charter." In. New York: Grossman Publishers.

³⁰ Howard, Ebenezer. 1898. *To-Morrow: A Peaceful Path to Real Reform*. 2nd ed, *Garden Cities of To-morrow*. London: Swan Sonnenschein, 30.

design choices were readily conveyed in his planning and perspectival drawings (figure 116).

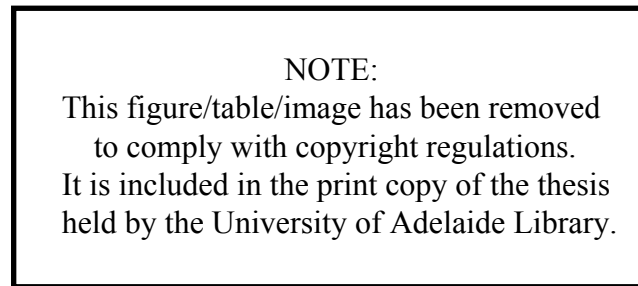


Figure 116. Le Corbusier's centre of the Contemporary City. With the transportation centre and a runway on its roof surrounded by highrise towers from *Oeuvre complèt de 1910-1929*. (Source: Fishman, 1977, refer plates).

6.2 Mapping and Designing

Corner argues that contemporary planning practices are preoccupied with tools from Enlightenment and modernist paradigms.³¹ Sites are treated as tabula rasa or as geometrically manipulated from above.³² It is evident how the two predominant forms of mapping became instrumental in translating projective utopian concepts into formal rules and principles of design: the *survey* and the *master plan*. The ways in which the survey and the master plan were created and used reveal the influence of Enlightenment rationalism. Surveys were considered quantitative inventories and master plans reflected rational and contained ideals. A good example of this practice is evident in Le Corbusier's *Voisin* plan (figure 117), with the combination of the aerial photo and the shaded plan. The geometrical design in the master plan solution

³¹ Corner, 1999a, 224. See also Halton, Eugene 1995. "The Modern Error: Or, the Unbearable Enlightenment of Being." In *Global modernities* edited by Mike Featherstone, Scott Lash and Roland Robertson. London ; Thousand Oaks, Calif. : Sage Publications.

³² Pinder, 2005, 72. See also Careri, Francesco. 2003. *Walkscapes: Walking as an Aesthetic Practice*. Barcelona: Aleu SA.

set against the context of the old town is overwhelming, given they are projected at the same scale.

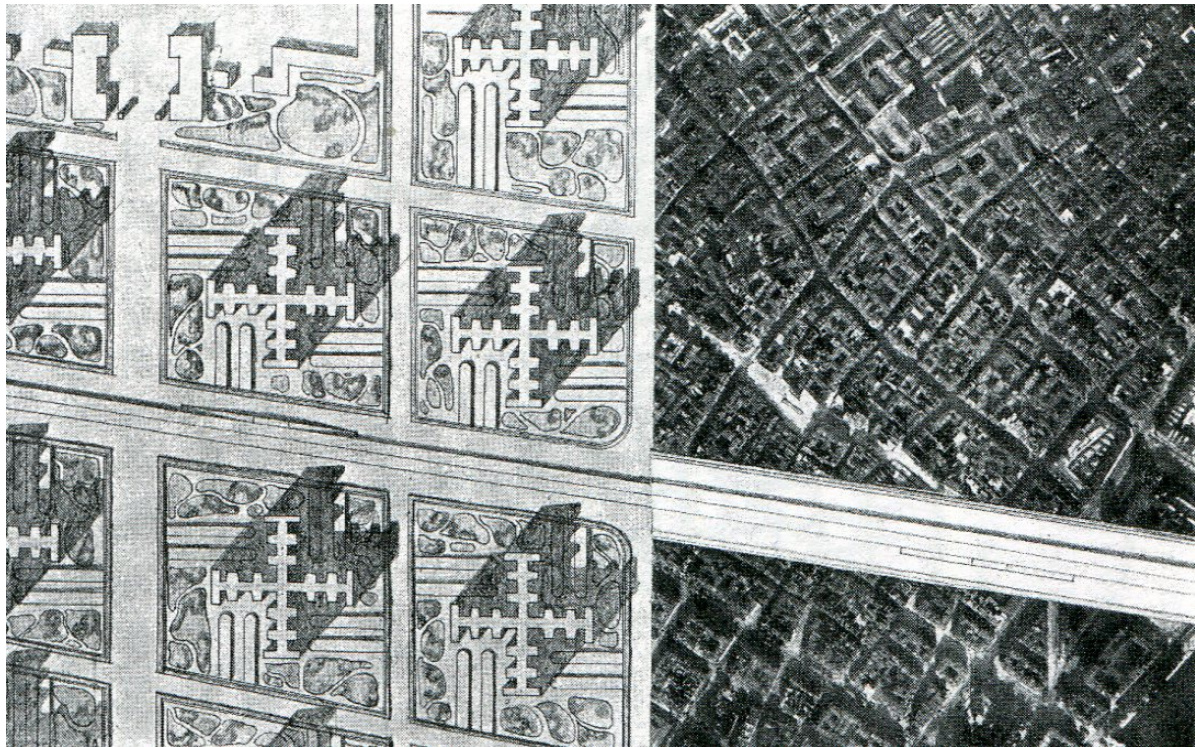


Figure 117. Photograph of Paris and Le Corbusier's Voisin Plan 1925. These images are both at the same scale, Corb's drawing shows the replacement design for the traditional areas of Paris. (Source: Pinder, 2005, 73).

Le Corbusier's belief, for example, envisaged centralised planning as the solution not only to urban buildings but could infiltrate every aspect of life, in particular as an alternative to France's urban ills.³³ The *Voisin* plan (figure 117) in its juxtaposition with the aerial photograph also suggests an urban malaise of jumbled old urbanities may be removed with the ordered new forms of planning. The drawing is key to marketing this message, as Le Corbusier further articulates below the power of planning.

In this system, everything would be determined by the plan, and the plan would be produced "objectively" by experts; the people who would have a say only in who was to administer it. "The harmonious city must be first planned by experts who understand the science of urbanism. They work at their plans in total freedom from partisan pressures and special interests; once their plans are formulated they must be implemented without opposition."³⁴

³³ Hall, Peter Geoffrey. 1996. *Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century*. updated edition ed. Oxford: Blackwell Publishers. Original edition, 1988, 210.

³⁴ Corbusier, 1973, 239.

The so-called “science of urbanism,” proposed by Le Corbusier and other modernists in its projective mode of design presented an imposition of utopian ideas onto urban environments which seemingly underestimated socio-cultural complexities of urban life. The graphic translation of modernist ideas such as the example of the Contemporary City proposal below, illustrate the monumentality and highly rationalised nature of these schemes. Although Corbusier intended the representations to symbolise order and harmony, perhaps they were also seen by governing bodies as annihilating every trace of the past and any established socio-cultural practices or qualities, as in many instances they were not built.

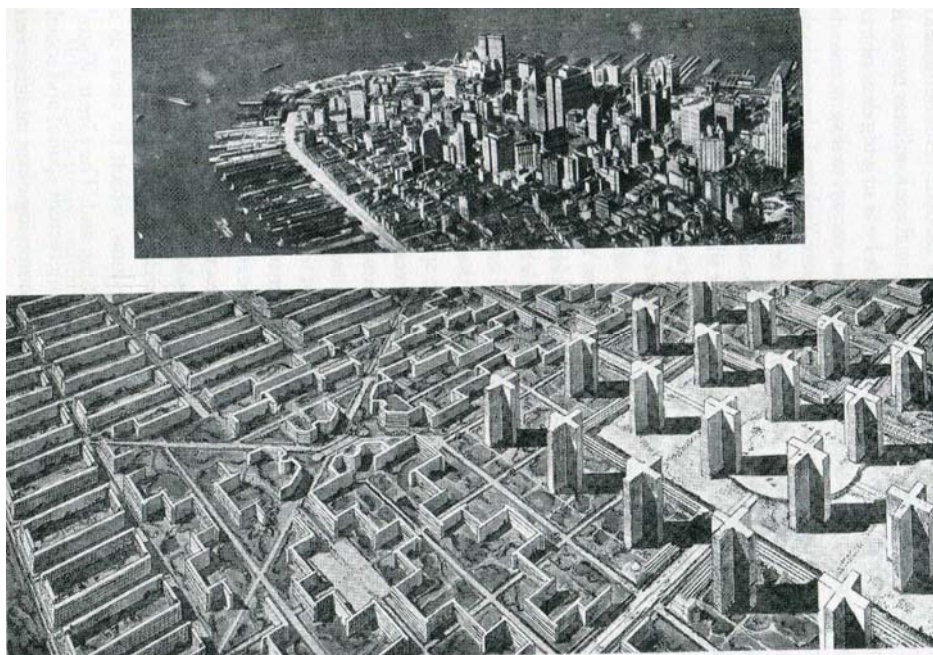


Figure 118. Manhattan juxtaposed with view of the Contemporary City. At the same scale and from the same angle, 1922. For Le Corbusier, Manhattan reflects congestion, chaos and upheaval in this photograph, and his Cartesian city is ‘harmonious and lyrical,’ drawn axonometrically adjacent.³⁵

CIAM’s philosophy summarised town planning into four functions consisting of living, working, transport, and recreation.³⁶ These themes aided the translation of original utopian agenda into diagrams for persuading, coercing, dictating to “experts” (presumably the planners and architects), and representing the form of urban settlement, which was required to fulfil utopian objectives in order to achieve a new way of living. They also contributed to the realisation of the utopian model.

³⁵ Pinder, 2005, 95.

³⁶ Wigley, Mark. 1998. *Constant's New Babylon: The Hyper-Architecture of Desire*. Rotterdam: 010 Publishers, 131.

Diagramming of projective utopian concepts, which was understood by 1960s urbanists as legible and easily negotiated urban space, resulted in the evolution and future resilience of the modern master plan of human settlement. The reduction of concepts, which were intended to reshape human behaviours, enhance sociability and the efficiencies of the functioning of everyday urban life, to diagrammatic models of spatial interactions prompted criticisms that the city had lost its meaning.³⁷ Lefebvre concurs,

The structures of space cannot be explained by a vitality of an urban community. They are the result of history that has been understood as a creation of social agencies of actors, generally of collective subjects. From their interactions, their strategies, successes and failures, derive the qualities and characteristics of urban space.³⁸

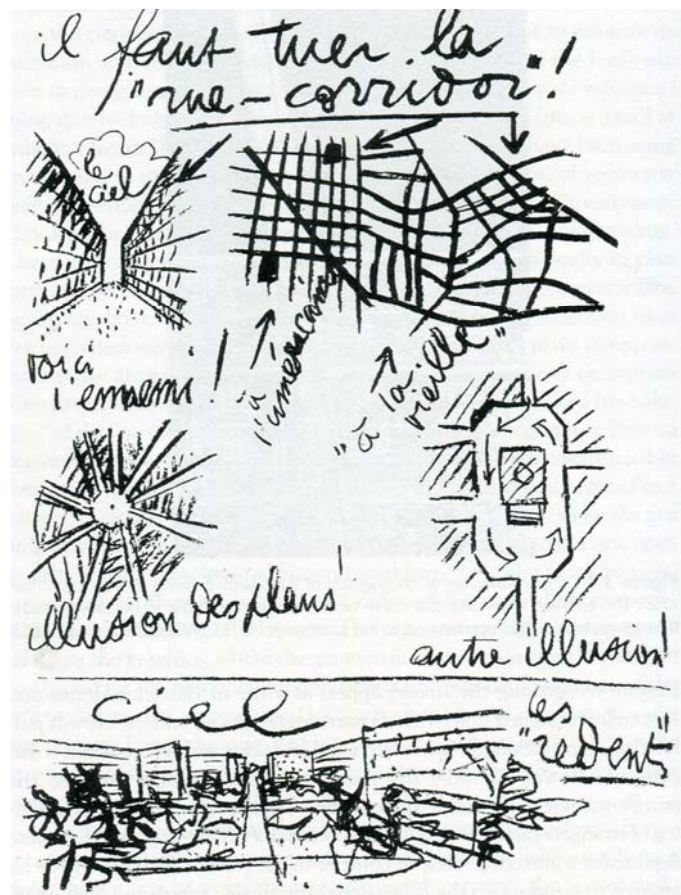


Figure 119. Sketch by Le Corbusier for a Buenos Aires in 1929. The sketches demonstrate Le Corbusier's dislikes ranging from the corridor street given it's dark and dinginess where one is unable to see the sky, as well as being over-crowded. The desire for well-lit urban space was also to discourage mental ill health and diseases of morality.³⁹

³⁷ Urry, John. 1995. *Consuming Places*. London: Routledge. See also Andreotti, Libero and Xavier Costa. 1996. *Theory of the Derive and other situationist writings on the city* Barcelona : Museu d'Art Contemporani de Barcelona: Distribution, ACTAR.

³⁸ Lefebvre, Henri. 1976. *Die Revoultion der Stadte*. Frankfurt: Syndikat, 137. See also Sadler, Simon 1998. *The situationist city*. Cambridge Mass. : MIT Press

³⁹ Pinder, 2005, 73-5.

The emergent modern mappings demonstrated graphically, value systems to reshape society as modernist public space in its scale and exposure was more easily able to be monitored compared with spaces of traditional cities. As representations of social reform, modernist mappings in their projective utopian nature, prioritised the ordering space for the purpose of ordering society, therefore they may be seen as an apparatus of government as well as tools for design.

6.3 Mapping as Designing

When we use mapping as a projective device, conveying a modelled and highly defined spatiality, the map becomes a design tool and is utilised with an understanding that there are a series of rules pertaining to the conception of settlements. Other graphically inspired “tools of thought” included modes of projection, such as axonometry, orthography, perspective, quantitative surveys and inventories, which were all modes of representation used in the dissemination of modernist works, (figure 119) in Le Corbusier’s single line perspective of the Radiant City.

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Figure 120. Le Corbusier’s concept for Antwerp, the Radiant City.
The radiant city was never built. 1933. (Source: Fishman, 1977, plates section).

The modernist city became the radical new model or arguably a three-dimensional mapping of the post-industrial age. It served as both a conceptual and physical model for urban form, and through the implementation of regular geometric forms and

minimal aesthetic embellishment of spaces it was intended to alter human behaviour and ways of living for the common good.⁴⁰ As modernist maps of urban space in their geometric regularity maximised efficiencies through the ease of circulation, visibility, and increased parkland spaces, this imposed sense of order was expected to have social ramifications. In spatial order and clarity, there was also envisaged to be social harmony, order, and control.⁴¹ The master-plan governs from above, as a source of graphic instructions indicating how the settlement should function and organise its peoples (figure 120).

The modernist city, influenced by the nature of industrialised cities' urban slums, invoked radical change of urban forms in opting for high-rise buildings for residential accommodation, in order to prioritise urban park land space. High-density residential towers would be able to cater for large population increases, which were occurring as people moved from agrarian based activities to the vocations offered by an industrialising city.⁴² Catering for increasing urban populations was also a key component of Le Corbusier's motivations for realising the high-rise city. The choices of different typologies for living and structured and geometrical forms equated to new urban design thinking.

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Figure 121. Model of the Voisin Plan for Paris.

Le Corbusier's proposal for the Marais District to be replaced with his machines for living. (<http://www.mheu.org/en/utopia/tower-blocks.aspx>, viewed 14 March 2012)

⁴⁰ Pinder 2010, in Cordua, 20.

⁴¹ Cordua, 2010a, 20.

⁴² Hannigan, 1995, 165. Typically, a modernist vision for the city, entailed "space shaped according to an overarching social objective; architecture and planning aim to integrate the metropolis; imposes an external utopian vision; commerce-oriented; geographically centralised; austere, inflexible; authoritarian; rectangular, unadorned."

Le Corbusier adopted a paradoxical position in the realisation of his new visions for cities and has been famously coined as “we must decongest the centres of our cities by increasing their density.”⁴³ Le Corbusier saw these new principles of the city being implanted on a cleared site, therefore city centres would need to be demolished to cater for large boulevards and highrise towers. This functional reorganisation was also to correspond with a reconfiguring of accepted social structures. Le Corbusier stipulated that the “cell” apartments would be all mass produced in keeping with the period of industrialisation. The variations would only be in the layout of the blocks and the types of planting in the green spaces at ground level for any differentiation to be achieved.

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Figure 122. Plan of the Radiant City by Le Corbusier.
The central district is residential, above it the business district and below it the industrial sector.
(Source: Fishman, 1977, plates section).

⁴³ Hall, 1996, 207. For the political view of the role of utopian cities see Rouvillois, Frederic. 2000. "Utopia and Totalitarianism." In *Utopia: The Search for the Ideal Society in the Western World*, edited by Roland Scaher, Gregory Claeys and Lyman Tower Sargeant, 316-32. Oxford, UK: Oxford University Press, 316. Jacoby, Russell. 1999. *The End of Utopia: Politics and Culture in an Age of Apathy*. New York: Basic Books, xi-xii.

The austerity of such proposals were reflected by the nature of the design tools—the survey, master plan whilst also evident in the modelled space. The value systems associated with designers of cities of Industrialisation, shared the view that city form had to respond to the efficiencies of production, characteristic of the age, as industrialisation was a permanent condition. (Refer figure 121 for the regularity of planning measures in the Radiant City plan.) The modes of representing the functional requirements of human settlement at this time, were also reduced down to their most rational forms, metaphorically championing industrial processes, but also responding to the bleak social and living conditions industrialisation had created in traditional urban environments. Further improving on the legacies of Enlightenment technologies for perceived accuracy and precision, the survey and master plan facilitated a new mode of urban design whilst the model form provided a three-dimensional translation of these ideals, that led to the creation of modern cities.

6.4 Maps, Society, and Urban Life

The ultimate dissemination of the model is through projective utopian approaches, which are the most common form of appropriating urban space for the colonial city. Architects such as Le Corbusier and Cerda saw the opportunities for realising their new ways of living, and social agendas for change, in the colonial worlds of India and South America. The recipients of colonisation, their local traditions, customs, and specific ways of living were largely disregarded for the priority of installing experimental model utopian urbanities. The projective utopian approach was legitimised as “an integral part of regional master-plans even though it denatures and dehumanises the surface of the earth through the abstract projection of built forms.”⁴⁴ However, urban rationalism, according to Choay, has been sustained in colonial policy ever since the sixteenth century, in that “the pattern for colonisation of the Third World, in which industrialisation reigns by means of the modelling of its spaces.”⁴⁵ Utopian models adopted on a broad scale have actually fallen to the fate of the utopia presented by Thomas More. More predicted that levels of control and conditioning of the public and their behaviours, in the creation of homogenous and stereotypical urbanities, would be detrimental to the citizens of utopia. The argument

⁴⁴ Hall, 1996, 277.

⁴⁵ Ibid.

for implementation of rational urbanist projects into colonised regions was typically one of efficiency, economies of scale, and time in the standardisation of urban space, which in reality proved quite the opposite.

Le Corbusier's moment for realising his only built urban plan at Chandigarh in India, demonstrated the problems of translation of utopian thought from lofty ideas into geometrical rules and principles with which to realise the model. The survey and master plan, were integral to the type of urban form produced and the modelling of the resultant designed space. Sandercock recounts, "[m]odernist thinking about the city tended to see rational order in visual and aesthetic terms..." that is via orthogonal and geometric forms.⁴⁶

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Figure 123. Le Corbusier inspects his master plan for Chandigarh.
(Source: <http://urbanomnibus.net/2011/03/teaching-urban-design-2/> viewed 11th June 2012).

Chandigarh demonstrated for Le Corbusier a shift from a focus on implementation of a certain planning style and formula synonymous with his original agenda as proposed by CIAM, instead for the prioritisation of an architectural style. As Sarin suggests, Le Corbusier's focus highlights an ideological shift

⁴⁶ Sandercock, Leonie. 2003. *Cosmopolis II: Mongrel Cities of the 21st Century*. London: Continuum, 29.

towards a preoccupation with visual form, symbolism, imagery and aesthetics rather than basic problems of the Indian population. By concentrating on providing Indian architecture with forms suited to the Second Machine Age, the existing Indian situation could be more or less ignored.⁴⁷

Despite proposed overarching social and environmental objectives, projective modes of utopian design once translated from rationalised sets of rules and principles into a physical form failed to deliver reform for the case of Chandigarh. Manfredo Tafuri suggests that the technical revolution, which occurred through industrialisation, permitted new “laws of production.” This process in turn enabled “new conventions” to be embraced.⁴⁸ Tafuri states that “architecture as ideology of the plan is swept away by the *reality of the plan* when, the level of utopia having been superseded, the plan becomes the operative mechanism.”⁴⁹

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Figure 124. Preliminary site plan (not as executed), Chandigarh, India (1951).
Architect: Le Corbusier. Copyright: F.L.C./Adagp, Paris, 2011/RIBA Library Drawings and Archives Collections. (Source: <http://www.architecture.com/LibraryDrawingsAndPhotographs/OnlineWorkshops/UrbanAdventures/16Corbusier.aspx> viewed 11th June 2012).

⁴⁷ Sarin, M. 1982. *Urban Planning in the Third World: The Chandigarh Experience*. London: Mansell, 47.

⁴⁸ Ibid., 35. See also Tafuri, Manfredo. 1976. *Architecture and Utopia*. Cambridge MA: MIT Press.

⁴⁹ Tafuri, 1976, 135.

The client for the work was the post-colonial government of the autocratic British Raj and the design consisted of a gridded sequence of roads, building forms and layouts, which adhered to European climatic principles rather than north Indian. Disregard for socio-cultural practices particular to an Indian way of life were evident in Chandigarh, and as Evenson argued, building layouts demonstrated a “total failure to produce built forms that could aid social organisation or social integration; the sections fails to function as neighbourhoods.”⁵⁰ The omission of qualities integral to Indian society highlights the extent to which the power of rationalised planning rules and models were exonerated in favour of basic human spatial qualities of settlement.

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Figure 125. SIT plan of Tiong Bahru
(Source: Lim, 2011, 149).

As Leonie Sandercock states, this belief in scientific method stemming from Enlightenment understandings, which privileges the technical over any other forms of knowledge, dismisses a realm of equally important knowledge systems: “experiential,

⁵⁰ Evenson, N. 1966. *Chandigarh*. Berkeley and Los Angeles: University of California Press, 95.

intuitive, local knowledges based on practices of talking, listening, seeing...visual and other symbolic [representations].”⁵¹ According to Eunice Seng, all European modernist interventions into colonial space did not have such negative effects. When the housing estate of Tiong Bahru was proposed in Singapore in 1948, there were clear adaptations of European modernist concepts to suit the local socio-cultural requirements. As Seng states Tiong Bahru exemplifies garden city utopian planning, where the green space was intended to be the rehabilitation area for the mind and body.⁵² Seng highlights there was a flexible arrangement put in place to cater for the local citizens. A green belt of open space around the city was specified to be reserved with the intent of it being used for recreation or agricultural purposes, but building development such as urban kampongs were not permitted. Yet over time these un-programmed spaces became zoned as spaces of communal social amenities.⁵³

As Corner suggests, contemporary designers view space as being more complex than just physical objects and forms.⁵⁴ Rather it is characterised by “inter-relationships” and the effects of “dynamic interactions.”⁵⁵ This view is shared by Abidin Kusno, who, despite tendencies of planning and policy to dominate and control, finds opportunities for resistance in the “little and “derivative” traditions characteristic of Southeast Asian socio-cultural practices.⁵⁶ Kusno suggests that architects, such as Tay Kheng Soon, Sumet Jumsai, and Ken Yeang, are amongst those Southeast Asian practitioners, which revived the regionalist discourse of the region in seeking a specific Southeast Asian progressive approach to their urban environments (see chapter seven for discussion on regionalism).⁵⁷ It is these cases to which Choay alludes where the utopian model was only ever partially implemented and provided local opportunities to emerge.⁵⁸

⁵¹ Sandercock, 2003, 6.

⁵² Seng, 2011, "Politics of Greening: Spatial Constructions of the Public in Singapore." In *Non West Modernist Past*, edited by S. W. Lim. William and Jiat-Hwee Chang, 143-160. Singapore: World Scientific Publishing Company., 149-50, 145.

⁵³ Ibid.

⁵⁴ Corner, 1999a, 227.

⁵⁵ Ibid.

⁵⁶ Ibid.

⁵⁷ Kusno, Abidin. 2000. *Behind the Postcolonial: Architecture, urban space and political cultures in Indonesia*. Edited by Thomas A. Markus and Anthony D. King, Architext Series. London: Routledge., 58.

⁵⁸ See also Yeoh, 1996; Gandelsonas, Mario. 1991. *Urban Text*. Cambridge, Massachusetts: Chicago Institute for Architecture & Urbanism (CIAU) MIT Press.

Concluding Remarks

The utopian vision presented a universal view of the world and these ideas were translated into visual forms, which included the survey, master plan, and the model. These forms of projection may be seen as the stand out elements in the transition of mapping from a retrospective role to the projective. The survey was believed to be an accurate description of a geographical reality. Although highly rationalised and the extents of geographical information conveyed was through a rigid conceptual frame, the survey was also influenced by the limitations of the techniques able to produce it. The master plan became the key tool for organising large amounts of information about life for a large proportion of people. Sets of social relationships were reduced to rules and principles and presented on a two-dimensional line drawing to inform the production of the model space. The model equates to either a three-dimensional or two-dimensional reduction of all the utopian thinking, and ultimately represents the living environment which is going to be implemented. The proposed scheme suggests a series of objects or forms, which may be universally applied to human settlement. The dilemma for the urban design process is that the field of operations is so narrow it is unable to connect with the complexities of modern life and thus contributing to the problems of the production of modern urbanism. Some contemporary practitioners are managing to re-imagine some creative possibilities within these restrictive design parameters of the modernist mapping paradigms and their story features next.

Chapter 7: Reaction to Modernism

Despite the Enlightenment being a highly productive period for the development of science and technology, whereby modern society gained immense benefits, its legacy, in the forms of positivism and rationalism, has been the source of dissatisfaction at many levels, including human environments. A range of responses to modernism emerged since the mid-twentieth century, including the revisiting of mapping processes in urban design. As Denis Cosgrove suggests, “[m]apping begets further mappings,” whereby not only are many maps based on their predecessors as a record of comparison, but are also subject to modification and interpretation once absorbed into the cultural milieu.⁵⁹ From within the cultural milieu, first, maps as material objects are able to generate “metaphorical meanings” between, for example, mapping language and ecological visions as well as the psychology of landscape.⁶⁰ Secondly, mappings act as a means of projecting the imagination in the form of “utopias,” where a social order is conceived and a spatial order results represented via the map.⁶¹ In this chapter, four themes representing the major movements that emerged between the second half of the twentieth century and the twenty first century are examined through the notions of metaphor and utopia, prompted by deep dissatisfactions with modern urbanism and rational urban design strategies. The movements discussed under these themes have developed different mapping approaches to collecting and analysing social, urban, and environmental data.

The first theme is nomadity and urbanity, under which movements such as the 1960s Situationists fall, as well as projects ranging from New Babylon to the Walking City. Practitioners and theoreticians considered nomadity and urbanity from the utopian perspective, focussing on theorising the city as an entity in flux, constantly changing and responding to its inhabitants as well as global influences, rather than being characterised by something fixed and static, typically associated with settlement. The second theme for consideration is landscape and urbanity, which includes the

⁵⁹ Cosgrove, 1999b, 14. See also Lefebvre, Henri. 1991. *The Production of Space*. Oxford, UK.: Blackwell.

⁶⁰ Ibid., 15. See also de Certeau, Michel. 1984. *The Practice of Everyday Life*. Translated by Steve Rendall. Berkeley: University of California Press.

⁶¹ Ibid., 15-16. See for discussion of contemporary theoretical utopias Sykes, A. Krista 2010. *Constructing a new agenda [electronic resource] : architectural theory 1993-2009* New York: Princeton Architectural Press.

landscape urbanism movement that originated in the 1980s. Landscape urbanism protagonists viewed landscape and urban systems as interacting cohesively and it may be considered conceptually linked to metaphorical relations with natural landscapes. Their process of implementation, however, is closely associated with statistical processes of Enlightenment thinking, which is focussed on imaginings of a new order for society, and thus forms part of the utopian genre. Through incorporating new mapping processes, large quantities of data are applied as a design solution. Thirdly, postcolonial theorisations of urban space have been aligned with the theme of regionalism and urban identity. This theme also relates to environmental metaphors, which resonated with practitioners and theorists concerned with the effects of globalisation on the distinctive qualities of urban environments. From a theoretical perspective, critical regionalism featured in critical architectural and urban discourse around the 1990s, whilst tropical regionalism and other sub-categories of regionalism featured in architectural styles from the same period.⁶² The final theme to be examined here is that of ecology, environment, and the city, adopted by the movement known as ecological urbanism, which also has its origins in the 1990s. This movement, across metaphorical associations with ecological factors of landscape, acknowledges that the relationships among economics, ecological considerations, and socio-political factors come into play to affect the design of the city.

Although these four movements surfaced in response to a rationalist context and the early modernist reductive methodology, their urban design approaches maintained, in different ways, modernist undertones. For contemporary practitioners, the difference is that they realise the limitations of modern rationalism, and instead strive to accommodate the non-rational and spontaneous aspects of human life and revisits the imaginative qualities of urban space. Like their predecessors, however, their intent remained utopian, whereby they wished to overthrow the modernist paradigm of simplifying urban design to basic geometries. By contrast, under the themes listed below are mappings which display complex factors that contribute to urban design through imaginative thinking, compared with the reductive nature of the early modernists. In addition, mapping technologies and techniques have developed into the twenty first century to accommodate means of representation to further understand

⁶² Frampton, Kenneth. 1983. "Prospects of a Critical Regionalism." *Perspecta* no. 20: 147-162. MIT Press.

our human condition. Mapping processes and representations demonstrate an integrated relationship between new forms of mapping and recording information based on understandings of the complexities of our world. However, this complexity of thinking does not always translate to a new and improved way of designing. The contemporary map in all of the study cases still exists as a design instrument, not deterministic, but rather informative in nature.

7.1 Nomadity and Urbanity

Practitioners and theoreticians who considered nomadity and urbanity from the utopian view, focussed on theorising the city as an entity in flux, constantly changing and responding to its inhabitants as well as global influences, rather than being characterised by something fixed and static, typically associated with settlement. Movements, such as the Situationists considered the city from the perspective of nomadity; their interest in engaging with urban space was by experiencing it through walking or drifting. In their subversion of modernist cartography of the city, the Situationists constructed their own personal spatialities in participating in the *dérive*.⁶³ One utopian 1960s urban project, New Babylon, proposed by Dutch artist Constant Nieuwenhuys, a founding member of the Situationists, involved individuals engaged in projectively mapping their living spaces.⁶⁴

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Figure 126. Mike Webb's Sin Centre Project, 1958-62
(Source: Banham, 1976, 92)

⁶³ Cosgrove, 1999b, 16.

⁶⁴ Saggs, H W F. 1965. *Everyday Life in Babylonia & Assyria*. London: Jarrold & Sons Ltd, 28.

This methodology was intended to overthrow existing societal norms and challenge traditional assumptions and conditions for living and settling. “Settlement” understood within its historic associations with fortification and safety, as well as an urban establishment fixed permanently in a desired position or place, was not supposedly desirable for citizens of New Babylon.⁶⁵ New Babylon, a highly utopian model for living, in its proposal of mobility as a radical alternative to urban life, challenged common conceptions of quotidian existence. The connection between temporality, nomadity, and cities also challenges traditional historical interpretations of urban settlements, in that they have been considered, bounded, and physically resolved.

Other examples of the 1960s/70s include the following projects: Stanley Tigerman’s *Instant City Project*, Buckminster Fuller’s *Triton Project*,⁶⁶ Archigram’s *Walking City Project*,⁶⁷ and Mike Webb’s *Sin Centre Project*.⁶⁸ Nomadity in the contemporary context includes movements, ranging from the physical practice of traversing real space to the capacity of virtual technologies.

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Figure 127. Archigram’s *Walking City Project*, 1963
(Source: Banham, 1976, 85)

⁶⁵ Simpson, J A, and E S C Weiner. 1989, 1675.

⁶⁶ Banham, Reyner. 1976. *Megastructure: Urban Futures of the Recent Past*. London: Thames and Hudson Ltd, 158.

⁶⁷ Ibid., 85. See also Sadler, Simon. 2005. "Archigram [electronic resource] : architecture without architecture " In. Cambridge, Mass.: MIT Press., <http://library.adelaide.edu.au/item/1681464>.

⁶⁸ Ibid., 92. See also Thomsen, Christian W. 1994. *Visionary architecture : from Babylon to virtual reality* Translated by John William Gabriel. Munich ; New York Prestel.

Constant's New Babylon originated out of political and social conditions of the 1960s, and followed the Situationists' perception that the modernist movement's negligence was in its failure to recognise the human psychological connection with space.⁶⁹ Developments in automation together with population expansion meant increased suburbanisation, and led to the demise of creative culture and the destruction of the very life it was meant to support.⁷⁰ Constant believed automation would supersede manual work, free time would be immersed in travel, general ludic behaviour, and creating spaces for living. Engagement in urban space would be achieved and recorded by mapping processes. New Babylon was an opportunity for architecture to be used to turn playful urban existence into a new way of living.⁷¹ Constant's New Babylon, as a mobile and temporary city, consists of two discrete components, the aesthetic and the theoretical. The aesthetic component, or utopian model, of New Babylon involves explorations of representational mediums, ranging from mappings to detailed architectural models.⁷² The theoretical component, or theoretical model, involves the ideas of unitary urbanism⁷³ and psychogeography, which originates from Situationist urban philosophy.⁷⁴

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Figure 128. Constant's New Babylon/Amsterdam, 1963
(Source: Wigley, 1998, 150.)

⁶⁹ "The Great Urbanism Game" cited in Wigley, 1998, 9.

⁷⁰ Ibid, 9.

⁷¹ Ibid, 16. See also Solnit, Rebecca. 2001. *Wanderlust: A History of Walking*. London: Verso.

⁷² Choay, 1980, 10.

⁷³ Wigley, 9.

⁷⁴ Ibid. See also Daskalakis, George, Charles Waldheim, and Jason Young, eds. 2001. *Stalking Detroit*. Barcelona: ACTAR.

The graphic technique used to convey the expansive nature of a *dérive* in the city is evident in the above mapping of Amsterdam. Standard maps are overlaid over the existing historical city centre of Amsterdam in a contrasting colour.⁷⁵ These map fragments represent sectors of the new urban environment which sits over the old city. Similar to pre-modern mappings, Constant's graphic portrayals of space were accompanied by textual accounts, lectures to eager architectural students or manifestoes professing the criteria for the proposed new urbanity, all of which provided insight into the socio-cultural qualities of the spaces.⁷⁶

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Figure 129. Constant's *Detail of a Sector*, 1969
(Source: Wigley, 1998, 194.)

⁷⁵ Wigley, 1990, 61. Unitary urbanism involved, according to its authors, the Situationists and Constant, the revival of the "art of construction" in architecture and the practice of the "construction of ambiances" in urban environments. Debord, G. E. "Constant and the Path of Unitary Urbanism" [Original in French, 'Constant et la voie de l'urbanisme unitaire,' written in 1959. Partly published in German in *Constant. Konstruktionen und Modelle* (Essen: Galerie van de Loo, 1960). Translated by Brian Holmes] cited in Wigley, 1998, 95. Constant's dissatisfaction with 1960s urban solutions was related to both their myopic nature and the absence of any "socio-cultural" component in the conception or realisation of modern cities. Debord, G. E. in 'Sur nos moyens et nos perspectives,' *Internationale Situationniste*, no. 2 (December 1958), cited in Wigley, 1998, 95. The practice of unitary urbanism was intended to reinstate cultural practice in the urban realm by focusing upon social contacts and interactions in the intense interior spaces of New Babylon. Thus, unitary urbanism was considered, "the objectification of the creative urge... the materialisation of dynamic lifestyle. A lifestyle which recognises no goal in life, which is not intent on giving life meaning, but which makes life itself the goal, which looks for the fulfilment of this life in daily praxis, a lifestyle, which aims to be the creation of our life." Constant "Unitary Urbanism" [Original in Dutch. 'Unitair Urbanisme,' unpublished manuscript of a lecture held at the Stedelijk Museum, Amsterdam on 20 december 1960. Translated by Robyn de Jong-Dalziel] cited in Wigley, 1998, 132.

⁷⁶ Cosgrove, 1999b, 16.

By contrast, the models and the drawings of the built of form of New Babylon indicate monolithic structures, occupying and totalising the existing city in a similar way to the modernist agenda of overturning the existing modes of production of urban life. Constant blamed utilitarian habits for the production of the existing static and material 1960s urbanism and modernist planning solutions. Only revolution would deliver revised dynamic versions of urban environments.⁷⁷ Psycho-geography and *Walking the City* were instrumental to overturning the utilitarian habits, through nomadic practice of the *dérive* or the drift. The subversion of the psychological order of the city (urban planning) was achieved in the drift⁷⁸ and resulted in the “construction of atmosphere.”⁷⁹ The drifter would negotiate the city in a non-systematic way, and this practice was likened to a sporadic, psychological mapping.⁸⁰ Unexpected interactions and challenging situations of the detour occurred in residual, marginal urban space of traditional cities.⁸¹

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Figure 130. Constant's *New Babylon North*, 1959
(Source: Wigley, 1998, 117.)

⁷⁷ Wigley, 1998, 132.

⁷⁸ *Ibid.*, 12.

⁷⁹ *Ibid.*, 14.

⁸⁰ Arendt, Hannah cited in Chambers, Iain. 1994. *Migrancy, Culture, Identity*. London, UK: Routledge, 17. See also Bingaman, Amy, Lise Sanders, and Rebecca Zorach. 2002. *Embodied utopias : gender, social change, and the modern metropolis* London: Routledge. Hannah Arendt, in her book “Human Condition,” argues that indeterminate conditions may also evolve into innovative spaces, provoked through tensions of socio-economic, political, cultural, religious, and ethnic difference.

⁸¹ *Ibid.*

Spaces of indeterminacy delivered ambient-rich events and atmosphere, and returned to the walker the spontaneity of living. Constant represented these interactions with various modes of mappings. In “New Babylon North” (figure 129), Constant graphically depicts the numerous paths and connections of the walker with a sporadic mass of intersecting lines, as the linking device to the mapped sectors in space. This representation attempts to reflect a “rhizomic” quality to spatial relations.⁸²

The model (figure 130) demonstrates the sheer scale of Constant’s proposal in three-dimensions if comparing it with the cars stationed underneath. The physical space of New Babylon appears to fall short of its theoretical intentions, in that there is a fixity and static quality to the model, which is absent in the two-dimensional mappings.

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Figure 131. Constant’s *Orange Construction*, 1958.
(Source: Wigley, 1998, 80).

The aesthetic model, was an imagined physical long span structure, stationed more than 30 metres above the existing city fabric and topography, supported on enormous steel pilotis. The ground plane, or existing city level, was set aside for vehicular movement, the first level for the pedestrians and the creation of living spaces, the top

⁸² See Deleuze and Guattari, 1986.

level for playing fields, recreational spaces and landing space for aircraft.⁸³ Quotidian spatiality of New Babylon was determined by its fluctuating patterns of use. Inhabitants of New Babylon only ever resided temporarily in any one location. Participators in the interiorised New Babylon space were required, under their own motivations, to create their “patch” for living, sleeping, and playing, through technical manipulation of computer-based atmospheric equipment, movable screens, and partitions. New Babylonians were initially presented, with a three-dimensional empty canvas, a voluminous, artificially-controlled internal environment where all natural microclimatic systems were excluded. In the absence of external or natural phenomena, interactive technological systems engendered a “sense of place.” Sound, air-conditioning, and heating equipment responded to the participator’s desired “ambience.”⁸⁴ The resultant atmosphere was both a psychological and physical play on spatial experience.

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Figure 132. New Babylon/Den Haag (the Hague) by Constant.
Water colour on paper. (Source: Wigley, 1999, 155.)

⁸³ Constant “New Babylon: Outline of a Culture” [Original in Dutch, ‘New Babylon, een schets voor een kultuur.’ Rewrite of a chapter from an unpublished book manuscript, written in German between 1960 and 1965, published in *New Babylon* (The Hague: Haags Gemeentemuseum, 1974), pp. 49-62. Translated by Paul Hammond] cited in Wigley, 1998, 161.

⁸⁴ Constant “Unitary Urbanism” cited in Wigley, 1998, 134.

Each individual needed to map their experiences of personal and spatial interactions to achieve their own kind of desirable living environment. As a concept, New Babylon played on and borrowed from traditionally organised societies, where everyday practices motivated urban form, except that mappings were retrospective. The imagined connection between the old and new cities is also displayed in mappings whereby selected traditional cities are re-mapped by Constant. Refer the map above of Den Haag with the new sector space in red overlaying the old, this is not a new mode of mapping but simply a reconfiguring and utilisation of typical mapping practice. The new mapped representation is reliant on the background context of a traditional map to give the painting any meaning. Similarly the same technique is used to convey a revised urban layout of Barcelona (figure 132).

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Figure 133. New Babylon/Barcelona.
(Source: Wigley, 1999, 154)

In the context of Françoise Choay's study, and Denis Cosgrove's understandings, New Babylon was ultimately a utopian project.⁸⁵ A useful tool to interpret the urban environment and critique the city, New Babylon in its invention of radical urban

⁸⁵ Choay, 1980, 22.

situations — utopias — are crucial conceptual instruments to invoke change.⁸⁶ In Choay’s terminology, New Babylon’s aesthetic and theoretical agendas represent and relate to her “model space” and “model society” respectively, which she identifies as characteristic of utopian genre. Model space is considered as an integral support to the model society, which is opposed to any historically real society.⁸⁷ Also the model society is disconnected spatially to the traditional city and not subjected to any traditional constraints of time and change.⁸⁸ The notion of the model, suggests a priority of overturning the existing social order to construct new spatial orders as indicated in the two-dimensional mappings (figure 127) of Constant as well as the three-dimensional proposal of the utopian model (figure 128).

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Figure 134. Guy Debord “Life Continues to be Free and Easy” collage 1959. (Source: Wigley, 1999, 19).

⁸⁶ Choay, 1980, 34. See also Rosenau, Helen. 1959. *The ideal city in its architectural evolution*. London Routledge.

⁸⁷ Ibid. See for modernist utopian visions Coleman, Nathaniel 2005. *Utopias and architecture* New York: Routledge.

⁸⁸ Ibid. See also Dostoglu, Neslihan Turkun 1986. *Architectural deterministic thinking in the development of urban utopias, 1848-1947*, Architecture, University of Pennsylvania, Ann Arbor, Mich.

Constant's concepts have been adopted in contemporary architectural offices such as "Archigram, Architecture Principe, Office of Metropolitan Architecture" and others.⁸⁹ Often in the practice of architecture, many architectural projects do not get built, and the ones that do are usually compromised. So therefore many projects have a utopian aspect and New Babylon forms part of this genre of the unbuilt.⁹⁰ In addition, other favourable aspects, depicted by Wigley include Constant's ideas associated with the 1960s cybernetics, which connect New Babylon with contemporary interpretations of cyberspace. In 1958, Constant pioneered a radio-controlled *dérive*, with the use of the walkie-talkie to invoke a different type of social space through the "short circuited physical space of the city, fostering the production of a different kind of city."⁹¹

Guy Debord's conception (figure 133), in mapped form representing the options and possibilities of moving about the spaces or in a psychogeography of the city, was a present to Constant.⁹² The conceptualisation of urban space and its relations is represented diagrammatically, which also is not a new mode of portraying spatial connections. The main criticisms of New Babylon is in its representing a type of Situationist architecture, a generic contemporary problem of the process of translation from theory to formal realisation in the construction of urban spaces, is highlighted. Constant's ideas are relevant in envisaging some lifestyles today, but his proposals operated within a Modernist regime. Through Constant's over-arching objective of revolutionising 1960s ways of living and eradicating what was existing then, his utopian concept thrived from the same rationalism and authoritarianism, to which he was reacting. There is an attraction in spontaneous situations, in fleeting moments, evoking surprising and unscripted responses as well as creating instantaneous mappings and personal trajectories of experience in space. However, urban environments cannot evolve instantaneously in this sense and then evaporate in the next moment, and by definition, as constructions they are no longer ephemeral situations. Once Constant's imagined spatialities were mapped into two and three dimensional representations the spontaneity was lost.

⁸⁹ Wigley, 1998, 63.

⁹⁰ Ibid. See also Cairns, Stephen, ed. 2004. *Drifting: Architecture and Migrancy*. Edited by T. A. Markus and A. D. King, *The Architext Series*. London: Routledge.

⁹¹ Ibid., 65.

⁹² Guy Debord was a co-founder of the Situationists group with Constant.

Nomadity resonates in contemporary architectural theory as it may occur in the virtual realm, or through modes of thinking, the common link is a quest for new experience as well as altered qualities of human environments. Whether desire for experience, is based upon the phenomena of sedentary living, or connected to the psychology of urban environments, the nomad is motivated to wander in search of other events, situations, peoples, and cultures, as well as preferencing mobility itself. Nomadic traversal is “rhizomic,”⁹³ and self-directed rather than a conscious movement pattern from place to place, or via delineated paths of urban planners.⁹⁴ A nomadic identity is characterised by the ontology of movement in which he/she always exists. A nomad’s place is always in flux and therefore has an ephemeral quality. Iain Chambers through his work on conceptualising nomadity and place experience explains that for the nomad “the sense of belonging” typically associated with place exists but is constructed in mobility.⁹⁵ The realm of the contemporary citizen/nomad, in their global interconnectedness, has outgrown traditional modes of thinking and requires an analysis based on the psychological and physical shifting relationships with place.⁹⁶ Contemporary mediums such as the World Wide Web, virtual “real” space models and dynamic mapping processes are tools for examining these changing relationships between physical and psychological space. The status of the architect or urban designer has changed since the 1960s. Architectural totalisations, such as New Babylon, equate to art or solely the realm of unrealised utopian solutions surviving in mappings, rather than serious architecture or urban design.

7.2 Landscape and Urbanity

Landscape urbanism protagonists viewed landscape and urban systems as interacting cohesively and conceptually, linked to metaphorical relations with natural landscapes. Modes of mapping employed for realising landscape urbanism design solutions are

⁹³ Deleuze & Guattari. 1986, 6.

⁹⁴ Cresswell, Tim. 1997. "Imagining the Nomad: Mobility and the Postmodern Primitive." In *Space and Social Theory: Interpreting Modernity and Postmodernity*, edited by G. Benko and U. Strohmayr. Oxford: Blackwell Publishers Inc., 364. Place experience in the contemporary world, which may be paralleled with nomadity, has been transformed by modernity and globalisation. Dovey, 1999, 48.

⁹⁵ Chambers, 1994, 25. Arjun Appadurai, in his studies of the notions of local and global, suggests that the “ephemeral” quality of a region, in the present era, is due to globalisation. He confirms that “locality itself is a historical product and that the histories through which localities emerge are eventually subject to the dynamics of the global.” Appadurai, Arjun. 1996. *Modernity at Large: Cultural Dimensions of Globalisation*. Vol. 1. Minneapolis: University of Minnesota Press, 183.

⁹⁶ Cresswell, 1997, 364.

closely associated with statistical and thematic maps of Enlightenment thinking. Large quantities of statistical data are analysed and collated for the use of related themes and metaphor, selectively applied to the design case. Foregrounded by James Corner, Charles Waldheim, and Mohsen Mostafavi, landscape urbanism resulted from postmodernist critiques of modernist urban architectural and planning outcomes. Again through a search for meaning in human environments, this movement utilised metaphorical readings of the city and the natural represented through mappings to implement utopian ideas into the void spaces of the city. Two contemporary landscape projects are used in the discussion later to demonstrate these mapping processes, the first project is by Rosalea Monacella (2003) and the second, design is by Rafael Contreras (2010) from the London school of the Architectural Association.

Early landscape urbanism projects date back to the 1980s with projects such as Parc de la Villette. Once the site of the largest abattoir in Paris, the brief for the competition for a new urban park, contained a key requirement, the winning design should embrace possibilities for the 21st century.⁹⁷ Landscape in this project became representative of a complex transformation of urban infrastructure and a site of public events, whilst catering for any number of potential configurations for the future. Bernard Tschumi developed a set of relations within the landscape in which to cater for changing and shifting social and urban relationships. The intent therefore was that the park was able to cater or engage with the staging of “all sorts of activities, planned and unplanned, imagined and unimagined over time.”⁹⁸ The intent of such projects is to permit a continuum of changes and events which shape the project, in a process of dynamism. As natural landscapes are always operating within a lifecycle continuum, the collaboration of the natural and the man-made landscapes of landscape urbanism practices facilitate a dynamism not always possible solely within a constructed environment.⁹⁹ The drawing below depicts axonometric representations of the follies designed to sit within the landscape. Although in practice, they may invite participation and activity the drawings reflect, what we have come to understand in contemporary architectural practice as typical built projections. They express

⁹⁷ Waldheim, Charles. 2006. *The Landscape Urbanism Reader*. New York: Princeton Architectural Press, 038-039, 040.

⁹⁸ Ibid., 041.

⁹⁹ Ibid. As Waldheim states, “...postmodern architects practiced a kind of pre-emptive cultural regression, designing individual buildings to invoke an absent context, as if neighbourly character could contravene a century of industrial economy.”

geometric concerns of form, scale and proportional relationships above all else. These representations although, may be producing a different architectural style to previous genres of design, the drawings remain passive in their contribution. A new mode of mapping or translation is not evident.

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Figure 135. Axonometrics of follies at Parc de la Villette.
(Source: <http://codythesis1011.blogspot.com.au/2010/10/bernard-tschumi-parc-de-la-villette-le.html> viewed 7th June 2012).

Waldheim coined the term “landscape urbanism” in a March-1997 conference to define the practices of designers, who had replaced landscape as the main mediating form of urban space. This thinking was utopian in its overthrow of the traditional hierarchical relationships of city spaces whereby landscape designs were prioritised over built form.¹⁰⁰ Victor Gruen, who was integral to the phenomenon of the megamall, in 1955 proposed the term “city-scape” in opposition to the notion of “landscape.”¹⁰¹ In this context, landscape was defined as “environment in which

¹⁰⁰ Shane, Grahame. 2006. "The Emergence of Landscape Urbanism." In *The Landscape Urbanism Reader*, edited by Charles Waldheim, 055-067. New York: Princeton Architectural Press, 059.

¹⁰¹ Corner cited in Waldheim, 2006, 025-026.

nature was predominant.”¹⁰² Therefore a clear distinction between the natural and landscape emerged whereby landscape became understood as an environment which had been altered as a result of human habitation.¹⁰³ Corner identifies four themes in order to demonstrate how contemporary landscape urbanism may be realised in the physical realm. These include: “processes over time, the staging of surfaces, the operational or working method, and the imaginary.”¹⁰⁴

Field diagrams or maps describing the play of those forces are particularly useful instruments in furthering an understanding of urban events and processes. For example, the geographer Walter Christaller’s diagrams of population distribution and city planner Ludwig Hilberseimer’s diagrams of regional settlement patterns each articulate flows and forces in relations to urban form.¹⁰⁵

Corner highlights that ecological metaphors are useful in trying to grasp the complexity of contemporary urbanism, and mappings are useful representations through which significant processes in the natural world may be relayed, which enables a complexity of ever-changing relationships to coexist in an environmental system. Linear systems in such cases are deemed obsolete in favour of cyclical and evolving systems responding to ever-changing environmental circumstances. As a legacy of Enlightenment landscape urbanism provides a means of conveying and organising taxonomies of data through series of mappings to then project the design solution based on the rationalised data. As is consistent with projective and contemporary design processes meanings and identity are sought through metaphors of natural landscapes, whilst maps provide the physical interpretation of these theoretical ideas. James Corner, in his essay “Terra Fluxus,” believes that the conceptualisation of landscape in today’s design schools permits a broader organisational framework, within which to study the complexity of issues which affect landscape while at the same time a similar framework may be adopted to

¹⁰² Waldheim, 2006, 026.

¹⁰³ Ibid., 028. Corner believes, “...the very complexity of the metabolism that drives the contemporary metropolis demands a conflation of professional and institutionalised distinctions into a new synthetic art, a spatio-material practice able to bridge scale and scope with critical insight and imaginative depth.”

¹⁰⁴ Ibid. The motivation for landscape urbanism, according to Waldheim, has been due to, “... [a]cross a range of disciplines, landscape has become a lens through which the contemporary city is represented and a medium through which it is constructed. These sentiments are evident in the emergent notion of “landscape urbanism”.”

¹⁰⁵ Ibid.

analyse the contemporary city.¹⁰⁶ The London Architectural Association is one such school which engages with different landscape urbanism strategies.

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Figure 136. Rosalea Monacella's "Catchment Network" AA 2003.
(Source: Mostafavi, Najle, 2003, 14.)

Ecological, cultural and design factors are addressed through a series of techniques involving large scale mapping processes in order to organise data for strategies from pre-design analysis through to the final design product (refer figure 135). Although these are not new ways of mapping, the drawings convey the complexity of information, and depth of considerations affecting the design problem. These systems may be seen as stemming from the notion of taxonomies and methods by which to order knowledge, and make sense of it, rationalise it, for the purpose of designing new environments. The design outcomes are also not clear in this particular scheme, as the experimentation and focus appears to be the process of mapping.¹⁰⁷ The aerial photograph of the existing site, mass produced and laid out without the joins between panels being evident, reiterates the representational language of Constant, in the

¹⁰⁶ Corner, James. 2006. "Terra Fluxus." In *The Landscape Urbanism Reader*, edited by Charles Waldheim, 023-033. New York: Princeton University Press, 023. Corner writes, "... [i]n particular, thematics of organisation, dynamic interaction, ecology, technique point to a looser, emergent urbanism, more akin to the real complexity of cities and offering an alternative to the rigid mechanisms of centralist planning."

¹⁰⁷ *Ibid.*, 025. Landscape urbanism may be considered a hybrid practice through which to contemplate the realms of landscape and the urban in order to realise design solutions. This gesture is not merely a token green realm within a brownfield site but rather an operational and deliberate strategy, which drives the urban environment to perform to its best capabilities.

superimposition of the new over the old. Rosalea's layering of coloured modelling clay in specific locations intends to reflect the intensity of programming in some areas of the site over others (figure 136). These mapped conceptualisations act as design tools and diagrams to inform the designer, for the next stage of design. Rosalea's innovative mode of representation is aesthetically interesting but it nonetheless does not seemingly affect the passive role of the map in the design outcome.

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Figure 137. Rosalea Monacella's "Coexistent Territories" AA 2003.
(Source: Mostafavi, Najle, 2003, 16.)

Landscape urbanism concepts and processes of implantation are entirely dependent on maps and mapping processes. The "field" of cartographical association has become a focus in the process of form-making in the architectural world, where the notion of surface has sought to combine landscape and the building together so rooves and walls become intertwined. For landscape architects and architects ideas around urban infrastructure suggests future sites for development. The sheer expanse of infrastructure unleashes many sites of potential, or as Corner puts it, "urban infrastructure sows the seeds of future possibility."¹⁰⁸ Grids related to propositions of infrastructure, as well as a means of rationalising space and information on a map,

¹⁰⁸ Corner, 2006, 031. See also Churchill, Robert R. 2004. Urban Cartography and the Mapping of Chicago. *The Geographical Review* 94 (1):1-22.

have an ability to frame objects and topographies within each of their fields, enable a collation of data within each frame of the grid. This process of using mappings and grids to simplify the complexity of information available when studying sites for design interventions also reflects the processes developed in the Enlightenment to reduce space, data, and details of the field study to a manageable, conceivable level and make sense of it all.

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1. **Figure 138.** (1) **Piazza-Metallica Duisburg-Nord.**
(Source: <http://www.upenn.edu/gazette/0505/0505arts01.html> viewed 23rd April 2012).
2. **Figure 139.** (2) **Nature comes back at Duisburg-Nord.**
(Source: <http://www.flickr.com/photos/patrickscholl/4960949832/sizes/m/in/photostream/> viewed 23rd April 2012)

Landscape urbanism relies on the ecological aspects of the natural elements in designs to react against Cartesian regularities and uniformities. The natural design components introduce a level of dynamism and freedom in that their growth patterns are not entirely known, and therefore cannot be mapped. Landscape, in projects such as Peter Latz's Duisburg Nord Steelworks Park in Germany, acts as a remedial installation to counter the ill-effects of the industrial age. It appears successful at integrating landscape ecologies into large scale infrastructure projects for the purposes of recreational and environmental regeneration. Mapping ecosystems, seasonal variations, populations of species, pedestrian patterns, infrastructure networks, programming of the site and so on when represented in mapped forms, contribute to decision making in their collation of data to a legible format, but remain as instruments rather than direct realisers or determinants of the design outcome.¹⁰⁹ Therefore the mapping processes, although graphically very sophisticated and working in three-dimensional formats do not necessarily stray from the dilemma of the modernist paradigm. This may be partially due to the scope of these projects which engage with large scale environmental and infrastructural systems, that have an

¹⁰⁹ See also Shane, 2006, 063.

engineering component to them and result in visually monumental schemes. Rafael Contreras' "Crackology" explores metaphors and ideas of flows in a non-linear fashion and non-uniform insertions into the everyday fabric of the city, in a variety of models and mappings (figure 139).¹¹⁰ His metaphorical basis is that of how water moves through spaces in a fluid and amorphous manner. Aerial photographs replace the topographical survey as the base of the design process, in their ability to capture the colours and natural attributes of the landscape. The diagramming below indicates how the water encroaches into the cracks of the natural landscape over time, and this symbiotic relationship is mirrored in Carreras' design.

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Figure 140. Rafael Contreras' "Crackology" project, 2010.
Based on the metaphor of water making its own way or mapping and trajectory within the landscape. (Source: Contreras, 2010, 24.)

¹¹⁰ Contreras, Rafael. 2010. "Crackology." *Kerb 18* (PlastiCity FantastiCity: International Design Competition):22-29, 22.

Urban morphologists require within human settlements interaction between activity and spatial patterns, Shane states that “[s]uch linkages, when repeated over time, form islands of local order structuring the larger patterns of global, ecological, and economic flows.”¹¹¹ The form making arising out of this type of approach seems to reflect the sinuous buildings on the site plan, indicating infrastructural and user flows of movement through space, as seen in the model below.¹¹²

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Figure 141. Rafael Contreras’ “Crackology” modelled project.
(Source: Contreras, 2010, 22-3).

James Corner notes that landscape via ecology and geography offers an opportunity to attempt new ways of embracing urbanisation as it is occurring around the world today, moving it away from its traditional passive role, formerly in movements such as the picturesque.¹¹³

¹¹¹ Shane., 063.

¹¹² See also Waldheim, Charles. 2010. "On Landscape, Ecology and Other Modifiers to Urbanism." *Topos: European Landscape Magazine* no. 71 (Landscape Urbanism):21-24, 21. Charles Waldheim states, "...landscape urbanism proposed a critical rereading of the environmental and social aspirations of modernist planning and its most successful models...it proposes a potential recuperation of at least one strand of modernist planning, the one in which landscape offered the medium of urban, economic and social order."

¹¹³ Corner, 2010, 26.

Sieve Mapping: Metaphors in Process

Richard Weller is a Perth based landscape architect and academic. His recent publication *Boomtown 2050* looks at future projections of growth for Perth and how these conditions may be catered for within the theoretical confines of landscape urbanism. Weller traces his regionalist approach back to Lewis Mumford, an urban historian of the 1920s, credited with connecting planning to bioregions. This was also the approach of Ian McHarg (1920-2001) in his book “Design with Nature,” which looked at a means of determining sites for development in planning methodology that could be universally applied.¹¹⁴

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1. **Figure 142. (1) Compilation of all layers of a McHargian landscape.**
Analysis of the Perth Metropolitan Area.
2. **Figure 143. (2) Landscape structure plan including habitat corridors.**
3. **Figure 144. (3) 118,000 hectares for suburban development.**
Deemed suitable due to the comprehensive McHargian analysis.
(Source: Weller, 2009, 167).

The landscape provided clues to the optimal conditions for development, which involved mapping the landscape, overlaying the data to obtaining one holistic map and thus defined conditions for certain kinds of development. This process was called “sieve mapping” whereby certain regions would be deleted from the development site possibilities based on inadequate or inappropriate conditions. These requirements would render large tracts of land unsatisfactory for development (see figures 141-

¹¹⁴ Weller, Richard. 2008. "Planning by Design: Landscape architectural scenarios for a rapidly growing city." *Journal of Landscape Architecture* no. Autumn 2008:6-17, 167.

143). The limitations of this method were the obvious complexities associated with contemporary development, which must account for amounts of data exceeding the parameters of McHarg's study.¹¹⁵

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Figure 145. Food City: Agricultural, industrial and residential landscapes.
This image is to reflect the integrated relationships proposed between agriculture, industry and landscape in Weller's concept for Perth 2050.
(Source: Weller, 2008, 10).

Weller's proposal for Perth 2050 identifies five different options, under the following thematics: Food City; POD City; Surf City, Sky City, River City.¹¹⁶ The thematic approach is intended to inspire a diversity of development and a variety of ways of thinking about food production, transport, and types and densities of housing. Within the genre of traditional landscape urbanism approaches, mappings convey data ranging from infrastructure extents to areas required for food production. These mappings are also accompanied by textual accounts explaining the assumptions and logic behind the statistics. Maps aid the method of design, in a way that "[t]he landscape thus forms the foundation from which the various urban-growth scenarios

¹¹⁵ Weller, 2008, 171.

¹¹⁶ Ibid., 11.

emerge.”¹¹⁷ As is evident in the figure 145, the fly-over computer-modelled projection, attempts to place these PODS in a geographical context to suggest a spatial and thus physical relationship between the sectors for development. However it may be argued that the scale and viewing angle of the proposal, presents spatial connotations of isolation and disconnection of each of the sectors, whereas the intent is the design should be a sustainable solution. These problems associated with thematic mappings have their origins in the Enlightenment and although, this mapping below has a more sophisticated graphic, the outcome highlights the inadequacies of this type of representation.

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Figure 146. Richard Weller’s Garden City PODS.
(Source: Weller, 2008, 11).

Cosgrove traces the origins of statistical mapping in Europe to the late eighteenth and early nineteenth centuries, which were graphically relayed through charts, graphs and maps.¹¹⁸ Thematic mappings also eventuated in this historical period with Alexander von Humboldt’s meteorological map, showing weather patterns rather than solely statistical information. Thematic maps were popularised around the mid-nineteenth century in their demonstration of medico-statistical information for social planning.¹¹⁹ The authority of these maps are based in their statistical foregrounding, however two

¹¹⁷ Weller, 2008, 165.

¹¹⁸ Cosgrove, Denis. 2010. *Geography and Vision: Seeing, Imagining and Representing the World*. London, New York: I. B Tauris, 162.

¹¹⁹ *Ibid.*, 163.

main areas of critique include the spatial propositions put forward by these projections, are often vague, as well as the modes of highlighting different areas through shading. Cosgrove suggests that shading in dark tones carries certain “moral connotations” of negative attributes of the space, for example highlighting areas of socio-economic decline or areas on the map where disease predominates.¹²⁰

7.3 Regionalism and Urban Identity

Postcolonial theorisations of urban space have engaged with the theme of regionalism and urban identity. From a theoretical perspective, critical regionalism featured in critical architectural and urban discourse around the 1990s, whilst tropical regionalism and other sub-categories of regionalism featured in architectural styles from the same period. Regionalism a theoretical concept, references historical and traditional materials, traditional archetypes, climatic factors and ways of seeing the world, to carry through some associations of socio-cultural context into the production of human settlement. In visual terms, the picturesque movement captured a particular way of representing a traditional context, which was later seen as highly contrived and orientalist in its romanticism of the native (see figure 146).

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Figure 147. A drawing by M. E. B. de la Touanne, published 1828. Produced from the voyage of Baron de Bougainville. This image, in the picturesque tradition, illustrates what were considered the quintessential features of the Southeast Asian landscape in the Philippines. published in Paris in 1828. (Source: Suarez, 1999, 22).

¹²⁰ Cosgrove, 2010, 164-5. See also Wright, John K. 1947. "Terra Incognita: the place of imagination in geography." *Annals of the Association of American Geographers* no. 37:1-15.

Regionalism has also suffered from criticism that it romanticises the past in seeking reasons for designing and representing a region, when those references no longer have the same meanings for contemporary space.

Contemporary forms of tropical regionalism use environmental metaphors for motivations to design and represent up-to-date interpretations of region, which resonated with practitioners and theorists concerned with the effects of globalisation on the distinctive qualities of urban environments. In seeking cultural identity within a context, this movement attempts to secure the concept of regionalism in its built environments in its utilisation of maps and architectural elements as material objects to relay a language and style constructed about a place (refer figure 147).

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Figure 148. Ken Yeang's vertical mapping in the project "Green skyscraper"
(Source: Powell, R. 1999).

Similar to picturesque graphic interpretations of particular contexts, drawings stemming from architects work with a regionalism agenda, create ambiguous connections with the settlement, environment and culture they are attempting to reference. If we observe the diagram below, despite the written rhetoric associated

with this sketch being proposed as a “theory of vertical urban design,” for implementation in the Southeast Asian region, the graphic reflects an architect’s drawing of a concept, and regional associations are not implicit.¹²¹

Ken Yeang sees the skyscraper as a “‘vertical city’ embracing the concept of ‘mapping the skyscraper,’” where these buildings are vertical interpretations of cities containing pedestrian routes, public realms of greened zones, civic areas, some floors should contain higher densities to others, and social space should also be created.¹²² Although valid design ideas, these buildings and their representations do not reflect solely Southeast Asian ideals, as environmental sustainability and ecological considerations of design have a global audience.

A constructed spatiality through the employment of elements seen as originating or pertaining to that region, addressing particular socio-climatic conditions implies an association with that context. However, these elements may be transferrable to other contexts of similar geographies and climates and just as easily become synonymous with that place. Regionalism also proposes a utopian notion, that there might exist some type of regional ideal form to suit both context and peoples of a certain place in the world. This search for meaning of the projective designer is based on a nominated space demarcated on a map and is problematic, yet symptomatic of societies which no longer identify with socio-cultural, spiritual, or religious connections to place. Even in pre-modernity aspects of complexity to everyday lives of peoples extended beyond environment and climate. A quest for meaning based on climatic and environmental factors dismisses the value of other everyday activities, which also contribute to a holistic picture of peoples’ lives.

¹²¹ Powell, Robert. 1999. *Rethinking the Skyscraper: The Complete Architecture of Ken Yeang*. London: Thames and Hudson, 159.

¹²² *Ibid.*, 156. See also Yeang, Ken. 1997. *The Skyscraper Bioclimatically Considered*. In *Lecture Series accompanied by an exhibition of T. R Hamzah and Yeang's Architecture*. New York Chapter: American Institute of Architects.

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Figure 149. Expo 2005 Nagoya Hyper-Tower, a series of zoning plans.

Ken Yeang's 'vertical city' proposal. (Source, Powell, 1999, 157). The plans above demonstrating zones of occupation and program fit within the modernist paradigm of spatial containment and order, which is typical of spatial representations of the time, yet again there is not an evident connection or any indicators graphically which associate this drawing with the Southeast Asian region. Powell suggests that if the intention of Yeang is to develop a new theory of urban design, "[e]mpirical studies of the behavioural activities and their concurrent behavioural milieu," would be of use to see how these spaces in the sky may be organized and might function.¹²³ The plans above seem to reflect the thematic style mappings of the Enlightenment rationalist thinking and therefore the limitations associated.

In his essay "The Concept of Regionalism," Alan Colquhoun questions the rationale behind the regionalist position in contemporary societies, when particular socio-cultural practices are not necessarily related or tied to a specific geographic region.¹²⁴ Colquhoun identifies the notion of regionalism as coming out of the separation between romanticism and rationalism traditions, prompting nativist and naturalist approaches of eighteenth and nineteenth centuries' revival in discourses contemplating built space.¹²⁵ Regionalism is based on almost a utopian notion of a regional ideal, both from a locational and social perspective.

¹²³ Powell, 1999, 159-60.

¹²⁴ Colquhoun, Alan. 1997. "The Concept of Regionalism." In *Postcolonial Space(S)*, edited by Gulsum Baydar Nalbantoglu and Chong Thai Wong, 13-24. New York: Princeton Architectural Press, 13.

¹²⁵ *Ibid.*, 14. Postcolonial spatiality discourse of the late 1990s, stems from the colossal oppositions set up in the eighteenth century between "East/West, traditional/modern, natural/cultural, structural/ornamental." This discourse, according to editors of the book *Postcolonial Space(s)*, Gulsum Baydar Nalbantoglu and Chong Thai Wong, has been given a contemporary voice in regionalist arguments of the present day. Gülsüm Baydar Nalbantoğlu and Chong Thai Wong, 1997, 8. Regionalism is defined in

According to this model, all societies contain a core, or essence, that must be discovered and preserved. One aspect of this essence lies in local geography, climate, and customs, involving the use and transformation of local, “natural” materials.¹²⁶

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Figure 150. Ken Yeang’s BATC Signature Tower.
The section highlights the reference to “green mappings” with the photomontage representation of trees stationed in the vertical city. (Source: Powell, 1999, 160).

Concepts of regionalism and what is understood as a region are central to what is established on a map. The motivations around this utopian model date back to the eighteenth century when all the attributes of indigenous and local societies were perceived as threatened. In relation to architecture or built form, the connection to natural or raw materials was important, if a regional quality to the buildings were to be achieved. However, this connection is more of a “desire” as Colquhoun puts it,

Colquhoun’s essay as “...a search for an authentic cultural and architectural essence....formulated ‘precisely at the moment when the phenomena that it described seemed to be threatened and about to disappear.’” An argument of authenticity is controversial as it forces a reductive view of whatever is supposed to be authentic, given that representations of authentic things result from later analyses.

¹²⁶ Colquhoun, 1997, 14. Theories of the late nineteenth century relating to the rationalisation of social life under industrial capitalism are linked to concepts of regionalism in that there was a general disenchantment due to the effects of “iron age” of capitalism, from Max Weber’s analysis.

rather than any particular attempt at authenticity.¹²⁷ The result, however, in seeking a mandate of authenticity, the regionalist doctrine in effect invokes an oversimplification of what is a very complex cultural form of production.

Colquhoun believes that compared with traditional cultures modernity permits a level of standardisation not possible in traditional practices of production. By contrast the dissemination process is infinitely more variable in the number of different forms of communications on offer in the contemporary environment, compared to traditional scenarios. These transitions in forms of production with the resultant multivalent nature of coding available in the modern world have undermined what was previously a much more rigid process which linked traditional practices to a region.¹²⁸

The concept of regionality depends on it being possible to correlate cultural codes with geographic regions. It is based on traditional systems of communication in which climate, geography, craft traditions, and religions are absolutely determining. These determinants are rapidly disappearing and in large parts of the world no longer exist. That being the case, how is 'value' established?¹²⁹

Mapping in pre-modernity represented, and was closely associated with, a physical and often ephemeral context, as were other modes of cultural production. In an increasingly globalised world, the notion of regionalism as an explicit form of expression in maps and architecture, over-simplifies spaces of modernity. For the case of mapping, maps are not tied stylistically, technologically, or socio-culturally to their place of production. Their physical production follows cartographical standards and codes where the point of difference is in interpretation or knowledge-base of the viewer. It is then, that the map-reader who evokes the subtleties of meaning of the

¹²⁷ Colquhoun, 1997, 22.

¹²⁸ Ibid., 22.

¹²⁹ Colquhoun, 22. See also Kusno, 2000. Abidin Kusno writes, "[t]he shaping of the built environment is also a writing of the history of a nation." Kusno, as is the case for other postcolonial studies' authors, focuses on the colonised and their agency to resist being dominated by the colonisers, and their role in shaping their urban environments. Other authors such as Brenda Yeoh's (1996) scholarly inquiry into the shaping of modern Singapore, reveals the strength and abilities of the colonised to substantially impact and affect the evolution of their urban spaces. The city of Singapore unfolds as a result of activities between both British and Chinese inhabitants. The value of these understandings may be seen through processes of mappings in that once the colonisers reached the shores of Southeast Asia, typically representations of space were largely influenced or commissioned under colonial instruction. Kusno states "...the ways in which 'old' colonial imaginings – found to be useful in the memories of 'modern' postcolonial governing elite – continue to surface and to structure the politics of time and space in the later postcolonial regime." Kusno, 2000, 19. Kusno believes the shaping and values of contemporary architectural and urban space are focused on socio-political motivations rather than socio-cultural concerns

mapped projection and through their socio-cultural or socio-political position. Literal regionalism references have also lost their meaning in a global environment. Henri Lefebvre argues that the knowledge base required to decode the infinite number of codes and meanings associated with social spaces of modernity is an unknown entity.¹³⁰ Lefebvre states, “[w]e are confronted not by one social space but by many indeed, by an unlimited multiplicity or unaccountable set of social spaces.”¹³¹ However this aspect of mapping often is overlooked as maps in their craftsmanship and presentation are often very persuasive, and unlike in writing, it is not possible for the map-maker to express their limitations. Therefore maps have a tendency to be viewed as “naïve representations of reality,” but rather map knowledge is culturally reproduced so mapping codes and skills have to be learned so that we recognise the reality with which we are being represented in maps.¹³²

In essence, maps represent a view of the world, constructed by the map-maker and these selective interests are further revealed and built upon through the process of design.¹³³ Ecological urbanism adopts a variety of map-making principles to serve its interests in shifting the focus of urban systems to ecological systems as the way forward to realise a sustainable urban future.

7.4 Ecology, Environment, and the City

Themes linking built form with ecology, flagged in the book *Ecological Urbanism*, deliver a series of different approaches to contemporary design reviving the imaginative qualities and complexities of mapping. The predominant modes of mapping concur with methods outlined above, using statistics and metaphor to arrive at design proposals. According to Mohsen Mostafavi, the author, the intent is to offer “a framework that through the conjoining of ecology and urbanism can provide the knowledge, methods and clues of what the urban can be in the years to come.”¹³⁴ Therefore Mostafavi envisages an urbanism where there are opportunities for the coexistence of ecology and urban rather than their current positioning in opposition to

¹³⁰ Lefebvre, Henri. 1991. *The Production of Space*. Oxford, UK.: Blackwell, 85.

¹³¹ Ibid.

¹³² Pickles, John. 2004. *A history of spaces: Cartographic reason, mapping and the geo-coded world*. London: Routledge., 35 and 61.

¹³³ Wood, Denis. 1992. *The Power of Maps*. New York: Guilford Press, 183.

¹³⁴ Ibid., 32.

one another. Due to our contemporary challenges of rapid urbanisation as well as declining natural resources, a reconsideration of design on a large scale is required.¹³⁵ Mostafavi is thus proposing design collaborations globally to address environmental and urban problems which are unprecedented. The task consists of confronting a complex array of considerations ranging from ecological, economical, social, political and cultural all of which affect local and global communities.

Drawing influence from a 1980s philosophy written by Félix Guattari in “The Three Ecologies,” Mostafavi references Guattari’s idea of “ecosophy.” This concept demonstrates the holistic relations between environment, social relations and human subjectivity.¹³⁶ Pressing for revolution of a global scale from social and cultural perspectives, Guattari’s key aim was to redefine methods of “the production of material and immaterial assets.”¹³⁷ Guattari recognises the importance of both individual and group actions to realise his aims of revolution and ultimately change the production of urban life.¹³⁸ Mostafavi also promotes radical change in human activity and patterns of living for the reorganisation and rethinking a sustainable existence. The magnitude of the global environmental predicament and the need to act, Mostafavi believes, requires a revision of urban design methodologies entrenched in master planning processes. As the projects of ecological urbanism address large scale problems, this exposes the limitations of traditional planning and urban design tools of production. Cosgrove states that,

Urban space and cartographic space and remain inseparable. As each is transformed the relationship between them alters, and current visual technologies mean that the opportunity for creativity in shaping and recording urban experience is greater than ever, as too is the need for making and meaning of both public and private urban spaces.¹³⁹

¹³⁵ Mostafavi, Mohsen. 2010. "Why Ecological Urbanism? Why Now?" *Topos: European Landscape Magazine* no. 71 (Landscape Urbanism):30-35, 31.

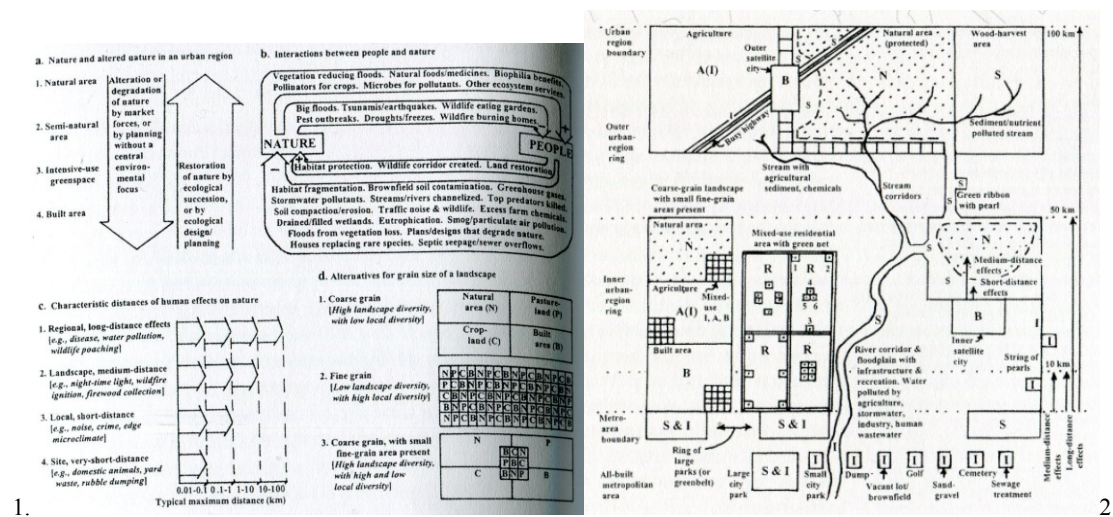
¹³⁶ *Ibid.*, 34.

¹³⁷ Guattari, 2010, 35.

¹³⁸ Mostafavi, 2010, 35. Mostafavi states, “Extending Guattari’s suggestions that the ‘ecosophic problematic’ has the capacity to define a new form of human existence, we might consider the impact of the ecological paradigm not only on ourselves and our social actions in relation to the environment, but also on the very methods of thinking that we apply to the development of disciplines that provide the frameworks for shaping those environments.”

¹³⁹ Cosgrove, 2010, 182.

The reality of the ecological urbanism projects as presented in Mostafavi's book, although harnessing the visual technologies to which Cosgrove refers, the majority of the projects utilise diagramming as well as innovative presentations of textual reports in representing their design ideas and methods. One such analysis is Richard Forman's book chapter and method identified as "spatial principles for nature in urban regions."¹⁴⁰ The diagrams indicated (figures 150 & 151) reference taxonomies of the Enlightenment, and serve as principles through which to realise the concept of urban ecology for Forman. Based on four main categories from natural to built form, they propose ecological alteration based on the actions of humans decreasing "natural vertical structure, horizontal pattern, and/or flows and movements."¹⁴¹ According to Forman, areas of degradation can be improved by ecological planning, limiting suburban sprawl which seems to involve a mix of fine grain and coarse grain landscape interventions.¹⁴²



Forman's mappings are examples (interpreted using current computer graphics in figure 153), which form part of his focus on a combination approach to urban

¹⁴⁰ Forman, Richard, T. T. 2009. "Urban Ecology and the Arrangement of Nature in Urban Regions." In *Ecological Urbanism* edited by Mohsen Mostafavi and Gareth Doherty, 312-323. Harvard University Graduate School of Design, USA: Lars Muller Publishers, 313.

¹⁴¹ Ibid., 314. See also Newman, Peter, and Isabella Jennings. 2008. *Cities as sustainable ecosystems*. USA: Island Press

¹⁴² Ibid., 316. See also Koolhaas, Rem. 2010. "Advancement versus Apocalypse." In *Ecological Urbanism*, edited by Mohsen Mostafavi and Gareth Doherty, 56-71. Baden, Switzerland: Lars Muller Publishers & the President and Fellows of Harvard College, 58.

planning and ecological science, where in an evaluation of thirty eight regions around the world, with the main purpose being to establish natural systems patterns in contact with human settlements.¹⁴³

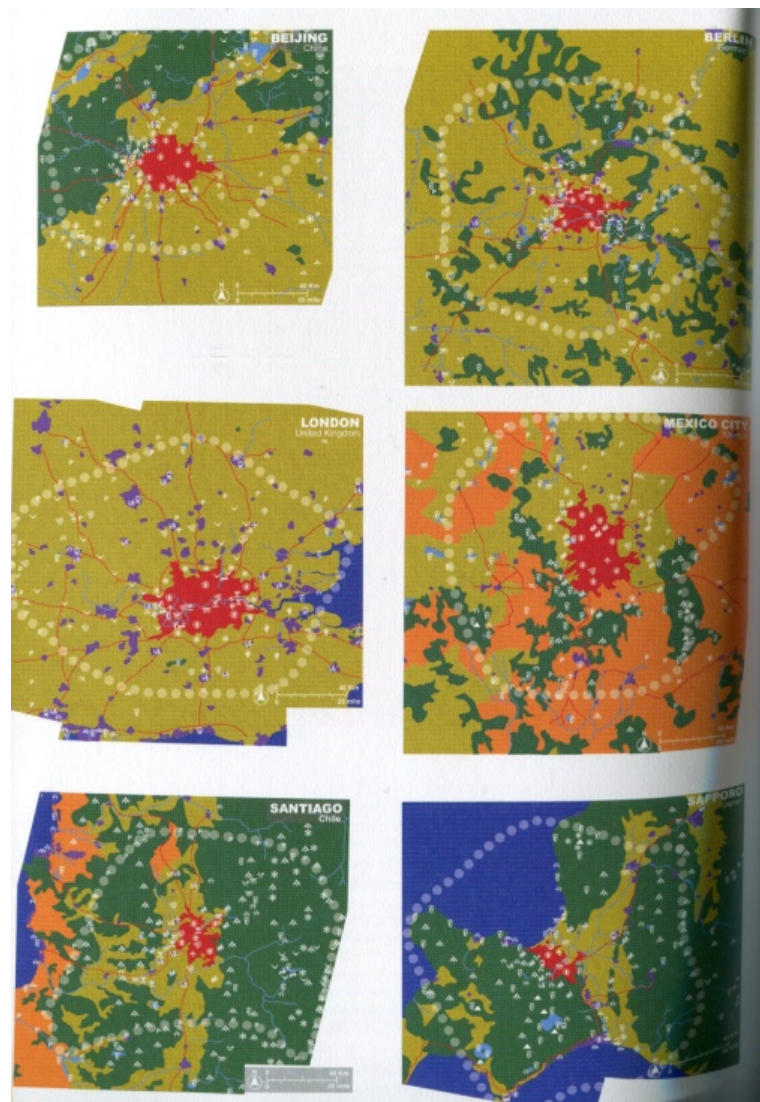


Figure 153. Forman's principles of urban ecology. "Determining the boundaries of regions allows us to see the primary zones of flows, movements and interdependencies between city and surroundings." (Source: Forman, 2009, 318.)

These modes of representation and research do not indicate always physical proposals, but reflect conceptual urban design frameworks, although demonstrating complex sets of relations, have not really strayed aesthetically and functionally from the modernist utopian model.

¹⁴³ Forman, 2009, 318. See also McDonough, William, and Braungart Michael. 2002. *Cradle to Cradle – Remaking the way we make things* USA: North Point Press.

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Figure 154. OMA's North Sea Project.

"Zeekracht consists of a ring of cables between several windmill parks that will create a network between seven 'North Sea countries'. The architects think Europe can be 'reasonable independent' from oil and gas energy in 2050, thanks to wind and solar energy." (Source: <http://www.ecoficial.com/rem-koolhaas-of-oma-unveiled-masterplan-zeekracht-82/> viewed 24th April 2012)

Koolhaas believes the future of ecological urbanism lies in the innovation of large scale engineering projects which embrace renewable energy sources to bring about a change in the way we construct our urban landscapes. OMA's North Sea Project is an example of the attempt by countries bordering the North Sea, such as Norway, Sweden, Denmark, Holland, Belgium, and England to form an amalgamation of political force to harness wind energy from the North Sea for power generation to these countries.

The initiative is also intended to utilise other energy sources, such as solar, tidal as well as wind to form a European energy grid.¹⁴⁴ This project has a different spatiality to conventional or traditional infrastructure projects. The drawing (figure 153) highlights components of the project which will be utilised to produce energy, but which will also change over time given they are dynamic elements of the ecological environment, that is wind, tidal performance, and solar aspects. The North Sea Project bridges countries and their planning systems to bring about a far greater level of coordination to benefit the participatory countries. This may be considered a holistic initiative of achieving collaborations between countries for the production of energy.

¹⁴⁴ Koolhaas, 2010, 70-71. See also Kunstler, J. Howard. 2005. *The long emergency*. Canada: Atlantic Monthly Press; Beyer, E, A Hagemann, and T Rieniets. 2006. *Atlas of Shrinking Cities*. : Hatje Cantz Publishers.

It is an approach which may be instrumental in driving future thinking about the formation of settlements based on a global scenario, and on motivations for modifying and regulating consumption of energy, which in turn would affect conceptions of human environments.

Concluding Remarks

The different approaches discussed in this chapter operate within the rationalist frame of the modernist paradigm. This frame persists as a legacy of the Enlightenment, and although it has permitted, in post-modernity, innovative thinking and conceptualising of urban environments, mappings have not responded to the active potentials flagged by geographical theorists, such as Corner and Cosgrove. Other than design drawings, the map's role in the realization of spaces of landscape urbanism, regionalism, and ecological urbanism remains a passive tool. Situationist philosophy perhaps is the one exception, which enacted mapping via the practice of psychogeography, yet these actions did not result in the creation of built form or new space. However, Cosgrove continues to have faith that the visual and creative technologies available to contemporary designers today will aid a shift in mapping practice, and move it beyond notions of metaphors and utopias. Virtual computer tools will realize new methods of activation in mapping and potential for altering what we have come to associate as the reductionist map.¹⁴⁵

¹⁴⁵ Cosgrove, 2010, 182.

CONCLUSION

As an urban designer I have presented a study on the story of mapping based on a search to discover the modern map's origins, to further understand its limitations as well as its possibilities for urban design practices in Southeast Asian and Western societies. This story has uncovered three main modes of mapping which include the following: the imaginative and non-rational modes of pre-modernity; the rational, literal, and reductive modes of early modernity and the Enlightenment; and the return of the imaginative in post-modernity in an attempt to redeem some of the lost qualities in processes of modernisation. These three forms of mappings demonstrated particular projections; pre-modern maps were characterised by their non-orthographic and non-perspectival but illustrative nature; Enlightenment ideas were expressed in the reductive forms of the exact science, expressed in the utopia, the survey, and the master plan; whilst post-modern practices discussed have revisited projections of early modernity to introduce statistical, thematic, and layering techniques to these earlier forms to recapture the imaginative potentials of mapping.

Maps of pre-modern times' key imaginative qualities were in their adoption of subjects and the projection of ideas about places from the mythical to the sacred perspectives. For Southeast Asian pre-modern peoples, from what we know, mappings appear to have served purposes for socio-cultural and religious instruction on earthly and non-earthly relations, as well as embracing mythical ideas. Concepts of this scope were largely tied to retrospective representations of settlement or inscriptions on major temples and sites of worship. Thus pre-modern mappings do not appear, from the evidence available to us, to have informed the process of settlement creation in a highly preconceived and projective way in the Southeast Asian region. From the evidence depicted in the primary sources, representations of built form extended to retrospective maps of religious temples and shrines as well as military maps of settlements produced for purposes of conquering neighbouring territories.

By contrast, the early modernist period and the European Enlightenment signified a period of transitional mapping practices, from declining preoccupations with spiritual and mythical space to quests for a precise geography. Geography was the core science

which changed understandings of the earth and how we describe these understanding in modern maps. Requirements for an increasingly accurate map of the world corresponded with the Second Great Age of Exploration. Geographical knowledge of the new world was refined by first- hand account and with objectives of securing and demarcating territories for empire expansion. Therefore, the survey emerged as a critical instrument for negotiating issues of land ownership, as well as the information pertaining to topographical territory characteristics, also a means by which to chart natural resources and commodities of the region. The other two forms of mapping also related to colonial expansion were utopian representations and the master plan. Based on Françoise Choay's work, we learned that conceptualising urban space in writing originated as part of Western discourse on human settlement. Out of this genre of writings emerged the notion of utopia, whereby sets of rules and principles, foregrounded in critical understanding of urban environments, could all be rationalised to a theoretical frame for building. The master plan contributed to the representation of the model space in its further reduction of utopian ideals into a two-dimensional drawing.

These three legacies of Enlightenment geography: the survey; utopian model, and master plan led to the re-mapping of territories in colonial Southeast Asia. A shift in mapping practices occurred whereby retrospective approaches encompassing imaginational spatialities of the sacred and profane were disregarded. Projective techniques utilising the survey, utopian model, and master plan were prioritised, and a universality of the mode of production of human environments followed. The Industrial Revolution and the Machine Age advanced the perceived authority of rationalisation. As rationalisation in the factory related to efficiencies of time and costs, while maximising mass production, this thinking motivated the modern movement's embrace of rational forms of planning.

A reaction to modernism, although still within the legacy of a rational framework, seen in post-modern practices has tried to reconnect with the imaginational aspects of mapping practices. From the Situationists in Europe to Tropical Regionalism in Southeast Asia, these movements have strived to reject modernist paradigms and re-imagine new urbanisms. Statistical and metaphorical methods of landscape and ecological urbanism movements have also attempted to create more responsive and

engaging human environments. However, ultimately the map's role has remained passive in the mode of production of settlement.

Along this journey of enquiry I have reconnected with lost meanings and functions of mapping to reconcile the loss of identity and quality in some urban designed spaces of post-modernity. The future possibilities of mapping seem to be in not how they look but what they do and how they function. To borrow the words of David Harvey, opportunities for the role of mapping in the design of urban environments may be in the shifting of maps from being passive tools to being active interfaces, and thus focussing on a “utopia of process” over a “utopia of form.”¹ Ecological urbanism prioritises mapping process, and goes some way to highlighting the significance of interrelated systems in a sustainable world. This movement invites further research in that it appears to also facilitate formal qualities of design in responding to the changing nature and needs of people, plants, and animals, all of which are essential to the production of fast-paced urban environments.

¹ Harvey, David. 2000. *Spaces of Hope*. Edinburgh: Edinburgh University Press.

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