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Analysis of the Landscape Architectonic Composition

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Proefschrift

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Contents (concise)

Abstract

Besides the efforts that are of a descriptive and celebrative nature, studies related to Sri Lanka's historical built heritage largely view material remains in historical, sociological, socio-historical and semiological perspectives. There is hardly any serious attempt to view such material remains from a technical-analytical approach to understand the compositional aspects of their design. The 5th century AC royal complex at Sigiriya is no exception in this regard. The enormous wealth of information and the material remains unearthed during more than 100 years of field-based research by several generations of archaeologists provide an ideal opportunity for such analysis. The present study aims, therefore, to fill the gap in research related to Sri Lanka's historical built heritage in general, and to Sigiriya in particular. Therefore, the present research attempts to read Sigiriya as a landscape architectonic design to expose its architectonic composition and design instruments. The study, which is approached from a technical-analytical point of view, follows a methodological framework that was developed at the Landscape Design Department of the Faculty of Architecture at the Delft University of Technology. The study reveals that the architectonic design of Sigiriya constitutes multiple design layers and multiple layers of significance with material-spatial-metaphorical-functional coherence, and that it has both general and unique landscape architectonic elements, aspects, characteristics and qualities. The richness of its composition also enables the identification of the landscape architectural value of Sigiriya, which will help reshape policies related to conservation and presentation of Sigiriya as a heritage site, as well as to its protection and management as a green monument. The positive results of the study also underline that the methodology adopted in this research provides a framework for the study of other examples of historical gardens and landscapes in Sri Lanka, which will eventually provide insight into the typological aspects of a possible Sri Lankan tradition of landscape design.

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The present research is the outcome of work carried out in the field, archives and the drawing studio; the analysis of such material was carried out in 1995, 1996, 1999 and 2003 in Delft. It was the late Prof. dr. ir. Frits van Voorden, Chair, Architectural and Urban Conservation of the Faculty of Architecture of the Delft University of Technology, the Netherlands (TUD), who supervised and guided my research before his untimely demise. In him I found a great mentor who made me look at historical built heritage differently from the conventional art-historical perspective. Prof. dr. ir. Clemens Steenbergen, Chair, Landscape Architecture of the same faculty, who was the co-supervisor during the initial stages of my research, agreed to be my supervisor after the demise of Prof. van Voorden. I am most privileged to be associated with and guided by Prof. Steenbergen, who is one of Europe's innovative researchers on landscape design, and whose research work on West European gardens and landscapes was a great source of inspiration for me. Prof. Steenbergen devoted much of his valuable time to discussing my study, reading the text and drawings meticulously and giving critical remarks to improve the quality of this research work. When Prof. Steenbergen in 2011 retired as Chair, he requested Prof. dr. Erik de Jong, with his great expertise in the history of landscape architecture, also to be a supervisor of this project. He devoted much time to going through the text of my study and gave his specific input to improve its quality. It has been an enviable pleasure to carry out this research under their expert guidance, and I respectfully record my deepest gratitude to these three teachers.

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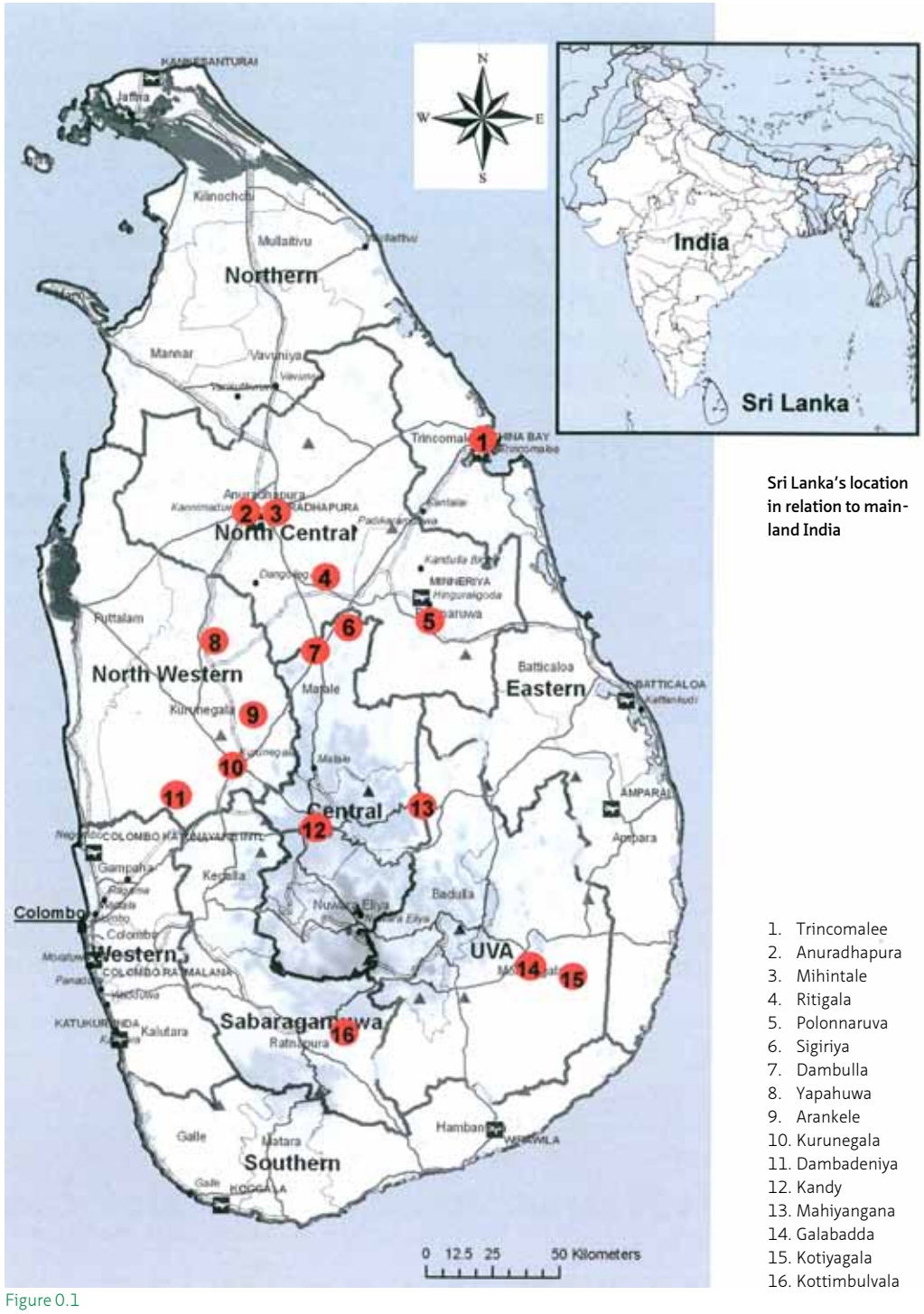
Nilan Cooray
Colombo, September 2012

To the late Prof. dr. ir. Frits van Voorden
Former Chair, Architectural and Urban Conservation,
Delft University of Technology, the Netherlands

Contents (extensive)



Sri Lanka's location in relation to mainland India

1. Trincomalee
2. Anuradhapura
3. Mihintale
4. Ritigala
5. Polonnaruva
6. Sigiriya
7. Dambulla
8. Yapahuwa
9. Arankele
10. Kurunegala
11. Dambadeniya
12. Kandy
13. Mahiyangana
14. Galabadda
15. Kotiyagala
16. Kottimbulvala

Figure 0.1
Map of Sri Lanka showing sites referred to in the text

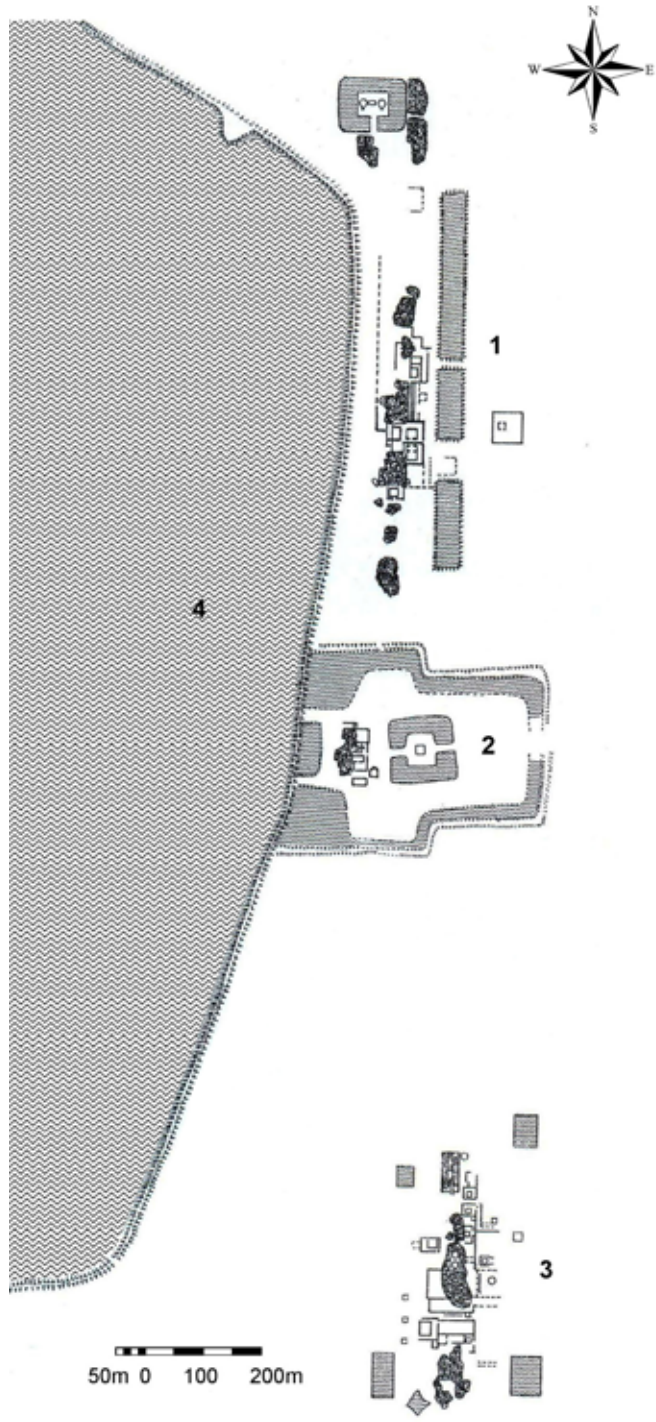
1 Introduction

§ 1.1 Sri Lanka's Historical Built Landscapes: General Overview

Historical references in literary sources indicate that Sri Lanka's earliest built landscapes were the royal parks and woods that existed in the ancient royal center of Anuradhapura during the pre-Buddhist period (before the 3rd century BC), which were later offered to Buddhist monks by transforming them to monastic use. Therefore, the pre-Buddhist Mahameghavana and Nandana (later Jotivana) gardens at Anuradhapura could be regarded as such woods and parks of royalty.[1] As per the commentaries of the chronicle Mahavamsa (chapters XI:2-3, XV:1-3, 7-9) these woods and parks would have consisted of thick foliaged fruit and flowering trees, aromatic plants and streams providing shade and coolness. The chronicle Culavamsa (chapter LXXIX:2-3, 4-5) mentions that the park called Nandana at Polonnaruva (12th century AC) was adorned with hundreds of fruits and blossoms, and indicates that the park called Lakkhuyyana, also at Polonnaruva, was planted with thousands of trees of every variety. The offering of a royal lodge within Mahameghavana at Anuradhapura to Arahant Mahinda, who led Buddhist missionary activities to Sri Lanka from India, for his night stay indicates that built structures were also elements of the landscape design of such parks and woods (Mahavamsa, chapter XV:11-13). An inscription of Nissankamalla (1187-1196) found at the pavilion named Priti-dana-mandapa at Polonnaruva, where the king distributed alms for the poor and forbade the picking of fruits from the surrounding orchards, indicates that this pavilion was also a built structure of a park (Prematilleke and Karunaratne, 1993:111). The references in the Mahavamsa (chapter XIV:1-10) to the meeting of King Devanampiya Tissa and Arahant Mahinda at Mihintale, 13 kilometers east of Anuradhapura, during a hunting expedition of the king also indirectly indicate that hunting parks were not unusual, at least during Sri Lanka's pre-Buddhist era.[2]

1 The chronicle Mahavamsa (chapter I:21-23) also mentions a garden called Mahanaga that existed during the 5th century BC at Mahiyangana in central Sri Lanka as a customary meeting place of Yakkhas, one of the early inhabitants of the island. For more information on gardens referred to in ancient literary sources, see Dissanayake (2003:5-62).

2 Geiger (1960:62) mentions that hunting was a sport to which the king and noblemen were devoted. Adithya (1981:9), referring to the Mahavamsa, points out that hunting was an accepted sport, despite Buddhism being the state religion, and killing was resorted to by royalty.



1. Ranmasu Uyana
2. Isurumuniya
3. Vessagiriya
4. Tisavava Reservoir

Figure 1.1
Location of royal and monastic landscapes in relation to Tisavava reservoir at Anuradhapura (courtesy: Bandaranayaka 1993a)

The most interesting built landscapes, however, were the pleasure gardens *(magul uyan)* for the sensual enjoyment of royalty that continued over the centuries with a possible pre-Buddhist origin.[3] As seen at Ranmasu Uyana[4] (7th or 8th century AC[5]), located below the earthen bund of Tisavava, a gigantic man-made reservoir at Anuradhapura (figures 1.1, 1.2), and at Dip Uyana (literally: Promontory Park, 12th century AC), located between the citadel and Parakramasamudra (figure 1.3), the great man-made reservoir at Polonnaruva, the pleasure gardens were elaborated with moated island pavilions and summer palaces, ornamental baths and swimming pools, artificial waterfalls and cascades.[6] Ranmasu Uyana also showcases that natural boulders were used as caves and to build garden structures upon them.[7] However, the most famous garden is at Sigiriya (5th century AC), which is the subject of this study. The provincial royal complex at Galabadda (11th century AC) in southern Sri Lanka, which is still largely uninvestigated, also falls into this category. The royal precinct of Kandy (19th century AC), the last royal capital of Sri Lanka, with the vast sheet of water of the man-made lake in the foreground and the green-forested mountain in the background, was designed to give an impression of an abode, floating in the sky[8] (figure 5.60).

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3 Studies on Sinhala literature also indicate that water sports and water gardens were important aspects of Sri Lankan courtly life (Gooneratne, 1983).

4 See ASCAR (1940-1945:18-22) and Paranavitana (1944:193-209) for detailed accounts of Ranmasu Uyana.

5 Van Lohuizen (1979:340) assigns the date of the rock-cut reliefs of elephants on either side of a royal bath house at Ranmasu Uyana to the late 7th or early 8th century AC. However, Dissanayake (2003:55) argues that the garden was established during the period from 3rd to 1st century BC.

6 The Culavamsa (chapter LXXIII:98-100) gives a vivid description of the different varieties of trees and structures within the pleasure gardens at Polonnaruva. For a detail description of the variety of trees grown within the historical built landscapes and their use, see Dissanayake (2003:224-230). Also see Ashton, et al. (1997:391-399) for the use of trees in Sri Lanka's history, and De Silva, N. (1998) for indigenous trees associated in the traditional landscapes of Sri Lanka.

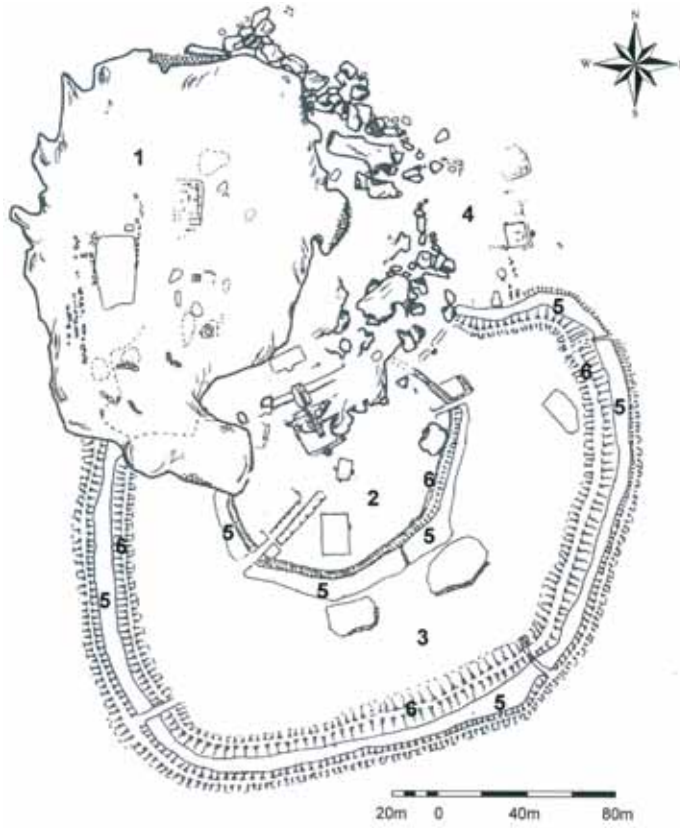
7 Upavana Vinodaya (1964:21) prescribes creating artificial caves and arches within the gardens by means of vegetation, and this indicates that caves are important features of the built landscape.

8 According to tradition, King Sri Vickramarajasingha (1798-1815) commissioned the royal architect Devendra Mulacariya to transform the city of Kandy into a celestial city. After seven days, the royal architect explained the design concept to the king thus: "Your Majesty, I imagine that the thick green Udawattakele (the forested mountain) behind the palace building is Neela Megha, the blue clouds of the sky; and that in front of the palace building, it is possible to create cloud-walls in white. Then by transforming the paddy fields into a lake, one will see the reflection of cloud-walls and the palace buildings in water, and no doubt, it will appear like a city floating in the sky" (cited by De Silva, N. 1993:159).

Figure 1.2
Ranmasu Uyana at Anuradhapura

Figure 1.3
Dip Uyana at Polonnaruva (photo: Roelof Munneke)

Such architectural elements as walakulu bemma (the cloud drift parapet wall, as depicted in temple paintings) running at the level of the base of the palace buildings, and diyareli bemma (the wave swell parapet wall) over the lake, also heighten the above impression and reinforce the dynamic composition of the scheme.[9] Although not yet investigated from a landscape design point of view, the rock-associated royal capitals of Yapahuwa (13th century AC), Dambadeniya (13th century AC) and possibly Kurunegala (14th century AC) could also be significant built landscapes (figure 1.4).



1. Rock
2. Inner City
3. Outer City
4. Monastic Precinct
5. Moat
6. Rampart

Figure 1.4
Layout, rock associated royal capital at Yapahuwa

9 For further detail on walakulu bemma and diyareli bemma, see Seneviratne (1983:86) and Duncan (1990:101-107).

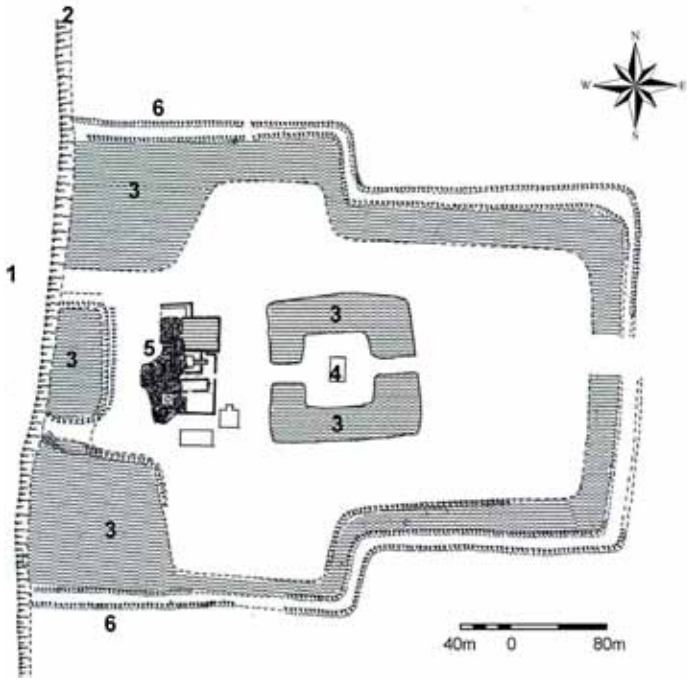
The cave/rock-associated Buddhist monastic sites, which were meant to concentrate on the religious ideals of the monks, were the earliest monastic landscapes[10] of the island, dating from the 3rd century BC. As seen at Mihintale, Dambulla and numerous such sites (almost all dating from the 3rd or 2nd century BC), natural and/or partly excavated cave shelters on rocky mountain peaks or slopes were utilized with minimum disturbance to the natural setting. Sigiriya (3rd/2nd century BC) and modern Vessagiriya (ancient Issaramana, 3rd century BC, figures 1.1, 1.5) at Anuradhapura were also cave-associated monastic landscapes, before they were altered in the latter half of the 5th century AC.[11]

Figure 1.5
Vessagiriya at Anuradhapura

10 For more description of Sri Lankan monastic landscapes, see De Silva, N. (2009).

11 Kasyapa (477-495) absorbed the monastic landscape of Sigiriya into his royal garden, while that of Vessagiriya was relaid as a 'pancavasa' type of monastery and renamed after his two daughters and himself as 'Bo-Upulvan-Kasub-giri vehera'. For further detail, see Silva (1988:222, 228-229).

The modern Isurumuniya at Anuradhapura, between Ranmasu Uyana and Vessagiriya, provides a different example, with moats and island structures arranged in an axial layout with the backdrop of a towering rock mass[12] (figures 1.1, 1.6, 1.7). As seen at Puliyankulama at Anuradhapura (10th century AC) and numerous other sites in the island, the Pancavasa Monasteries presents a highly formal layout with a series of concentric squares of monks' cells, so ordered as to circumscribe an elevated, central ritual quadrangle. These monasteries are usually enclosed by a moat with axial avenues oriented to the cardinal directions leading up to the central quadrangle[13] (figure 1.8).



1. Tisavava Reservoir
2. Earthen Bund
3. Moat/Pond
4. Island Structure (?)
5. Rock
6. Earthen Embankment

Figure 1.6
Layout, Isurumuniya at Anuradhapura (courtesy: Bandaranayake 1993a)

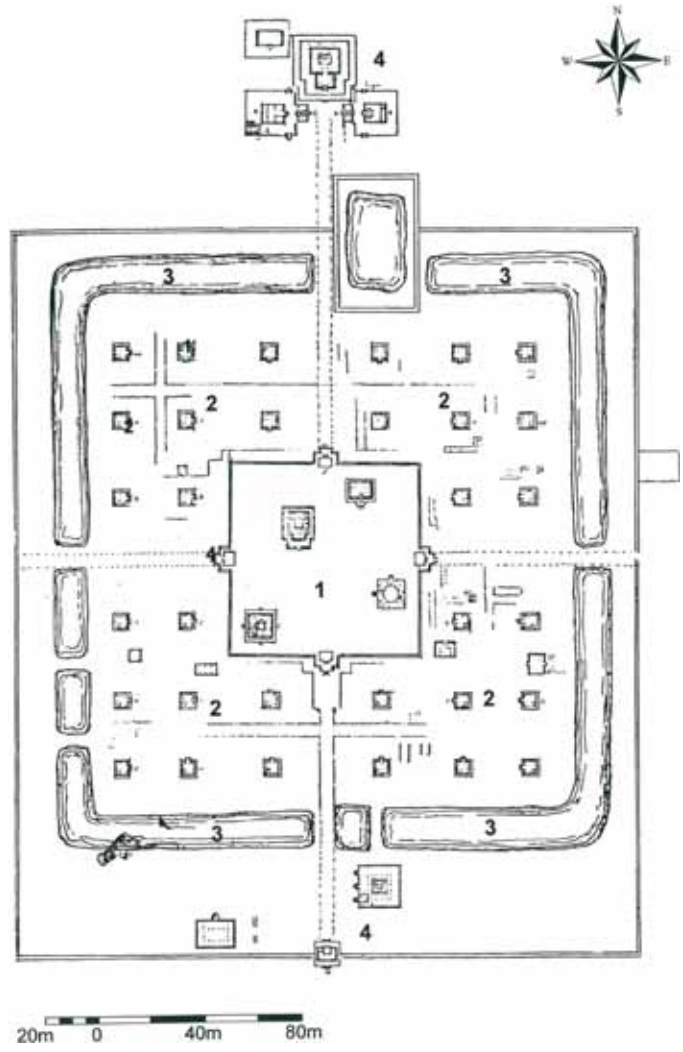
12 Due to the secular sculpture found at the site and to its location in relation to Ranmasu Uyana, the very existence of Isurumuniya as a monastic establishment is questionable. Bandaranayake (1993a:32) suggests that together with Ranmasu Uyana, they were likely to have come under royal and monastic use collectively or separately at various stages of history. However, van Lohuizen (1979:340) attributes the secular rock-reliefs at Isurumuniya to the same period as those at Ranmasu Uyana (late 7th or early 8th century AC). Judging by the decorations at the entrance to the rock-cut shrine, Paranavitana (1953:173), on the other hand, suggests that the site was a Buddhist center from about the 10th century AC, or later.

13 See Silva (1995:215-273) for the planning system of the Pancavasa Monasteries.

The forest monasteries of Ritigala (9th century AC) and Arankele (9th-10th century AC), with well-defined pathways that traverse the thick wooded natural topography, and subtle positioning of the monastic structures with restricted views, present different characteristics to those described above[14] (figures 1.9, 1.10). However, the monastic landscape associated with Kaludiya Pokuna (literally: Dark Water Pond, 8th-10th century AC) at Mihintale is unique and a rare example which demonstrates the integration of man-made geometrical forms with natural elements such as rocks and water. The visual integration of the natural landscape beyond the monastery proper is achieved through its large man-made pool (figures 1.11, 1.12).

Figure 1.7
General view, Isurumuniya at Anuradhapura

14 For a detailed description of the forest monasteries, see Wijesuriya (1998).

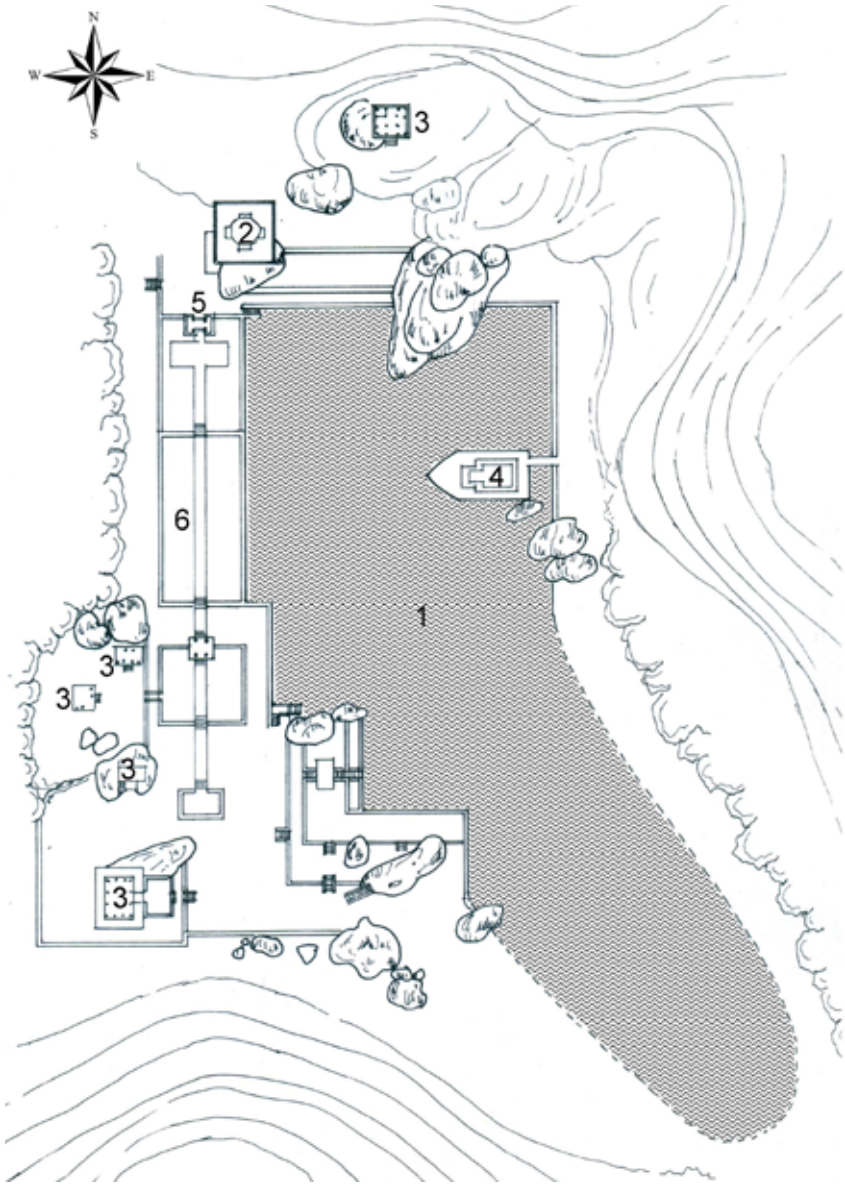


1. Central Ritual Quadrangle
2. Concentric Squares of Monks' Cells
3. Moat
4. Service Buildings

Figure 1.8
Layout, Pancavasa Monastery, Puliyankulama, Anuradhapura

Figure 1.9
Pathway, Ritigala forest monastery (photo Lakshman Nadaraja; courtesy: Fernando, S. 2009)

Figure 1.10
Winding pathway, Arankele forest monastery (photo: Lakshman Nadaraja; courtesy: Fernando, S. 2009)



1. Pool
2. Stupa
3. Monastic Buildings
4. Island Structure
5. Entrance Porch
6. Axial Avenue

Figure 1.11
Layout, Kaludiya Pokuna Monastery at Mihintale

Figure 1.12
General view, Kaludiya Pokuna Monastery at Mihintale

§ 1.2 The Central Issue and Main Objective

The site of Sigiriya celebrated 100 years of archaeological activity, research and interpretation in 1994. Many scholarly studies have been carried out on various aspects during this period. With exposure of the remains of garden structures at the western precincts of the complex in the late 1940s, archaeologists began to interpret Sigiriya also as an example of built landscape that can be dated to the 5th century AC (ASCAR 1952:18). Up to the commencement of the UNESCO-Sri Lanka Project of the Cultural Triangle at Sigiriya in the early 1980s, scholarly consideration of the historical built landscapes of Sri Lanka had mainly focused on several isolated examples, such as the royal gardens at Sigiriya, Ranmasu Uyana at Anuradhapura and the monastic gardens of Alahana Parivena at Polonnaruva (Paranavitana, 1944, 1955; Bandaranayake 1976). With the commencement of the above project at Sigiriya, much interest was generated not only to study various aspects of the built landscape itself, but also to understand the process behind its creation. In this regard, Silva (1984) speculates that earlier monastic concepts of the arama or the park must have set the pace to design norms at Sigiriya, while Bandaranayake (1993a:8) declares,

'The Sigiriya gardens are the survivals of a fairly recently identified Sri Lankan tradition of garden-art, of which there are few other surviving examples, some historical and literary documentation, and traces and fragments at nearly every site of the historical period. The gardens at Sigiriya are a concrete and mature expression on a grand scale of these various strands and traditions, which we see at other sites and in literary descriptions, in a fragmentary form.'

Based on the physical elements and characteristics, Bandaranayake (1993a:8-25) goes on to identify three distinct types of 'landscape traditions' at Sigiriya: symmetrical water gardens, organic boulder gardens and stepped tiers or hanging gardens; he remarks that 'each of these [traditions] has clear antecedents and successors within the Sri Lankan tradition itself.'

As such, Silva attempts to hypothesize that Sigiriya was not a sudden occurrence in history, but that the already existing landscape design knowledge played a role in its landscape design. Bandaranayake goes one step further and hypothesizes that Sri Lanka had a tradition of landscape design and Sigiriya was the climax of this tradition. Therefore, the above two statements focus on two important and interconnected theoretical issues that are central to research on historic built landscape in Sri Lanka: Did Sri Lanka possess a distinctive landscape tradition of its own?; Are historical examples, including Sigiriya, an outcome of this tradition?

There is no doubt that a number of factors, such as ideological, political, socio-cultural and technical contexts of the period, would have influenced this process. Although Bandaranayake (1990a, 1993a) briefly touches upon these issues from a historical point of view, there have been no serious and in-depth studies carried out in this regard. Therefore, one of the tasks for researchers of all disciplines related to historic built landscapes in Sri Lanka is to contribute to addressing these issues. From a landscape design point of view, the above-mentioned theoretical issues lead to several important and again interconnected research questions that are related to the design of historical built landscapes in Sri Lanka: Do Sigiriya and other historical built landscapes belong to one family of common characteristics (of landscape design)?; Which work(s) provided design ingredients to the designers of Sigiriya?; Was Sigiriya a prototype where new architectural inventions were experimented with?; or Was it a synthesis of many elements of Sri Lankan landscape tradition?; or Was it both?; What role in turn was played by Sigiriya in this tradition?

In order to answer such research questions, one has to first carry out separate studies on the landscape design of Sigiriya and other significant historical built landscapes that have survived in order to see by what (architectural) means the elements are arranged/

organized in their composition and so to understand their characteristics of landscape design. The comparison of such characteristics of these various historical built landscapes will then provide insight into answering the above research questions. Since it is not feasible to undertake such a vast scope in a single study of limited duration, as a point of departure the present study will focus on Sigiriya, which is the relatively best preserved, much explored and well-documented historic built landscape in Sri Lanka.

Therefore, the main objective of the present study is to read Sigiriya as a landscape architectonic design with special emphasis on the architectonic means (design tools, principles/rules, techniques) employed by the designers to arrange/organize the elements in the composition and thereby to understand its design characteristics.

§ 1.3 The Secondary Objectives

Apart from partially contributing to the answers of the research questions mentioned in 1.2 above, the present study has the following secondary objectives that have either scientific or practical significance.

§ 1.3.1 Positioning Sigiriya in the Global Landscape Design Context

In order to position Sigiriya among other international landscape traditions, several criteria could be proposed. Antiquity coupled with the degree of preservation is one of them. As far as antiquity is concerned, only age is involved as a factor, and as shown in Figure 1.13 there were numerous gardens belonging to Egyptian, Babylonian, Chinese, Assyrian, Persian and Roman landscape traditions that predate Sigiriya. If the degree of preservation of its physical fabric is brought into the equation, Sigiriya ranks only second to the gardens of Rome, such as the private and public gardens of Pompeii and Herculaneum and the imperial Villa Adriana at Tivoli (Bandaranayake, 1993a:25). Despite articles published at international level (for example, Bandaranayake, 1993a, 1986b, 1997; Bopearachchi, 1993; Cooray, N., 1997), and despite attempts to find international parallelisms and correspondence with the 'three types of garden traditions' at Sigiriya by Bandaranayake (1993a:25-26), many international publications on built landscapes suggest that

Sigiriya is still almost unknown in the global landscape architectural design context.[15] There is hardly any serious study so far that compares Sigiriya with other international gardens (and traditions) in terms of a landscape design point of view. Therefore, one of the scientific objectives of the present study is to position Sigiriya in the global landscape design context through a comparison of its landscape design with those of other international landscape traditions. However, as will be pointed out later, the present attempt is confined to a comparison of the landscape design of Sigiriya to those of the West European landscape tradition.[16]

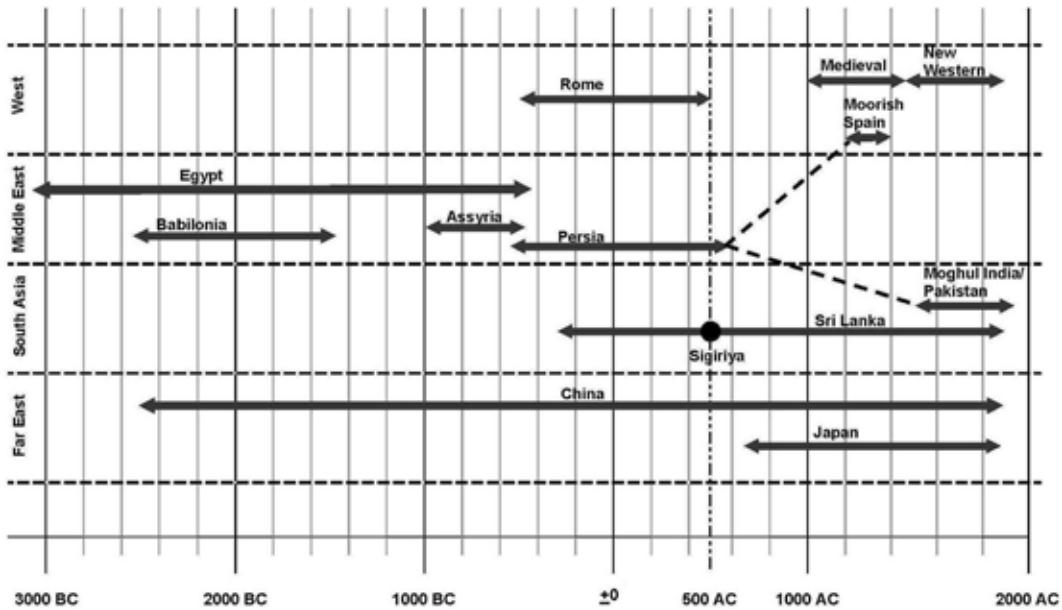


Figure 1.13
Schedule showing the antiquarian value of Sigiriya in relation to other international garden traditions

15 For instance, there is no mention of Sigiriya in The Landscape of Man (Jellicoe and Jellicoe, 1995), which is a concise global view of built landscapes from the prehistoric to present eras, and is regarded as the standard work on the subject, not only among landscape architects, but other academics interested in the subject. The International Symposium on Gardens held in Leiden, the Netherlands, in 1990 (Fat and De Jong, 1991), as a project of the World Decade of Cultural Development of the UN and UNESCO, is another instance where there was no mention of Sigiriya in the discussions and deliberations on gardens of Europe, the Middle East and Far East. One exception is Holmes (2001:12-13), in which Sigiriya is mentioned at a global level among other historic gardens.

16 For the justification, see section 6.2.

§ 1.3.2 Conservation, Presentation and Management of the Heritage Site of Sigiriya

Sigiriya has been conserved, presented and managed as a heritage site since the 1890s.[17] The degree of scientific understanding of the site since then has no doubt influenced the shaping of the site's conservation, presentation and management policies. As will be pointed out in Chapter 3, the dominance of the archaeo-historical studies on Sigiriya would have also contributed to giving prominence to antiquarian values in deciding such policies. On the other hand, the increase in cultural tourism to the site since the 1980s has necessitated facilities for a better interpretation of the site, as well as the establishment of such facilities as toilets, parking and visitor access within the site, and a proper road network, restaurants, guest houses and hotels within its hinterland. Therefore, such demands also have an impact on policies regarding the presentation and management of the site. Since the present study is expected to provide scientific knowledge on the landscape design of Sigiriya, and thereby to underline its landscape architectural value, one of the practical objectives is to re-examine the validity of some of the interventions carried out so far at Sigiriya, and to discuss policy issues and make suggestions for the consideration of heritage professionals in reshaping the site's future conservation, presentation and management.

§ 1.4 The Approach, Method, Scope and Limitations

Since the main objective of the present study is to read Sigiriya as a landscape architectonic design, the study will best be approached from a technical-analytical point of view.[18] In such a study the availability of architectural theories, philosophy and the approach of the original designer, together with other works of the same designer, are vital sources. Moreover, the client's functional requirements and his aspirations are major considerations in the design process. Access to such information makes a study very much easier. However, in the study of Sigiriya, a historical example of the distant past, the original designer is unknown. Unlike designers of the recent past, any clues to the designer's architectural theories, philosophies and approach in the form of letters, diaries and sketches are also

17 See section 3.2 for details.

18 See Chapter 4 for the justification of a technical-analytical study.

absent. Further, there are no records of other works attributed to the same designer.[19] Although the client for Sigiriya and his aspirations, at least during the major constructional phase, are briefly indicated in the chronicles, it is difficult to rely on such information due to the biased nature of recording by the chroniclers. Such information may be useful only to cross-examine the results of the present study. Therefore, all these suggest that the only option available to carry out the present study is to analyze and interpret the existing material remains at the site.

As will be pointed in Chapter 3, Sigiriya is a multiperiod site with monastic phases preceding and following its royal phase. However, Sigiriya's dominant identity is a royal complex, and hence this study will be limited to analysis of the material remains related to the royal phase. Therefore, analysis of the material remains related to other phases is not within the scope of the present research.

Being a site that has been overrun by nature for several centuries, and due to abandonment, the superstructure of almost all the built features has disappeared. As far as the original planting scheme is considered, it has gone through faster cycles without leaving any physical trace of its original character.[20] In its present form, therefore, the site does not provide all the data required for this study. Unlike in the western tradition there are no engravings of Sigiriya. Thus, the present study is limited to the material remains and the data that have been uncovered during the last 100 years of archaeological activity. This means that the outcome of such a study cannot be treated as final, and will no doubt be elaborated on in the future with the exposure of more findings, employing advanced archaeological methods that will be developed in the future.

With regard to the research questions raised in 1.2 above, finding answers to such questions will only be possible after identifying the landscape design characteristics of Sigiriya and other historical built landscapes in Sri Lanka. Since a detailed study of all these built landscapes to identify such characteristics is an enormous academic exercise, which is not feasible in a single study, the present study is limited to indentifying the design characteristics of Sigiriya, and hence becomes the first step of this long process. The next steps to be followed will be to study separately

19 As per the inscriptional evidence at Vessagiriya in Anuradhapura recording that Kasyapa has relaid the site as a monastery. De Silva, N. (2012) however opines that due to the use of Lapis Lazuli, a semi-precious stone imported from Afganistan, as a blue pigment in paintings found only at Sigiriya, Vessagiriya and Ranmasu Uyana and the similarities in design concepts found at these three sites ('landscape driven architecture' instead of 'architecture driven landscape') are factors that can be considered as evidence to attribute all three of these works to the same architect or the same design school served during Kasyapa's reign.

20 Although there have been a few attempts to investigate the archaeological and palaeo environment of Sigiriya and plant micro-fossil remains, such as pollen and hydroliths, especially from pond sediments, with a view to identify the plants of the original Sigiriya garden (Bandaranayake, 1994d), the results of such studies do not provide insight to the present study.

other historical built landscapes to identify their individual design characteristics – subjects of a series of studies of a similar nature. The comparison of such characteristics of these various historical built landscapes will ultimately provide answers to the research questions raised in 1.2 above. Hence, answering the research questions is not within the scope of the present study.

§ 1.5 The Structure of the Thesis

Chapter 2 provides a general cultural-geographic, technical and historic context for the present study. Chapter 3 inquires into two aspects that are relevant to the present study: first, the approaches to and conclusions of previous studies and interpretations on Sigiriya by various scholars, with a view to see if such approaches are capable of providing a methodological framework for the present analysis of material remains at Sigiriya; and second, the policies and approaches of conservation, presentation and management activities carried out so far at the site. The intention of Chapter 4 is to derive a methodological framework for the present study. It also involves a survey of the existing methodologies, analytical tools and keys employed and developed by various researchers to study landscape design around the world. Considering the situation of Sigiriya, an appropriate methodology together with tools and keys will then be adapted to read the landscape design of Sigiriya. Chapter 5 deals with an analysis of the landscape design of Sigiriya by applying the methodological framework adopted in Chapter 4, and hence becomes the core chapter of the study. Based on the above analysis, Chapter 6 will derive specific statements with regard to the design characteristics and also make a comparison with other world garden traditions in order to position Sigiriya in the global design context to read Sigiriya as a landscape architectonic composition. Chapter 7 deals with the perspectives that may arise out of the present study, in order to discuss policy issues and make suggestions to help reformulate overall policy and programs for the conservation, presentation and management of Sigiriya, and also to discuss the scientific and methodological aspects of the present research itself, based on the results of Chapter 5. This final chapter is also expected to suggest other possible future studies that may arise out of the present study.

2 Context for the Study

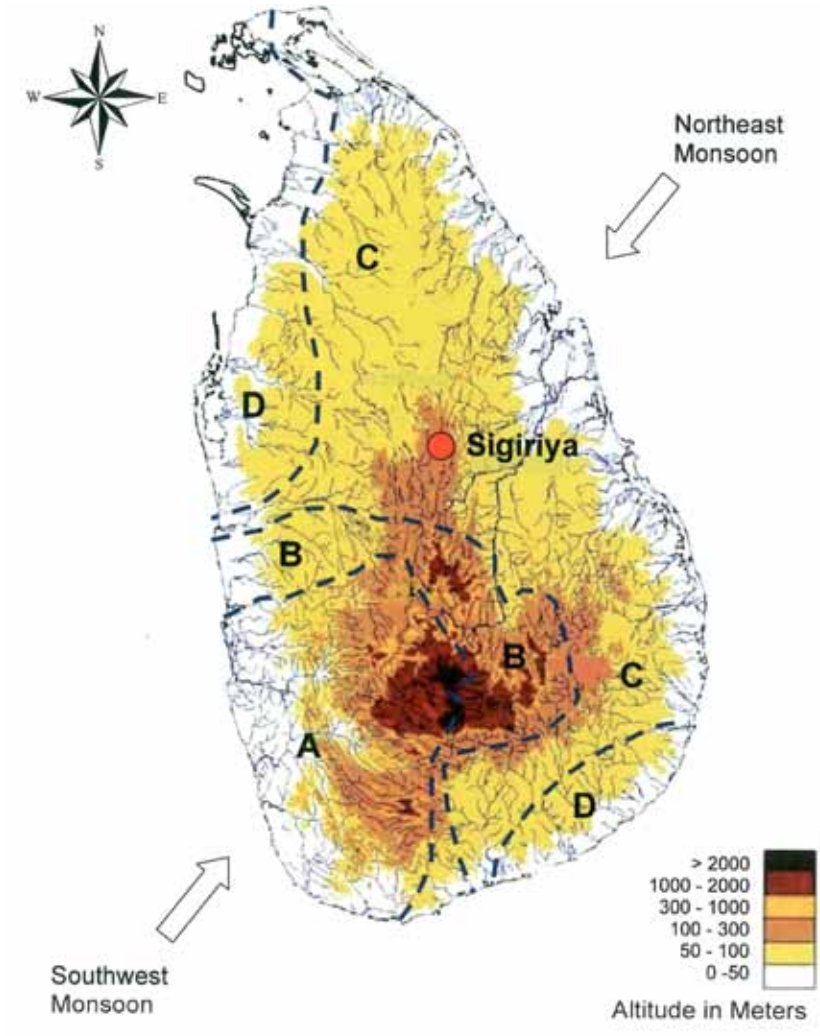
§ 2.1 General Context

§ 2.1.1 Environment, Topography and Society

Situated approximately 50 kilometers off the southern tip of mainland Asia, Sri Lanka is an island in the Indian Ocean, measuring 430 kilometers north to south and 225 kilometers east to west (figure 0.1). The topography consists of a lowland coastal belt, an intermediate upland towards the interior, and highland in the center. The highland, which consists of a mountain mass, reaches a maximum elevation of about 2,500 meters above sea level (figure 2.1). Due to its location in the Indian Ocean, the climate is influenced by the tropical monsoon system. This wind pattern together with the central highland, which acts as a barrier more or less at right angles to the direction in which the monsoon blows, divide the country into two distinct climatic zones. The western, southwestern and central regions, which constitute the wet zone, receive a heavy rainfall, especially through the southwest monsoon from May to September. Hot humid weather prevails in the lowlands, while it is cooler and more wholesome in the central highland. The dry zone, which constitutes about 70% of the total land area, in contrast, receives rain only from the northeast monsoon from mid-October to January, and suffers an annual severe drought for the rest of the year. Dry and harsh weather prevails in the north central, eastern and south central dry zone, while it is semi-arid in the northwest and southeast, and arid in the further north. The topography of the dry zone predominately consists of intermediate upland and lowland. The gently undulating terrain with several isolated erosion remnants and rocky hills in the north central plain gives way to monotonous, featureless flat landscape further north.

The natural vegetation is characterized by rain forests in the wet zone with drier variants in the dry zone. Several rivers and streams that emerge from the central highland (the island's hydrographic hub) flow in a radial pattern across both zones into the Indian Ocean. The rivers across the wet zone are perennial, while those across the dry zone are mostly seasonal in their flow with a tendency to dry out during droughts. One of the notable exceptions is the Mahaveli (the 'Great Sandy

River'), which flows in a northeasterly direction across the dry zone and reaches the sea at Trincomalee on the eastern seaboard. Apart from the wet dolines *(villu)* to the northwest and northeast, natural lakes are lacking. However, the coastal belt is characterized by several lagoons and beaches of scenic beauty.



A Wet Zone
B Intermediate Zone
C Dry Zone
D Arid Zone

Figure 2.1
Map of Sri Lanka showing climatic zones, topography, wind and the drainage pattern

Contemporary research (Deraniyagala, S., 1992:686, 2001:54) reveals that by about 125,000 BP there were prehistoric settlements in the island. During the Prehistoric Iron Age (circa 900-600 BC), the inhabitants had already settled down to communal living to farm the land (Deraniyagala, S., 1992:709).[21] The geographic position of Sri Lanka in relation to mainland Asia also made it one of the terminal points of constant immigration from the subcontinent. In or around 500 BC, therefore, the culture of the indigenous inhabitants was overwhelmed by immigrants from India, who predominantly spoke an Indo-Aryan dialect (Paranavitana, 1967:1). The two cultures merged, and it was this amalgamation that laid the foundation to form a distinctive island civilization in the succeeding centuries. These settlements were basically concentrated in the harsh dry zone. As at present rice was the staple food, and successful cultivation of rice in the dry zone depended upon proper storage and management of rainwater. Initially existing streams and rivers were dammed to construct reservoirs of modest scale to irrigate the land during the dry season. These reservoirs thus became the first significant man-made features in the dry zone landscape.

During the latter part of the first millennium BC, initial signs of urbanization emerged at Anuradhapura, located in the north central plains. Buddhism was introduced to the island from its birthplace in northern India during the reign of Asoka, emperor of India in the 3rd century BC. Anuradhapura quickly became the center of both political power and the Buddhist religion. The new religion provided a serene philosophy of life, which served as an enduring source of inspiration for creativity in art, architecture and literature. The social structure was based on the caste system, with the king at the apex and Buddhist monks acting as the spiritual guardians of the nation, and as advisers to the king. Such features of state formation as the use of a script for writing, participation in external trade, emergence of Buddhist monastic establishments, technological advances and the resultant social stratification contributed to make Sri Lanka a distinct world civilization during the first millennium AC, with Anuradhapura as its great urban center.

Sri Lanka's close proximity to the South Asian mainland on the one hand and its isolation due to the ocean on the other – as Japan is to China, and England to the European mainland – has made it considerably influenced by the mainland and at the same time has preserved its distinct individuality.

21 The latest research indicates that the farming of barley and oats was practiced at least from about 8,000 BC in central Sri Lanka (Premathilake, 2000).

§ 2.1.2 Attitude towards Nature

Ancient Sri Lankans, like those of many South Asian countries, did not distinguish themselves from nature, but believed that they were part of it. This attitude made them pay immense respect towards nature. The religio-cultural belief system of society also reflects this attitude. For instance, it is believed that deities *(wruksha devata)* live in association with trees, particularly those with large canopies, and the practice of lighting oil lamps under such trees as a mark of respect to the deity is continued by villagers even today (de Silva, N., 1996:6). Buddhist teachings further promoted respect towards nature. The three important events of the Buddha – birth, attainment of spiritual enlightenment and passing away – were directly associated with trees. The Bodhi-tree under which Buddha attained spiritual enlightenment and supreme wisdom is sacred to Buddhists. A sapling (southern branch) of this sacred tree at Bodhgaya in India, brought to Sri Lanka in the 3rd century BC and planted at the park of Mahameghavana at Anuradhapura, is still venerated by Buddhists as a supreme relic of the Master, and it is considered to be the world's oldest, recorded, living historical tree. The cutting of trees was discouraged unless for a genuine purpose. The rituals to be performed before cutting a tree (for example, lighting an oil lamp under the selected tree for three nights to respectfully inform the associated deity that the intention is for a good purpose, and to request the deity to leave the tree) also illustrate this point (de Silva, N., 1996:6). The consideration of ancient Sri Lankans towards trees is also very well reflected in identifying man-made reservoirs, villages, and so on, in association with an individual tree or a grove of trees.

The concept of a mountain cult of socio-religious life of pre-Buddhist Sri Lanka has also led to a respect for mountains, by assigning them some degree of numinous power (Basnayake, 1983:1). The association of pre-Buddhist deity Sumana Saman with the mountain peak Sri Pada is an example (Paranavitana, 1958). Special attention to mountains is reflected in identifying rocky mountains with the shape of animals, such as Atu-gala (in the shape of an elephant), Ibba-gala (tortoise), Anda-gala (eel), Vandura-gala (monkey), Sigiriya (lion?), and so on.

Since the natural environment was not harsh, but conducive to outdoor living, nature was not treated as an enemy of human existence or a rival to be conquered or subordinated, but as a guardian. This attitude also gave rise to a specific living pattern centered on outdoor living. Therefore, most family activities of ancient Sri Lankans, such as cooking, eating, chatting and even entertaining outsiders, took place in outdoor spaces, while indoor spaces were used, for example, for protection from rain and the privacy of female members. Hence the indoor space of a house was very much smaller than the outdoor space.[22]

22 Also see De Silva, N. (1990:2) and Lewcock (1998:9-18).

Apart from providing food, the trees gave shade for outdoor living under tropical climatic conditions. This attitude towards nature also promoted the least human intervention in the natural landscape and the incorporation of natural features into the built environment without significant alteration. Moreover, popular beliefs in the worship of nature were fully appreciated in the art of building construction, both secular and religious, as reflected by the contents of various ancient Silpa texts (Manjusri Vastuvidyasastra 1995:4).

§ 2.1.3 The Cosmology

The ancient Sri Lankan view of the physical nature of the universe is best reflected in Buddhist cosmology and cosmography. Although adapted from Hinduism, the Buddhist cosmology has no creation myth. However, some aspects of Hinduism were absorbed into Buddhism, and such Hindu gods as Brahma and Indra (Sakra of the Buddhist tradition) were incorporated into Buddhism, not as world creators, but as devout followers of the Buddha (Adikaram, 1946:145) who were pious men during previous lives. According to Buddhist cosmology, world systems are destroyed and recreated in *kalpas* (cycles or great ages). The world system that exists during a *kalpa* has several planes of existence in the vertical sequence divided into several worlds: underworlds (including various hells, world of departed beings, demons, animal kingdom, and so on), world of humans, and heavenly abodes of the gods *(sagga-loka)* on top of the Mount Meru, the cosmic mountain. All these planes are subdivisions of the world of sensation *(laukika)*, and higher than these planes is the world of form *(rupa-loka)*, the abodes of the Brahmas who have a material body. Above these planes is the fourfold arupa-loka, or the world of no-form, the abodes of the Brahmas who do not possess a material body (Adikaram, 1946:153-154).

Mount Meru, the mythical cosmic mountain which lies at the center of the universe is thought to be the axis of mundi joining the earth with abodes of the Brahmas at the highest planes. The heavenly abode of god Sakra is on the summit of Mount Meru. This cosmic mountain sits upon three peaks, the Trikuta, while a thick forest of silk cotton trees covers the mountain slopes. The palaces of the four guardians of the world adorn the slopes of the Meru. Below the Meru on Trikuta is the underworld. Mount Meru is surrounded by seven annular seas, which are in turn separated from each other by several mountain ranges. Beyond the last of these ranges lies an ocean containing four continents, one each at the cardinal directions (Duncan, 1990:42-48). Therefore, this cosmography gives rise to a bottom-up vertical sequence of cosmic landscape with increasing divine habitation above the layers of the human world. The belief system of the pre-Buddhist concept of mountain cult, in which mountain tops were the realms of gods who reside above humans, would have also reinforced this cosmography.

This cosmic landscape was a great inspiration to artists, sculptors and architects throughout the historical period.[23] It is well reflected in the interior arrangement of the relic chambers of Buddhist stupas. These relic chambers, embedded at the center of the masonry work of the totally inaccessible hemispherical dome of the stupa, functioned as repositories of the relics of the Buddha, which signifies the presence of the Master within the stupa. A square pillar of stone, which forms the central object of the relic chamber, represents the mythical Mount Meru. The small chambers below the Meru stone contain the objects connected with the world of Nagas (serpents) representing the underworld. The stone pillar sits upon three smaller stones representing the Trikuta. Placed on top of the pillar is the casket containing the relics of the Buddha, symbolizing the Buddha seated on the abode of god Sakra. The series of seven horizontal bands carved on the faces of the stone pillar represents the seven ranges of the mountains that surround Mount Meru (figure 2.2). In some cases, the northern, southern, eastern and western sides of the pillar are painted yellow, blue, white and red, respectively, which tallies with the accepted conventions about Mount Meru, where the northern, southern, eastern and western sides of the cosmic mountain are believed to be gold, blue sapphire, silver and coral, respectively (Paranavitana, 1946:20-24; Silva 2004:21-22; Seneviratne, 1991:366-376). The internal walls of the chamber in some instances are painted with figures of gods of heavenly realms moving among clouds. Seneviratne (1991:366) concludes that the relic chamber therefore represents the middle world containing the earth and atmospheric region.

The spatial divisions within the interior of the painted Buddha image houses also symbolically re-create the Buddhist cosmography representing the whole universe, where the lowermost painted register is divided vertically into panels depicting the various hells and underworlds, while ceiling paintings depict higher cosmic realms (Bandaranayake, 1986a:22-23).
By citing several studies, Duncan (1990:48-49) remarks,

'... the myth of Mount Meru became a paradigm for the spatial organization of state, capital and temple in much of Southeast Asia. Terrestrial space was structured in the image of celestial space. Many royal cities were exquisitely built to represent the cosmos in miniaturized forms, with the central part of the city representing the celestial city of the gods, high upon the cosmic mountain. These cities were built as a square or rectangle and fixed at the cardinal directions. The square form of the city was actually conceptualized as lying within a mandala, a circular cosmic diagram fixed at the four cardinal directions and anchored by a fifth point in its center. By paralleling the sacred

23 Also see Aryawansa (1958:61-70) for a description of the mythical Himalayan region.

shape of the mandala, these cities were transformed into microcosms of the cosmos. The king, by situating his palace at the center of this mandala, occupied the center of the universe and the summit of the Mount Meru, and hence maintained the liminal status of a god on earth. By occupying this position at the center of the cosmos, he became a cakravarti who could control the world through the magical power of parallelism.'

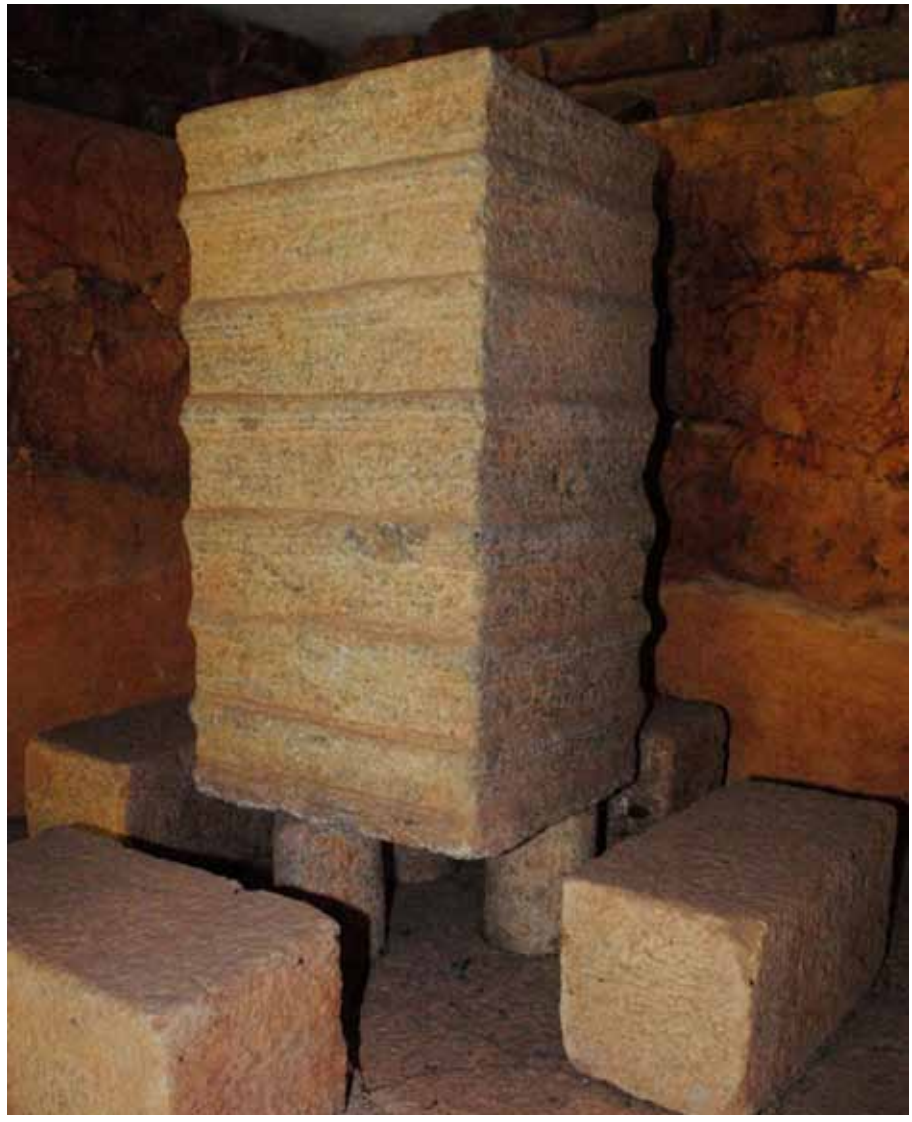


Figure 2.2
Relic chamber of a stupa at Mihintale on display at the site museum showing the mythical cosmic mountain (Mount Meru) sitting upon three smaller vertical stone pillars (partly covered) representing Trikuta. Also note the series of seven horizontal bands carved on the faces of Mount Meru representing the seven ranges of mountains that surround the mythical cosmic mountain and the paintings on the internal walls of the chamber.

Angkor Thom in Cambodia (12th-13th century AC) is identified as the clearest example that set out to re-create the cosmic landscape (Kastof, 1991:172-173). Duncan (1990:53-58) argues that such principal political centers in Sri Lanka as Anuradhapura (4th century BC-10th century AC), Polonnaruva (11th-13th century AC) and Kandy (17th-19th century AC) also have varying degrees of cosmic modeling and speculates that Sigiriya is perhaps the clearest example of a cosmic city in early Sri Lanka.

Another aspect of cosmology is the cosmic ocean of milk, with water as the creative agent. Accordingly, the high up in heaven Ahas Ganga, the starry river of milk (the Milky Way), falls into Lake Anotatta on top of Mount Meru. At each cardinal direction, this cosmic lake, the most sacred of lakes in Buddhist literature, has an outlet in the shape of the mouth of an animal. The northern, southern, eastern and western outlets are shaped like the mouths of a lion, bull, elephant and horse, respectively. The four streams that emerge from these outlets then flow around the lake three times, and at the eastern end of the lake become the Ahas Ganga, which drops into the ocean to the south. It is *amrita*, the fluid of creation, which circulates through the universe. The water containing *amrita* possesses the magical property of cleansing humans and making them fit for divine association (Duncan 1990:45).

The 18th century, painted, Buddhist cave shrine at Kottimbulvala in Ratnapura District offers one of the best representations where the overall theme of paintings is inspired by Buddhist cosmological ideas. The major part of the rock ceiling of the central cave depicts the mythical Himalayan landscape centralized around the cosmic lake Anotatta. The variant inhabitants of the mythical region and its physical features such as lakes, streams, rocks, trees and plants are represented in the liveliest manner. The paintings on the wooden ceiling of the verandah are complete with hells, the human world consisting of different continents and major rivers, heaven with presiding divinities and many mythical Himalayan scenes (Chutiwongs, Prematilleke and Silva 1990c:41).[24] The elaborate landscape composition featuring the cosmic lake is also well illustrated in the 18th century wall paintings of the Buddhist cave shrine at Dambulla (figure 2.3). Here, the waters issuing from the mouths of the directional animals are seen flowing out in four directions.[25] The one to the east flows over a mountain, enters Lake Anotatta and thereafter divides into five great rivers before finally entering the ocean (Bandaranayake, 1986a:160, 178-179; Chutiwongs, Prematilleke and Silva, 1990b:78-79).

24 Commenting on the Buddhist cosmology reflected in the paintings at Kottimbulvala, Chutiwongs, Prematilleke and Silva (1990c) declare that "such a remarkable monochromic scheme is rarely found in the paintings of Sri Lanka."

25 The conventional directions of the bull and horse have been interchanged in the painting, perhaps due to a misconception of the artist (Chutiwongs, Prematilleke and Silva, 1990b:78-79).

Figure 2.3
Cosmic lake of Anotatta, a painting from Dambulla cave shrine, 18th century AC (photo: M. W. E. Karunaratne)

Being an agro-based society using irrigated agriculture, this cosmic pattern represents the hydrologic cycle: the ocean, lakes, rivers and rainfall that enable the earth's fertility. Therefore, it reflects the ecological characteristic that is so essential for agrarian communities, where water is the essential commodity. Duncan (1990:53-54) argues that there is a link between the cosmic waters and the practical irrigation projects of the ancient Sri Lankan kings in modeling cosmic cities.

§ 2.1.4 Discourse of Kingship

Duncan (1990:38) identifies two major discourses within the larger discursive field pertaining to kingship in ancient Sri Lanka, the Asokan and Sakra. The Asokan model, which came with Buddhism during the Mauryan Buddhist missionary activities of India during the 3rd century BC, was based on the Mauryan Emperor Asoka, who was looked upon as an ideal Buddhist king. According to this model, the king should be pious, righteous and devoted to the fostering of Buddhism and to the welfare of the people (Duncan, 1990:5). This favored immensely the creation of a landscape dominated by religious structures and public works. As seen at Anuradhapura, during the time of the laying out of Sigiriya, the kings constructed monumental religious structures, such

as stupas,[26] that dominate the landscape. These stupas not only express the growing confidence and stability of the nation, but a determination to place a mark on the natural landscape (figure 2.4). Mahathupa or Ruvanvalisaya (2nd century BC, original height: approximately 90 meters), Abhayagiri (1st century BC/1st century AC, original height: approximately 106 meters) and Jetavana (3rd-4th century AC, original height: approximately 120 meters), the three mega stupas at Anuradhapura, are not only the largest monuments of their kind in the entire Buddhist tradition, but are still the tallest brick structures in the world, being surpassed in height only by the two stone-built great pyramids of Gizeh, Egypt. In the same way, kings devoted themselves to constructing massive man-made reservoirs at Anuradhapura, such as Abhayavapi (modern Basavakkulam, 4th century BC, 100 hectares in extent), Tissavapi (modern Tissavava, 3rd century BC, 160 hectares) and Nuwaravava (or City Tank, circa 2nd century AC, 1,200 hectares), as public works to irrigate land to sustain agriculture. These towering stupas with large sheets of water (man-made reservoirs) in the foreground, symbolize the material and spiritual heights reached by ancient Sri Lankans. The landscape model of Asokan discourse on kingship was, therefore, simultaneously religious and utilitarian.

The Sakran model, on the other hand, is based on Hinduism, where God Sakra (Indra of the Hindu pantheon) is considered the king of gods. With regard to this model, Duncan (1990:40) comments,

'In the Sakran, as in the Asokan discourse on kingship, the king was also expected to be just, pious, caring and attentive to the needs of the citizens. However, the former view stressed the glorious and divine quality of kingship. The king was seen a cakravarti, a universal monarch who rules over his people and other kings just as the king of the gods, Sakra, rules over the thirty-two gods in the Tavatimsa heaven. The Sakran model of kingship stressed the building of palaces, cities and lakes that glorify the god-king. These landscapes were modeled upon textual descriptions of the cities of the gods in heaven on the top of Mount Meru.'

26 The stupa is an important and essential ritual edifice of Sri Lankan Buddhist worship. Originally, it was meant to enshrine the relics of the Buddha, but later became a representation of Him. The striking and dominant element of the stupa is its hemispherical dome, which generally stands on an elevated square terrace. The dome is surmounted by a cubical structure and a cone. Constructed out of solid masonry, these elements of the stupa are arranged in a single vertical axis. The volume of each element gradually decreases as the eye travels upwards along this axis. The relics are enshrined within small chambers of the solid masonry of the hemispherical dome. The contrasting combination of square and circular plan forms and of hemispherical, cubical and conical volumes gives a dramatic form to this edifice.

Although Buddhism incorporated God Sakra as a devout follower of the Buddha, the Sakran model, which promoted the glorification of the king through building heavenly abodes, became oppositional to the Asokan one, and hence Buddhism during this period did not sanction the devotion of great expense to sacral kingship. However, Duncan (1990:53) points out that some aspects of the landscape model based on Sakran discourse were used by kings during this period as reflected in the erection of storied monastic mansions, such as Lohapasada (chapter house), in honor of the religion rather than as palaces for the glorification of the king himself.

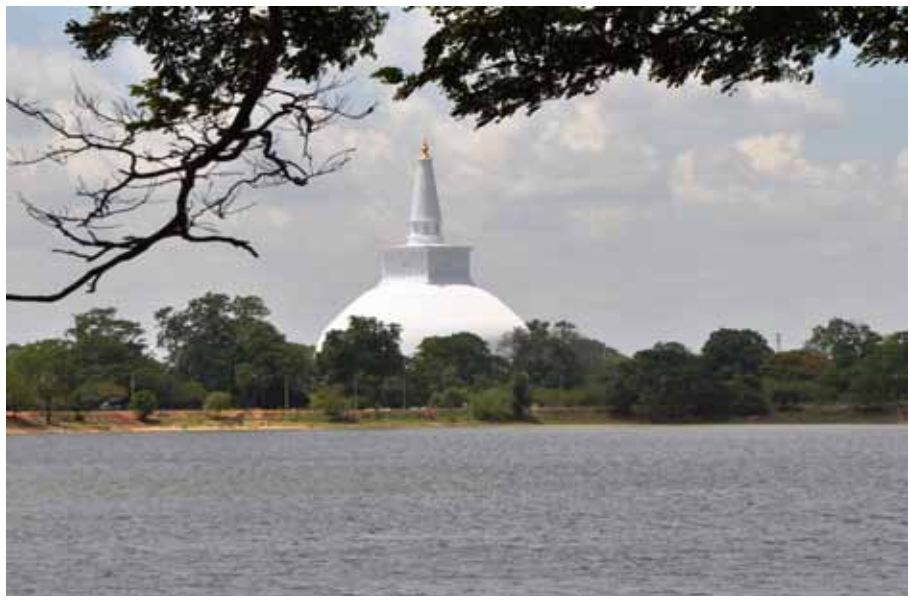


Figure 2.4
Mahathupa (Ruvanvalisaya), a colossal stupa at Anuradhapura, rising from the bank of an artificial reservoir

§ 2.1.5 City Planning and Architecture

Due to close cultural contacts with mainland India, the ancient Indian standard texts and treatises on city planning and architecture, such as Kautiliya Arthasastra, Manasara, Milindapanha and Mayamata, were known to the master builders of Sri Lanka from a very early date (Silva, 2000:50-51). The introduction of Buddhism to Sri Lanka from India during the 3rd century BC would have also provided an opportunity to associate with counterpart professionals in India and to adapt prototypes of Buddhist ritual structures that were developed in India.

According to Pali literature and other Buddhist texts, the cities in India during Buddhist times (3rd century BC) were usually square and defended with walls on all four sides. There were four gates, one in the middle of each wall facing the four quarters, and four main streets led from these gates to the center of the city. With regard to the fortifications, there were three successive moats: the 'water moat,' 'mud moat' and 'dry moat' (Geiger, 1960:53, 58). These descriptions also agree with the Kautiliya Arthasastra, according to which three moats, each narrower than the other, must surround a royal residence with the gates located at the four cardinal directions (Kangle, 1965:244). These treatises prescribe *vastupurusa-mandala* (figure 2.5), the gridded centralized diagram, as the basis of site planning (Mayamata, 1985:15-22). Manasara (1946:124-125) introduces 32 variants of *vastupurusa-mandala* that take the square or rectangular plan.

As per this system, which prescribes the organization of the citadel, the royal palace is to be located at the center, and several concentric precincts fortified by walls and entered through gateways facing cardinal directions are to be assigned for various other functions in a decreasing order of hierarchy (figure 2.6).[27] Manjusri Vastuvidyasastra[28] (1995) also prescribes the rules governing the selection of sites, location of buildings according to a *mandala* concept, orientation, rules governing measurements, method of selecting trees, and so on, for the laying out of Buddhist monasteries and construction of buildings.[29]

By the time of the laying out of Sigiriya in the 5th century AC, the royal city of Anuradhapura had an organically evolved and well-developed city plan with the citadel as its nucleus, which is surrounded by a series of concentric rings of monastic and suburban settlements (Silva, 2000:51-62). Although the citadel was not a true square,[30] the city wall and the moat beyond with gates facing cardinal directions, the streets running in north-south and east-west directions, dividing the citadel into four quarters and connecting the entrances and extending beyond, are in accordance with the city planning principles prescribed in the Indian texts. The royal palace including the household was located within the walled citadel.

27 Also see Mayamata (1985:38-44) for a description of the towns.

28 Manjusri Vastuvidyasastra, a unique manuscript of a Silpa text dealing with Buddhist architecture, is attributed to the 14th-15th century period, but indicates the continuity of earlier compilation of technical texts (1995:16).

29 Also see De Silva, N. (1988, 1989).

30 De Silva, N. (1997:7) suggests that "the city of Anuradhapura is in the form of 'Murudange', the drum shape which is considered as a non-Aryan city form."

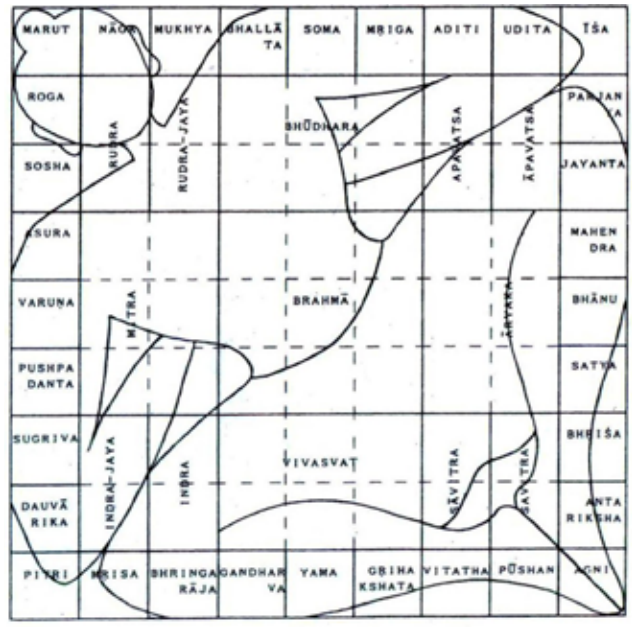


Figure 2.5
Vastupurusa-mandala, the gridded centralized diagram (courtesy: Mayamata 1985)

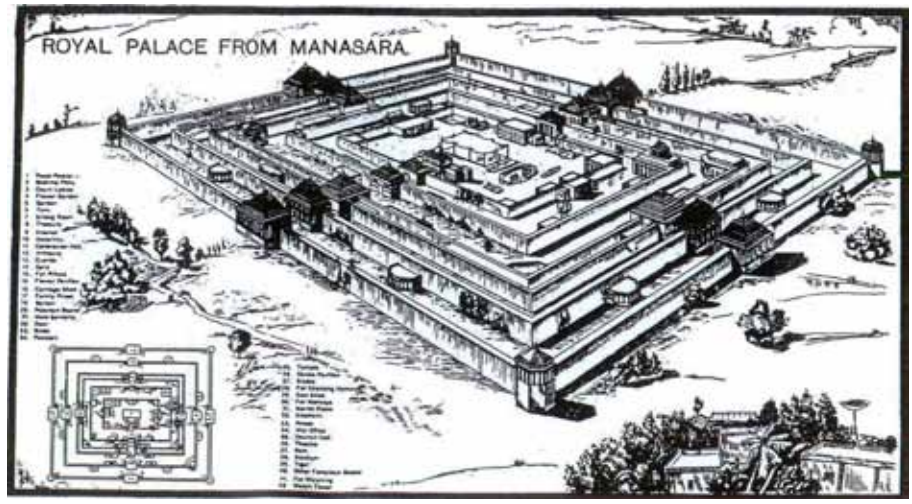


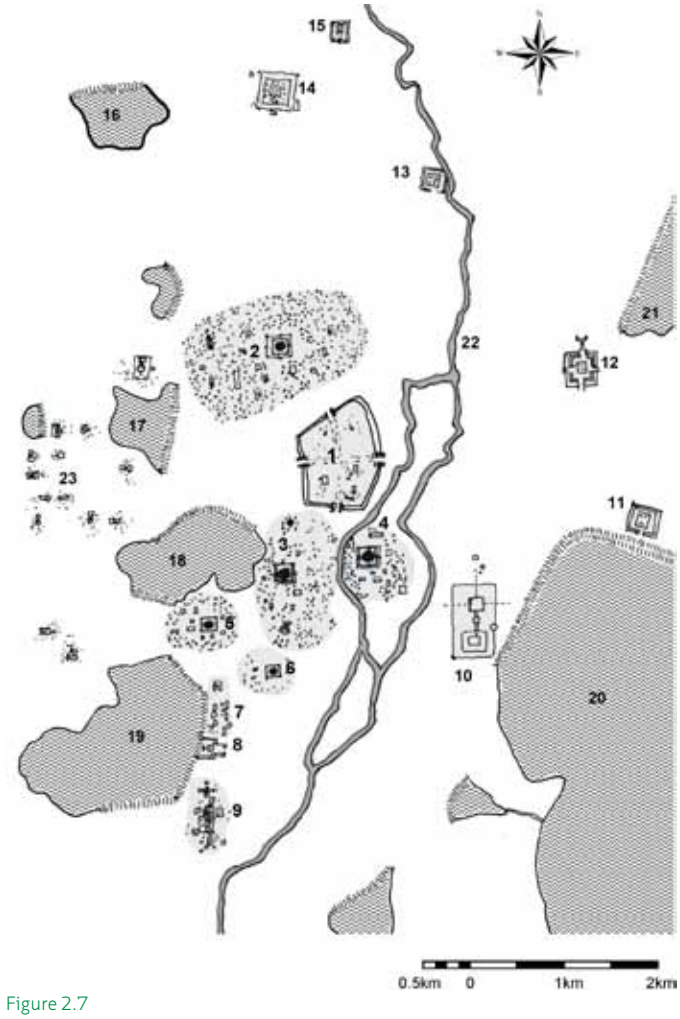
Figure 2.6
Bird's-eye view of an ideal royal palace by P. K. Acharya as per the descriptions given in Manasara (1946)

Also located within the citadel was the temple of the scared Tooth Relic of the Buddha and alms halls for the Buddhist monks. The five great Buddhist monasteries formed the inner ring outside the city walls. Established and patronized by royalty, as part of their program of fostering Buddhism, and developed from the 3rd century BC up to about the 5th century AC, each monastery had an extensive layout. The largest monastery is about 200 hectares in extent, which is larger than the citadel itself (about 160 hectares). Located at the center of each monastery was a colossal stupa as a distinct architectural focal point. The highest reaching 120 meters, these stupas dominated not only the respective monastery, but the entire skyline of Anuradhapura. The artificial reservoirs, including the agricultural settlements located beyond these monasteries, formed the second ring of the city plan. The existing pre-Buddhist reservoirs of this ring were further developed by constructing additional reservoirs or by enlarging the existing ones by successive kings, again as part of their program to construct public works for the welfare of the people. In addition to serving a utilitarian purpose, these reservoirs were dominant elements in the cityscape, which also gave enchanting scenic beauty to the city. Therefore, Anuradhapura's city plan and its morphology clearly reflect the Asokan discourse on kingship as well as the social hierarchy of the period. The location of Buddhist monasteries immediately around the city also portrays the influential role played by Buddhist monks as the advisors to the king in state affairs[31] (figure 2.7).

Although the chronicles mention that numerous secular buildings existed from a very early date in Sri Lanka, the state of preservation of such buildings at present does not provide information to understand the character of secular architecture at the time of the laying out of Sigiriya. On the other hand, the religious architecture of ancient Sri Lanka shows that it is essentially a mixture of deeply rooted local building tradition and the natural development of the forms introduced from mainland India during the Mauryan Buddhist missionary activity of the 3rd century BC (Paranavitana, 1967; Bandaranayake, 1974; Silva, 1988). Within a few centuries of the Christian era, architecture reached a very mature stage at Anuradhapura. The architectural designs of such Buddhist ritual structures as stupas, vatadages and Bodhi-tree shrines show that although distinctive individuality had been acquired during the process, no profound modifications had taken place to obscure their origin. In India itself, the Buddhist architecture in vogue in the period during which the Buddhist religion was introduced

31 The final phase of the city planning of Anuradhapura occurred when a certain section of Buddhist monks of the Great Monasteries of the inner ring preferred to be away from the busy urban environment and to lead a life based on meditation. The result was the establishment of several monasteries that were located beyond the ring of reservoirs and agricultural settlements. Therefore, these monasteries formed the outer ring of the city plan adjacent to the forests that were beyond. These monasteries seem to have relied on patronage from the middle ring of the agricultural community rather than on royalty and the urban elite in the city center. This phase, beginning in around the 5th century AC, culminated in around the 10th century (Silva, 2000:62, 2008:231-232).

had, by about the 5th century AC, been submerged by extraneous influences and developments within. The elaboration of detail at the expense of architectural form gradually became the rule in mainland India, both among Brahmanical sects as well as Buddhists. Sri Lanka, on the other hand, preferred the ethical simplicity and monastic puritanism of the Theravada, the orthodox Buddhist church, which ceased to be of any influence in medieval India, to the mythological exuberance and metaphysical subtlety of Mahayana Buddhism and later Brahmanism. The keynote of religious architecture throughout the Anuradhapura period (which includes the laying out of Sigiriya in the 5th century AC) was, therefore, its simplicity, harmonious proportions and dependence on the overall built form rather than on ornamentation and decoration to create an effect (Paranavitana, 1955:77).



1 Citadel
2 Abhayagiri Stupa and Monastery
3 Mahathupa (Ruwanvalisaya) and Monastery
4 Jetavana Stupa and Monastery
5 Mirisaveti Stupa and Monastery
6 Dakkhina Stupa and Monastery
7 Ranmasu Uyana
8 Isurumuniya
9 Vessagiriya
10 Toluvila (Pancavasa Monastery)
11 Pacinatissa (Pancavasa Monastery)
12 Puliyankulama (Pancavasa Monastery)
13 Pankuliya (Pancavasa Monastery)
14 Vijayarama (Pancavasa Monastery)
15 Kiribath Vehera (Pancavasa Monastery)
16 Halmillakulama (Reservoir)
17 Bulankulama (Reservoir)
18 Basavakkulama (Reservoir)
19 Tisavava (Reservoir)
20 Nuvara-vava (Reservoir)
21 Puliyankulama (Reservoir)
22 Malvatu Oya (Stream)
23 Western Monasteries (Tapovana)

Figure 2.7
City plan of Anuradhapura

§ 2.1.6 Irrigation Engineering

Being agriculturists in a system based on paddy cultivation, the early settlements were concentrated on riverbanks of the dry zone. Although the Indo-Aryan colonizers brought with them a basic knowledge of irrigation, the need to combat the prolonged droughts of the dry zone demanded a much more organized artificial irrigation system than before. In the pre-Christian era, village reservoirs of modest size to store water for irrigation became the characteristic feature of the agricultural and cultural landscape. From this basic understanding of water storage, a vast methodology of hydraulic engineering was developed within a short period. This consisted of building up a complex system of reservoirs, damming rivers, and constructing canals and anicuts. The kings, influenced by the Asokan discourse on kingship, initiated massive irrigation projects as public works for the sustenance of agriculture, not only within the principal political center of Anuradhapura, but in the whole of Sri Lanka's north central plain. Water was diverted along artificial canals to irrigate paddy fields. King Vasabha of the 1st century AC is regarded as the first significant builder of reservoirs and canals of great dimension. King Mahasena (276-303 AC) was the greatest builder of tanks of colossal proportions. The Kalavapi of King Dhatusena (459-477 AC), father of the founder of Sigiriya, carried water to Tissavapi in Anuradhapura through the 86-kilometer-long artificial canal called Jaya Ganga.[32] The country, which lacked inland natural lakes, was gradually transformed into a landscape dotted with hundreds of reservoirs of different sizes, which were interconnected by an intricate network of canals of different gradients traversing the gently undulating terrain of the dry zone. The philosophy of water conservation and management of this agro-based society was that 'every drop of water that falls on the island must not flow into the ocean without serving its people' (Culavamsa chapter LXVIII:8-10).[33]
Taking full advantage of the differences in the natural contours of the topography, reservoirs were organized into a linear cascading sequence (figure 2.8) to allow efficient water management (Madduma Bandara, 1985).[34] The water management for

32 Also see Parker (1909), Brohier (1934-1935) and Fernando, D. N. (1980) for detailed descriptions of irrigation works.

33 Ellepola (1990:173) comments that although this famous statement was made by King Parakramabahu in the 12th century, other Sri Lankan monarchs were probably less articulate; yet the philosophy of water conservation was traditional from very early times.

34 Artificial reservoirs are linearly connected forming cascades, allowing surplus water from upstream reservoir(s) and return flow from upstream command area(s) to reach the reservoir immediately downstream. This facilitates the reuse of water in the command area of the downstream reservoir, and in effect increases the water available for irrigation.

cultivation was developed with great skill using many expedients. Among these, the well-known cistern (Biso-Kotuwa) played a singular role. A valve-pit locked the waters of the tank, which were released through sluices in an ingenious method. Hydraulic engineering was thus one of the greatest skills acquired by the people. Consequently, there was a considerable agricultural surplus to provide a basis for a stable economy and sustain a large non-agrarian community of monks, artisans, craftsmen, and so on, in addition to the royal court and military personal. This surplus, on the other hand, allowed kings to construct monumental religious structures such as stupas, which dominate the landscape. Water was the most precious and treasured commodity in this hydraulic civilization. This fact is vividly reflected in the famous Dhatusena-Kasyapa story as recorded in the chronicle Culavamsa (chapter XXXVIII:103). The response given by former King Dhatusena to his son Kasyapa, when the latter, in captivity and facing death, demanded treasures of the state, was to show nothing but the waters of Kalavapi, which he had constructed during his reign as the wealth of his prosperous kingdom. Therefore, at the time of the laying out of Sigiriya by Kasyapa in the 5th century AC, the country possessed a vast knowledge of hydraulic engineering with centuries of practical experience of water management (Ellepola,1990:175).

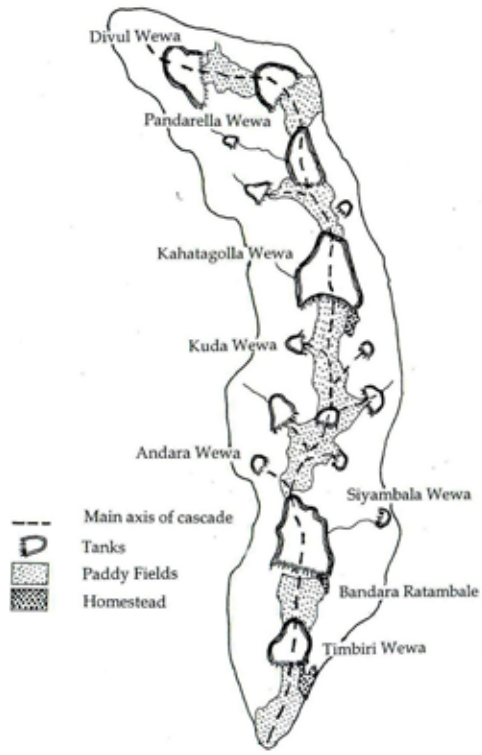


Figure 2.8
Organization of reservoirs into a linear cascading sequence (courtesy: Abeywickrama, 1991)

§ 2.1.7 Pleasure Activities of Royalty

Despite making indirect reference to water festivals associated with royalty[35] and having the physical remains of pleasure gardens at Anuradhapura, such as Ranmasu Uyana, chroniclers do not specifically record the nature of the activities associated with pleasure gardens. Since such activities were connected with sensual pleasure, Dissanayake (2003:50-51, 2009:28) suggests that the author of the Mahavamsa deliberately omitted such activities as they were against the Buddhist philosophy. The insignificant location of Ranmasu Uyana in relation to the overall city plan of Anuradhapura (figure 2.7) also indicates that the Asokan discourse on kingship would have also discouraged an emphasis on the pleasure activities of royalty as a major item of the official royal program of kings.

Although there are no records available in the chronicles on the nature of the pleasure activities of royalty, studies of the Jataka stories and other Sinhala literary works, mostly dating from the 10th century onwards (Gooneratne, 1983; Dissanayake, 2003:231-242), show that garden sports *(uyan-keli)* and water sports *(diya-keli)*, which took the form of royal ceremony, were part of Sri Lankan courtly life,[36] and the royal pleasure garden was the main theater for such activities. The pleasure gardens were not only meant for the king and his immediate family, but for a multitude including the nobility and harem as well. These studies further indicate that these pleasure activities were held for a significant duration of the day, and the water sports were held after the garden sports, suggesting that water sports were the climax of the pleasure program of royalty. The rock-cut reliefs of elephants dallying among lotuses and squirting water over themselves and each other, on either side of a royal bath house at Ranmasu Uyana, and the liveliness of the movement of the elephants carrying lotuses in their trunks and engaging in water sports, as depicted in a landscape composition painted on a rock ceiling at Kotiyagala, very well express the mood of water sports of the period.[37] Moreover, water sports mainly involved women, and these literary works give vivid descriptions of the specific garments, female make-up including the hair dress

35 The Mahavamsa mentions that King Devanampiyatissa (3rd century BC) arranged a water festival for dwellers in the capital before he set forth to the Missaka Mountain (chapter XIV:1-2), and Prince Dutugemunu (2nd century BC) made a tank near Kasa Mountain near Anuradhapura and held a water festival during his campaign against King Elara of Anuradhapura (chapter XXV:50-51), and another with women in the harem for a whole day after his consecration ceremony at Tisavava (chapter XXVI:6-10).

36 Also see Geiger (1960:62).

37 See Jayasinghe, G. and Rassapana (2003:26) for the reproduced paintings of elephants at Kotiyagala.

and decoration, and the sensual mood associated with water sports. A painted female figure at Kotiyagala,[38] in the attitude of decorating herself with flowers, also shows this. Gooneratne (1983:6) observes that in most literary works the women participating in water sports are described as wearing red dresses, while in some it is said that they wore red and blue garments. Very often, the Sinhala poet saw women engaged in water sports as lightning accompanied by dark rain clouds, symbols associated with rainmaking (Gooneratne, 1983:7). Godakumbure (1970) suggests that water sports themselves could be considered as part of a fertility cult. Since ancient Sri Lankan society mainly depended on irrigated water, Godakumbure attempts to support his argument by considering the connection of the king with rainmaking, the role of the Rain-God and the relationship between water, fertility and various Sri Lankan Buddhist festivals and ceremonies. The connection between the pleasure parks themselves and rainmaking is further strengthened by an incident recorded in the Mahavamsa (chapter XI:2-3), when a great cloud gathered over the site selected for the laying of a pleasure park at Anuradhapura by King Mutasiva (307-247 BC) and poured forth non-seasonal rain. Due to this incident the park was named Mahamegavana (the park of the great cloud). Dissanayake (2003:238) also suggests that it was customary for kings as the prosperity makers of the kingdom to engage in different activities associated with pleasure gardens to bring forth rain, and hence the pleasure gardens were considered as symbols of rainmaking and prosperity.

§ 2.1.8 External Contacts

The island of Sri Lanka occupies the southernmost position of mainland Asia in the Indian Ocean, and latitudewise it is almost on the Equator, where the annual monsoon effects and navigational winds blow for three months of the year in one direction and change direction for another three months. It was also the halfway point between the two great empires of Rome and China. Due to the uniqueness of Sri Lanka's geographical position, the island became a continuous navigational hub in relation to ancient and medieval trade between the Mediterranean and the China seas along the silk route of the sea[39] (figure 2.9). Therefore, besides cultural contact with India due to close proximity to mainland Asia, the island has a long history of international exposure and transoceanic communication with other parts of the ancient world,

38 See Jayasinghe, G. and Rassapana (2003:25) for the reproduced female figure at Kotiyagala.

39 Also see Huzayyin (1942).

through international trade and commerce. The most valuable merchandise from Sri Lanka were pearls and gemstones, hence the island name of Ratnadipa (Island of Gems). Referring to the 6th century AC vivid account (Topographia Christiana XI) by the Greek writer Cosmas Indicopleustes, in which he refers to the chief Sri Lankan port at Mantai on the northwestern coast as the 'great emporium', Silva (1988:1-4) suggests that Sri Lanka was the port-of-return in the region for maritime trade vessels from Chinese ports in the Far East and from Roman and other Red Sea ports in the West, and an ideal international center for barter and exchange. In the wake of such trade activity, the envoys of King Bhatika Abhaya (19 BC-9 AC) were sent to the Roman Empire (Weerakkody, 1990:158). Silva (2006:3-4) therefore argues that the financial resources for such massive undertakings as the construction of great stupas at Anuradhapura came equally from the income derived from exporting precious items and custom duties and other levies on international trade and commerce, and from agriculture.[40]

Figure 2.9
Ancient maritime trade routes between Rome and China (based on Huzayyin, 1942)

40 Also see Kiribamune (2000).

It is mentioned in 5th and 6th century foreign records[41] that Arab merchants and a Persian community were living in the city of Anuradhapura, which was, no doubt, due to such international trade activity. Many items of trade from the Far East and the West, such as stoneware and porcelain from China, and glazed ceramics and glass vessels from West Asia and Rome, have been unearthed during excavations at the seaport of Mantai as well as at Anuradhapura (Ratnayake, 1990; Prickett-Fernando, 1990). The archaeological excavations conducted at Sigiriya have also unearthed Roman and Indo-Roman coins as well as earthenware utensils belonging to the Sassanian dynasty (222-651 AC) of ancient Persia (Codrington, 1924:32-33; Bandaranayake, 1984:17, 1993a:25-26; Bopearachchi, 1990, 1996:70-71). Graffiti numbers 219, 221 and 230 on the Mirror Wall of Sigiriya mention silk, while in verse number 399 "Chinese silk" is clearly mentioned (Paranavitana, 1956:134, 135-136, 141, 248).

Therefore, in this context it could be assumed that international maritime trade and commerce contributed considerably to raise funds to lay out the massive complex at Sigiriya in the 5th century AC.

§ 2.2 Sigiriya: A Basic Introduction

§ 2.2.1 Historical Context

Located in the dry zone of Sri Lanka's north central uplands, Sigiriya is approximately 160 kilometers northeast by road of the present capital city of Colombo. The expansion of archaeological activity at Sigiriya in recent times reveals that the first occupant of this site was Mesolithic man (circa 3rd-2nd millennium BC). Rock shelters, mainly to the east of the central rock, were used with an occupational sequence starting nearly 5,000 years ago (Adikari, 1994; Karunaratne, P. and Adikari, 1994). However, the first significant interventions to the natural landscape occurred during the early historic period (3rd/2nd century BC up to the 1st century AC), with the establishment of a rock-

41 The accounts of a visiting Chinese scholar monk of the 5th century AC (A Record of Buddhistic Kingdoms) and Greek writer Cosmas Indicopleustes of the 6th century AC (Topographia Christiana XI), as cited by Silva (2000:59)

shelter associated with Buddhist monastic settlement on the western slopes adjacent to the main rock. At least 30 rock shelters in this area were adapted as dwellings of the monastery. These early monastic cave dwellings are marked by a drip-ledge cut along the brow so as to prevent rainwater flowing into them. Some of the caves contain donor-inscriptions carved just below the drip-ledge.

The site became nationally famous due to a significant event of the island's history, when Kasyapa (477-495), a son of King Dhatusena (459-477) by a wife of unequal birth, and hence not the lawful heir to the throne, assumed the kingship by a palace conspiracy, which ultimately led to the execution of his own father by having him walled in alive. Moggalana, his half-brother, born of the anointed queen and heir apparent to the throne, fled to India. According to the chronicle Culavamsa (chapter XXXIV:1-19), Kasyapa, fleeing the inevitable return of Moggalana, sought refuge in the inaccessible stronghold of Sigiriya (about 60 kilometers southeast of the then capital Anuradhapura). The chronicle further mentions that Kasyapa built a palace on the summit of the gigantic rock of Sigiriya by defending it with walls, and engineered a staircase in the form of a lion, which gave the name of the site Sihagiri (Lion Rock). Most of the remains exposed at the site are attributed to the major constructional phase of the 5th century AC (Kasyapan period), considered as the brightest age of Sigiriya (Bandaranayake 1993b:114). However, the capital was short-lived (only during the reign of Kasyapa), ending abruptly with the return of Moggalana from India and the subsequent death of Kasyapa by slashing his throat with his own dagger on the battlefront. Moggalana, not interested in his rival brother's royal center, handed over the site of Sigiriya to Buddhist monks.

During the post-Kasyapan period commencing from the late 5th century to the 13th century AC, parts of the Sigiriya complex were converted for Buddhist monastic use by altering or modifying earlier structures to accommodate the needs of the monks. These latter interventions, however, did not affect the overall original physical layout of the Kasyapan period (Bandaranayake 1993a:24). Historical sources continue to record that there were two incidents of further assassination of royalty at Sigiriya, of Samghatissa II and Moggalana III at the beginning and end of the 7th century AC, respectively, indicating that the site did not entirely lose its political significance even after its partial conversion for monastic use (Basnayake, 1983:5-6).

The graffiti inscribed at the site by numerous visitors to Sigiriya, which are dated to a period from the 6th to the 13th or 14th centuries AC, also demonstrates that after the abandonment of the site as one of the major political centers at the end of the 5th century, it was visited purely for its secular and aesthetic value (Bandaranayake 1993b:122). Sigiriya has, therefore, a long-standing record of being a destination of cultural tourism commencing from the 6th century. After the 13th or 14th century AC, the site was almost abandoned, and in the 16th and 17th centuries it was a distant military outpost of the Kandyan kings. With the final abandonment of the site after the 17th century AC, Sigiriya was overrun by the ever-advancing nature.

The structures and numerous other creations, once viewed in elegance and splendor, were completely in ruins or buried in debris when Sigiriya came into focus as a site of antiquarian value in about the 1830s. Archaeological activity has been conducted from

1894. Mentioned in the chronicles as a hideout of a patricidal king, who seized the throne from his father, the primary attention of early archaeologists was to explore the site as a stronghold (ASCAR, 1895:10). Although the evidence of a 'pleasure garden' was also noticed during this period (ASCAR, 1899:7), the unreachable rock summit, fortified by a series of moats and ramparts, would have undoubtedly encouraged early archaeologists to proceed on the above lines. However, it was only from the late 1940s that archaeologists began to interpret the site as an example of built landscape, with the exposure of a water-associated pleasure garden to the west of the rock (ASCAR, 1953:15-19; Paranavitana, 1972a:40).
Sigiriya has been inscribed as the 202nd site on UNESCO's World Heritage List in 1982 under Criteria II, III and IV,[42] due to its outstanding universal values.[43]

§ 2.2.2 Physical Characteristics

Since the physical elements of Sigiriya have been described in great detail in several publications (ASCAR, 1894-1900, 1902, 1905, 1949, 1951-1953, 1965; Paranavitana, 1950, 1956, 1961, 1972a; De Silva R. H., 1976; Bandaranayake, 1984, 1990a, 1993a, 1993b, 2005; Dissanayake, 2003, 2011), what is attempted below is not to reproduce or summarize such information, but to provide an overall picture of the physical characteristics to form a background for the present study.
As it appears today, Sigiriya is centered on a monumental rock, a residual of denudation, which rises abruptly to a height of about 180 meters above the surrounding plain or 360 meters above the mean sea level (MSL), with sheer cliffs on all sides. Like a giant pebble, the rock sits on a natural hill, whose escarpments are dotted with natural boulders of varying size and picturesque appearance. The outer limits of this hilly terrain, which roughly follow the 200-meter contour line, is defined by a massive wall of roughly dressed stone, faced with brick in the west, and

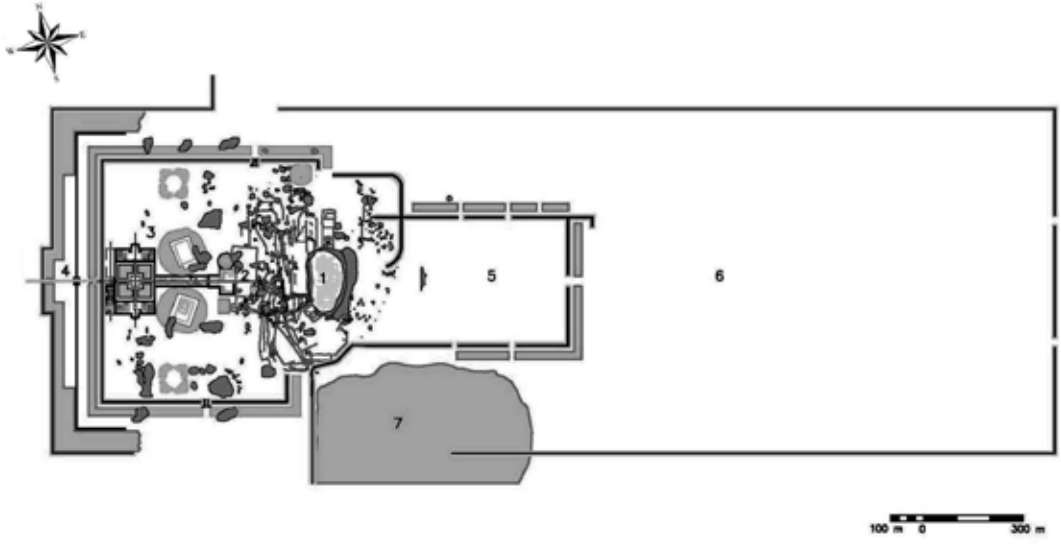
42 The definitions of the criteria which were current and in use at the time of the nomination of Sigiriya for inscription on the World Heritage List are as follows:
Criterion II : Have exerted great influence, over a span of time or within a cultural area of the world, on developments in architecture, monumental arts, or town planning and landscaping.
Criterion III: Bear a unique or at least exceptional testimony to a civilization which has disappeared.
Criterion IV: Be an outstanding example of a type of structure which illustrates a significant stage in history.

43 The Outstanding Universal Value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity (UNESCO, 2008:14).

by high earthen ramparts in the northeast and southeast (figures 2.10, 2.11, 2.12). This walled-in hilly terrain is roughly elliptical in plan and about 15 hectares in extent. Extending to the east and west beyond it are two inner rectangular precincts, each fortified by an earthen rampart and a moat in succession. The inner eastern rectangular precinct measures about 500 meters north to south, and 700 meters east to west, while corresponding measurements of the inner western rectangular precinct are 900 meters by 800 meters. The inner western rectangular precinct is further fortified by a brick-built (middle) rampart beyond the inner moat. An outer earthen rampart, which forms a large and elongated rectangle, encompasses the central rock, the walled-in hilly terrain and two rectangular precincts to the east and west. This rectangle, which measures about one kilometer north to south and three kilometers east to west, thus creates two outer precincts to the east and west beyond the inner eastern and inner western precincts. Just inside the outer rampart on the western limit of the outer western precinct is another wide moat. All the rectangular enclosures are symmetrically laid out on a single east-west axis, which cuts across Sigiriya rock at its center. The principal gateways of the complex in the east-west direction are also set on this axis. Extending further southwards from the outer limits of the hilly terrain is the partly man-made and partly natural Sigiri Mahavava (great Sigiriya reservoir), which is formed by an earthen bund nearly eight kilometers long. A rocky fortification, presently known as Mapagala (Rock of the Viceroy), borders the Sigiri Mahavava to the west, as well as the outer earthen rampart to the south. This fortification is linked to the hilly terrain at the south through the earthen bund of Sigiri Mahavava (figure 2.13).

Figure 2.10
Satellite image of Sigiriya and its immediate environs (courtesy: Google Earth)

Figure 2.11
Semi-aerial view of Sigiriya from the northwest (photo: Dominic Sansoni/ThreeBlindMen)



1. Palace on Rock Summit
2. Walled-in Hilly Terrain
3. Inner Western Precinct
4. Outer Western Precinct
5. Inner Eastern Precinct
6. Outer Eastern Precinct
7. Sigiri Mahavava

Figure 2.12
Plan, Sigiriya

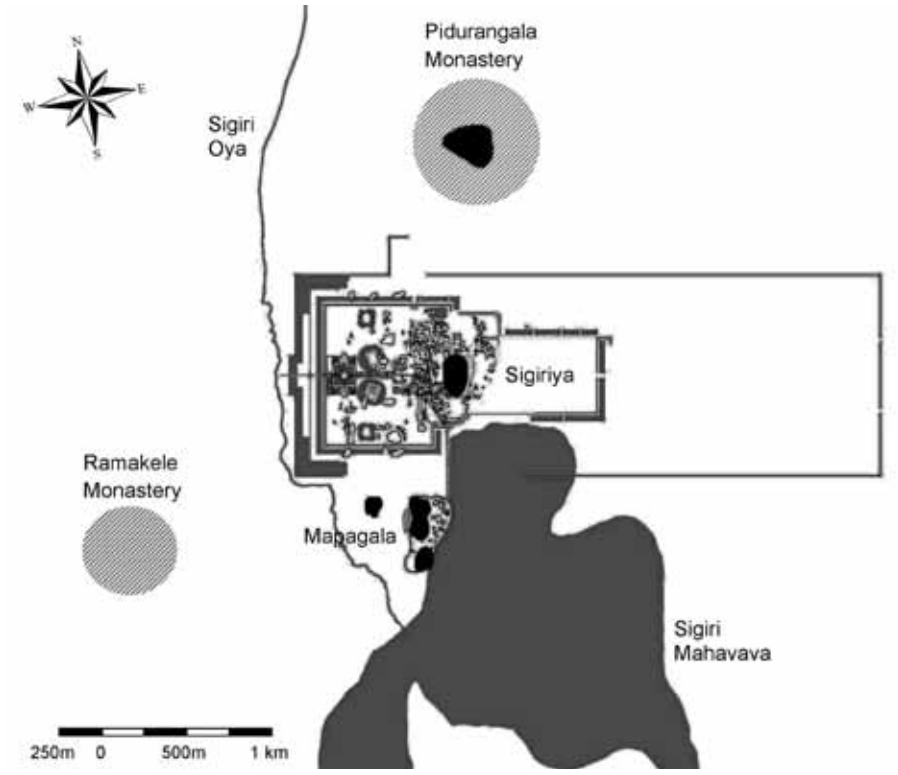
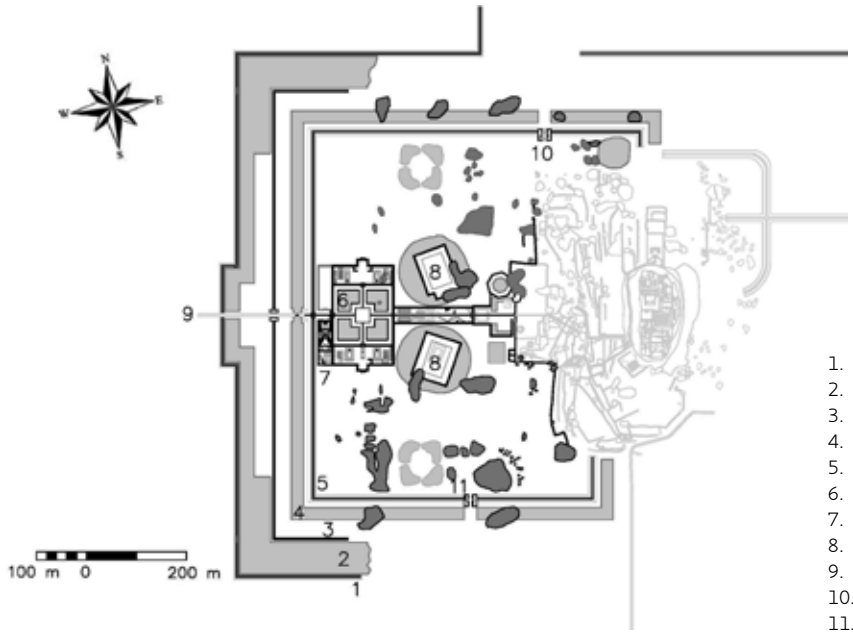


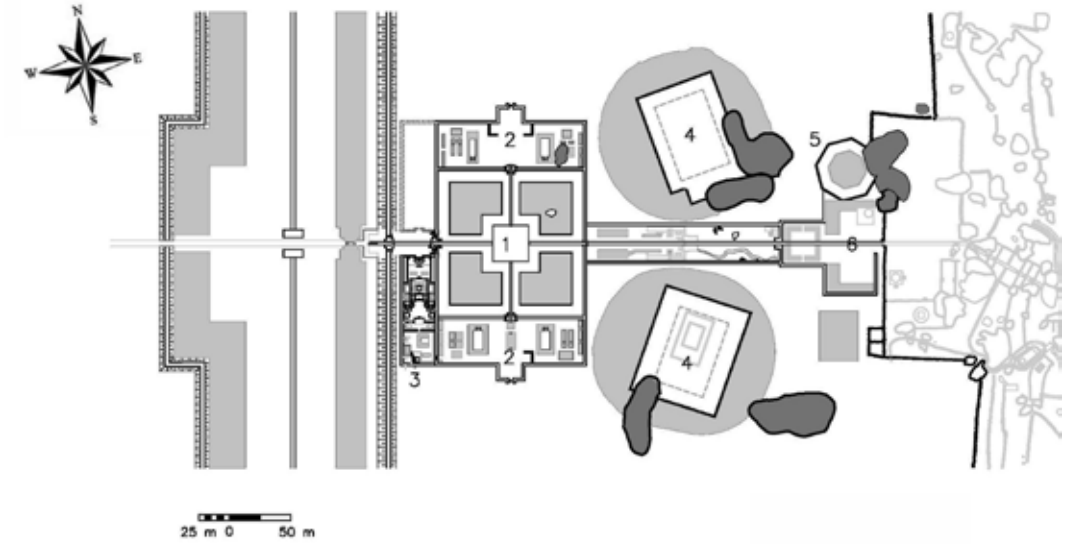
Figure 2.13
Greater Sigiriya showing Mapagala, Pidurangala, Ramakele and Mahavava

The inner western rectangular precinct (average elevation: 195 meters above MSL) has gateways on the north, south and west across its inner moat and through the rampart (figure 2.14). An axial pathway traverses the whole east-west length of this precinct from the western gateway to its eastern limit, where the main gateway to the walled-in hilly terrain is placed. The central zone of this precinct is dominated by water-associated structures, such as reflecting pools and ponds, fountains and serpentine streams, bathing pools and changing rooms, moated island structures and summer palaces, arranged in a symmetrical order along its east-west axis (figures 2.15, 2.16, 2.17). These water bodies are fed by a network of surface and subsurface hydraulics, which operates on the principle of gravity and pressure. A rectangular compound associated with a 'four-quartered' landscape feature is located transversely across the east-west axis within this precinct (figure 2.18). This landscape feature originally had a central pavilion at the intersection of the main axis and the transverse axis. This landscape feature is reminiscent of the well-known garden form found within the 'paradise gardens' of ancient Persia, of which the Sigiriya version is one of the oldest surviving examples (Bandaranayake, 1993a:24-25, 1993b:123).



1. Outer Rampart
2. Outer Moat
3. Middle Rampart
4. Inner Moat
5. Inner Rampart
6. 'Four-quartered' Feature
7. Miniature Water Garden
8. Summer Palace
9. Western Approach
10. Northern Gate
11. Southern Gate

Figure 2.14
Plan, western precincts



1. Four-quartered Feature
2. Outer Compartment
3. Miniature Water Garden
4. Summer Palace
5. Octagonal Pond
6. Axial Pathway

Figure 2.15
Plan, central zone of the western precincts

Figure 2.16
Central zone of the inner western precinct from the rock summit

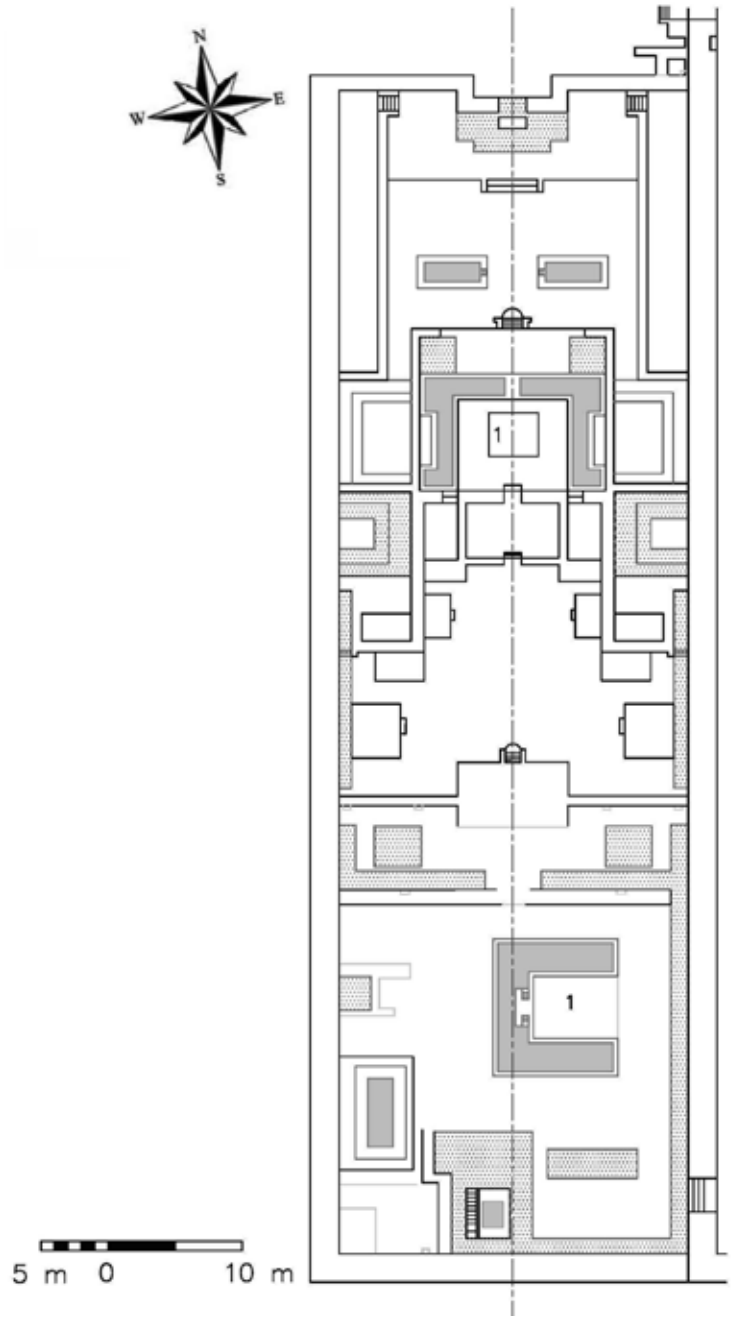
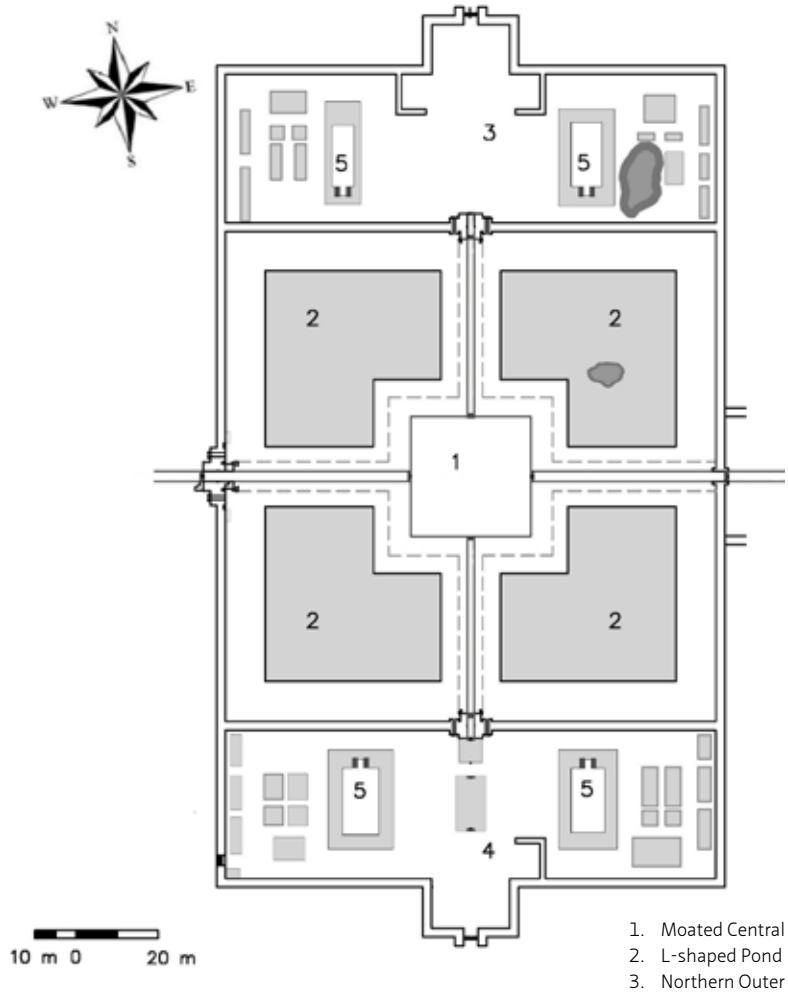


Figure 2.17
Plan, Miniature Water Garden

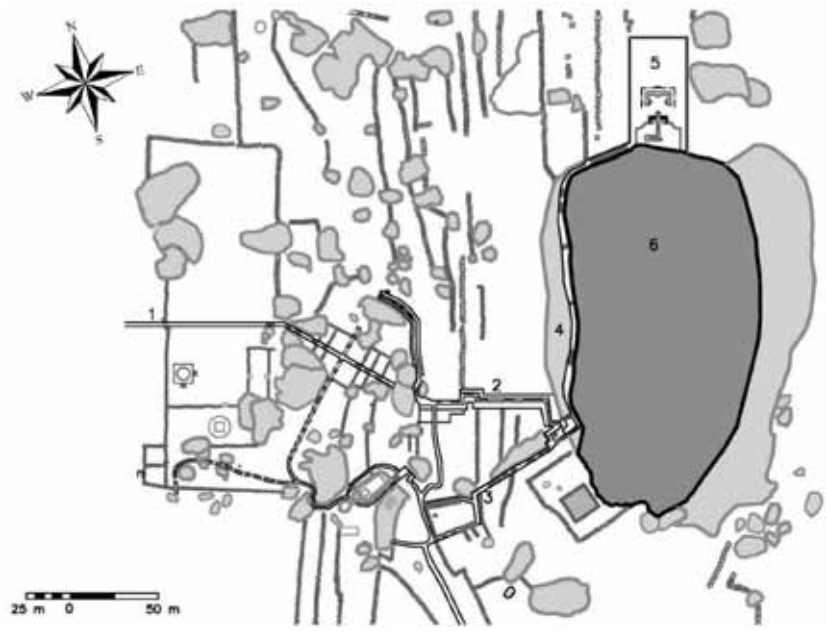


1. Moated Central Pavilion
2. L-shaped Pond
3. Northern Outer Compartment
4. Southern Outer Compartment
5. Pavilion

Figure 2.18
Plan, four-quartered feature

Dotted with natural boulders of varying size and picturesque appearance, the hilly terrain is formed into a series of ascending terraces towards the base of the rock (figures 2.19, 2.20). These terraces are linked to each other by means of flights of steps. The cut-marks on nearly all the boulders indicate that they had a structure erected on top while the natural overhanging at their base served as rock-shelters (figures 2.21, 2.22). These rock-shelters were originally utilized by Buddhist monks of the pre-Kasyapan monastic phase. A few constructional works associated with the interiors of the rock-shelters and some retaining walls are also attributed to this period (Bandaranayake, 2005:10-15). The soffits of these rock-shelters below their

drip-ledges were plastered and painted during the Kasyapan phase and have close similarities to those of the main rock face. The ceiling painting on the rock-shelter popularly known as the Cobra-hood Cave is of a different type showing a geometric pattern (figure 6.1). Winding pathways are laid out through the arches, courtyards and alleys formed by these boulders (figures 2.23, 2.24). Two main access routes to the rock summit in the form of ascending flights of steps traverse the western and southwestern escarpments to converge at a brick-built gatehouse on the southwest base of the main rock (about 250 meters above MSL).



1. Western Entrance to Hilly Terrain
2. Western Route
3. Southwestern Route
4. Pathway associated with Mirror Wall
5. Lion Plateau
6. Main Rock

Figure 2.19
Plan, western escarpment

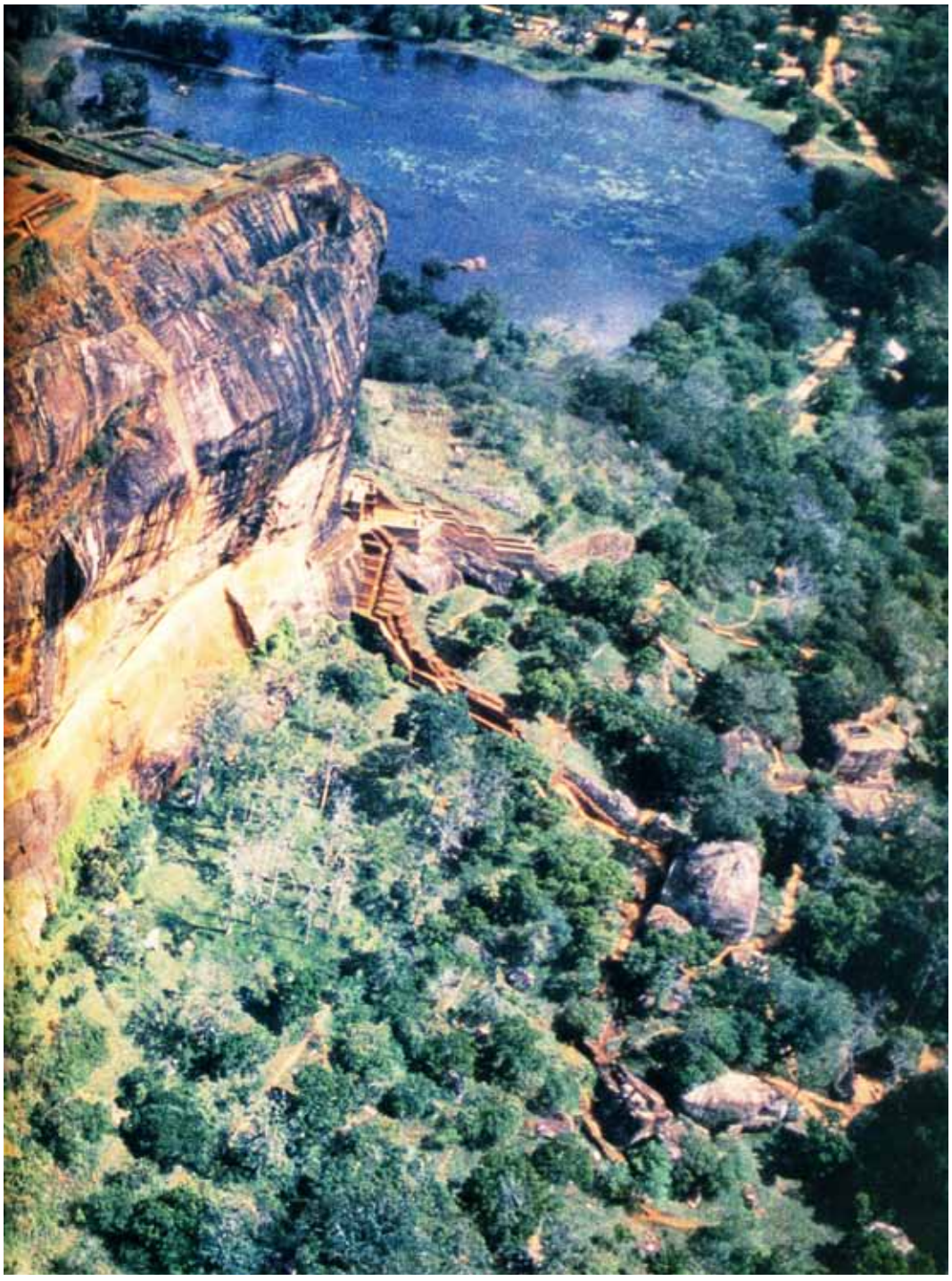


Figure 2.20
Semi-aerial view of the western escarpment (photo: R. Swathe Inc.; courtesy: Bandaranayake, 1993b)

Figure 2.21
Boulder showing the cut-marks on the top to receive the brick masonry of a structure

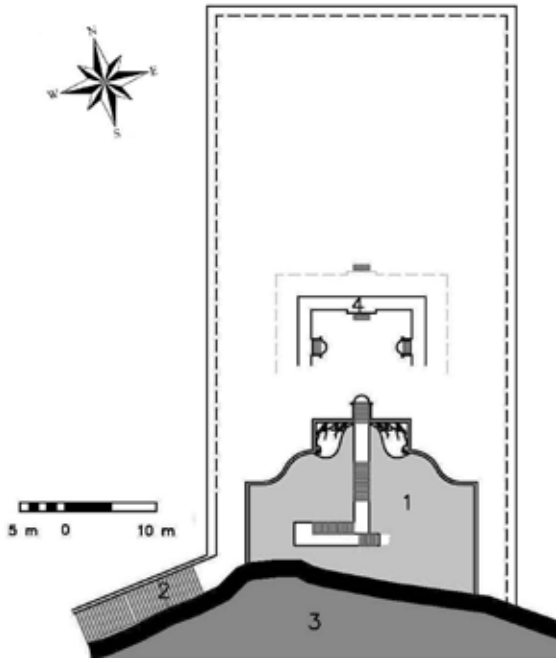
Figure 2.22
A rock-shelter at the base of a boulder

Figure 2.23
Boulder arch No. 01

Figure 2.24
Boulder arch No. 02

An elevated pathway, punctuated by a short flight of steps and set along a collar-like declivity of the western rock face, at an average height of 15 meters above the base of the rock, runs northwards from this gatehouse. This pathway is protected by a high brick-built parapet wall on its western edge, and by the natural overhang of the rock on top (figure 2.25). Popularly known as the Mirror Wall, due to its highly polished plaster on the internal surface, this parapet wall contains poems and other graffiti inscribed by ancient visitors to the site from the 6th to the 13th or 14th centuries AC, who recorded their emotional expressions of the site (Paranavitana, 1956; Priyanka, 1990, 1994, 2010). The drip-ledge cut at the brow along the entire length of the western and part of the northern rock faces prevented rainwater flowing along the surface into this pathway. This protected pathway winds around the northwest corner of the rock and continues along the northern face as rather a steep stairway built on firm ground, to lead on to an elevated and elongated plateau. This plateau (about 300 meters above MSL), which protrudes northwards from the northern rock face, measures about 64 meters north to south and 32 meters east to west (figures 2.26, 2.27). Built on this plateau against the northern vertical face of the rock and facing north is a staircase-house in the form of the forepart of a colossal lion. At present, only the massive forepaws of the so-called Lion-Staircase-House and an internal passage with flights of steps leading up towards the rock summit have survived (figure 2.28). The final ascent to the summit of the rock from this so-called Lion Plateau is, therefore, firstly through this Lion-Staircase-House and then along a protected zigzag stairway above it, built on the northern vertical face of the rock, of which only the crevices cut on the rock surface to support the masonry work of the stairway have survived.

Figure 2.25
The Mirror Wall and the pathway



1. Lion-Staircase-House
2. Pathway/Stairway associated with Mirror Wall
3. Main Rock
4. U-shaped Structure

Figure 2.26
Plan, Lion Plateau

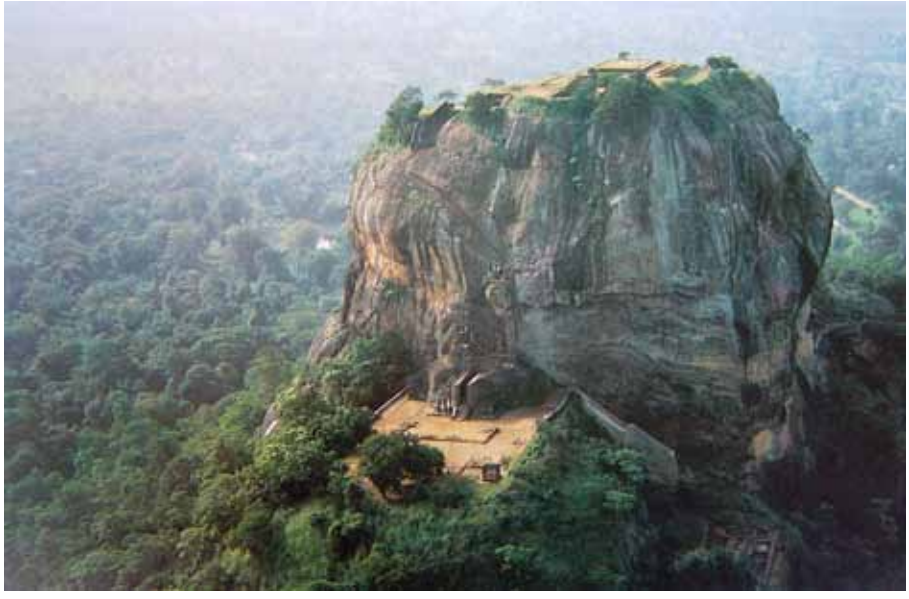


Figure 2.27
Semi-aerial view of the Lion Plateau which protrudes from the northern rock face (photo: Dominic Sansoni/ ThreeBlindMen)

Figure 2.28
Remains of the Lion-Staircase-House (note the crevices cut on the upper part of the rock surface to support the masonry work of the zigzag stairway above the Lion-Staircase-House to reach the rock summit) (photo: Dominic Sansoni/ThreeBlindMen)

The area below the horizontal drip-ledge cut high up along the length of the western and northern rock faces was originally plastered and painted with the famous Sigiriya Ladies (Sigiri landun), only 19 of which have survived on adjacent depressions of the western rock face above the protected pathway[44] (figure 2.29). This painted band was originally about 140 meters long and, at the widest, about 40 meters high (Bandaranayake, 1986a:26). According to some graffiti scrawled on the Mirror Wall, there had probably been approximately 500 such figure paintings originally. This would have been, according to John Still (1907:43), a British civil servant of the early 20th century, perhaps the largest picture in the world. In this painting composition, only the upper part of the body of the ladies, cut off about 20 centimeters below the waist by clouds, are shown floating among the clouds.[45] Similar paintings of the ladies are also found on one of the rock-shelters

44 Three more depressions, higher up on the western rock face, also contain plaster and pigments and fragments of a painted figure.

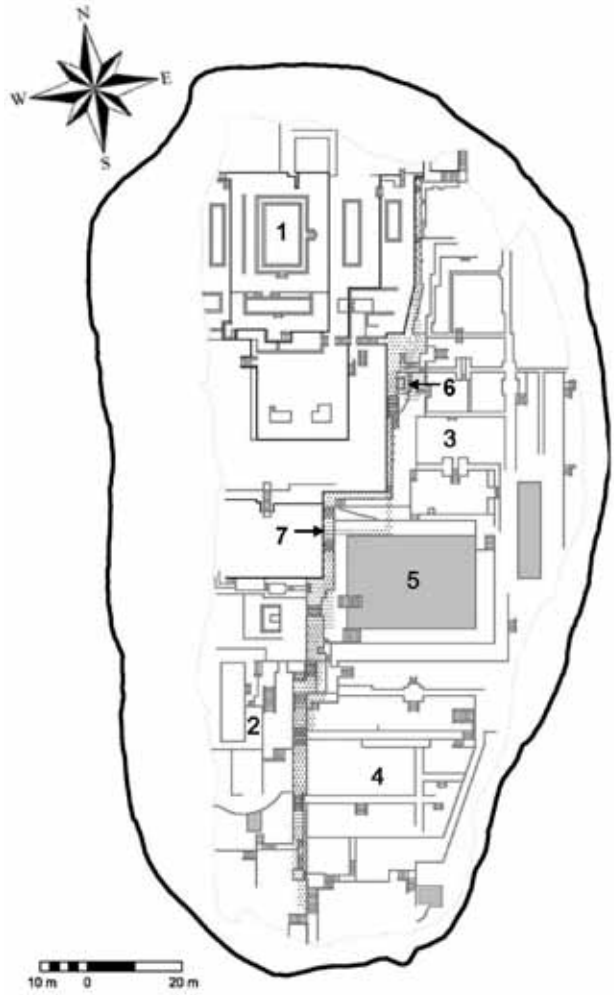
45 The terracotta figurines unearthed in excavations at the western escarpment of the hilly terrain display close similarities in general form and concept to the ladies painted on the rock face. Bandaranayake (1993c) dates these exquisite figurines to the period between the 7th and 10th centuries, and believes that they may have been replicas of the painted ladies, used as souvenirs to be carried away by visitors to Sigiriya.

situated on the hilly terrain, the only difference being that they are not cut off below the waist by clouds, and hence are full figure representations with legs bent in a flying posture. A painted lady and pigments discovered on the plastered outer surface of the Mirror Wall in 2004 (Wagaachchi, 2005) indicates that the whole of the outer surface of the Mirror Wall was also painted in a similar manner to that of the rock face. However, the surviving painted figure indicates that it is also a full figure representation very much similar to the painted figures of the rock-shelters of the hilly terrain.

Figure 2.29
Remnants of the plaster band on the rock face showing the Sigiriya Ladies floating among clouds (photo: Gamini Jayasinghe; courtesy: Bandaranayake 1986a)

Roughly elliptical in plan and about 1.5 hectares in extent, the summit of the rock is occupied by palace buildings, service structures, rock-cut and brick-built pools and water retaining structures as well as gardens and terraces (figures 2.30, 2.31,

2.32). Another interesting feature is an east-facing rock-cut seat which was originally provided with a canopy (figure 2.33). Running at the middle and entire north-south length of the rock summit is a limestone-paved pathway which links various spaces on either side (figure 2.34). The entire rock summit was originally surrounded by a parapet wall rising from the slopes below the edge, on almost the total periphery of the rock (figure 2.35). Originally concealed within the parapet wall surrounding the rock summit, a north-south running drain of considerable cross-section cut on the western cliff was used to collect the rainwater run-off of the western sector of the rock summit. A vertical drain cut on the southwest face of the rock carried the water down to a cistern built at the base of the rock.



1. Main Palace
2. Other Palace Structures
3. Upper Palace Garden
4. Lower Palace Garden
5. Pool
6. Rock-cut Seat
7. Limestone-paved Central Pathway

Figure 2.30
Plan, rock summit

Figure 2.31
Rock summit (view from southeast) (photo: Dominic Sansoni/ThreeBlindMen)

Figure 2.32
The large rock-cut pool at the rock summit

Figure 2.33
The rock-cut seat at the rock summit (note the post-holes at the floor level that supported a wooden structure for the canopy) (photo: M. W. E. Karunaratne)

Figure 2.34
Limestone-paved central pathway at the rock summit

Figure 2.35
Rock summit showing the cut-marks to receive the brick masonry. Extending up to the very edge of the cap-rock, these cut-marks indicate that the compound of the palace complex rose from the slopes below the edge of the rock (courtesy: Prema 2001)

Figure 2.36
Ritual center of the post-Kasyapan monastic phase

The inner eastern precinct, which has its gateways at the north, east and south across the moat and through the rampart, is still to a large extent uninvestigated, but there was at least one large centrally located, pillared pavilion built on a rock outcrop along the east-west axis, of which only the postholes have survived. The little-investigated outer eastern precinct also contains a stone-pillared square structure across the moat, just outside the northern gateway to the inner eastern precinct.

The post-Kasyapan interventions are also evident, and during this period some of the earlier structures were partly altered or modified to accommodate the monastic needs of monks. The ritual center, containing the stupa, Bodhi-tree shrine and cave shrine sheltering a Buddha image of the post-Kasyapan monastic phase located just inside the walled-in hilly terrain to the west, is a notable feature during this phase (figure 2.36). These latter interventions, however, did not affect the overall original physical layout of the Kasyapan period (Bandaranayake, 1993a:24).

Beyond the fortifications are the natural forest and agricultural landscape with rice fields, settlements, artificial reservoirs and agrarian infrastructure. The remains of several Buddhist monastic establishments dating to the 5th century are also scattered within the hinterland of Sigiriya, of which Pidurangala and Ramakele monastic remains are located to the north and southwest of Sigiriya, respectively.

Since the site was abandoned as a royal center in the latter decades of the 5th century, constant and continuous additions and rebuilding are relatively fewer as compared to the long-lasting royal centers. Therefore, with such outstanding architectural remnants that are mainly dated to the 5th century, Sigiriya provides valuable data and offers an excellent opportunity to discover the state of landscape design during the 1st millennium of the present era.

3 Previous Research and Interventions

§ 3.1 Previous Studies and Interpretations of Sigiriya

Sigiriya became a subject of modern antiquarianism from the 1830s due to the pioneering efforts of British colonial officials and travelers. The primary intention of these early visitors (Casie-Chitty, 1834; Frobes, 1840; Sirr, 1850; Anonymous, 1851; Bailey, 1853[46]; Tennent, 1859) were to record impressions of their visits to the site. The account on the rock, visible remains and paintings by Rhys Davids (1875), the detailed description of the site and the first layout plan of Sigiriya by Blakesley (1876), accounts on the site by Burrows (1885, 1887, 1889) and the documentation of paintings by Murray (1891) reflect a move away from the 'impressionist' attitude towards precise and reality-based descriptive documentation during the latter part of the 19th century. The Department of Archaeology (then Archaeological Survey of Ceylon) during its initial phase of work at Sigiriya from 1894 (like any other site of antiquarian value elsewhere in the country) initiated a program of documentation, site survey and exploration of an investigative nature, thus laying a foundation in the succeeding decades to formulate scholarly traditions of systematic documentation, study and interpretation of Sigiriya. Therefore, from its commencement of activity at Sigiriya in 1894 and up to 1982, when the Cultural Triangle Project commenced its work at the site, systematic documentation, study and interpretation of Sigiriya were almost exclusively carried out by the Department of Archaeology. However, there were a few exceptions, such as Coomaraswamy (1908) and Bandaranayake (1976), who as individuals contributed towards this task. With the establishment and commencement of the Cultural Triangle Project, the gates for these scholarly aspects were opened to various academics and professionals in other government sector institutions such as the Central Cultural Fund, the universities and even to those in private-sector institutions such as architectural/conservation consultancy firms. Therefore, more than a century of study and interpretation of Sigiriya indicates that scholarly interest in Sigiriya can be broadly divided into several aspects:

46 John Bailey (1853), A. Y. Adams and Wijekoon, accompanied by local villagers in 1853, were the first recorded explorers to climb the rock summit in modern times.

a. Understanding of the chronology of the site and related settlement research
b. Function and meaning of the overall scheme and of various features such as paintings and sculptures
c. Linguistic studies on graffiti
d. Design and technical aspects of city planning, architecture, landscaping, hydraulics, and so on
e. Studies of minor arts such as decorative features and figurines

Out of these, (b) and (d) are of special interest for the present study. What is intended in the following subsections, therefore, is not to critically evaluate the validity of the arguments, theories or hypothesizes, but rather to provide an overview of the conclusions of previous studies and interpretations to form a background for the present study.

§ 3.1.1 Function and Meaning

3.1.1(a) The Overall Scheme

Deraniyagala, P. E. P. (1951, 1958:2) holds the view that Sigiriya was a monastery fortress and served in turn as a fortress and monastery. Bandaranayake (2010b:116-117), by considering the site's archaeological sequence based on stratigraphic excavations, accepts that Sigiriya is a multiperiod site, but stresses that it has a major period of construction at a time commensurate with that assigned to Kasyapa's reign, which is preceded and followed by monastic phases, and that the overall plan and many features created during the major construction period were not fundamentally altered by other construction periods.
Paranavitana (1950:129-134, 1961) was the first scholar to scientifically reject the conception that defense was the primary motivation of its creators in selecting this particular location and designing such an elaborate scheme. Interpreting the clauses of the Culavamsa, that Kasyapa built a palace on the rock like unto a second Alakamanda (mythical Himalayan domain) and lived there like Kuvera (Lord of Wealth), Paranavitana (1950) brought forward a novel and alternative theory to explain various features of Sigiriya, which cannot be explained purely on military grounds. Paranavitana thereby attempts to relate Sigiriya as representing the cosmic Himalayan landscape, and its features as modeled upon the textual descriptions of the abode of Kuvera in the classical North Indian works of Kalidasa. This theory proposes that Sigiriya is a replica of Kuvera's Himalayan domain, with Sigiri Mahavava representing the sacred lake of Anotatta; the rock itself, which is north of Sigiri Mahavava – the

mount Kailasa, one of the highest peaks of the Himalayas, rising from the northern shores of Anotatta; the Aerial palace complex – the domain of Kuvera on top of Kailasa; the rock boulders on the escarpment immediately below the base of the main rock that were originally plastered – the snowy peaks of the lower Himalayas; the pathway associated with the Mirror Wall – the narrow mountain passage, Krauncarandhara, along the approach road to Kailasa; the Lion Plateau – Manosilatala (the platform of Red Arsenic); the painted ladies of darker and yellow complexion on the plastered rock face – the clouds and lightning princesses of Kuvera, respectively, suggesting that the palace of Kasyapa is above the sphere of the clouds. Paranavitana thus attempted to explain Sigiriya as an impression of the cult of divine royalty (the concept of God-king) and supported his argument by drawing parallelisms with monuments that had been influenced by such politico-religious conceptions from countries in Southeast Asia and had a common cultural background.
Bandaranayake (1986a:29), while welcoming the approach of Paranavitana in the study of historic works of art, also questions his conclusions,

'While these identifications may seem to us today an over interpretation too specific to accept on its totality – deriving from Paranavitana's attempt to see the Sigiriya palace and royal complex primarily as an impression of divine kingship – they do draw our attention to important sociological dimensions in the understanding of ancient works of art ... While such observation may be obvious at a certain level of generalization, to interpret individual details as specifically as Paranavitana tries to do is more difficult and require more rigorous analysis than he provides. Moreover to insist on the validity of a single interpretation is always inadequate.'

Further commenting on Paranavitana's concept, Bandaranayake (2010b:111) remarks,

'In essence, the scholarly consensus is that Paranavitana used his profound and wide ranging scholarship to 'prove' a concept that was based on a mistaken translation of the term devaraja in Cambodian inscriptions not 'the King who is a God' but 'the King of the God' ... Also that he used too elaborate an argument based on very thin evidence ... Nevertheless, it appeared that his main, underlying proposition was indeed very significant: that the social meaning of the Sigiriya complex was to express 'a politico-religious concept' by creating an elaborate mandala that would embody the elevated ritual position of the king, in residence in a palace on the summit, surrounded by complex architectural landscapes and astonishing works of art.'

While welcoming Paranavitana's attempt at reading the overall scheme of Sigiriya through the eyes of Kasyapa, its creator, and his method of going from 'totality' to 'specific' readings of individual but interconnected elements, Weerasinghe (2010:234) also thinks that Paranavitana's[47] identification of individual elements at Sigiriya are over interpretation.

Chutiwongs, Prematilleke and Silva (1990a:38) surmise that the Kalidasa's classical idealism of mythical Himalaya inspired Kasyapa in designing Sigiriya. Duncan (1990:54), a cultural geographer and semiologist, is also of the opinion that Sigiriya represents the clearest example of a cosmic city in early Sri Lanka. Seneviratne (1991:337) also believes that Kasyapa structured his Sigiriya abode to suit the descriptions of cosmology available to him at the time.

Liyanagamage (1984-1985) argues that Anuradhapura continued as the capital of King Kasyapa's kingdom, while Sigiriya was his pleasure resort. Bandaranayake (1990:24), however, points out that Sigiriya was the political capital of Sri Lanka during the reign of Kasyapa and argues that 'the most tangible expression of this is the remains of the great royal and urban complex at Sigiriya'. With more than a decade of field-based archaeological research, Bandaranayaka's (1994a:14-15, 2010a:28) interpretation of the scheme is that the rock summit, the (principal) royal residence with palace garden, the walled-in hilly terrain is the 'citadel' or the inner royal precinct; the inner western precinct – the royal park or the pleasure garden; inner eastern precinct – the 'ceremonial' precinct; the outer eastern precinct – the outer city; and the area beyond the outer rampart – the suburbs, villages and the Sigiri Mahavava (figure 3.1).

By studying descriptive accounts of the way a palace functioned in parallel Asian cultures together with the archaeological remains at the rock summit, Bandaranayake tentatively ascribes functions to the major structures and zones on the rock summit. According to this, the royal residence on the rock summit consists of three distinct zones: the inner or upper palace (central palace, west palace, east palace, palace reception hall and pavilion, south palace complex, including 'sun-set' pavilion, and so on) occupying the western half of the rock summit; the outer or lower palace (public reception hall, audience hall with the stone-cut throne, and so on) located on the

47 By interpreting the readings of ancient lithic records that are datable to a period well before the composing of the Culavamsa, Paranavitana (1972b) in his years of retirement formulated yet another alternative hypothesis to the classical version of the Sigiriya story, as described in the Culavamsa, where he suggests that Sigiriya, in fact, was not a creation of Kasyapa, but of Dhatusena, his father. Paranavitana thus revises his earlier hypothesis of 'God-King' and retheorizes that Sigiriya was an attempt by Dhatusena, in his yearning to be Parvataraja, the king of the mountains. The contents of this work, together with those of Paranavitana's two other research works (1966, 1971) are contested by several scholars (Indrapala, 1969; Gunawardena, 1972; Weerakkody, 1986; Guruge, 1996), and they are of the view that there could be no logical or scientific reason to accept his conclusions. With regard to this alternative hypothesis of Paranavitana, Bandaranayake (1994c) remarks that 'in his years of retirement, Paranavitana fell victim, as it were, to his immense scholarship and brilliant imagination.'

northeast sector; and the palace garden including the central bathing pond laid out on the southeast sector (Bandaranayake, 2010a:28-30). However, the low density of the built structures on the northeast sector of the rock summit make it difficult to ascribe that this sector is predominantly a palace, as Bandaranayake suggests. On the other hand, the spatial relationship of the stone-cut throne with other close-by structural remains in this sector makes it difficult to ascribe it as an audience hall. Therefore, considering these facts, it is safe to assume that the northeast sector is more a garden than a built-up space.

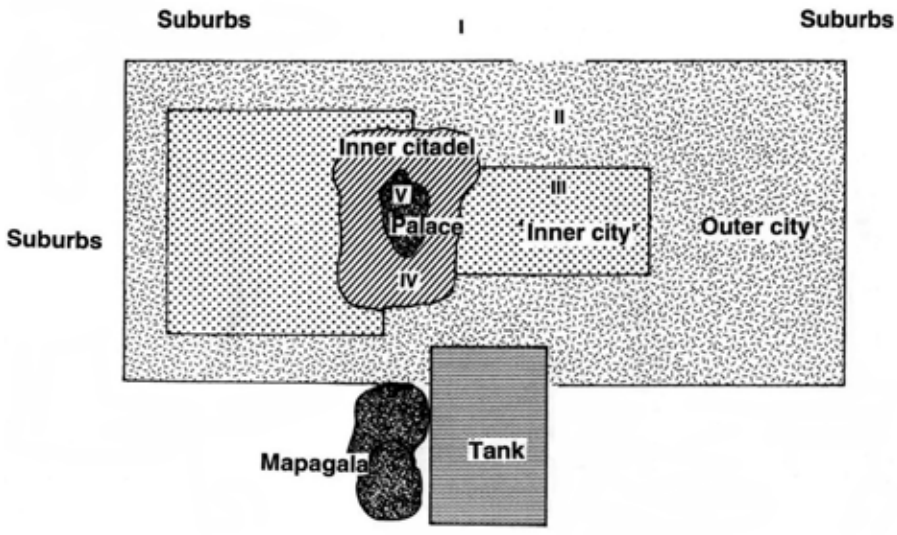


Figure 3.1
Functional areas of the scheme as per the interpretation by Bandaranayake (1994a:15)

De Silva, R.H. in a number of publications and articles attempts, on the other hand, to prove that Sigiriya is neither Kasyapa's capital nor his pleasure domes, but a monastic establishment of the Mahayanic Buddhist persuasion (De Silva, R.H., 1990, 1997, 2001, 2002, 2004, 2009). Karunaratne, S., (1997), however, opposes the above theory by pointing out that it is difficult to assume the existence of Mahayanic monuments in 5th century Sri Lanka. The arguments that are brought forward by De Silva, R.H. to support his hypothesis are also questioned by Karunaratne, S. Taking into account a number of factors, such as accounts in the chronicles, the material remains and the archaeological sequence at the site, 'eye witness' accounts in the 'graffiti', literary and epigraphic reference to Sigiriya, and ethno-historical sources, Bandaranayake (2010b) states that 'Sigiriya appears as an extremely complex multi-period site, whose substantial and dominant identity is as a grand and brilliant conception of a royal city from the middle of the first millennium', and hence quite rightly dismisses the arguments brought forward by De Silva, R. H.

Weerasinghe argues that Kasyapa, a son of a non-royal consort and the murderer of his royal father, was not in a position to acquire conventional divine attributes of the Buddhist tradition, and suggests that the whole scheme at Sigiriya is an attempt by Kasyapa, through a retailored concept of kingship as status imbued with divine attributes and associations, to convince the elite class of society of the divinity and powers that Kasyapa amassed at Sigiriya, away from the city of Anuradhapura, the real political power center. He further suggests that the water gardens, terrace gardens and the royal palace on the rock summit, together with such features as waterways,[48] fountains, baths, Mirror Wall and the painted ladies floating among clouds, all become a part of Kasyapa's ambitious political statement (Weerasinghe, 2010:236-238).

3.1.1(b) Painting and Sculpture

Like all ancient and modern day visitors to Sigiriya, the painted figures on the plastered rock face have been the main focus of attention of many scholars who attempted to interpret them from different points of view. Observing that all the female figures carry flowers, as if they are in a 'moving' attitude in a northward direction, Bell, the first commissioner of Archaeology made the first scholarly suggestion that they portray the ladies of Kasyapa's court in a devotional procession to the monastery at Pidurangala, which is to the north of the Sigiriya complex (ASCAR, 1905:16-17). He also suggests that the ladies with a yellow complexion represent queens or princesses, while their darker companions are the ladies-in-waiting or maid servants. Since all the surviving figures are cut off below the waist by cloud formation, and referring to the modern artistic tradition, Coomaraswamy (1908:178, 1927:163) proposes to identify the figures as divine beings *(apsaras)*. As part of his elaborate hypothesis, that Sigiriya expresses the cult of the divine royalty (the concept of 'God-king'), Paranavitana (1961:387), with literary and sociological evidence, suggests that the figures represent the Lightning Princesses and Cloud Damsels and opines,

'The drawing of naturalistic clouds on the rock face would not have impressed the beholder; and if the clouds had been fully personified, their nature would not have been evident to him at first sight. The master mind that was responsible for the

48 Referring to the hydraulic features at Sigiriya, Weerasinghe (2010:236-238) argues that water, which is present in the pleasure garden, implies the idea that water comes from the rock summit, to present Kasyapa not only as the controller of water, but also the person who lives in a palace where water originates. Therefore, he suggests that Kasyapa is making a statement in relation to a new concept of kingship with divine attributes and associations taking water as a metaphor, an icon and an index.

designing of Sigiriya therefore made a compromise between these two methods, and showed the clouds half personified and half naturalistically. The dark damsels rising from clouds thus would represent the Cloud Maidens, and their fair companions are the representation of lightning, which issues forth from the cloud, and is golden in color. Alakamanda (Alaka) being thus the place from which the clouds originate, one who is symbolically its lord can claim to be able to control rain on which the life of an agricultural community ultimately depends.'

Whatever the validity of his hypothesis, the most interesting aspect of his argument is that Paranavitana for the first time attempts to relate the painted figures and the whole painted band as component(s) of a larger scheme.
Bandaranayake (1986a:29) rejects Bell's suggestion as being a purely imaginative reconstruction that has no precedence in the artistic and social traditions of the region or the period. Weerasinghe (2010:233) also remarks that 'Bell's interpretation carries no social-historical or site specific or pan-regional meaning and Sigiriya apsaras [ladies] become an idiosyncratic expression of Kasyapa.' With regard to Paranavitana's suggestion, Bandaranayake (1986a:29) comments,

'There is no doubt, however, that the spatial organization and spatial symbolism of the Sigiri complex is profoundly determined by the cult of the king and ideology of kingship. The great tapestry of paintings at Sigiriya, like the palace on the summit and the lion staircase, are all part of a complex 'sign-language' expressing royal power and ritual status.'

Although Bandaranayake does not favor Paranavitana's hypothesis, he seems to accept that the plastered rock face with its figures are part of the spatial organization of the whole scheme.
However, Bandaranayake (1986a:29) agrees with Coomaraswamy's identification of the painted figures as divine beings by pointing out that it is in keeping with well-established South Asian tradition and concludes,

'We can see almost with certainty that the Sigiriya ladies are celestial nymphs, very similar in essence to their successors, thirteen hundred years later in the 'Daughters of Mara' panel from Dambulla, but it is also likely that they had more than one meaning and function – as expressions of Royal grandeur and status and as artistic evocations of courtly life, with aesthetic and erotic dimensions.' [49]

49 See also Somathilake (2008).

Commenting on Coomaraswamy's identification of the painted figures, Weerasinghe (2010:233) remarks that 'the major drawback or the impotency of Coomaraswamy's explanation is that it is totally immune to Sigiriya as a complex social-historical/ social-political event and positions Sigiriya simply at the receiving end of an Asian visual art tradition and it also fails to offer any indication to the function and meaning of the mural.' While recognizing the approach of Paranavitana in the identification of individual elements at Sigiriya through a holistic approach, Weerasinghe (2010:232) observes that the immense plaster band 'would have provided a 'heavenly ambiance' to the pleasure garden.' With regard to the identification of the painted figures Weerasinghe (2010:238) states,

'...whatever they would be, their meaning as celestial beings is to conjoin with other art and architectural components of Kasyapa's political scheme and new concepts of kingship ... a re-tailored concept of the ancient idea of royalty as status imbued with divine attributes and associations ...'

By closely studying the garments, ornaments, outlook, expression, configuration and attitude, Chutiwongs, Prematilleke and Silva (1990a:41) suggest that the figures represent the queens, daughters and maid-servants of the royal court, performing the role of celestial ladies attending upon the God King. By studying the paintings in the wider Asian context covering ancient Persia, central Asia and northwest India and in the context of international maritime commercial contacts, Priyanka (2005) observes that the art motifs of Sigiriya have parallelisms with those of the above-mentioned Asian cultures. As such, he speculates that the models for the Sigiriya paintings were the court ladies of Kasyapa, and the artists of Sigiriya would have used artistic themes popular in many parts of Asia during the period to give the whole painting composition a heavenly atmosphere to the royal abode.

De Silva, R. H. (2002:66-123, 2009:96-122) suggests that the painted figures on the rock face represent the multiple representations of Goddess Tara, the consort of Bodhisattva Avalokitesvara, as part of his hypothesis that Sigiriya was an establishment of Mahayanic Buddhist persuasion. By pointing out the differences in figural treatment, iconography, age group, complexion and garments of the painted ladies, and the lack of spiritual qualities in their expression, Dissanayake (2011:240-241) rejects the above suggestion made by De Silva, R. H.

By referring to the descriptions of Sinhala literary works, Dissanayake (2011:242-252) suggests that the ladies depicted in the paintings on the rock face represent those of the harem; those with fair and dark complexions, the higher and lesser ladies *(utum* and *bala anganun)*; the feature which cuts off the bodies below the waist are not clouds, but waves of the ponds in which they are engaged in water sports; and the whole painting composition would have given a fitting backdrop to the water sports that were meant to be held within the pleasure garden. Since some of the ladies hold items that are not related to water sports (such as those similar to musical instruments), and their postures do seem as if they are within ponds, surrounded with

water, Dissanayake's suggestion that they are engaged in water sports is difficult to accept. Moreover, the full figure representations of painted ladies discovered on the outer surface of the Mirror Wall (Wagaachchi, 2005), which is below those on the rock face, are clearly depicted in the conventional flying posture, also strengthening the idea that the painted ladies are not associated with water sports.

The colossal sculpture of the forepart of a lion on the Lion Plateau is another feature at Sigiriya which drew the attention of many scholars and other interested people. The Culavamsa (chapter XXXIX:3-4) also indicates that it is a key feature of Kasyapa's grand scheme, which also gave it its name, the Lion Rock. Apart from being the stupendous gateway to the final climb to the aerial palace, several scholars are of the view that it has a definite symbolical meaning. According to Bell (ASCAR, 1904:9), this 'monstrous Simha' is suggestive of the legendary founder of the Sinhala race. Paranavitana's explanation (1950) is that it represents the lion on the plateau of Red Arsenic, which is in keeping with his hypothesis that Sigiriya is a replica of the Kuvera's Himalayan domain.[50]

Bandaranayake (1993a:130) comments that it made a major symbolic statement operating on various levels of meaning, enhancing the power and majesty of royal authority and invoking a ritual notion of dynastic origins, the lion being the mythical ancestor and royal symbol of the Sri Lankan kings. Bandaranayake (2010a:25, 35) also remarks that the lion figure was a massive architectural sculpture that served as the grand entrance to the staircase-house, and the remaining brick basements on the plateau in front of the lion figure are antechambers and courtyards forming the final reception area before the ascent to the summit. Since the entrance to the palace complex on the rock summit is from the north, De Silva, N. (2012) suggests that it was in keeping with tradition, where the lion is the animal assigned for the north and for the chariot of northern guardian deity Vaishravana.

50 Paranavitana (1950:151) goes on to mention that: "The mighty beast is represented as if he is lying down on his paws, the hind part of the body inside the cave, the fore part emerging out covering the whole entrance to the lair, ready to pounce upon an intruder. He is not only guarding his own lair, but anyone going further towards the abode of the God-king on the summit must literally pass through his jaws ..."

§ 3.1.2 Design and Technical Aspects

3.1.2(a) City Planning

In addition to a detailed description of the site, Blakesley's (1876) layout plan not only records the fortifications associated with the rock, but indicates that Sigiriya was a well-planned complex with the rock as its main element. The Sigiri Mahavava and Mapagala are also seen in this layout plan as important elements of a unified scheme. The macro picture of Sigiriya thus emerged for the first time (figure 3.2), which helped Bell, the first commissioner of the Archaeological Survey, to elaborate upon it later. Apart from precise documentation of individual monuments within Sigiriya, and some adjoining sites such as Mapagala, Pidurangala and Ramakele, Bell carried out a detailed survey of the then-known Sigiriya. The survey plans of Bell (ASCAR, 1907, for instance), which were a result of progressive mapping of the site, not only show the relationship of the moats, ramparts and other structures to Sigiriya rock, but indicate the zoning of various precincts and spaces in relation to the overall layout of Sigiriya.
Although Bell and later Paranavitana observed the layout of the rectangular precincts in relation to the central rock and to the east-west axis, with the principal gateway directly aligned with this axis, it was Bandaranayake (1994a:14) who developed the hypothesis that Sigiriya is one of the best-preserved urban forms of the first millennium AC, which exemplifies the grand scale and vision of Sri Lankan city planning. Through a decade of field-based archaeological research, Bandaranayake (1994b) suggests that the urban plan of Sigiriya conforms to a hypothetical urban model (of the social and conceptual organization of urban space), which he derives from his studies of Sri Lankan cities of early and middle historical periods (3rd century BC-13th century AC). With regard to the layout of Sigiriya, Bandaranayake (1990b:26) further comments,

'One of the most remarkable aspects of the urban form at Sigiriya is its planning mathematics and its total design concept. The plan of the city is based on a precise square module. The layout extends outwards from the outer section of the central east-west and north-south coordinates at the center of the palace complex, on top of the rock. The eastern and western entrances are directly aligned with the central east-west axis, while the intricate symmetry of the royal water gardens and the moats and ramparts of the western precinct is based on 'echo plan' ... In its total conception, however, Sigiriya represents a brilliant combination of concepts of symmetry and asymmetry, of a deliberate interlocking of geometrical plan and natural form.'

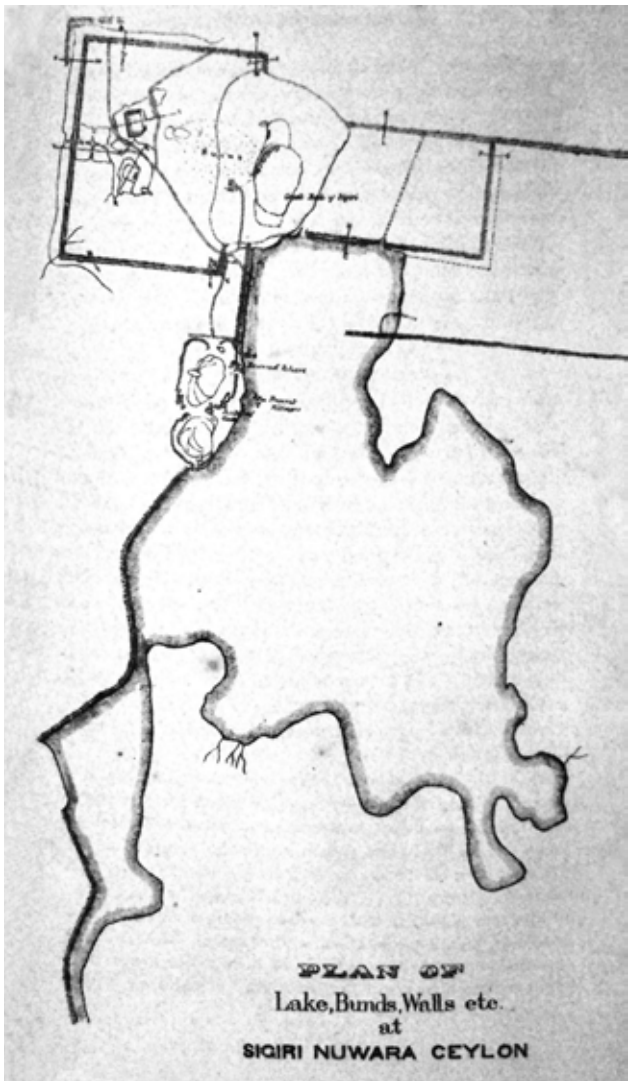


Figure 3.2
Layout plan of Sigiriya by Blakesely (1876)

In one of his subsequent articles on the subject, Bandaranayake (1994a:15-16) adds,

'The (Sigiriya) city can now be seen as having an elongated rectangular form, ... based on a square module of circa 170 meters and a concentric-cum-axial design. This geometric conception also accommodates organic and asymmetrical elements such as the Sigiriya rock itself, the terraced hill around the base of the rock, the Mapagala fortress, the partly man-made, partly natural topography of the lake, and the borrowed scenery of the Kandalama Mountains and the Matale ranges.'

Based on archaeological field research at Sigiriya and carrying out studies on classical literature on Indian town planning, Karunaratne, P. (1994) suggests that the areas identified by Bandaranayake (1993b:114-116) as inner city, outer city and suburbs are the ceremonial park with pavilions, the inner city comprising of markets and other buildings for public use, and the outer city for the urban social strata, respectively. As such, Karunaratne, P. argues that the layout of Sigiriya shows a deviation from the urban model of the early and middle historical period, which is hypothised by Bandaranayake.

3.1.2(b) Architecture and Landscape Design

Apart from documentation of the remains that are visible above ground level and are exposed due to archaeological excavation, and descriptive accounts of physical layouts, the studies on architecture proper of Sigiriya are largely limited to reconstruction of the superstructure of some monuments. Compared to the scholarly studies related to the reconstruction of the superstructure of monuments at Anuradhapura and Polonnaruva (such as Paranavitana, 1946; Bandaranayake, 1974, 1976, 1978; Silva, 1988, 2004; Nakagawa, 1990, 1991), most of such attempts at Sigiriya by both heritage professionals, such as Karunaratne, L. K. (in 1960, see Bandaranayake, 2010a:figure 6), Ellepola (1990:204, 208), Amarasinghe (2003) and Gunawardhana (2008), and others such as Amarasekare (in the 1930s, see Bandaranayake 2010a:figure 5), Kirinda (in 1996, see Bandaranayake 2010a:figure 6) and Deepthikumara (1998, 2000), could be regarded as pure conjectural reconstructions and/or artist impressions. With regard to the reconstruction of buildings on the rock summit, Bandaranayake (2010a:25-26) comments that 'few of these offer acceptable, impressionistic images; others are inelegant and bear scarcely any relation to the existing remains or to the fine sensibilities that inform all aspects of art and design at Sigiriya. Moreover, none of these reconstructions have argued the basis of their proposals.' Bandaranayake (2010a:35) also adds that 'all conjectural reconstructions of the lion have been based on 'imaginary' suggestions, derived (often at several removed) from the generalized experience of varied representations of this royal icon in South Asian art and architecture, both ancient and modern'.[51] The lack of considerable remnants of the superstructure and of archaeological data – the only indications being the square cavities left for timber columns in the brick masonry, the post holes, beam sockets, ledges and grooves cut into the rock, the stone pillar bases, roof tiles and iron nails – have also made it a difficult exercise.

51 Although Bandaranayake also initially attempted to reconstruct the buildings on the rock summit, based on a general consideration of the archaeological remains, rather than on careful study and interpretation, he admits that his reconstruction in 1984 (Bandaranayake, 2010a:figure 3) was still largely impressionistic.

Byrom (1986), by studying the remains of the southwestern compartment attached to the central four-quartered feature and relating them to some of the palace structures in the Indian state of Kerala, attempts to reconstruct the superstructure of the buildings of the above compartment (figure 3.3). He also suggests that at least the outer compartments attached to the central four-quartered feature must properly be regarded not as garden (open) space, but as a subsidiary annex to the palace with heavily built-up space. Although Byrom's reconstructions are too inventive and creative to accept his suggestions in totality, this study focuses attention on rethinking the open, built-up spatial relationship of at least the two outer compounds attached to the four-quartered feature, which is of much interest from an architectural point of view.

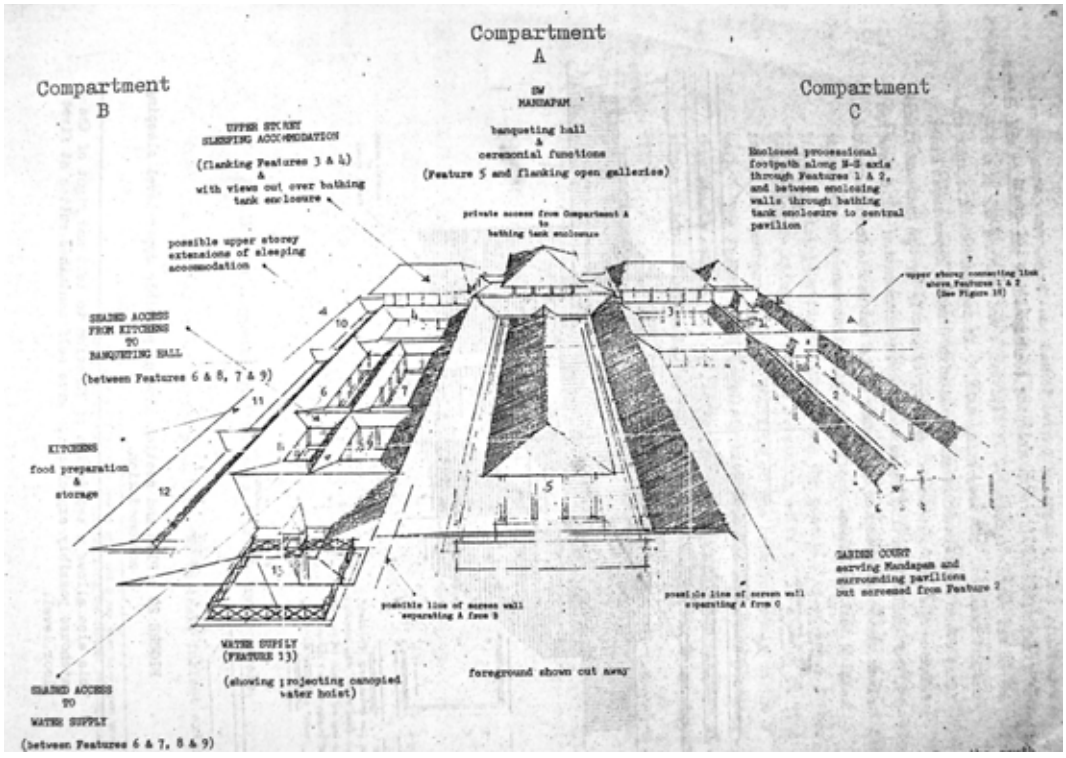


Figure 3.3
Byrom's (1986) reconstruction of part of the southern outer compartment associated with the four-quartered feature

Sunnemark and Wik (1997) carried out a survey of the cut-marks in one of the boulder clusters[52] within the hilly terrain to map the structures on top of these boulders. Although they went to the extent of conjecturing the structures, it was not based on the material evidence at the site and general Sri Lankan architectural tradition. However, the mapping of the structures on the boulders shows that the built elements at the ground level are related to the structures on top (figure 3.4).

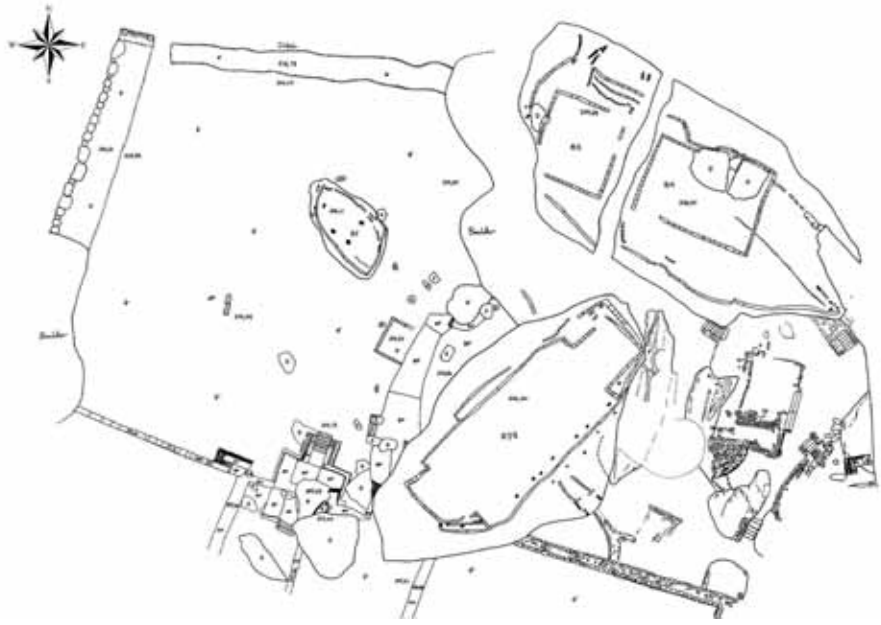


Figure 3.4
The cut-marks on one of the boulder clusters indicating the structures upon them and their relationship to the remains at the base (courtesy: Sunnemark and Wik 1997)

Analyzing the remains on the rock summit, and placing them in the context of Sri Lankan architectural tradition, Bandaranayake (2010a:29) assumes that 'the architecture on the rock summit was essentially the typical mixed brick-and-timber architecture of the early and middle historical periods (3rd century BC-13th century AC), most familiar to us from the monastic remains but also from royal contexts at Anuradhapura and Polonnaruva.' By such assumptions supported by comparison

52 The survey covered boulder numbers B1, B3, B4 and B7/8.

with other examples in Sri Lanka and elsewhere in monsoon Asia, Bandaranayake (2010a:31-34) reconstructs the buildings on the rock summit, with hipped roofs laid with clay tiles. The main palace building of the upper palace is reconstructed as a structure with a three-storied central block, which is surrounded on the east, south and west with single or double-story structures with central courtyards. The building on the southwest quadrant, which Bandaranayake labels as the 'sun-set pavilion' is conjectured as an open two-storied pavilion-type building to provide views of the outer landscape (Bandaranayake, 2010a:28-34).[53]

Although Bell excavated some of the structures within the western precinct in the 1890s (ASCAR, 1899:7), the attention of archaeologists up to the 1940s was mainly concentrated on such features as the aerial palace, Lion-Staircase-House, Mirror Wall and the paintings that are associated with the central rock. Paranavitana from the late 1940s, however, shifted the main focus beyond the central rock to the western plain below. His excavations revealed an elaborate garden layout in an extensive area of the inner western precinct. The central axial zone, which Paranavitana termed as the 'pleasure garden,' was identified as composed of three distinct zones: the four-quartered feature with its northern and southern compartments, the fountain garden, and the upper garden with octagonal pond, each in a walled enclosure. Paranavitana (ASCAR, 1952:18), therefore, for the first time could relate most of the features at the inner western precinct as components of a unified scheme, and declares,

'The plan of Sigiri ... show the relation that the newly exposed layout of the palace garden has to the other features of the place – the palace on the summit of the rock, the outer gateways, the moat and the island pavilions. It will be clear that every one of these various units is related to the others and all contribute to form a balanced whole. The skill exhibited by the architects in making the natural features harmonize with their own creations is beyond all praise. The formality and symmetry of the layout on the level ground is in contrast to the asymmetry, no doubt deliberately introduced, as one approaches the rugged boulders at the base of the hill. The various sheets of water in the moats, ponds and cisterns alternate with pavilions, which would have originally appeared as rising from water. In fact, the whole garden must have been used for water-sports, of which vivid descriptions are found in Sinhalese and Sanskrit poems. The entire plan of the garden is unfolded when one stands on the summit of the rock

53 Although Bandaranayake (2010a:35-38) also attempts to reconstruct the lion figure associated with the Lion-Staircase-House, by studying the rows of cuts in the rock face serving as footholds of brick masonry, which provide the width and height of the lion figure, and superimposition of a bronze representation of a lion from Anuradhapura, he admits that it is more of an approximation or conjectural reconstruction due to the limited evidence.

and looks westwards. It is even now a striking spectacle, and one can imagine what the sight would have been in Kasyapa's days, with the ornamental roofs of the pavilions and other buildings, the fountains, the flowering trees, the bowers and other features which are now no more. Even the bare layout now exposed, when properly conserved, will not be without aesthetic appeal to those who can appreciate balance and harmony and the ordering of the various parts to give unity to an elaborate scheme.' [54]

The commencement of the UNESCO-Sri Lanka Cultural Triangle Project activities at Sigiriya in the early 1980s witnessed the continuation of the study of 'garden art' initiated by Paranavitana. Based on the physical characteristics of Sigiriya and expanding Paranavitana's identification of 'garden styles,' Bandaranayake (1993a) further identifies three 'traditions of landscape gardening': the symmetrical or geometrically planned water gardens in the central and southwestern areas of the western precinct[55]; the asymmetrical or organic cave and boulder gardens on the western escarpment; and the stepped or terraced (hanging) gardens at the base of the central rock.[56] With regard to these three 'traditions of landscape gardens,' Bandaranayake (1993a:25) mentions,

'Each of these has clear antecedents and successors within the Sri Lankan tradition itself. Sites such as Vessagiriya, Isurumuniya (both of which are associated with Kasyapa), the monastery complexes at Anuradhapura, and especially the south western sector of the Abhayagiri Vihara, the Kaludiya Pokuna complex at Mihintale, the Alahana Parivena at Polonnaruva, sites such as Situlpahuva in the south or Salgala and Maligatenna in the west, are some of the many outstanding examples of site selection, site modeling and landscape gardening produced by the Sri Lankan tradition. The royal pleasure gardens at Anuradhapura, the lake side gardens and water palaces at Polonnaruva, and the royal palace and lake complex at Kandy are some of the examples of secular landscaping and water gardening that still remain in a skeletal or fragmentary form.'

54 Also see Paranavitana (1959:402, 1972a:40)

55 This includes garden number1 (the four-quartered garden or the Char-bagh with two outer compartments to its north and south), number 2 (fountain garden), number 3 (the half char-bagh, halls, podiums and the octagonal pond) that are previously identified by Paranavitana (1972a) in the central axial zone, and the Miniature Water Garden exposed at the southwest corner of the western precinct by Bandaranayake. Apart from the symmetrical or geometrical planning, Bandaranayake (1993b:126-127) remarks that the Miniature Water Garden has a far more complex interplay of tile-roofed buildings, water retaining structures and water courses than is seen elsewhere in Sigiriya, and suggests that it has been laid out as an extension and 'miniaturized' refinement of the Kasyapan macro plan.

56 Bandaranayake (1993b:123) also suggests that the palace garden on the summit of the rock is a combination (amalgamation) of the above three garden traditions.

Bandaranayake (1993a:25-26) also draws attention to international parallelisms and correspondence with each of the above garden traditions.[57] Bopearachchi (1993) argues that the Sigiriya gardens have parallelisms to those of the Persian garden tradition.

De Silva, N. (1996), apart from describing the ancient monastic and secular landscapes of Sri Lanka, attempts to highlight the boundary, entrance, paths, flight of steps, retaining walls and water as the 'design elements' used in these landscapes.

3.1.2(c) The Hydraulic Engineering

Apart from documentation of the hydraulic features at the surface and subsurface levels (see De Silva, R.H., 1976:7-8) and recent attempts to understand the irrigation systems of the Sigiriya hinterland (Manatunge, 1990; Wickramasekera, 1990; Myrdal-Runebjer, 1994), little attention has been given to study of the hydraulics of Sigiriya proper. Bandaranayake (1990a:46-48, 1993a:12-17), however, suggests that the hydraulics of the water garden is a result of a micro-scale application of the principles of the macro-hydraulics, which formed the essential technological basis for the Sri Lankan civilization during the early and middle historical periods (3rd century BC-13th century AC). He also remarks that the essential characteristic of the hydraulic system was the interconnection of macro- and micro-hydraulics. He goes on to identify two

57 Bandaranayake (1993a:24-26) states that: 'The historical importance of the gardens at Sigiriya lies essentially in two factors; one, their antiquity and degree of preservation; the other, their ingenious combination on a grand scale, of at least three traditions of landscape gardening ... Past and recent archeological excavations have confirmed that the gardens substantially dates from the 5th century ... The clearest parallels to the water gardens at Sigiriya are to be found in the much more ancient geometrical gardens of Egypt or the 'paradise gardens' of ancient Persia, while Sigiriya's chronological successors are the well-preserved examples of the gardening and the geometrical gardens of the Renaissance Europe. Of the ancient gardens of the world that survived in an archaeological sense, the only significant examples that pre-date Sigiriya and are equally well preserved are those of the Romans such as the private and public gardens of Pompeii and Herculaneum and the imperial gardens of Hadrian at Tivoli ... The subsequent developments in the Asian water gardening tradition, that is represented at such early dates at Sigiriya, are found on a majestic scale about four or five centuries later at Angkor in Cambodia, and even much later in the exquisite gardens of the Mughals ... The boulder gardens at Sigiriya on the other hand have eastern rather than western correspondence. The closest parallel to the Sigiriya gardens are the gardens of China, Korea and Japan ... The third garden form at Sigiriya, the terraced gardens, are so basic and archetypal in character that parallel forms exist in many diverse cultures of the ancient world from the ziggurats of Mesopotamia and 'Hanging Gardens' of Babylon to the pre-historic ritual terraces and stepped stupas of Southeast Asia. They are often encountered in early Indian sites and are a conscious element in Chinese landscape gardening and architectural planning. Their most obvious correspondence, however, are with the terraced rice fields and other terraced hillside agricultural systems which are extensively found in Sri Lanka, as in most parts of tropical Asia. The diversity of parallels and correspondences, that we see in the gardens at Sigiriya serve, in the end, only to underline the uniqueness of this 5th century creation of Sri Lankan master builders.'

macro systems: Sigiri Mahavava, which is at a higher elevation than the water garden, and a series of moats fed directly from Sigiri Mahavava and two micro systems; the main water retaining structures of the water garden in the western precinct, and water control and water retaining system from the rock summit up to the water garden. Ellepola (1990), with available field evidence and archaeological records of Sigiriya and placing them in the context of 5th century Sri Lankan knowledge of hydraulic technology, attempts to conjecture the hydraulics of Sigiriya. Based on his study, Ellepola (1990:183) remarks,

'The hydraulics of Sigiriya may be considered as a composition of many specialized systems that were engineered to serve the diverse needs of the citadel. Although these individual systems functioned differently, their component parts were intricately inter-related to form a single comprehensive network by means of numerous by-pass and loop connections. This facility permitted parts of the system to continue working while other sections remained closed, facilitating the processes of repair, maintenance or even water conservation. The water flowing through these different hydraulic systems within the citadel was passed out of the complex and collected into channels that finally emptied the water into the Sigiriya Oya. Downstream irrigation of the Sigiriya region was thus ensured with the water conserved from within the Sigiriya complex ... The water distribution through the complex was caused by gravity action, which created a gently flow into the successively lower areas where the supply was required.'

§ 3.1.3 Observations

The above inquiry shows that although much has been studied relating to the landscape design of Sigiriya, there are no serious and in-depth studies with regard to the central issue and the research questions mentioned under 1.2.
Based on the above inquiry on the research carried out so far on Sigiriya, the following assumptions will also be derived with regard to the present study.
Although Sigiriya is a multiperiod site, its dominant identity is a royal complex during the 5th century AC. The principal royal palace and the palace garden are located on the upper west and the lower east levels of the rock summit, respectively. The walled-in hilly terrain around the base of the rock is the inner royal precinct while the pleasure garden occupies the inner western precinct. The outer city occupied by the urban elite was located within the outer eastern precinct and/or just outside the outer ramparts, with the suburbs, villages and monasteries further beyond.
The foregoing inquiry also shows that the studies relating to landscape architecture and its related spheres – such as those of other historical architecture in Sri Lanka – are efforts to view archaeological material in historical, sociological, socio-historical and semiological perspectives. There is no doubt that such studies are important to,

and capable of, underlining the archaeo-historical value of Sigiriya, and contribute to the subject of art history. The approach used by Paranavitana (1972a) and developed by Bandaranayake (1990a, 1993a) – for instance, to attempt to formulate a typology for gardens based on their physical characteristics, such as different hydraulic features (pools, ponds, fountains), landscape features (water, boulders, terraces) or the identification of planning principles such as planning mathematics based on a square module, geometrical, axial, symmetrical, asymmetrical, organic, echo planning, without addressing their specific selection by the designers – can only highlight the historical importance of Sigiriya in the national as well as international context. Such a basis, on the other hand, does not in any way help to underline the importance of Sigiriya from a landscape design point of view. As far as landscape design is concerned, the use (or even deliberate non-use) of various hydraulic and landscape features is determined by the terrain and/or by overall architectural design concept, and their composition is a result of the skillful application of design tools and techniques by the designers. For instance, in French baroque gardens, the outer landscape is intentionally banished from the line of sight using architectural design techniques. In English landscape parks, the geometric system is deliberately dissolved in the physical line of forces of the natural landscape, again using architectural design principles (Steenbergen and Reh, 1996). Approaches from an art-historical point of view, therefore, hardly provide insight into technical aspects of landscape design. As far as the objectives of the present study are concerned, art-historical approaches are not capable of delivering the expected results.

The studies of De Silva, N. (1996), by identifying the boundaries, entrances, paths, flight of steps, retaining walls, water, and so on, as 'design elements' to understand the principles of landscape design, together with the studies of Byrom (1986) and Ellepola (1990), are seen as attempts to move away from the conventional art-historical approach. Since the use of various design elements is again determined by the overall design concept, and their composition is the result of the skilful application of design tools and techniques of the designer, the methodologies of such studies do not help to achieve the objectives of the present study.

All these suggest that in order to read the landscape design of Sigiriya to achieve the objectives of the present study, a sound methodology is a prerequisite. As such it is important to inquire into the methodologies followed by other researchers in the international context. The next chapter, therefore, attempts to inquire into and examine the methodologies available to study landscape architecture, in order to adopt an appropriate research methodology to carry out the present study.

§ 3.2 Previous Conservation, Presentation and Development Activities

§ 3.2.1 Sigiriya Proper

The clearing of the jungle cover by the Department of Archaeology at Sigiriya commenced in 1894, and with these attempts a clearer macro picture of Sigiriya came to light with much clarity. Following this program, by 1899 most of the structures on the rock summit and the remains of the Lion Plateau were exposed and conserved (ASCAR, 1894-1900). The excavations at the rock summit mainly revealed the brick basements and foundations of the palace and other related structures, retaining walls of the terraced gardens and walkways, stairways and pavements linking different spaces and levels. With regard to the conservation of such remains at the summit, the brickwork was mainly consolidated by pointing and adding a few sacrificial brick layers where necessary to protect deteriorated, existing inner brickwork (figure 3.5). Although several construction phases were identified during excavations, no significant attempts were made to differentiate such phases. Moreover, the presentation techniques employed during the period do not help to differentiate the open and built-up areas on the rock summit. As such, there is some confusion, even to an expert, in reading the total plan of the rock summit.

The excavations at the Lion Plateau made it possible to expose the deteriorated foreparts of the brick-built and lime-plastered colossal lion figure and part of the superstructure with internal flights of steps, as well as the basement of a U-shaped brick wall, which formed an internal courtyard at the immediate foreground of the Lion-Staircase-House. The two paws of the lion figure were restored to their original form, and the photographs taken before and after conservation suggest that this intervention could be regarded as one of the finest restoration works of the period (figure 3.6). The brickwork above the lion paws with its flight of steps was also restored up to the level of the available evidence. A steel ladder was introduced above this level to provide safe access to the rock summit. Only the inner wall of the U-shaped building on the Lion Plateau was consolidated, leaving the outer wall to the weathering elements (figure 3.7). This action also made it difficult to read the plan of the plateau, specifically with regard to the open and built-up spatial relationship.

Segments of the Mirror Wall that had partly collapsed were restored using brick masonry and plastered to its original height and appearance. The pathway associated with the Mirror Wall, which had collapsed in sections, was also reconstructed, as were the missing parts of the parapet wall of such sections. The reconstruction of segments where the foundations of this pathway had entirely collapsed were not attempted; instead, steel footbridges with handrails cantilevered off the rock were introduced to span such gaps (figure 3.8). By 1912 considerable portions of the stairways traversing the southern and southwestern slopes of

the hilly terrain were also exposed and restored utilizing all available stone steps from the site, and the missing stone steps were reproduced with new brickwork (figure 3.9).

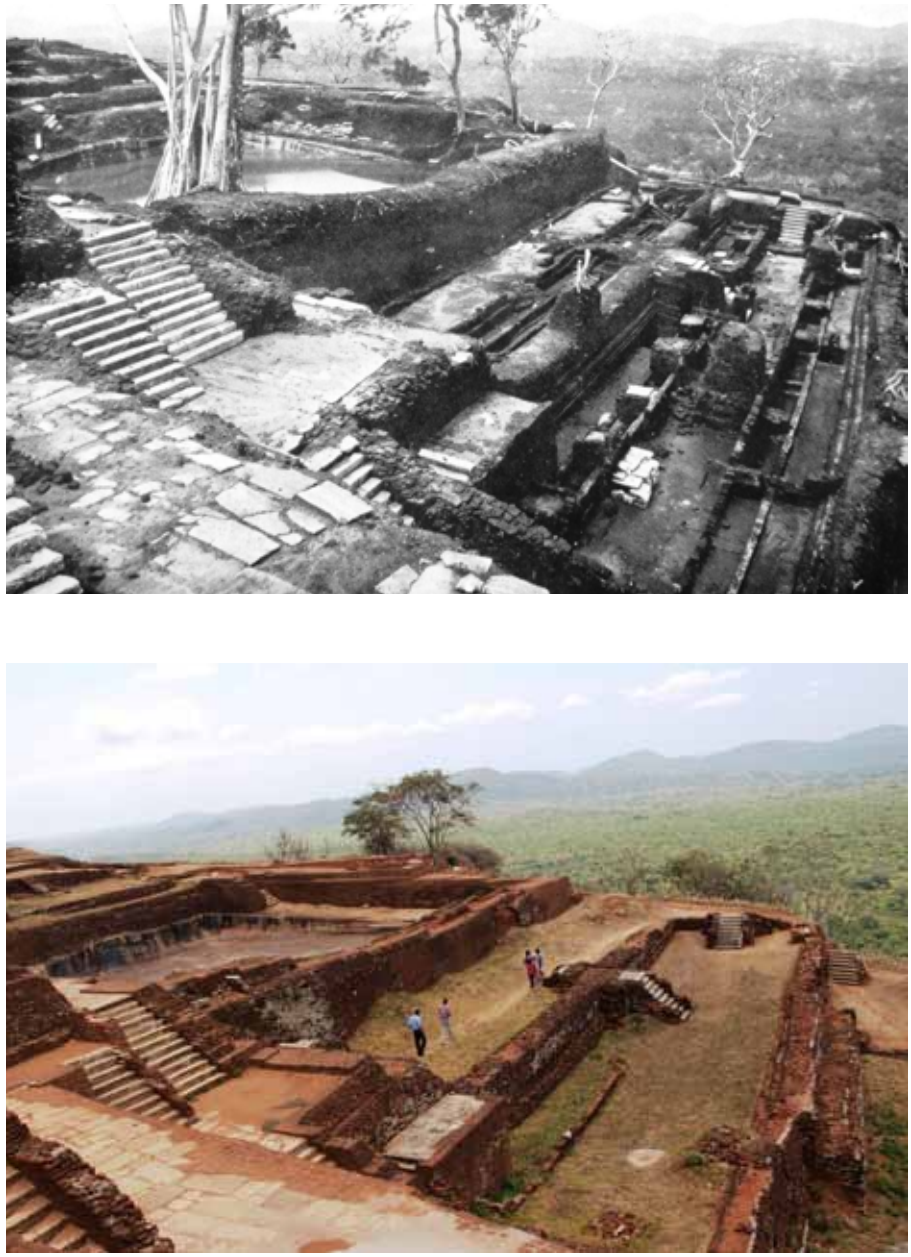


Figure 3.5
The structures on the rock summit, after excavation and after conservation (courtesy: Archaeology Department [top])

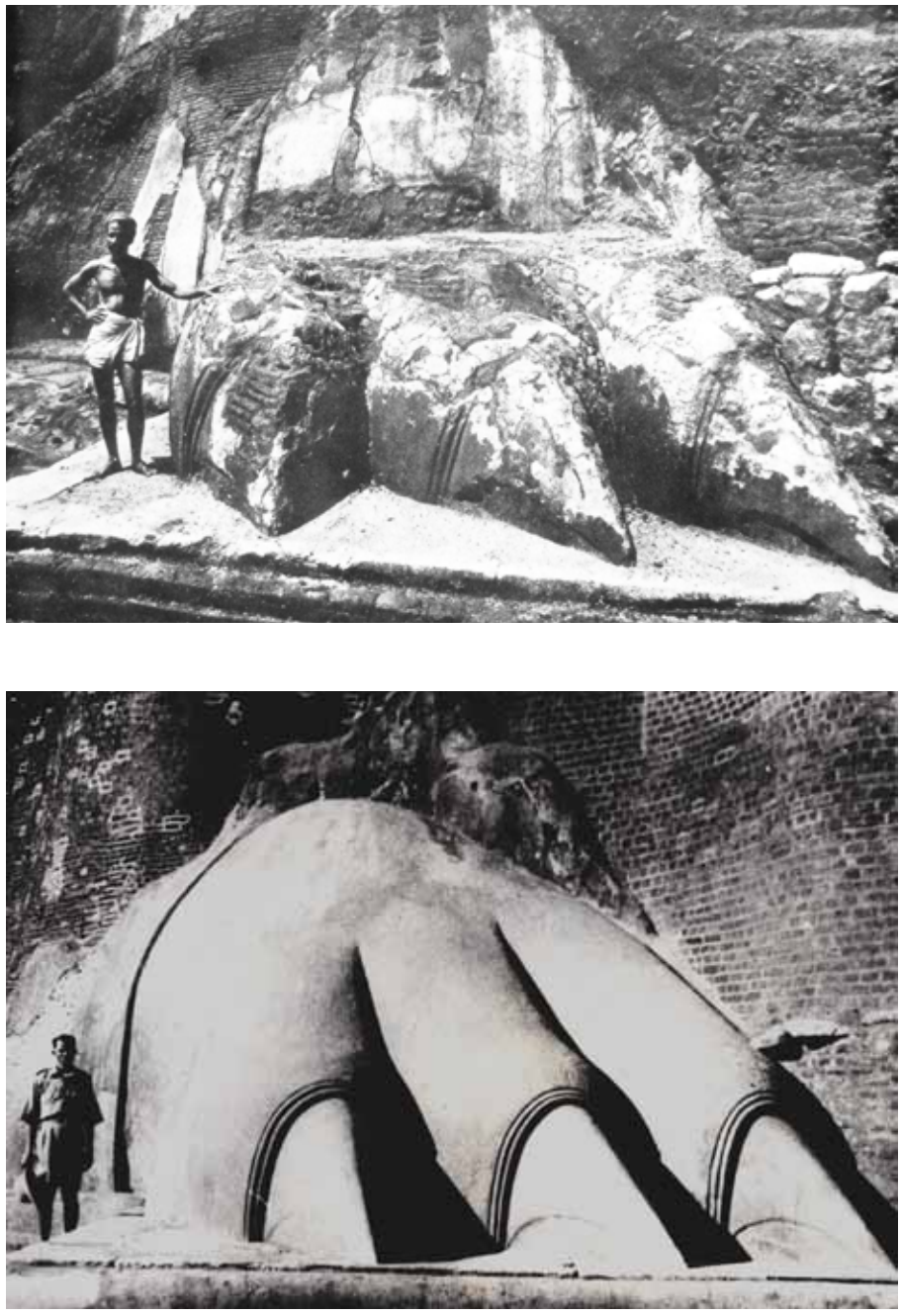


Figure 3.6
A paw of the lion figure, before and after conservation (courtesy: Archaeology Department)

Figure 3.7
The Lion Plateau

Figure 3.8
The Mirror Wall (before and after conservation) (note the steel footbridge introduced to span the gaps created by the segments of the wall that had collapsed) (courtesy: Archaeology Department [left])

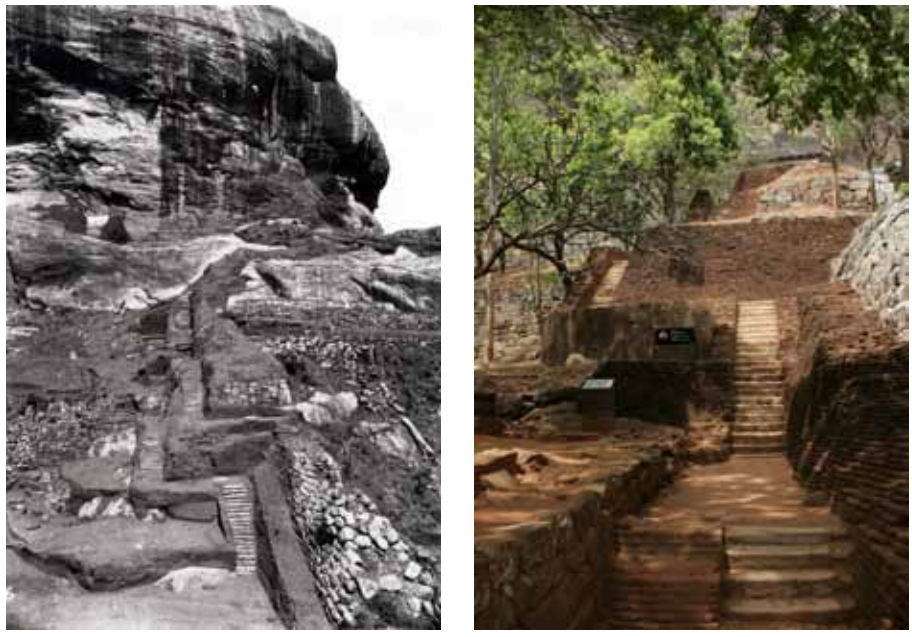


Figure 3.9
Stairway traversing the western slope of the hilly terrain, before and after conservation (courtesy: Archaeology Department [left])

During the period before 1900, excavations had been carried out on several structures on the pleasure garden as well, especially at the central island pavilion of the four-quartered feature and two island pavilions ('summer palaces') on either side of the central axial pathway. Although the remains uncovered were published (ASCAR 1889:plates IX, X, XI), no significant attempt has been made to conserve them. The retaining walls of the northern arm of the inner moat were partly excavated and restored during 1947-1949. Some of the remains at the rock summit were also consolidated during this period.

Excavations at the central and southwest sectors of the pleasure garden were conducted intensively during the period 1950-1954. The foundations of numerous enclosures, pavilions, terraces and other garden structures, and pools, ponds, fountains and streams, together with an intricate hydraulic system, were unearthed within this area. The pools, ponds, fountains and other hydraulic features were restored, while the structures above ground level were consolidated by only adding a few sacrificial layers where necessary. The underground conduits were also cleaned and rehabilitated. Partial landscaping and layout work of this area were also undertaken. By about 1958, retaining walls of the southwest L-shaped pond of the four-quartered feature were exposed and its retaining walls restored up to the existing ground level. The pond was then partly desilted and filled with water. The excavations and conservation of the enclosure to the south of the four-quartered feature was also undertaken during this

period. Here again, the exposed brickwork above ground level was only consolidated without proper interpretation. As in the case of the summit of the rock, there is again confusion with regard to the identification of open and built-up spaces within this enclosure.[58]

During the period 1961-1979, in addition to further investigation of the pleasure garden, excavations were also conducted in the outer western precinct. As a result, the western entrance to the pleasure garden with its limestone stairway was restored, while the northern and southern gateways to the same precinct were consolidated by adding a few sacrificial layers to protect the existing inner brick core of these structures. The western outer moat and parts of the inner moat were also exposed and their stone retaining walls restored. The middle rampart and its gate on the western side were excavated and consolidated to an appreciable length. The stonework of several terraces on the western escarpment were restored, and missing segments of a flight of steps that traverse the escarpments were temporarily linked for the easy ascent of visitors.

In 1980 the Sri Lankan government with UNESCO launched the Cultural Triangle Project to safeguard and present the outstanding sites and monuments within the triangular zone demarcated by the island's three ancient capitals: Anuradhapura (4th century BC-10th century AC), Polonnaruva (11th-13th century AC) and Kandy (16th-19th century AC), on a scale similar to such previous UNESCO campaigns at Abu Simbel, Venice and Borobudur.[59] Six major sites were identified under this project, and the conservation of gardens at Sigiriya was one of them.[60] The gardens of Sigiriya thus became the major landscape conservation program ever implemented in Sri Lanka.

With the commencement of the UNESCO-Sri Lanka Project of the Cultural Triangle at Sigiriya in 1982, the already ongoing conservation and presentation work program was given a new outlook. The objectives stated in the original master plan (Selvaratnam

58 See Byrom (1986) for his suggested reconstruction of the spaces within the compartment to the south of the four-quartered feature.

59 The principal difference between the Cultural Triangle Project and many other such UNESCO projects, however, is that the former project was conceived of, initiated and implemented by Sri Lankan experts, providing a unique model and experiment in heritage management in a developing country.

60 The other sites selected under the UNESCO-Sri Lanka Project of the Cultural Triangle were: (a) Jetavana Monastery (4th century AC) at Anuradhapura, which consists of the tallest brick-built edifice in the world; (b) Abhayagiri Monastery (1st century AC) at Anuradhapura, one of the largest pilgrim establishments ever built by man and consisting of the second tallest brick-built edifice in the world; (c) Alahana Parivena (12th century AC) at Polonnaruva, the largest Buddhist monastic university of medieval Sri Lanka; (d) rock and wall paintings of the cave temple (3rd century BC to 19th century AC) at Dambulla, which consists of the largest collection of classical mural paintings at one site; and (e) royal and monastic complexes of Kandy (16th to 19th century AC). All these sites have been declared as World Heritage Sites. For details on this project see Silva (1993) and Silva and Guruge (n.d.).

and Perera, 1992:6) of the project were 'to excavate, record monuments and carryout research on monuments uncovered, and on inscriptions, and paintings, discovered within the project area; to conserve and, or to carryout restoration work on monuments already uncovered; to provide facilities for the visitors to the area; and to provide guidelines for the development of the neighboring areas so that the project area of Sigiriya ... can be studied in its proper perspective.'

Therefore, from 1982 onwards the conservation, presentation and management activities at the site were handled by the Central Cultural Fund, the implementing agency of the UNESCO-Sri Lanka Project of the Cultural Triangle. Under the conservation and layout program, all previously conserved areas and monuments that showed signs of deterioration were consolidated. Since the features of the pleasure garden are almost symmetrical along its east-west axis, and the previous works were also mainly concentrated to the south of this axis, the intervention policy of the project was to confine all possible interventions also to the area south of this axis. The objectives of such an approach were to preserve a substantial part of the site free of contemporary interventions to minimize disturbance to the site and to leave a considerable area untouched for future investigation and interpretation, especially in anticipation of advanced techniques of data retrieval that will be evolved in the future (Bandaranayake, 1986b:104; Ellepola, 1999:20). Such a policy also had the added advantage of displaying to the visitor the corresponding 'untouched' and 'conserved' areas on both sides of the central axis. Therefore, the un-conserved segments of the inner moat, the southeast L-shaped pond, the retaining walls of the island pavilion ('summer palace'), and other ponds and pools, all to the south of the east-west axis, were excavated and restored to their original levels (figure 3.10). The un-conserved segments of the middle rampart, the miniature water garden (figure 3.11) between the four-quartered feature and the inner rampart, the structures within the enclosure to the south of the four-quartered feature, and the remains on top of the 'summer palace' to the south of the east-west axis were consolidated by adding a few sacrificial layers. The central east-west axial pathway was rehabilitated to its total length in the inner western precinct. The missing links of the western and southwestern stairways that traverse the hilly terrain, retaining walls of the terrace structure with their flight of steps, among others, to the south of the axis were also restored (figure 3.12).

The original ground levels of the area south of the east-west axis from the middle rampart up to the base of the main rock were almost established by removing soil deposits of the latter periods and were landscaped and laid out. Since the original planting scheme has completely disappeared without leaving any physical trace, no attempt has been made to adopt any reconstructional scheme. Instead, the policy on planting was to retain and protect the indigenous forest species that have survived at the site up to now. All exotic trees and the flowering plants introduced between 1940 and 1980 were removed and replaced with indigenous species found at the site (Bandaranayake, 1997:82). The existing trees showing signs of decay or disease have also been botanically treated (Ellepola, 1999:27).

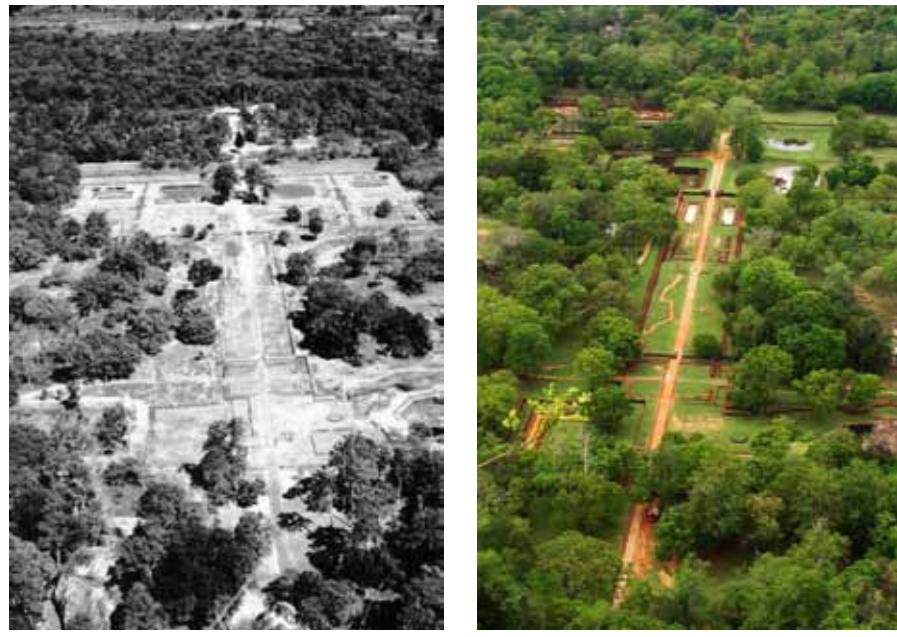


Figure 3.10
The central zone of the inner western precinct, before and after conservation (photo: M. W. E. Karunaratne [left])

Figure 3.11
The Miniature Water Garden, after conservation (photo: Upali Upananda; courtesy: Bandaranayake 1993b)

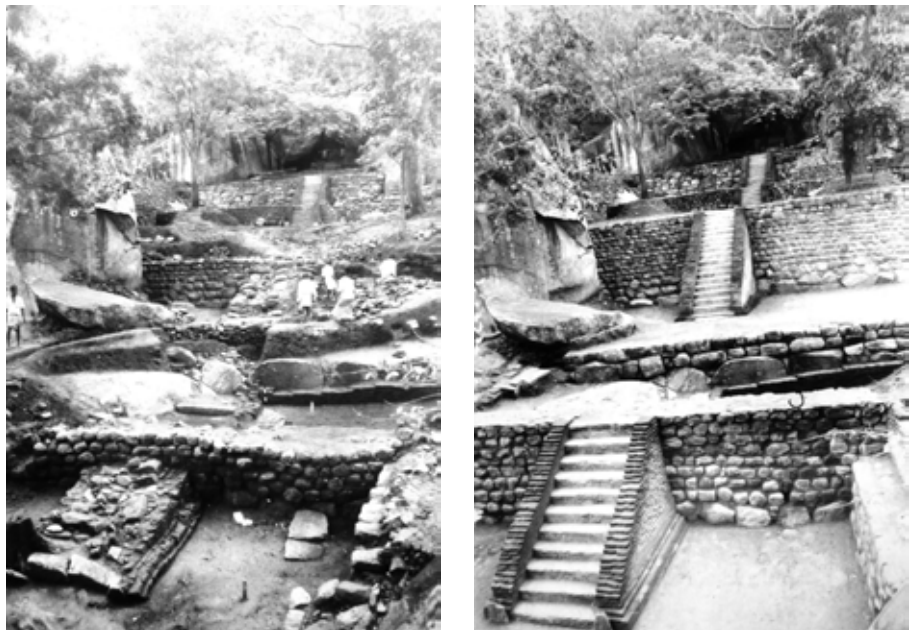


Figure 3.12
Western route through the hilly terrain leading up to the Boulder Arch No. 1, after excavations and after conservation (courtesy: Central Cultural Fund)

§ 3.2.2 Visitor Infrastructure and Facilities

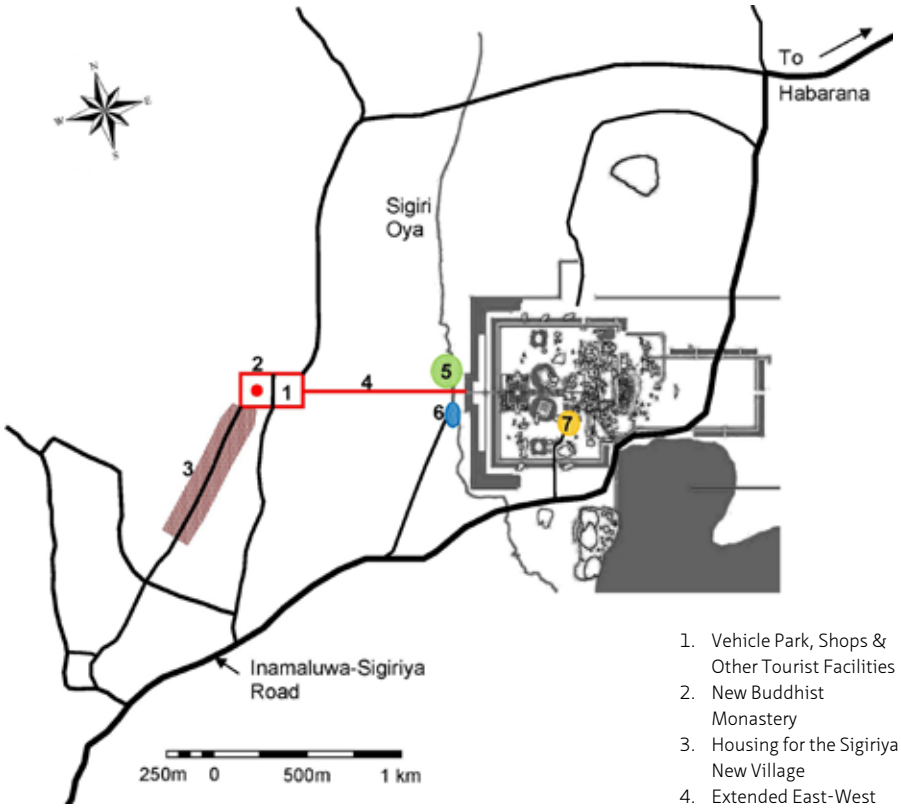
With regard to visitor access, the only means during the early period of activity at Sigiriya to ascend to the level of the paintings, which have survived halfway up on the western rock face, was the wire ladders suspended over the rock and dropping down to the ground. Later in 1938, a steel spiral staircase was introduced from the pathway associated with the Mirror Wall to view these paintings (figure 3.13).
With the declaration of Sigiriya as a World Heritage Site and the wide publicity it gained after the commencement of the UNESCO-Sri Lanka Project of the Cultural Triangle, Sigiriya undoubtedly became the most attractive destination for cultural tourism in the island, among domestic as well as foreign visitors.
During the period of operation of the Cultural Triangle Project, therefore, a modest car park, which was established before in the area between the base of the southwestern slope of the hilly terrain and the southern gate to the pleasure garden, was developed with toilet facilities and souvenir shops (figure 3.14). The car park was situated in such a way as to be hidden under the thick and wide canopies of the existing trees of the area

from high elevations. In order to avoid crowd congestion and cross traffic movement due to a large volume of visitors to the site, and to improve pedestrian circulation, the existing steel gangway to the rock summit was duplicated. Similarly, an additional spiral staircase to gain access from the pathway associated with the Mirror Wall to the paintings was also provided.

Figure 3.13
Spiral staircases installed to view the surviving paintings

The east-west axial pathway was extended to about one kilometer beyond the western outer rampart further west across the forest and paddy fields as the major approach road to the site. The objective of such an intervention was to provide different and changing views of Sigiriya rock to visitors approaching from a distance. With regard to this intervention, Ellepola (1999:40-42) remarks,

'The east-west axial line of the pedestrian pathway through the western water garden was extended outside the precinct to project the construction baseline of the new road trace. The western approach road was thus aligned with the existing geometry of the western precinct ... Several images of the Sigiriya landscape setting are captured along this road as the route approaches the western gate of the site ... The new road thus became the stage to reveal the drama and unique effects of the Sigiriya landscape setting.'



1. Vehicle Park, Shops & Other Tourist Facilities
2. New Buddhist Monastery
3. Housing for the Sigiriya New Village
4. Extended East-West Axial Approach
5. Herbal Garden
6. Sigiriya Museum
7. Vehicle Park

Figure 3.14
Layout of the Sigiriya complex showing the major interventions

As per the original master plan, a museum-cum-visitor center was constructed in the area beyond the outer rampart by this approach road

§ 3.2.3 The Surrounding Hinterland

With regard to the conservation of the hinterland surrounding Sigiriya proper, the master plan of the UNESCO-Sri Lanka Project of the Cultural Triangle at Sigiriya (Selvaratnam and Perera 1992:8) outlines its approach thus:

'... a complete excavated, restored and conserved citadel (Sigiriya proper) needs a proper setting. The setting has to be created not only within the gardens, but also outside the limits of the outer moat. The green fields, the landscape gardens, the presence of tanks, canals and other water sources, nearby monasteries, were all part of this setting. Thus, to take conservation as a whole, these must be looked into.'

As such, the principal lines of action suggested under this master plan are: preservation of the natural forest cover; conservation of Pidurangala and Ramakele monasteries and Mapagala fortification; rehabilitation of Sigiri Mahavava; prevention of township growth in the vicinity of Sigiriya and shifting of such development to Kimbissa; and preparation of guidelines for the development of townships.

Initially, an extent consisting of 5,100 hectares of land around Sigiriya was declared in 1988 as the Sigiriya Sanctuary under the Fauna and Flora Protection Ordinance (1937, amended 2009) to protect the forest and wildlife in the immediate vicinity of Sigiriya proper (figure 3.15). The traditional settlements, paddy cultivation and tourist accommodation facilities that are in conformity with the character of the sanctuary were permitted to function within this area.[61]

Although the hinterland surrounding Sigiriya has been economically deprived for several generations, the increase in cultural tourism and possible political and social pressure may create a major impact on the World Heritage Site of Sigiriya in the near future, and a decision has been taken to formulate a master plan for regional development by incorporating all the above actions to satisfy conservation as well as socio-economic development needs within the area. As such, the country's Urban Development Authority (UDA), which has regulatory powers to control development, was invited by the Central Cultural Fund to prepare a comprehensive regional plan for the conservation and development of the Sigiriya hinterland. As a result, a much larger area covering 9,400 hectares of land, conforming to the boundaries of the Inamaluwa Korale (local administrative area), was gazetted under UDA law. The principal objectives of this regional plan prepared in 1989 were to: conserve and develop Sigiriya and other significant archaeological sites; preserve the natural heritage; conserve traditional hamlets, villages and settlements together with their lifestyle including agricultural system; rehabilitate minor irrigation tanks; relocate settlements and townships; develop new townships to ease development pressure in the immediate vicinity of Sigiriya proper; and develop domestic and foreign tourism infrastructure with necessary guidelines

61 Later, the in-between land segment which is to the east of the Sigiriya Sanctuary and to the west of the Mahaveli Environmental Program Reserve was also taken to merge the two conservation areas into a single entity under the control of the Department of Wildlife Conservation. Therefore, the total sanctuary also played an important role in the conservation of the existing elephant population in the area, as it buffers its migratory corridors within the forest reserve (Ellepola, 1999:43).

(UDA, 1989). A Structure Plan was also prepared for this purpose (figure 3.16). Under this master plan, the small township that was developing in the area between the outer moat of the western precinct and Mapagala, and encroaching on the strict archaeological reserve, was relocated by the Central Cultural Fund, with much improved living conditions and facilities, to a location (new Sigiriya village) about one kilometer to the west of the outer moat of Sigiriya (figure 3.14). A commercial square was established at the western extreme of the newly laid out western axial approach road to Sigiriya. A car park and other facilities such as cafeterias, toilets, souvenir shops, publication sales center and tourist ticket sales for visitors were located within this commercial square, which is aligned with the axial arrangement of the Sigiriya scheme. The east-west axis of the layout was further extended westward to axially locate a new Buddhist monastery for the spiritual needs of the new settlement. By constructing a new stupa on this axis, the extended axis of the layout was terminated at this new ritual structure, which occupies the center of this monastery (figure 3.14). The bund of the Sigiri Mahavava between the hilly terrain and Mapagala was rehabilitated to facilitate the filling of the reservoir in the future, somewhat to its original capacity. With regard to the development of tourism, the Central Cultural Fund in collaboration with other related government and private-sector institutions prepared guidelines to regulate the future growth of the tourist industry within this area. These guidelines outline the development zones for tourist facilities as well as height, buildable area, color and texture of the buildings, infrastructure and other services to preserve the view from the rock summit. Apart from these activities, this master plan is not active at present.
Apart from the pressure due to cultural tourism, the area around Sigiriya is also being threatened by other development pressures. One such instance was the proposal in 2001 to expand and modernize the existing airport, of modest scale, located about three kilometers west of the World Heritage Site of Sigiriya into a major air base for military purposes. Although the military need was a priority during that period, the heritage managers in Sri Lanka together with UNESCO and ICOMOS convinced the authorities concerned of the unacceptability of that proposed project. The basis for the impact assessment, carried out by the Delft University of Technology on behalf of the ICOMOS (Van Voorden, 2001) with regard to this proposed development, was a scientific understanding of the significant value of the site,[62] and it was declared that the proposed project would cause serious and irreversible damage to the architectural, urban and landscape values of the site.
A tree-planting scheme was also initiated to reforest both sides of the Inamaluva-Sigiriya road, to provide a green belt and a dense canopy of foliage creating the effect of a drive through a tunnel of vegetation. Ellepola (1999:42) explains that this was intended to prepare visitors for the environmental experience of Sigiriya.

62 The report acknowledges the knowledge obtained from the present research (Van Voorden, 2001:1).

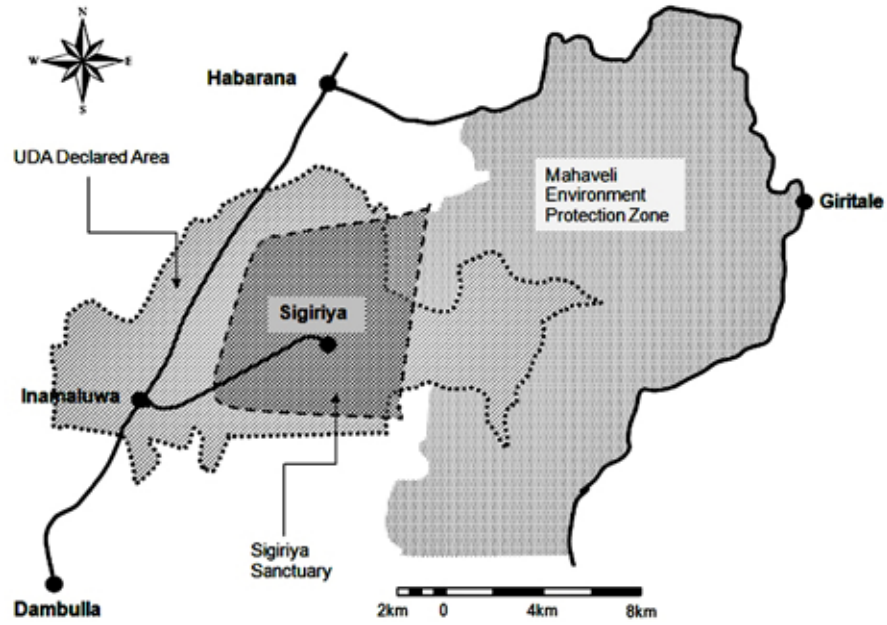


Figure 3.15
Different protected zones related to Sigiriya

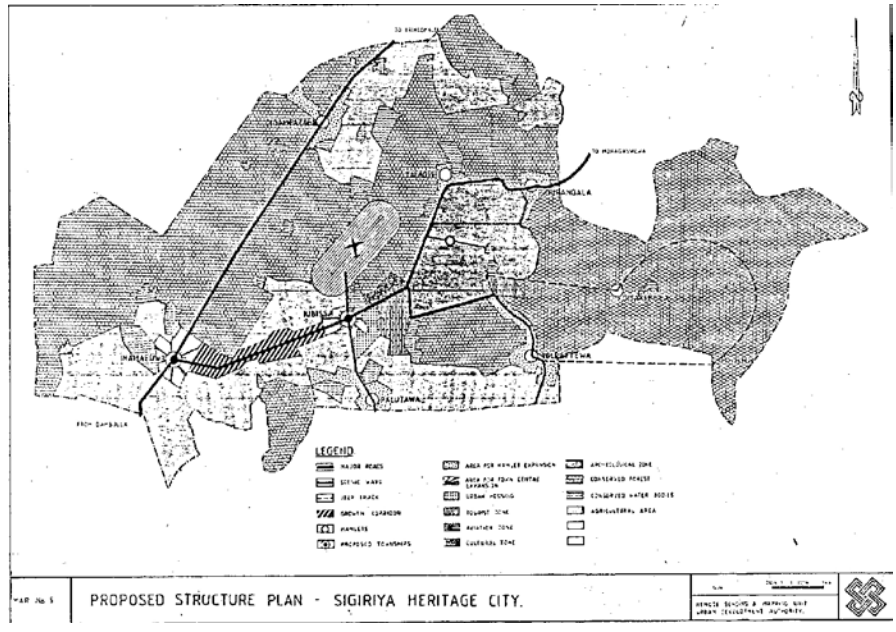


Figure 3.16
Proposed Structure Plan of the UDA for Sigiriya (courtesy: UDA, 1989)

§ 3.2.4 Observations

With regard to Sigiriya proper, emphasis was given to restoring the retaining walls of the terraces, ponds, pools and other hydraulic features that are either below ground level or at surface level. Except the remains that are necessary for visitor circulation within the site (such as flights of steps, stairways, pathways, and so on, that were either restored or rehabilitated for visitor use), the remains above ground level were mainly consolidated. This suggests that the conservation, presentation and development program so far within Sigiriya proper is basically an attempt to restore the ground morphology of the site and to partly revive the hydraulic system. The policy adopted for the remains above ground level (except those related to visitor circulation) is a minimal intervention to leave them as they are. The presentation technique used for the remains in certain areas (such as the rock summit, in front of the Lion-Staircase-House at the Lion Plateau, the four-quartered feature and its two outer compartments, miniature water garden) does not aid visualization of the differentiation between the open and built-up spaces. Therefore, due to such an approach, the three-dimensional aspects of the site are not properly presented. With regard to the remains that can be utilized for visitor circulation, they were either restored or rehabilitated. The new additions and major interventions, such as the introduction of the spiral staircase to view paintings and the extension of the east-west axis beyond Sigiriya proper in a further westward direction as the approach road to the site, suggest that visitors to the site have a major impact on the site. As far as conservation, presentation and development activities of the hinterland are concerned, other than confining to the administrative boundaries of Inamaluva Korale, there is no proper justification for the determination of its boundaries from a heritage point of view. Therefore, this suggests that these boundaries are arbitrarily decided. Although the conservation of the cultural and natural landscape beyond the walls of Sigiriya proper was identified as an essential aspect, the justification given for such an action is based on aesthetic reasons, that is to provide an appropriate setting for the Sigiriya site proper. This points out that the cultural and natural landscape beyond Sigiriya proper was identified only as a feature to serve as a mere background to the walled-in complex. The axial location of the commercial and visitor facilities at the western extreme of the newly laid out western approach road, and further extension of the east-west axis to terminate at the newly constructed Buddhist stupa, can also be considered as new additions and major interventions to the overall original formal layout.

All this indicates that policies with regard to conservation, presentation and development activities at Sigiriya have been largely influenced by the site's antiquarian values due to the dominance of archaeo-historical studies.

4 The Methodology

§ 4.1 Survey of Existing Methodologies

In order to derive an appropriate research methodology for the present study, a literature survey was carried out to see what methodologies have been followed in research on landscape design. Therefore, literature in the form of books, articles and periodicals were surveyed.[63] Literature dealing with such subjects as the horticulture and floriculture of landscapes was excluded from this survey, as they belong to a special subdiscipline of landscape design.

Since landscape design can be regarded as an art and a science at the same time, the survey reveals that the methodological approaches to study/understand landscape design can be roughly divided into two traditions: art-historical and technical-analytical.

Many publications fall into the category of the art-historical tradition. Such studies primarily focus on cultural-historical characteristics, picturesque aspects, art-historical study, and interpretation of landscape as works of art and architectural appraisal. This tradition is mainly developed by art/architectural historians and other culturally oriented academics. The text is the predominant medium of communication, while photographs, maps, plans and other drawings are used basically to illustrate their arguments. Only a few publications fall into the technical-analytical tradition.

63 Books surveyed are: Aben and De Wit (1999), Adams, W. H. (1978), Bentmann and Muller (1970), Berral (1978), Charageat (1955), Comito (1978), De Jong (1988, 1990), Dixon Hunt and Wills (1975), Berger (2002), Corner (1996), Fairbrother (1974), Fat and De Jong (1991), Frank (1956), Fleming and Gore (1979), Gollwitzer (1974), Gothein (1914), Hazlehurst (1980), Holmes (2001), Hussey (1967), Jashemski (1979), Jellicoe and Jellicoe (1975), Kask (1971), Laird (1992), Laurie (1975), Mann (1993), Mariage (1986), Moore, Mitchell and Turnbull (1993), Mosser (1991), Mostafavi (2003), Pechere (1987), Reh (1996), Reh, Steenbergen and Aten (2007), Shepherd and Jellicoe (1986), Smienk and Neimeijer (2011), Steenbergen (1990, 2008), Steenbergen and Bobbink (2009), Steenbergen and Reh (1996, 2003, 2011, 2012), Strong (1979), Thacker (1979), Tildon (2006), Tobey (1973), Turner (2005), Van Asbeck (1976), Van der Ree, Smienk and Steenbergen (1992), Van Voorden and Kwast (1997), Wittkower (1949), Woodbridge (1970,1982), and Yong and Yong (2005).

Among them,[64] Wittkower (1949) examines the architectural principles of Palladio villa design; Frank (1956) studies the typological arrangements of the Frascati villa; Hussey (1967) studies English gardens and landscapes; and Bentmann and Muller (1970) make the Italian villa the subject of a socio-historical analysis.

Hazlehurst (1980), in his study of the illusionist devices of French baroque gardens, designed by landscape architect Andre Le Notre, follows an approach that is a mixture of these two traditions. The main themes which he discusses in the publication can be summarized as follows:

- *Relationship to the topography:* how the design is imposed upon the terrain, how the existing topographical features such as mounds, valleys, streams and availability of water, and existing man-made features such as settlements and structures, were considered in the realization of the scheme, and, on the other hand, how these features have influenced the adjustment of the scheme, for example.
- *Definition of space:* what the spatial limits of the scheme are, how they are defined, treated, and so on.
- *Axes and focal points:* identification of the different types of axes in the scheme (for example, main axis, transverse axes), and how they are formed, reinforced and visually programmed using different elements (visual organization, direction, slowing and termination); identification of the focal points of the composition and how they are achieved, and so on.
- *Optical effects:* how the different forms of the scheme are visually interrelated to each other, and how they change with dramatic rapidity when the spectator advances down the scheme.
- *Sudden surprises:* how the elements of the design are highlighted and presented as a surprise, and how they are unveiled to the spectator.
- *Symbolic meaning:* what are the symbolic meanings of the elements in the spatial scheme and their expression.

For the analysis, Hazlehurst uses aerial photographs to show the relationship of the garden proper to the surrounding landscape, technical maps and plans with sight lines, a series of perspective sketches and special photographs to show how different elements in the scheme relate to each other, as well as conventional illustrations such as maps, plans and engravings.

Moore, Mitchell and Turnbull (1993), in their attempt to make suggestions about how the landscape 'patterns' and 'ideas' of the past can be appropriated, interpreted and transformed for modern times and in different locations by looking at the

64 Other studies that follow a technical-analytical approach are: Charageat (1955), Woodbridge (1970, 1982), Kask (1971), Mariage (1986), Shepherd and Jellicoe (1986), Corner (1996), Berger (2002) and Mostafavi (2003).

great landscapes of the past around the globe, also use a methodology which is in between these two traditions. Specially drawn plans, perspectives and axonometrics highlighting the elements are used as tools. The axonometrics are used to differentiate various spatial layers, such as the land form, buildings, walls, terraces, paths, water and planting of the landscape.

§ 4.2 Methodology of the Delft Tradition of Research

Steenbergen (1990, 2008), Van der Ree, Smienk and Steenbergen (1992), Reh (1996), Steenbergen and Reh (1996, 2003, 2011, 2012), Reh, Steenbergen and Aten (2007), Steenbergen and Bobbink (2009) and Smienk and Niemeijer (2011), in their studies of Italian, French, English, Dutch and other landscape design, use a methodology with a technical-analytical approach that has been developed at the Delft University of Technology in the Netherlands. This approach, which is part of the 'Delft tradition of research' on architectural and urban design, utilizes detailed and precise analytical tools with a broadbased overview.

This methodology, to analyze and compare architectural principles underlying the landscape designs of all influential periods of the West European landscape tradition, was developed by the Landscape Design Department of the Faculty of Architecture at the above university. The basis for such a methodology was a combination of the design/analytical tradition that had evolved in the architectonic and urban planning disciplines of the same faculty and the typological and morphological research developed by the Venetian School in Italy.

The analysis begins by examining the theoretical body of knowledge – the science, ideology and art theory, concepts of nature and space – of the period. An outline of the history of each landscape in relation to its commission is then provided. The morphology and topography of the site is analyzed to explain the basic form of the design. Next comes an analysis of the architectural design in more detail. Such a methodology implies departing from the romanticized preconception of historic examples in favor of "unearthing" the dynamic and creative thinking process behind them. As Reh (1996:496) remarks, 'the original design process cannot be precisely reconstructed, as it is forever lost in history. But it can be brought to life by inviting the reader to 'redesign in his own mind' the landscape gardens ...' The result of the analysis is a hypothetical compositional scheme of the design: an abstract model including all active compositional elements of the design.

The analysis uses topographic maps of the surrounding landscape, longitudinal/cross sections of the topography and digital three-dimensional terrain models to show the geomorphology, axonometrics of the scheme, plans with sight lines, and perspectives of how different elements of the scheme relate to each other. The text only complements the above, becoming a secondary medium of communication. The most

important aspect of this methodology is that it provides an insight into conceptual thinking and the three-dimensional aspects of the landscape design, and one can thus arrive at precise conclusions with a rational and logical language. As such, this research methodology has made it possible to examine design techniques and make comparisons of different designs from all the influential periods of the West European landscape tradition.

In the spatial analysis of the landscape of the Neercanne Gardens in Maastricht, the Netherlands, van Voorden and Kwast (1997) also follow a methodology similar to the above. The spatial and architectural themes of the composition are presented in a series of plans and analytical drawings. The text is also directly combined with the images. Aben and De Wit (1999) also use the above methodology to analyze the design of the European medieval 'enclosed garden'.

Since the objective of the present study is to read Sigiriya as a landscape architectonic design with special emphasis on the architectonic means employed to order the elements in the composition and thereby to understand its design characteristics, it is essential that this study adopt a technical-analytical approach. Out of the technical-analytical methodologies mentioned above, that of the Delft tradition of research is comprehensive and has delivered positive results. In order to adapt this methodology to carry out the present study, it is important to be familiar with the analytical keys and tools developed in the Delft tradition of research. For this reason, site visits were made to Italian Renaissance villas, French formal baroque gardens and the English landscape parks of the West European landscape tradition.[65]

In order to 'read in reverse' the landscape design, the landscape architectonic design is conceptually anatomized into the following four aspects,[66] which 'layout the relation between the architectonic design and its perception in a systematic way and afford insight to the spatial dynamic of the design.'[67]

65 The sites visited were such Italian Renaissance villas as Villa Medici at Fiesole, Villa Lante at Bagnaia, Villa d'Este at Tivoli, Villa Giulia in Rome and Villa Farnese at Caprarola; such French formal baroque gardens as Vaux-le-Vicomte at Melun, near Paris, Chantilly and Versailles; and the English landscape garden at Castle Howard in Yorkshire.

66 This layering system is similar to the theoretical model developed by the German architectural theorist Paul Frankl (1914), to describe architectural forms in terms of four categories: Spatial Form or spatial composition; Corporeal Form or treatment of mass and surface; Visual Form or treatment of light, color and other optical effects; and Purposive Form or the relation of design to function.

67 See Steenbergen and Reh (2003:383).

- The *Basic Form* or the basic plan in which the topography of the natural landscape and man-made landscape are rationalized.[68]
- The *Spatial Form* or the architectonic form and spatial effects of the three-dimensional landscape space, through which spatial dynamics are created.[69]
- The *Metaphorical Form* in which the metaphorical images of natural and man-made landscapes are adapted and come together with elements of the urban program and metaphorical-spatial references.[70]
- The *Programmatic Form* or the Form of the Program, which brings the divisions in the landscape and the architectonic expression of the program into relation with the pattern of movement in and through them.[71]

§ 4.3 Adaptation of the Methodology for the Present Study

The above methodology of the Delft tradition of research is mainly used for the analysis of gardens and landscapes that are in a good state of preservation and/or have enough

68 The basic form is the way in which the topography of the natural landscape or the man-made landscape is reduced, rationalized and activated in the ground plan of the design. For instance, a rational matrix can be laid notionally over the natural landscape. The components of the landscape that fall within the matrix are then arranged geometrically. Formal laws of design can also be played against the natural morphology. In this case, a balance is sought between the autonomy of the design and the irregularity of its landscape context. The basic form is definitive for the concept of 'place'. One might call playing with 'place' a prime generator of the landscape architectonic composition (Steenbergen, 2008:39).

69 Spatial form is the form and operation of three-dimensional landscape space which creates a spatial dynamic. This might be, for example, the framing of a landscape or urban panorama, or the construction of a spatial series along the route of a picturesque landscape composition. Spatial form is definitive for the understanding and experience of space. In landscape architecture the principle issue is always the coherence of the landscape space, from very close by to the far distance, as distinct from its architectonic delineations (Steenbergen, 2008:127).

70 The metaphorical form is the way in which iconographic and mythological images and architectonic structural forms are connected with one another and with elements from nature, such as water, the relief and vegetation. It is the systematization of various references to origins and to other worlds. Natural elements such as soil, water, plants and animals can play a role as references when they are connected to mythic elements or to the world of classical gods. Both history and the future are represented in the composition, and thereby connected with each other (Steenbergen, 2008:235).

71 Form of the program makes the functional zoning and the organization of the program in relation to patterns of the movement explicit. Here one is constantly faced with the question of to what extent the program determines the landscape architectonic composition, and vice versa. The form of the program is definitive for the understanding of human activity, for the purposiveness of the spatial organization of the landscape (Steenbergen, 2008:243).

reliable documentary and literary information to visualize the total three-dimensional aspect of the design. As far as Sigiriya is concerned, its physical remains have been preserved only in a skeletal form (only basements/foundations of most of the structures have survived to date), and no literary or documentary evidence is available to visualize the three-dimensional appearance of the complex. Moreover, there is a vast gap with regard to the time (about 1,500 years) and to the social, cultural, political and geographical context between the western tradition and Sigiriya. As such, in the following section, considering the context of Sigiriya, the analytical keys and tools of the above methodology are adapted for the analysis. Observations with regard to the western tradition are also provided in brief with reference to the three prototypes introduced by Steenbergen and Reh (1996:8-9, 14-15)[72]: the Italian Renaissance Villa Medici (1458-1462) at Fiesole, the French formal baroque garden Vaux-le-Vicomte (1656-1661) at Melun, near Paris, and the English landscape garden of Castle Howard (1698-1723) in Yorkshire.

a. Background Studies

I. The Theoretical Body of Knowledge: Science, Ideology and Art Theory of the Period

In the western examples, the examination of the above aspects in the landscape design context of the period has contributed to the analysis and interpretation of the design. Literature which gives direct reference to such subjects is available in the West European context. However, such direct data during the 5th century AC, at the time of the laying out of Sigiriya, are not available, and the compilation of such information is beyond the scope of the present study. However, the contents covered under environment, topography and society; attitude towards nature; cosmology; discourse on kingship; city planning and architecture; irrigation engineering; pleasure activities of royalty; and external contacts related to the society of the 5th century AC (see section 2.1) provide the context for this study.

II. Outline of the History of the Site in Relation to Its Commission

Since the outline of the history of western examples, together with the background of the client and of the architect in relation to the commission is known, such information has provided important background data for the analysis of these examples. With regard to Sigiriya, the establishment of the chronological sequence and periodization of the site in an archaeological sense and the client of the major constructional phase are known by name. Although the functional requirements and his aspirations are briefly recorded in the chronicles, such information cannot be

72 See Steenbergen and Reh (1996:8-9, 14-15).

regarded as precise data due to the biased nature of recording by the chroniclers. This suggests that such aspects, although they are related to the design, are also excluded from the present study.

b. The Basic Form

I. Characteristics of the Natural Landscape: Analysis of the Natural Geomorphologic and Topographic Characteristics of the Site

With the aid of topographical maps, contour plans, digital three-dimensional terrain models of the geomorphology, and engravings and literary descriptions of the site before and after the laying out of the schemes of the western examples, the characteristics of the natural landscape before the interventions (such as the natural axes, boundaries, focal points, views and view points) are analyzed to understand the internal logic of the natural landscape. At Villa Medici, there is an open view from the site across the large Arno valley, while the higher hills along the northern edge form a hard limit and the lower hills to the south form a diffuse boundary. The geomorphologic characteristics of Vaux-le-Vicomte do not provide specific natural view points. However, there are two natural axes formed by the valleys of Anqueil and Bobee. The rolling hills at Castle Howard enable unrestricted views of the outer landscape. In most of the design solutions, a balance is sought between the autonomy of the landscape design and the characteristics of the existing natural and agricultural landscape. Therefore, it is important to analyze the following aspects with regard to the characteristics of the natural and agricultural landscape of Sigiriya before interventions. Since Sigiriya rock rises to a height of about 180 meters above the virtual plain, it is important to analyze the characteristics of the natural and agricultural landscape in relation to the ***geomorphology*** and ***topography*** (including the geological system and the agricultural landscape with its partly natural and partly man-made drainage network) associated with Sigiriya rock, and the wider landscape context and in relation to the ***natural, topographic configurations*** (such as natural lines, axes). Unlike in the western examples, there are no engravings or literary descriptions of the natural and agricultural landscape before its major constructional phase. However, the archaeological research carried out at Sigiriya and at its hinterland (Bandaranayake, 1990b:19) suggests that no considerable change occurred during the past 1,500 years with regard to the geomorphology and topography, as well as the natural, topographic configuration of its natural and agricultural landscape. As such, the present topographical maps and contour plans, and digital three-dimensional terrain models of the geomorphology will be used for the present analysis.

II. The Interaction of the Formal Layout with the Natural and Agricultural Landscape

Using site plans, sections, layout plans with topographical maps, axonometrics and digital three-dimensional terrain models of the geomorphology, the interaction of the formal layout of the western examples with the characteristics of the natural landscape is analyzed in relation to location, orientation, positioning of the house and

garden, visual balance between the layout and the terrain's natural form, in order to examine the relationship between the internal logic of the natural landscape and the design response upon it. Such an analysis, therefore, enables one to see whether the formal layout has an autonomous architectural system (with no interaction with the natural landscape) or total/part adaptation to the natural landscape. At Villa Medici, the construction of garden terraces in a north-south direction is in keeping with the natural contours of the terrain. The scheme is laid out like a balcony overlooking the Arno valley and the city of Florence. At Vaux-le-Vicomte, the natural geomorphologic characteristics of the river valley were used to isolate the layout from the rest of the landscape. The cutting and filling of earth was also minimized by positioning the main axis diagonally through the natural contours of the site. The width of the garden proper was also determined by the natural width of the side valley. The complex interaction with the garden's axial symmetry, the geometric middle of the forest section and the natural course of the river valleys create a visual balance between the plan's symmetry and the terrain's natural form. This formal layout is isolated from the open agricultural landscape by a dense forest wall. However, river Anqueil, which flows across the site, was exploited to anchor the complex in the landscape. At Castle Howard, the positioning of the architectonic set pieces along the Great Avenue forms a series of composition that corresponds with important points of the natural morphology of the site. The positioning of the house, facing south, makes the open agricultural landscape part of the layout.

Since Sigiriya rock, a major natural feature, is part of the formal scheme and the layout has an axial arrangement, it is important to analyze the interaction of the formal layout of Sigiriya with the natural and agricultural landscape in relation to the ***lines of the formal layout*** (boundaries of the overall layout and various enclosures), ***location and orientation*** (of the overall layout, various enclosures, built elements within them), and ***axial arrangement*** (of the overall layout, compound associated with the four-quartered feature, rock summit). The site plans, sections, layout plans with contour lines, axonometrics and digital three-dimensional terrain models are used for the present analysis.

III. The Geometry

The analysis of the formal layout of the western examples in relation to its geometry (system of measure and proportion and grid system, and its position in the landscape) has enabled the establishment of whether the design is governed by a structuring geometric system, which can eventually be used for a hierarchic/centralized composition, or not (a move away from such a system to deliberately break this composition). At Villa Medici, the geometric system can be interpreted as a dimensional scheme in which the connection between the plan of the house, the garden and the landscape could be controlled mathematically. The plan as a whole has a maximum possible dimension in the given mountain slope. The geometric organization of the plan at Vaux-le-Vicomte consists of an orthogonal grid. The axis is the central line in the geometry. The grid module is larger towards the edges of the plan. This expanding

measurement system has basically three levels of scale: the house, the garden and the estate. By laying the measurement schemes over each other, a hierarchical system exists with a continuous series of jumps in scale between the interior and the landscape along the axis. Castle Howard, on the other hand, witnesses a move away from the formal geometric layout, with the fragmented rational and formal elements held together by the contours of the natural morphology.
Since a geometric grid has also been noted at Sigiriya by Bandaranayake (1990:26, 1994a:15-16), the analysis of the geometric relationship of the layout ***(geometry of the scheme)*** could be helpful to understand to what degree it was used to control the composition and to organize the scale of the elements in the design. As in the case of the western examples, the layout plans and detailed plans are used for the present analysis.

IV. The Symmetry and Asymmetry
Analysis of the symmetry of the formal layouts of the western examples shows how the objects and elements are organized and ordered to understand the compositional aspects of the design. At Villa Medici, the symmetricity is limited to the northern and southern terraces. At Vaux-le-Vicomte, axial symmetry prevails along its central axis. At Castle Howard, the symmetricity disappears among the physical and geographical line of forces of the natural landscape.
Since symmetry as well as asymmetry are noted at Sigiriya (Bandaranayake, 1990b:26, 1994a:15-16), analysis of the overall layout, various enclosures such as pleasure garden, hilly terrain, rock summit and the routes through various enclosures in relation to the ***symmetry and asymmetry,*** will help in understanding how such aspects contribute to order the composition of its design. As in the case of the western examples, contour maps and plans are used.

c. The Spatial Form

I. The Spatial Entities of the Scheme in Relation to Their Incorporation and Organization
Analysis of the spatial structure of the western examples in relation to the incorporation and organization of the spatial entities (the house, garden and open landscape) has contributed to understanding its hierarchical order. At Villa Medici, the house was at one extreme of the spatial scheme, while at Vaux-le-Vicomte it has become the central object of the space. At Castle Howard, the house as the central object of the scheme was again diminished with the introduction of several autonomous structures that are scenically composed in each other's line of sight. The garden at Villa Medici was the spatial and visual link between the house and the open landscape, while at Vaux-le-Vicomte it was the ultimate space that is linked to the house along the central axis. At Castle Howard, the garden merges with the open landscape and reads as a single entity. Open landscape was the newly added spatial entity at Villa Medici, while at Vaux-le-Vicomte the introduction of the forest as a thick wall between the garden and the open agricultural landscape visually separates the latter from its spatial scheme. Open

landscape reappears at Castle Howard and the space flows through the estate to the open landscape as unbounded space.
Since Sigiriya offers an interesting example where gardens and structures are laid out at different levels with a 360° panoramic view from its elevated position of the rock summit, it is important to analyze the spatial structure to identify the ***spatial entities*** of Sigiriya and how they are ***incorporated and organized,*** to understand its spatial design. The plans and sections are used for the present analysis.

II. The Three-dimensional Aspects of the Panorama/Horizon in the Spatial Scheme
Analysis of the three-dimensional aspects of the panorama and horizon (which is the limit of the outer landscape) in the spatial scheme of the western examples also helps in understanding its spatial design. At Villa Medici, the introduction of loggias and pergolas into the overall scheme provides scale to the panorama and creates a perspective relationship with the horizon. Although the panorama is not part of Vaux-le-Vicomte due to its location, the horizon was brought within its boundaries by artificial means. At Castle Howard the panorama and horizon reappear with all naturalness.
Since the panorama and horizon are noted at Sigiriya, the analysis of the three-dimensional aspects of Sigiriya in relation to the ***treatment of the panorama/horizon*** helps to understand its spatial design. Plans and exaggerated cross sections with perspective picture planes are used.

III. The Spatial Depth in Relation to the Arrangement of Spaces/Elements
Analysis of the spatial design of the western examples in relation to the arrangement of the spaces shows that the spatial depth resulting from the visual/optical boundaries of a scheme help to understand its spatial design. For instance, the visual boundaries of Villa Medici extend beyond the parameters of its property all the way to the horizon. On the other hand, although the physical depth of Vaux-le-Vicomte does not exceed more than a kilometer, its spatial depth cannot be gauged due to the perspectively manipulated sequence of spaces within the layout. At Castle Howard the reality prevails with its spatial depth again extending to the endless space beyond the boundaries of the plan.
Since the east-west axis of Sigiriya is visually blocked by an enormous rock mass, to see how this is spatially worked out it is therefore important to analyze the scheme in relation to the ***spatial depth*** to understand its spatial design. Plans and cross sections are used.

IV. The Scenography of Movement along the Three-dimensional Space

Analysis of the scenography of movement along the route of the three-dimensional space of the western examples shows that acceleration, deceleration or even ceasing of movement and the unrevealing technique (announcement in advance or sudden appearance) give rise to the three-dimensional aspect of the spatial design. At Villa Medici, the scenography of movement is almost static, while at Vaux-le-Vicomte it changes with dramatic rapidity from point to point along its main axis. At Castle Howard the pictorial scenography of the Grate Avenue indicates the vastness of the space as well as highlights the important geomorphologic points of the topography to become the backbone of the landscape composition. It is, therefore, a 'decomposition' of the formal model of axial symmetry. Since the central rock formation at Sigiriya has an overwhelming presence in the overall scheme, and large rock boulders are scattered around the base of the central rock, it is important to see how these features are manipulated in the ***scenography of movement*** along the three-dimensional space. Therefore, the analysis of the scenography of movement of Sigiriya will help to understand its spatial design. Plans and sections with sight lines, perspective sketches and photographs are used.

d. The Metaphorical Form

The Elements that Dictate the Image and Their Organization in the Pictorial Composition

Natural elements such as trees, rocks, forest, water, horizon and agricultural landscape, and man-made features such as springs, pools, ponds, parterre, sculpture and architectural objects in the scheme in relation to their visual expression, materialization and symbolic meaning of the western examples help to understand the elements that dictate the image and how they are visually organized in the pictorial composition. At Villa Medici, the incorporation of the open landscape as an individual spatial entity was a result of a change of attitude during the Renaissance. Natural features such as earth, water and vegetation were a fixed and expressive form of reality. At Vaux-le-Vicomte nature was depicted in a contrasting manner with parterre, the tapis vert and the forest, in a hierarchical sequence of increasing naturalness. The open landscape, which is the ultimate nature, was banished from the overall scheme and subordinated. At Castle Howard man's consideration of his classical past is represented in the iconography of classical structures. The autonomous position of each structure expresses the rising individualistic attitude of the age. Nature, which coexists in the scheme, expresses the rightful place it received during this age of enlightenment. Since Sigiriya also has natural features such as the rock, boulders and hilly terrain; agricultural features such as tanks, fields and canals; and man-made features of the built landscape such as rock/boulder and water-associated buildings, ponds and pools, fountains, serpentine streams and cascades that are activated through hydraulic features, analysis of the ***visual structure*** in relation to the visual expression, materialization and symbolic meaning of such features in the architectural context will help to understand the pictorial composition of its design. As in the case of the western examples, maps, plans, pictures and diagrams are used.

e. The Programmatic Form

Analysis of the organization of the functional spaces, the balance between negotium (business activities, production, administration, daily 'food' functions) and otium (scientific, cultural and religious interests and contact with nature, including places for recreation, representation, cultural activities) of the western examples has helped to understand how functional attributes of the scheme are reinforced through the architectural means. At Villa Medici, the open landscape was the most important space of the whole scheme, and most of the features were introduced to highlight this space. At Vaux-le-Vicomte the axial zone was the major space where ceremonial functions took place. At Castle Howard, again, the open agricultural landscape was the important space.

Since Sigiriya has programmatic domains (such as royal, urban strata, common masses, monastic communities) and spaces related to different activities (such as pleasure sports, leisure, religious, agricultural use), analysis of the ***activities and functional elements*** of Sigiriya will help to understand its design. Maps, plans and diagrams are used.

5 The Analysis

§ 5.1 Characteristics of the Natural and Agricultural Landscape

§ 5.1.1 Geomorphology and Topography

5.1.1(a) The Wider Landscape Context

Extending northwards from Sri Lanka's northern foothills (known as the Matale Foothills) of the central massif is a vast and extensive peneplain. A series of longitudinal ridges, resembling the fingers of an outstretched palm, splay fanwise from these foothills on the peneplain (Perera, 1984:228). Lithologically, this area belongs to the Wanni Complex, one of the three lithological subdivisions of Sri Lanka. Belonging to the Precambrian age, the lithological characteristics of the area coupled with millions of years of tropical weathering and erosion have given rise to a geomorphology of prominent ridges and valleys (Dahanayake 1990:107). With regard to the lithological characteristics of the wider landscape context and the weathering and erosion process, Prema (2001) describes,

'The ridges are composed of quartzo-feldspathic rocks with a high percentage of quartz. Quartzites and quartz-rich granitoids are the most resistant of these to weathering. The least resistant rocks are dolomitic marble, garnetiferrous, biotite-sillimanite gneisses and hornblende bearing gneisses which form negative relief features and are usually exposed in the valley bottoms.'

Another geological feature of this area is the inselbergs (erosion remnants) that have stood out against the leveling process of nature largely due to the fact that they are made of highly resistant rock-forming minerals. Their present heights give only an indication of the original height of the land, for even the inselbergs have suffered much leveling down (Cooray, P. G., 1967:54). Therefore, the area is characterized by undulating topography with interspersed ridges and inselbergs. Flanked by two such

south-north running ridges (Konduruvava ridge to the east and Inamaluva ridge to the west), Sigiriya rock pillar, one of such inselbergs, rises to almost 180 meters above the surrounding virtual plain (figures 5.1, 5.2, 5.3) or 360 meters above the mean sea level (MSL).

Just south and about one kilometer to the north of Sigiriya rock are two other rock formations of Mapagala and Pidurangala. Mapagala is elongated in plan and rises only to a maximum height of about 65 meters above the surrounding plain (245 meters above MSL) and hence does not at all dominate the skyline. Compared to Sigiriya, which has almost vertical walls on all sides and a roughly flattened summit, Pidurangala is conical and elongated and rises to a height of about 162 meters above the surrounding plain (342 meters above MSL), and therefore is about 20 meters less in height than Sigiriya. The vertical rock mass of Sigiriya, which resembles a 'rock chimney', therefore, dominates the skyline over Pidurangala and Mapagala from the plain below (figures 5.4, 5.5).

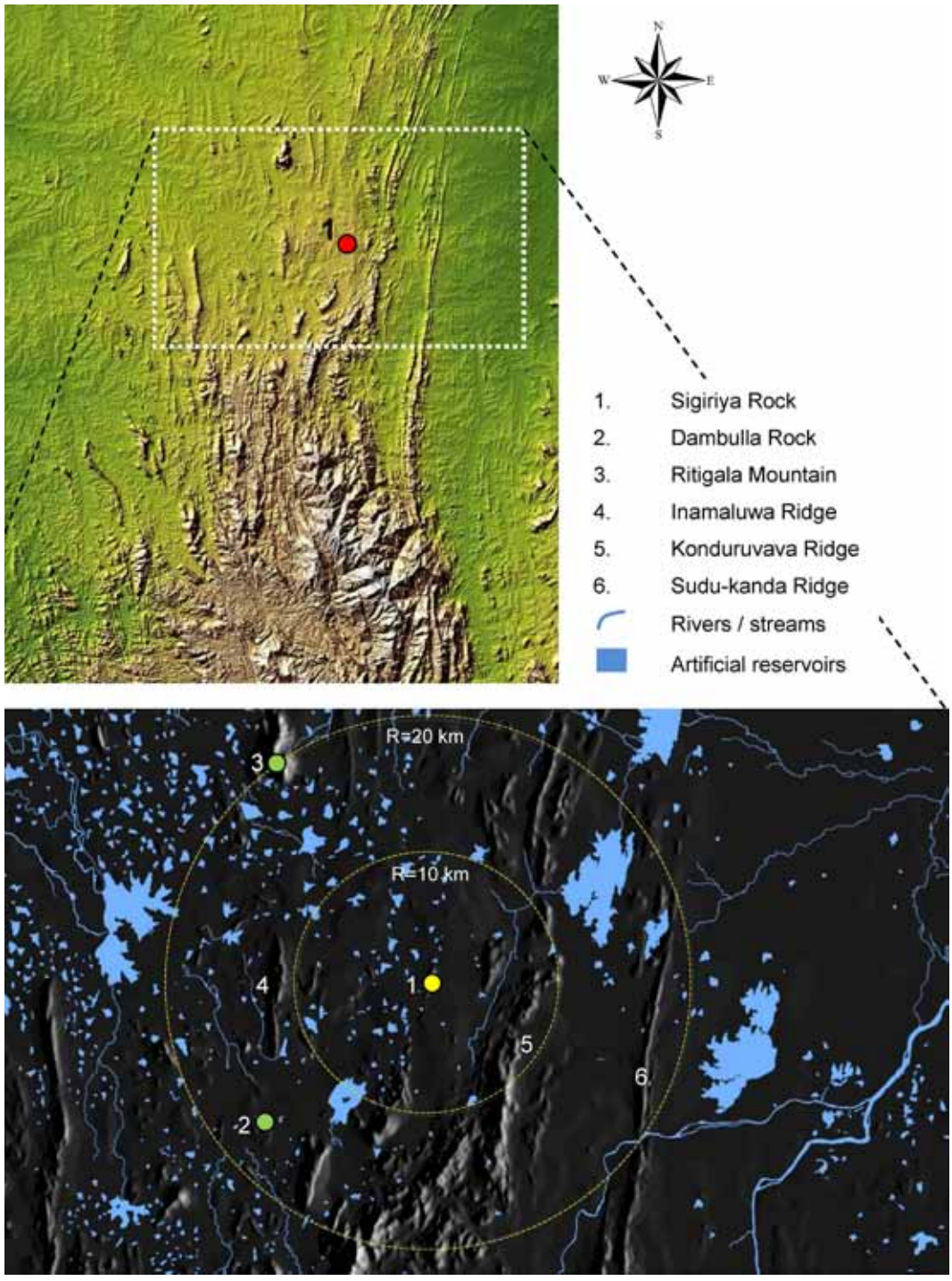


Figure 5.1

Peneplain extending from the Matale Foothills showing the longitudinal ridges and positioning of Sigiriya rock in the wider geomorphologic setting

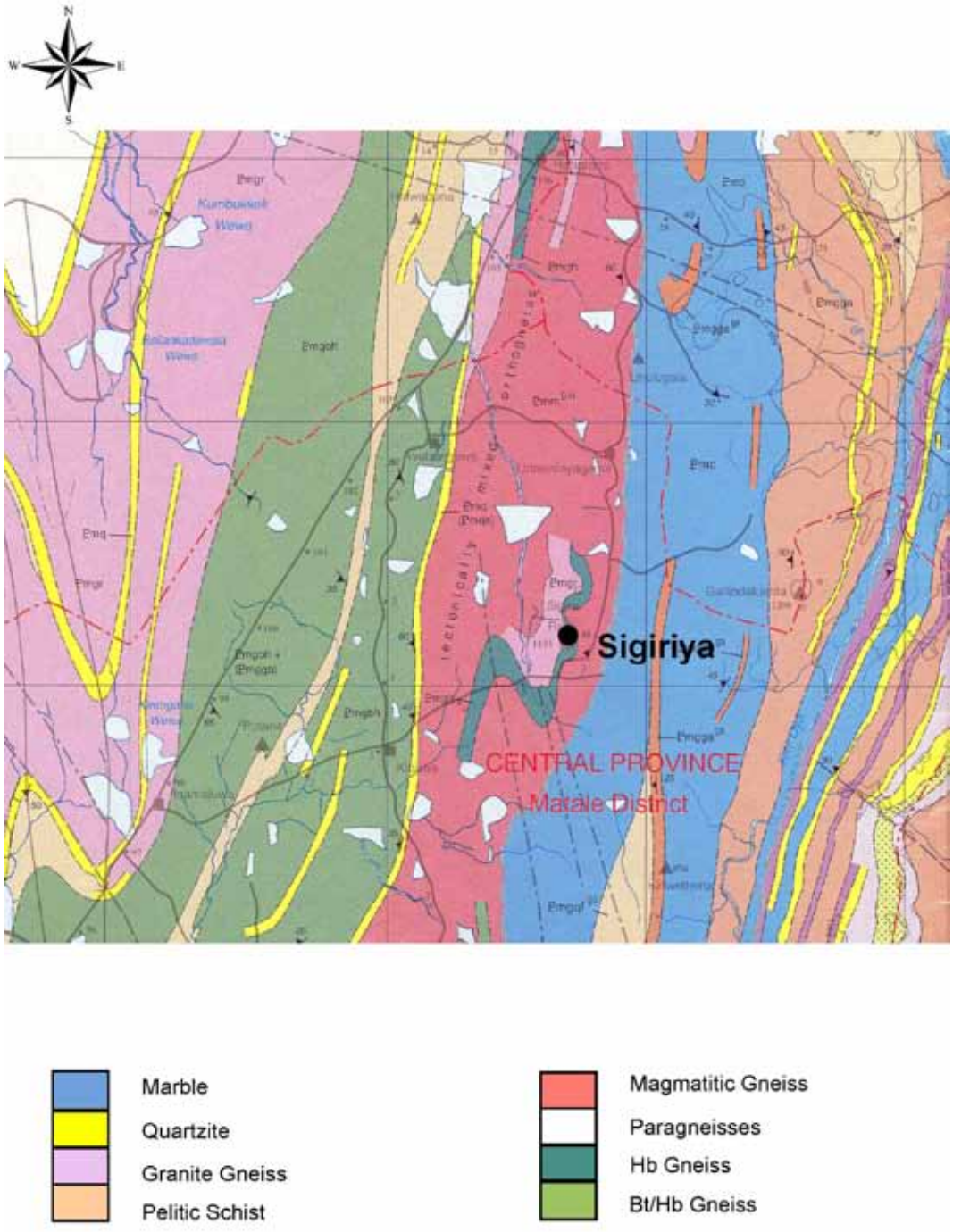


Figure 5.2
Sigiriya rock in the context of regional geological setting (courtesy: Prema 2001)

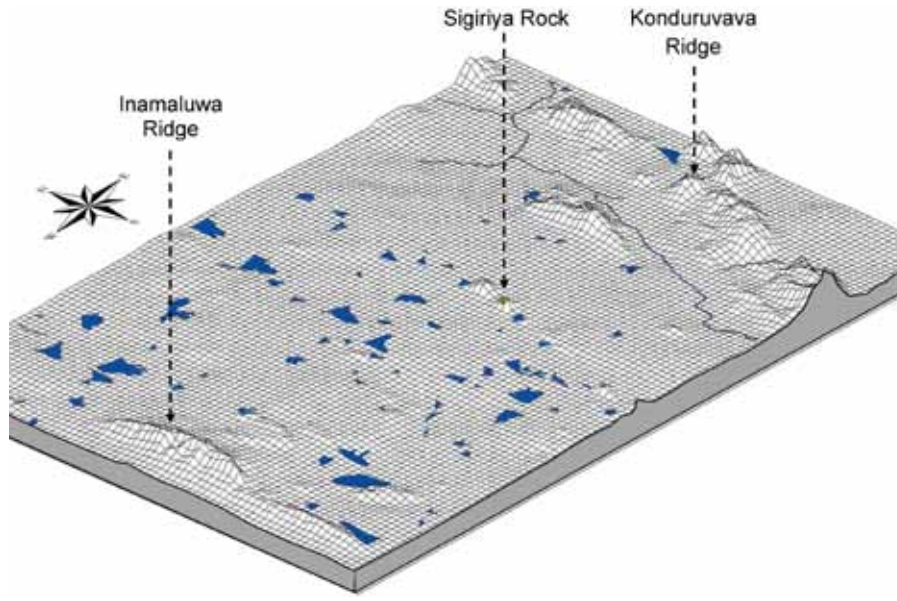


Figure 5.3
Terrain model showing the position of Sigiriya flanked by two longitudinal ridges (vertical scale exaggerated)

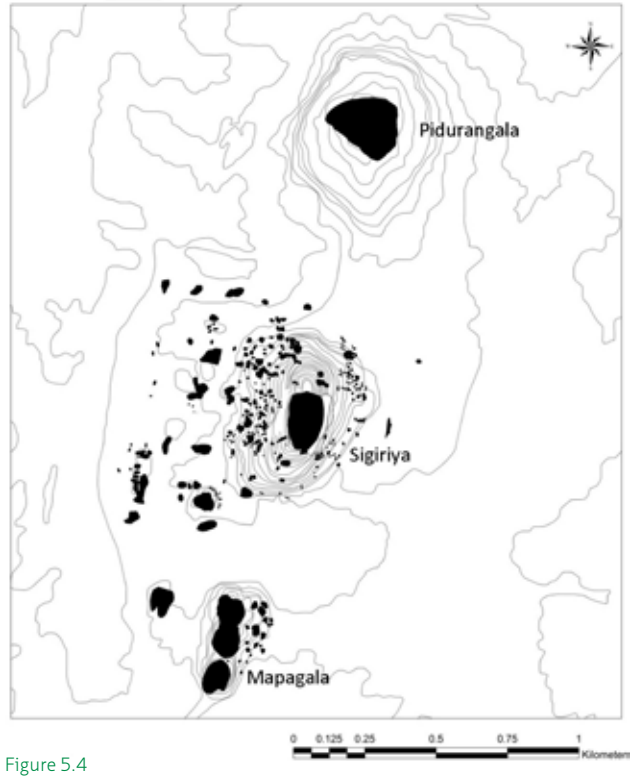


Figure 5.4
Contour map showing the relationship of Sigiriya with the rock formations of Pidurangala and Mapagala

Figure 5.5
North-south profile across Sigiriya rock (A) showing the protuberant features of Pidurangala (B) and Mapagala (C) rock formations

The presence of Pidurangala and Mapagala to the north and south, respectively, of Sigiriya rock, however, makes an uneven topographical profile across Sigiriya rock in both north and south directions (figures 5.6, 5.7). The profile along the east and west directions from the rock, in contrast, has a smooth descent towards the virtual plain without any significant protuberant topographical features. Unlike from the north and south, the views of Sigiriya rock from the plains to the east and west below, therefore, are unobstructed, and the rock rises abruptly against the eastern and western skies. This shows that the best views of the rock from the plain below are offered in both east and west directions.

Figure 5.6
Sigiriya rock showing the qualities of a 'rock chimney' (looking southwest) (photo: Dominic Sansoni/ ThreeBlindMen)

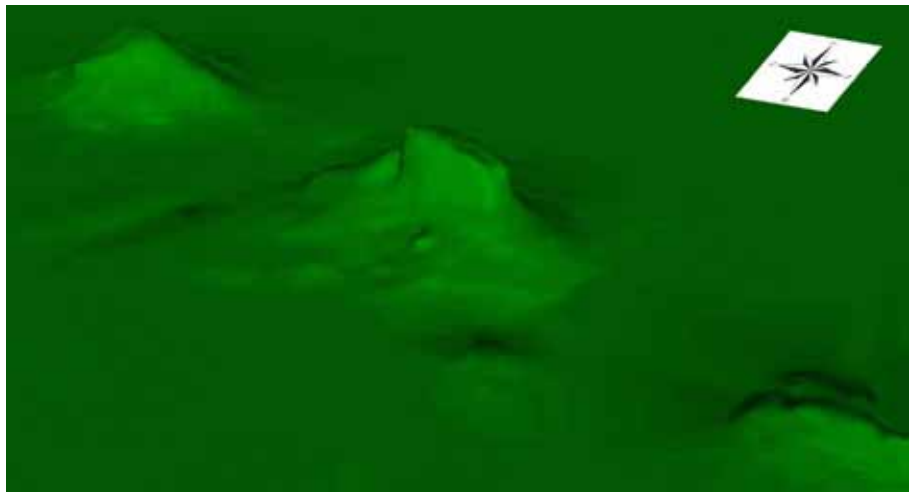


Figure 5.7
Terrain model showing the relationship of Sigiriya rock with Pidurangala and Mapagala rock formations

Since the summit of Sigiriya rock is situated at an elevation of about 180 meters above the plain, it has an extensive panoramic view of the undulating topography extending to the horizon in north, east and west directions. The panoramic view of undulating topography consists of natural and agricultural landscape, that is the dense green tropical forest cover over the extensive plain, which is interspersed with agricultural fields and settlements, and dotted with waters of the man-made agricultural tank cascades. The foregrounds of the northern and southern panoramas consist of Pidurangala and Mapagala rocks, respectively. With regard to the distant southern panorama, Perera (1984:229) remarks,

'Looking south, one views the cul-de-sac of the Nuwaragala Kanda (mountain) while the longitudinal ridges flanking the east-west – due to an illusion in perspective vision – give an appearance of a basin around the two rock pillars of Sigiriya and Pidurangala.'

The virtual plain immediately beyond the hilly terrain on which Sigiriya rock stands has an elevation of about 200 meters above MSL. If this plain is assumed as a level surface with the same elevation of 200 meters above MSL, the theoretical (calculated) optical boundary of the panorama (horizon), due to the curvature of the earth surface, will lie at a radius of about 48 kilometers from the center of the rock summit. But the panoramic depth in qualitative terms has little bearing on such objective measurements, and is very much dependent on indicators of the perception of depth, such as the effect of perspective and gradient of the texture in space (Von Meiss, 1986:104-105). Although the gradient texture together with the color and size of the natural landscape features of the northern panorama, such as rocks, trees and tanks, provide the depth to its foreground, as the eye travels towards the horizon, it gradually

reaches a point where the perspective diminution is so great that the gradient of texture together with color and size of the distant landscape features seem to melt into each other and dissolve into the atmosphere. Since such an effect created by a diffuse boundary does not permit a gauge of the panoramic depth, a real impression of its depth is effected. Although the theoretical depth of the northern panorama is so great, its visual depth is relatively shallow, and hence less impressive from the rock summit. On the other hand, if the visual limits of the eastern and western panoramas are plotted onto a map using view-shed analysis,[73] it shows that the optical boundaries of the scheme in east and west directions lie at about 8 and 11.5 kilometers, respectively, from the center of the rock summit (figure 5.8). Therefore, it is very much less than the theoretical depth, which is 48 kilometers. However, the geomorphology of the landscape to the east and west of the panorama indicates that the ground descends both in east and west directions to a certain distance from the rock and smoothly ascends again to the moderate ridges that flank the rock in both east and west directions. This concaved geomorphologic feature to the east and west, therefore, provides a greater depth to the panorama in qualitative terms on these two directions than is actually the case. As the distant landscape features (rocks, trees, tanks) of the eastern and western panoramas are not far away from the rock, the gradient of texture of these elements together with their color and size, in contrast to those of the northern panorama, neither melt into each other nor dissolve into the atmosphere. Since the comparison of these features in the distant background with their counterparts in the foreground is possible, it helps to achieve a great spatial depth in eastern and western panoramas in qualitative terms. On the other hand, in contrast to the smooth ascent of the geomorphology in the eastern and western panoramas, the Matale Foothills of the southern panorama rise abruptly (almost like vertical walls) to form a hard boundary to the southern panorama. Therefore, it does not provide the same optical effect as those of the eastern and western panoramas. All this suggests that the effect of the natural panoramic depth in qualitative terms is more in the eastern and western panoramas than in the other two directions. Therefore, as from the plain below, the best views of the panorama are offered from the rock summit in both east and west directions.

73 The view-shed analysis using ArcGIS software enables one to see the area(s) that will be visible from one or more observer points.

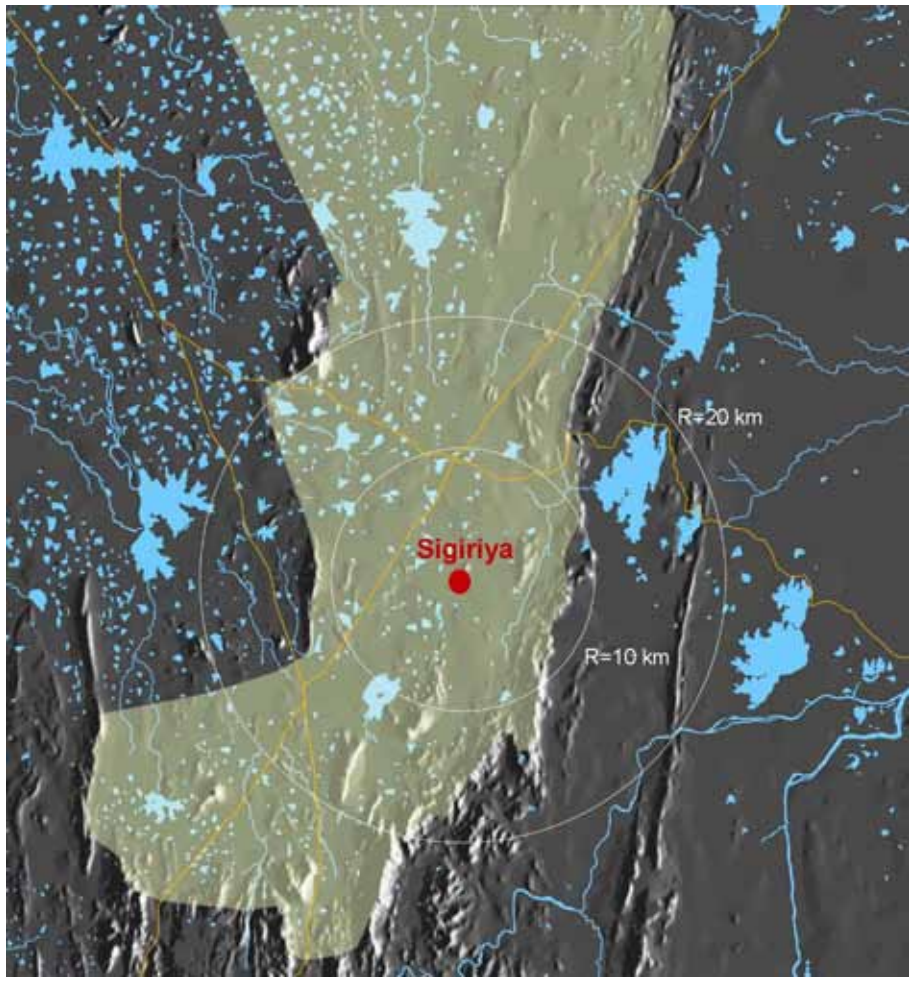


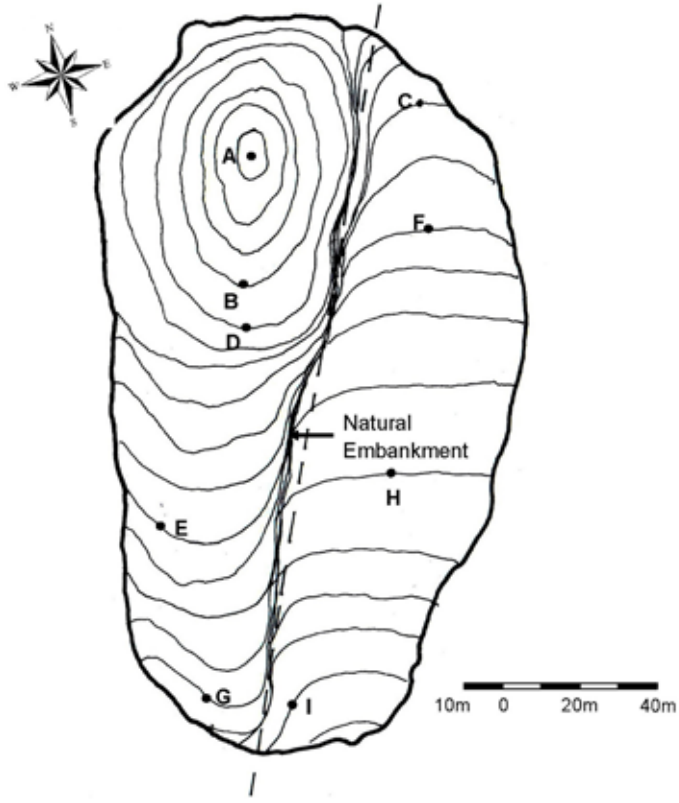
Figure 5.8
Panoramic depth from the rock summit as shown by the view-shed analysis

5.1.1(b) The Rock and Hilly Terrain

From the plain below, the slopes of the natural hill on which the rock stands give a skirting effect to Sigiriya rock. These slopes are covered with natural vegetation, and especially those to the west and southeast are dotted with clusters of boulders of varying size and appearance. The natural overhangings at the base of most of the boulders were earlier utilized by Buddhist monks as cave dwellings. Geologically, Sigiriya rock is comprised of three distinct lithological units (Prema, 2001). The lowermost unit from the base of the rock up to a certain level is garnet hornblende biotite gneiss, while the middle

unit is of mafic layers, and the topmost unit or the 'cap-rock' is garnet bearing quartzo-feldspathic gneiss. The middle unit, which is lithologically less resistant to tropical weathering, is more weathered than the other two units to make the cap-rock overhang from the upper level of the lowermost unit.[74] The several depressions on the rock face, particularly those of the western side of the middle unit, are formed due to extreme weathering. Despite these geological conditions, Sigiriya rock rises almost vertically as a pillar upon this natural hill.

Commenting on the rock of Sigiriya in the socio-religious context, Basnayake (1983:1) suggests that 'its [Sigiriya's] very nature and character would have rendered it a place of some importance as a marvelous un-scalable rock which possessed a considerable degree of numinous power.'



Altitude (MSL)

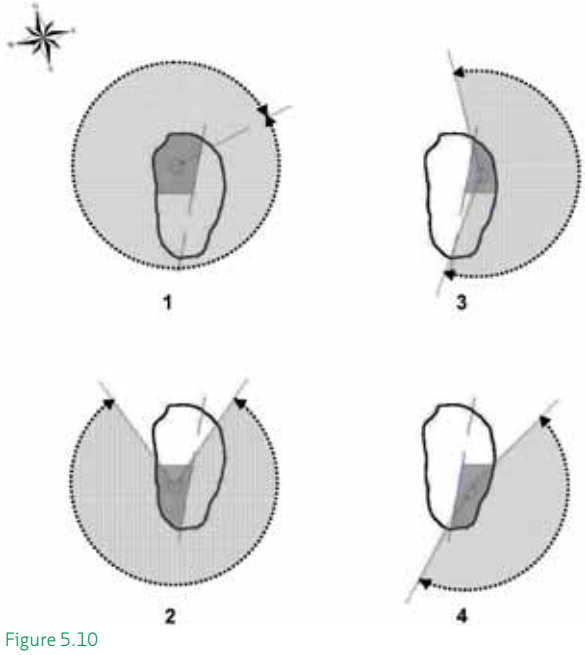
A: 360 m.
B: 354 m.
C: 350 m.
D: 350 m.
E: 345 m.
F: 342 m.
G: 328 m.
H: 335 m.
I: 330 m.

Figure 5.9
Site morphology of the rock summit (conjectural)

74 Also see Vitanage (1959) and Perera (1984:229).

The natural rock summit, which is exposed at several places, indicates that it is not a perfectly flat surface. The contours of the natural rock summit rise sharply from east to west across the summit diagonally in a northeast-southwest direction. Both these levels further descend separately from north to south. This morphologic feature, therefore, splits the summit into two levels – the upper west and lower east – formed by a natural embankment running at the center in a northeast-southwest direction to the entire length of the rock summit (figure 5.9).

Due to this site morphology at the summit of the rock, the northwest quadrant of the summit becomes the highest level above the surrounding plain, while the southwest becomes the second highest, the northeast the third highest and the southeast the lowest level of the summit. The angle of vision of the panoramic view from each quadrant thus decreases in the same sequence: the northwest quadrant (360°), southwest (less than 360°, but more than 270°), northeast (less than 270°, but more than 180°), and southeast (less than 180°, but more than 90°). Moreover, the northwest and southwest quadrants (the upper west level) offer views of both eastern and western panoramas, while the northeast and southeast quadrants (the lower east level) offer views only towards the eastern panorama. As far as the panoramic view is concerned, the western half of the rock summit has, therefore, many advantages over its eastern half. The northwest quadrant, which offers the full 360° angle of vision of the panoramic view, is the most potential quadrant of the rock summit in this regard (figure 5.10).



1. Northwest Quadrant: 360°
2. Southwest Quadrant: less than 360°, greater than 270°
3. Northeast Quadrant: less than 270°, greater than 180°
4. Southeast Quadrant: less than 180°, greater than 90°

Figure 5.10
Angles of panoramic visions from different levels of the rock summit

§ 5.1.2 Natural, Topographic Configurations

5.1.2(a) Topographical Features and Geological System

The long individual ridges extending from the Matale Foothills in the wider landscape context indicate that the topographical features are oriented in a rough south-north direction. The geology of the region suggests that its geological system is also oriented in the same direction[75] (Prema, 2001). The crystalline limestone (dolomitic marble) belt, which extends northwards as a 3,500-meter-wide band from Matale to Habarana, runs 750 meters to the east from the center of Sigiriya rock at both surface and subsurface levels[76] (figures 5.2, 5.11). Sigiriya rock is oriented approximately 8° clockwise from the true north-south direction. The natural plan configuration of the cap-rock assumes a rough ellipse with its imaginary major axis oriented in the same direction of the rock, while its minor axis is oriented in a direction of right angle to that of the major axis (figure 5.12). (Although this imaginary axial formation is not oriented in the directions of the major points of the compass, this orientation is referred to as north-south and east-west for easy reference.) The outer limits of the natural hill on which the rock stands is also roughly elliptical in plan, and the major and minor axes roughly coincide with those of the plan configuration of the cap-rock. If the maximum width of the east-west breadth of this second ellipse is extended as a strip both north and south of the rock into the landscape, all significant topographical features such as Pidurangala and Mapagala rocks, together with Sigiriya rock and its hilly terrain, lie within it. This strip, which can be termed as 'the corridor of natural topographical features', therefore, creates a strong visual axis – especially seen from Sigiriya rock summit – in a north-south direction across the center of Sigiriya rock (figure 5.13). The topographical features and the geological system of the wider landscape context also enhance this north-south oriented natural axis across the rock. This indicates that natural topographic features of the landscape create two axes in north-south and east-west directions, which intersect at the center of the rock. The north-south oriented axis of Sigiriya rock extends visually into the landscape in both north and south directions to become the dominant natural axis of the site. The natural embankment of the rock summit formed by the sharp cleavage of level differences (see 5.1.1(b) above), which

75 Also see Jayasinghe, P. (2010:308-310).

76 This is one of Sri Lanka's largest bands of limestone, which runs to a total distance of about 96 kilometers with its thickness varying from 1.5 to 15 meters (Cooray, P. G., 1967:54).

creates a diagonal axis in a northeast-southwest direction across the center of the rock, however, gives a different local direction (on the rock summit) to that of the natural north-south axis.

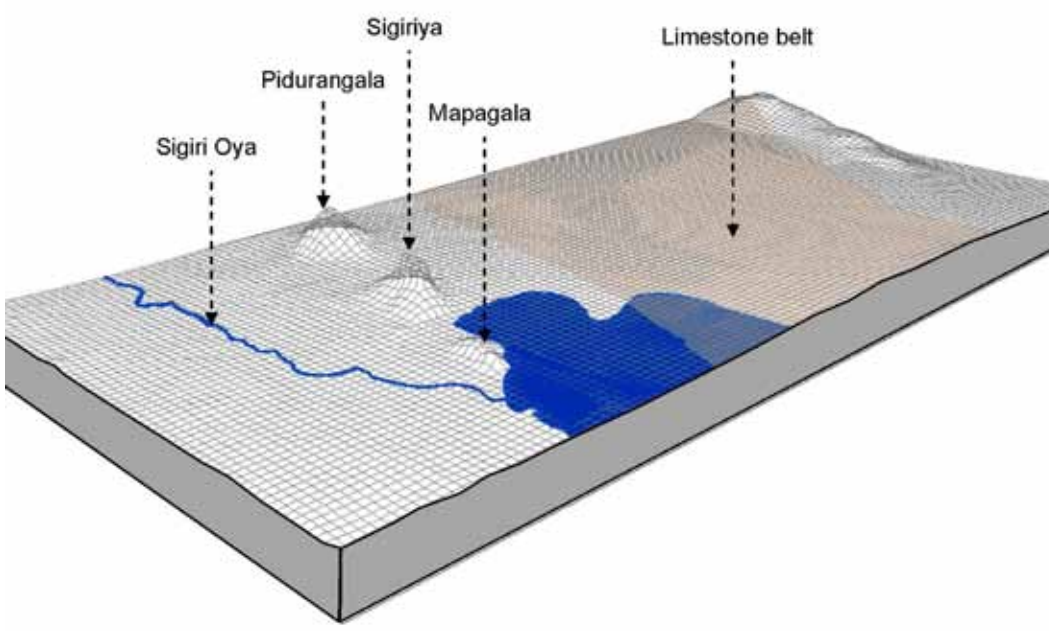


Figure 5.11
Sigiriya rock in relation to the limestone belt, Sigiri Oya and other rock formations (vertical scale exaggerated)

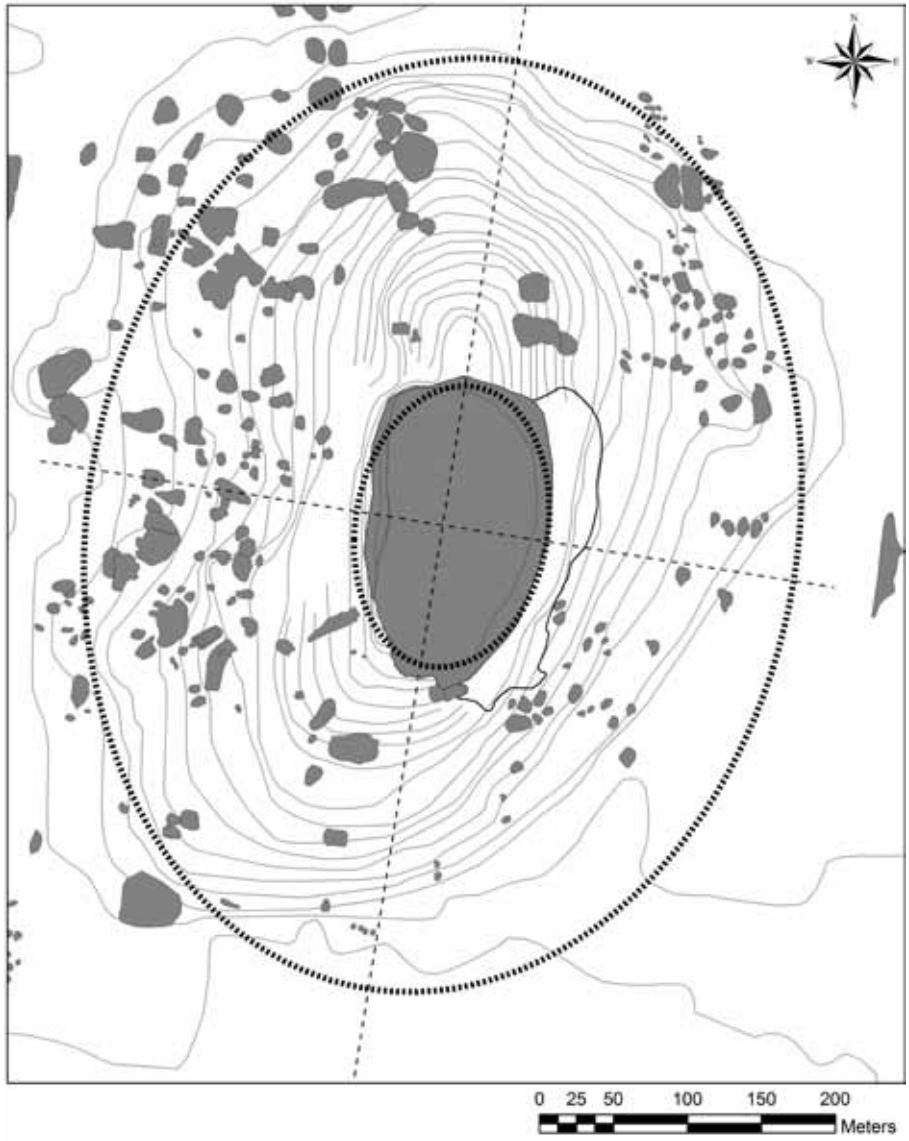
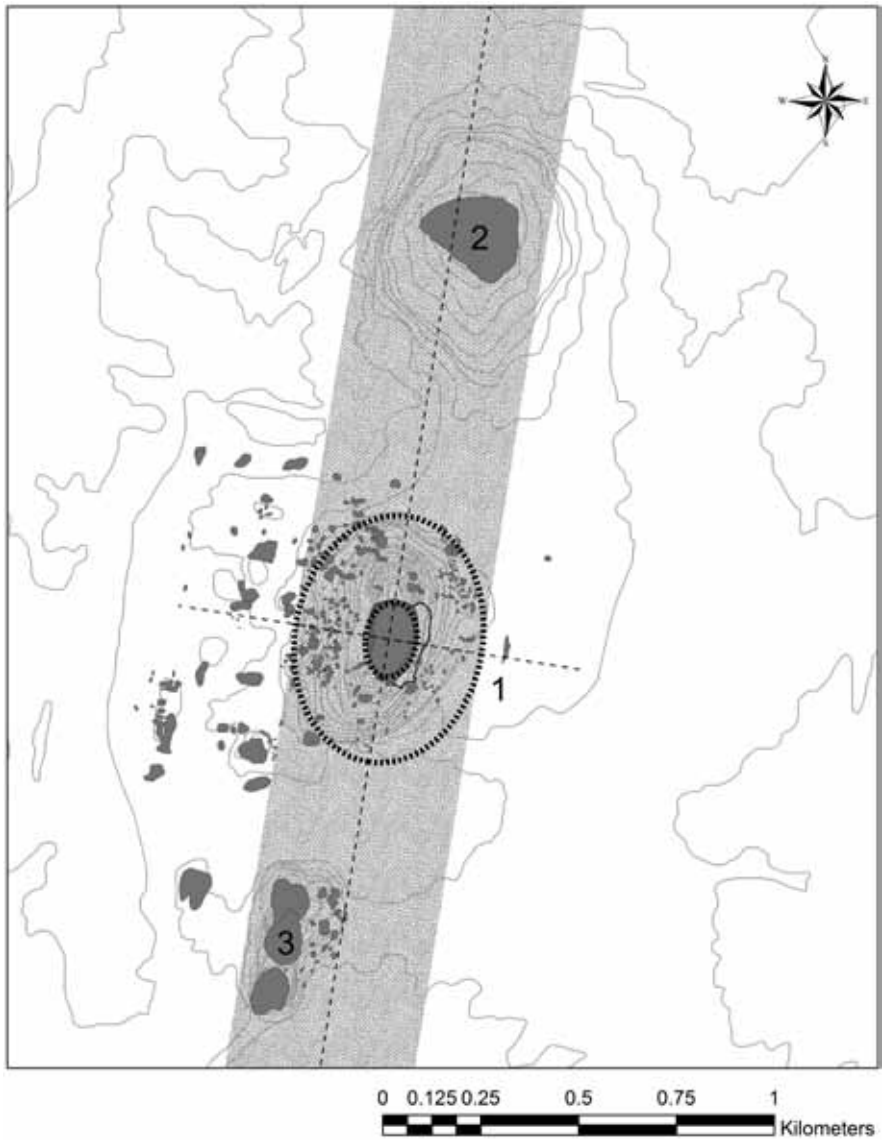


Figure 5.12
Line of forces of the natural features of the rock summit and hilly terrain



1. Sigiriya
2. Pidurangala
3. Mapagala

Figure 5.13
Corridor of the natural topographical features and the 'natural axis'

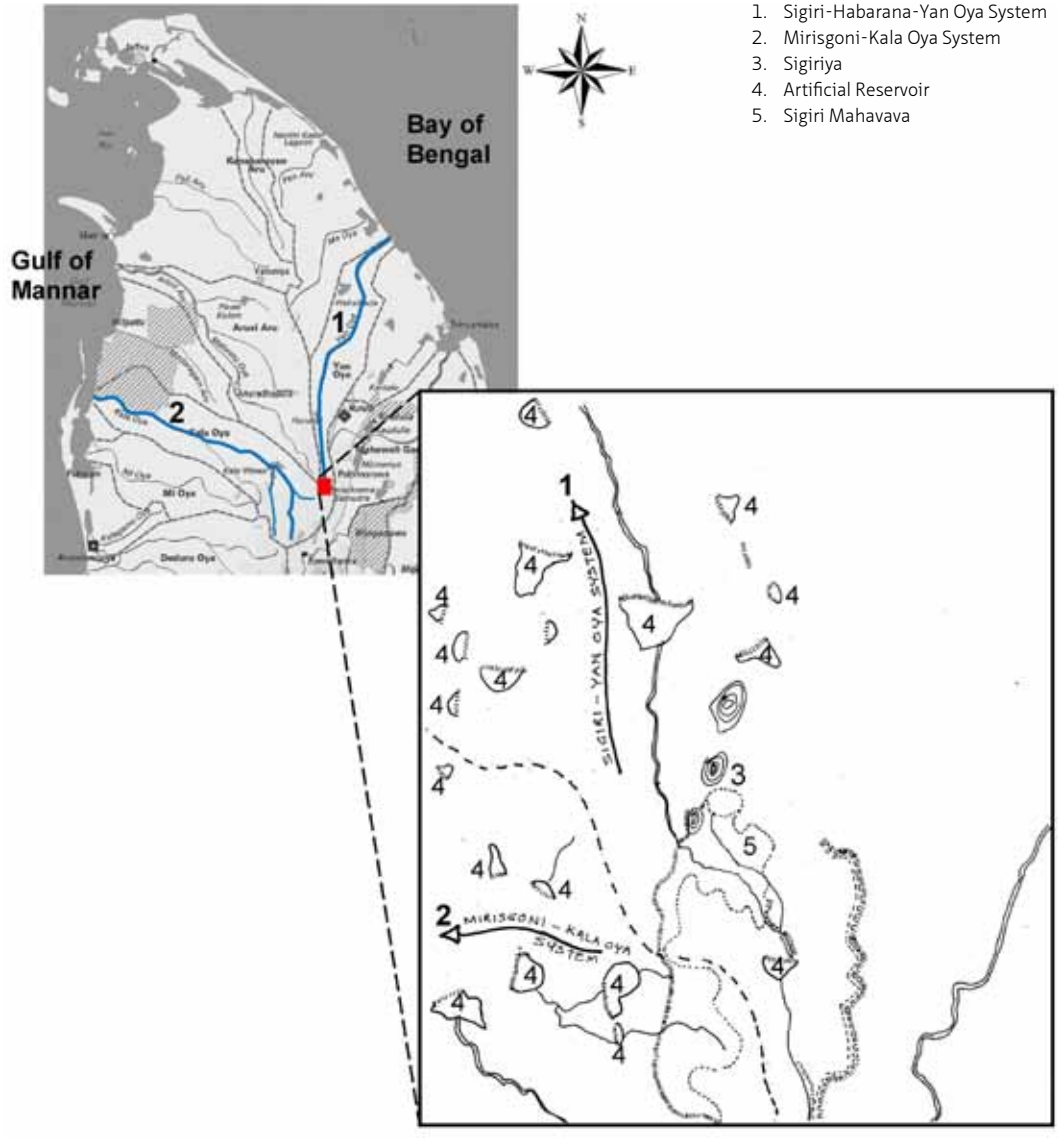
5.1.2(b) Natural-cum-Agricultural Drainage Network

With regard to the location of Sigiriya in the wider landscape context, Perera (1984:229) comments,

'Sigiriya and Pidurangala lie astride the main water parting of Sri Lanka and are, literally speaking located on the rooftop of the island overlooking the drainage basins of Kala Oya and Yan Oya. This axis or divide which separates the west flowing rivers from the east flowing rivers constitutes the main water parting between the catchments of the Bay of Bengal and the Gulf of Mannar.'

Bandaranayake (1990b:19) also states that Sigiriya forms a critical intermediate or transition zone hemmed in by three ancient core regions, which he calls the Kurunegala, Anuradhapura and Polonnaruva systems.
The location of Sigiriya in the wider landscape context, therefore, indicates that the rainwater that cascades over one segment of the rock summit flows northwards as the Sigiri-Habarana-Yan Oya system through Hurulu Palata to the Bay of Bengal, while the rainwater that cascades over the other segment of the rock summit flows westwards as the Mirisgoni-Kala Oya system to the Arabian Sea through the Gulf of Mannar (figure 5.14). This suggests that Sigiriya rock, in a symbolic sense, becomes the hydrographic hub for the island's two extensive natural-cum-agricultural drainage networks, whose ultimate limits are the Arabian Sea to the west and the Bay of Bengal to the east.

Sigiri Oya, which flows about 960 meters west from the center of Sigiriya rock in a northern direction, with its cascading tank system, indicates that the drainage axis of the Sigiriya basin runs in a rough south-north direction. The notable exception is the southern bay of the Sigiri Mahavava, which is located in the Mirisgoni Oya basin, whose drainage axis is oriented in the east-west direction. Therefore, it is apparent that except for those associated with the southern bay of the Sigiri Mahavava, the other lines of forces created by the natural-cum-agricultural drainage network are oriented in a south-north direction, and hence enhance the south-north oriented natural axis across Sigiriya rock.
Due to the presence of Pidurangala and Mapagala rock formations, the boundaries of the Sigiriya plain extending in north and south directions are confined to a distance of approximately 600 meters and 560 meters, respectively, from the center of the rock. On the other hand, the continuity of the plains to the east and west is also disturbed by the limestone bed and the Sigiri Oya, which are approximately 750 meters east and 960 meters west, respectively, from the center of the rock (figure 5.15). The presence of topographical, geological and drainage patterns, therefore, limits the plain immediately around Sigiriya rock in north, south, east and west directions to resemble a rough rectangle. Therefore, the morphologic characteristics of the site indicate that Sigiriya rock, which is elliptical in plan, is encompassed by the hilly terrain and the plain in succession, whose outer limits are elliptical and rectangular in plan, respectively.



1. Sigiri-Habarana-Yan Oya System
2. Mirisgoni-Kala Oya System
3. Sigiriya
4. Artificial Reservoir
5. Sigiri Mahavava

Figure 5.14
Sigiriya in relation to the drainage network

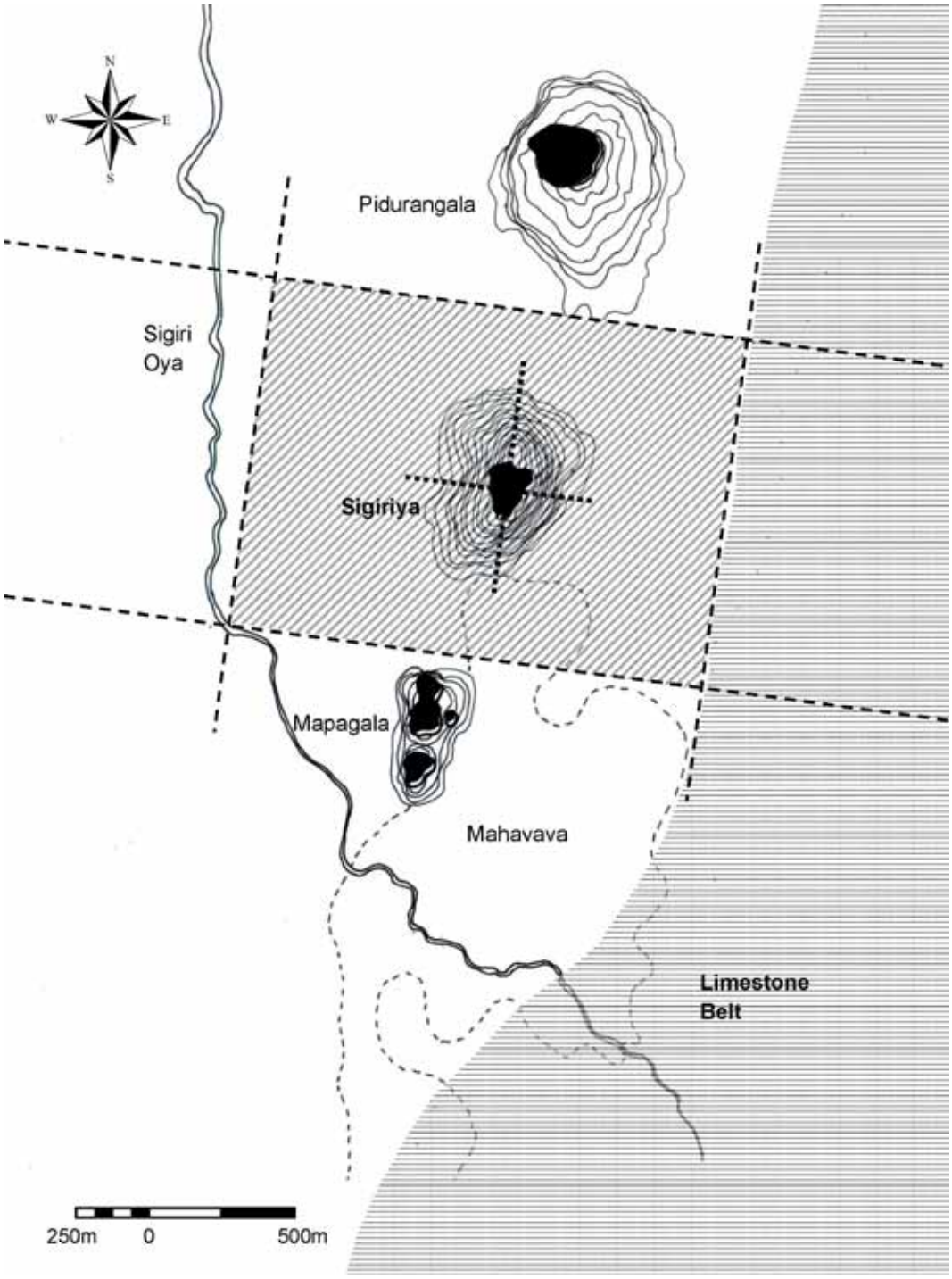


Figure 5.15
Area demarcated by the natural features of the landscape of Sigiriya

§ 5.2 Interaction of the Formal Layout with the Natural and Agricultural Landscape

§ 5.2.1 Lines of the Formal Layout

The superimposition of the formal layout over that of the natural and agricultural landscape indicates that most of the lines of the formal layout more or less coincide with those of the natural and agricultural landscape (figures 5.16, 5.17). The northern and southern limits of Sigiriya proper, which are defined by the outer ramparts of Sigiriya proper, coincide with the outer limits of the northern and southern plains, which are determined by the topographical features of Pidurangala and Mapagala, respectively, while its western limits coincide with the boundary demarcated by the Sigiri Oya. The eastern limits of the inner eastern precinct again coincide with the western edge of the limestone bed, which is a natural obstruction for the continuation of the moat in an eastward direction through this limestone bed (figure 5.18). The north-south axis of the formal layout also coincides with the common major axis of the elliptical plan configurations of the cap-rock and the hilly terrain. This also shows that the east-west axis of the formal layout is an extension of the minor axis of the above-mentioned natural elliptical plan configurations. The plan of the walled-in enclosure around the hilly terrain again roughly coincides with the outer contours of the hilly terrain. The compound of the entire palace complex on the rock summit is roughly elliptical in plan, which corresponds to the natural plan configuration of the cap-rock. Therefore, all these suggest that the lines of the overall formal layout of the scheme are greatly determined by the topographical, geological and drainage patterns of the natural and agricultural landscape.

Figure 5.16
Plan of the built landscape

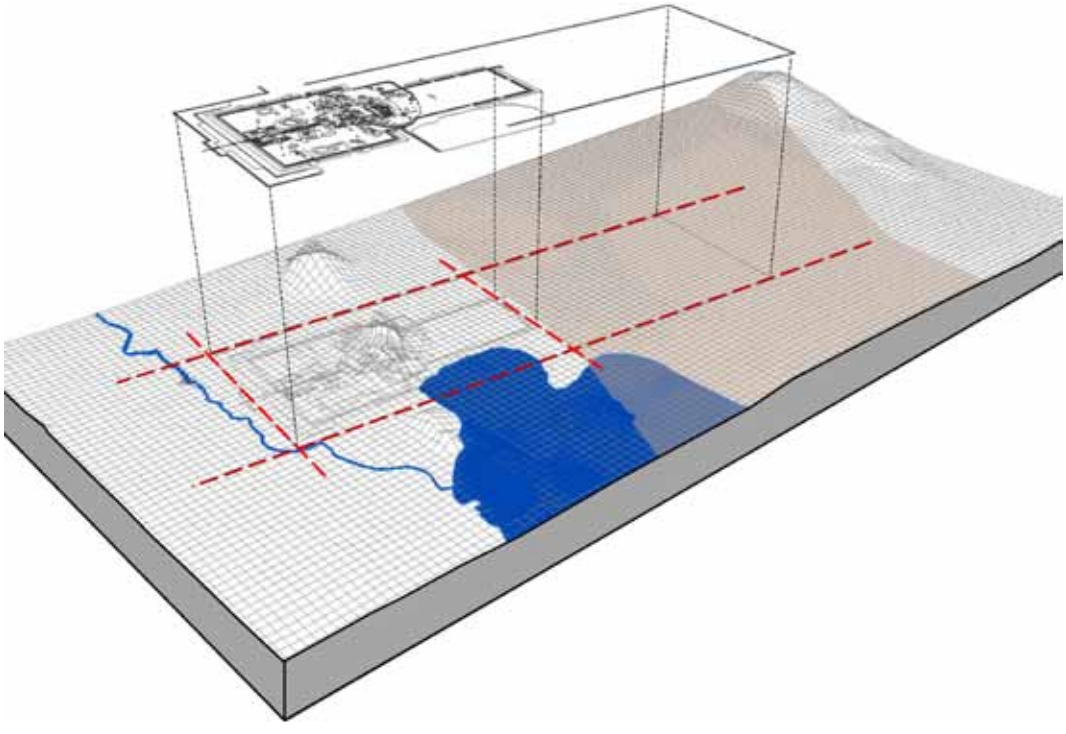


Figure 5.17
Superimposition of the plan of the built landscape over that of the natural landscape

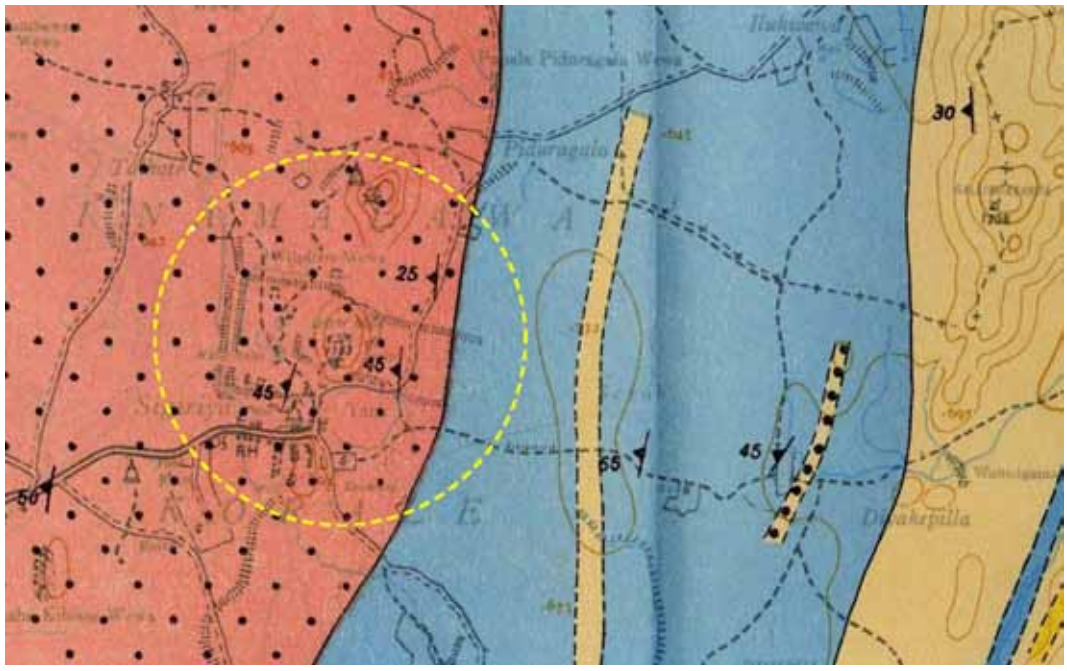


Figure 5.18
Geological map showing the location of Sigiriya in relation to the limestone bed (indicated in blue) (courtesy: Vitanage, 1959) (note the eastern limits of the inner eastern precinct of Sigiriya, which coincide with the western edge of the limestone bed)

§ 5.2.2 Location and Orientation

The Lion Plateau, which protrudes northwards from the northern rock face, and the Lion-Staircase-House, which is built on this plateau against the northern vertical rock face in the form of the forepart of a colossal lion facing north, further heighten the north-south orientation of the rock. Although the major axis of the natural plan configuration of the hilly terrain is oriented in a north-south direction, the pronaos projection introduced at the west on its east-west minor axis makes the hilly terrain deliberately oriented in the east-west direction. This has made it possible to connect linearly the two east-west oriented rectangular enclosures with this elliptical enclosure harmoniously at its eastern and western sides. All these enclosures are further nested by another east-west oriented larger rectangular enclosure. Due to such interventions, the overall formal layout is, therefore, oriented in the east-west direction (figure 5.19). This also shows that the orientation of the overall scheme is not determined in relation to the exact cardinal directions, but specifically to that of the natural rock.

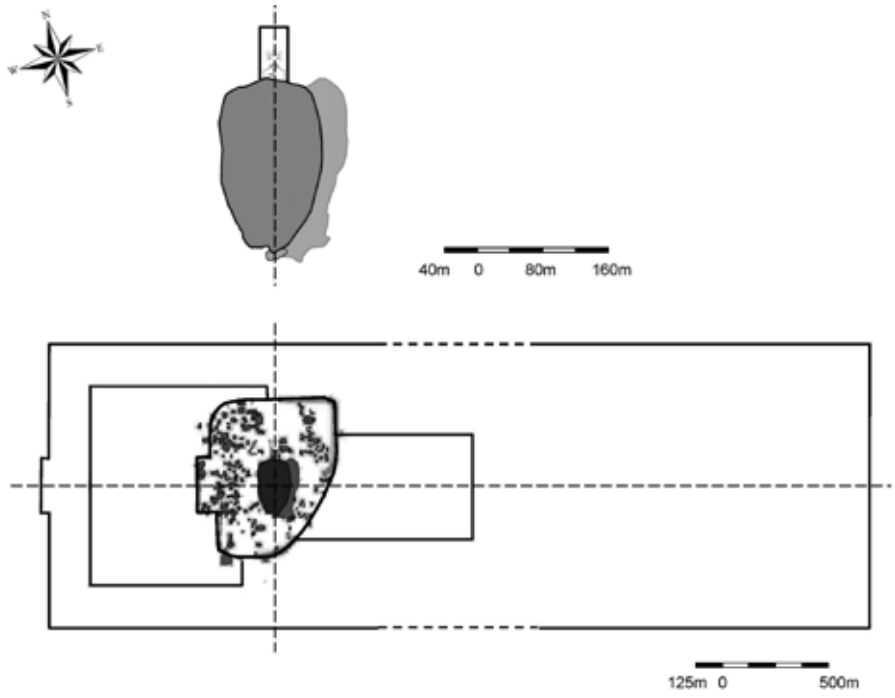


Figure 5.19
Enhancement of the axial formation of the natural features

The linear-cum-concentric arrangement of several enclosures around the central rock in the east-west direction, which offers the best views of the rock, make the rock dominant in the overall scheme. This suggests that the scheme has a rock-oriented composition.

Under 5.1.1(b), it was pointed out that due to the site morphology of the rock summit, its western half has more advantages than its eastern half in terms of panoramic view. The formal plan of the rock summit shows that the palace buildings are located on the western half of the rock summit, while the palace gardens are on the eastern half. The decision to locate the royal palace buildings, some of which were storied structures, at the summit of the rock is hard to justify from a climatic point of view, due to the high wind pressure at such a height. The principal royal residence is located at the northwest quadrant, which is the highest level of the rock summit. Although it is the most vulnerable building on the rock summit in terms of the effects of the heavy northeast monsoon rains, the principal royal residence offers a 360° angle of panoramic view of the undulating natural and agricultural landscape. The other palace buildings are located at the southwest quadrant, which is the second highest level. Although these buildings do not have the full 360° angle of panoramic view, it also offers the best views of the panorama in both east and west directions. The upper and lower palace

gardens are located in the northeast (third highest level) and the southeast (lowest level) quadrants of the summit, respectively, and their angles of panoramic view are in a descending order to those of the upper two levels. Although the palace gardens provide views of the eastern panorama, they do not provide views of the western panorama (figure 5.20). This indicates, therefore, that the location of the above-mentioned functional spaces on the rock summit has a hierarchical order in respect of the angle of panoramic view and the qualitative aspects of the panorama. It also shows that only the king, who dwelled in the principal royal residence located on the northwest quadrant of the rock summit, had total command of the overall landscape. On the other hand, the location of the palace complex upon the rock summit, which is the highest elevation of the overall scheme, has made the palace complex the dominant element and focal point of the overall scheme.

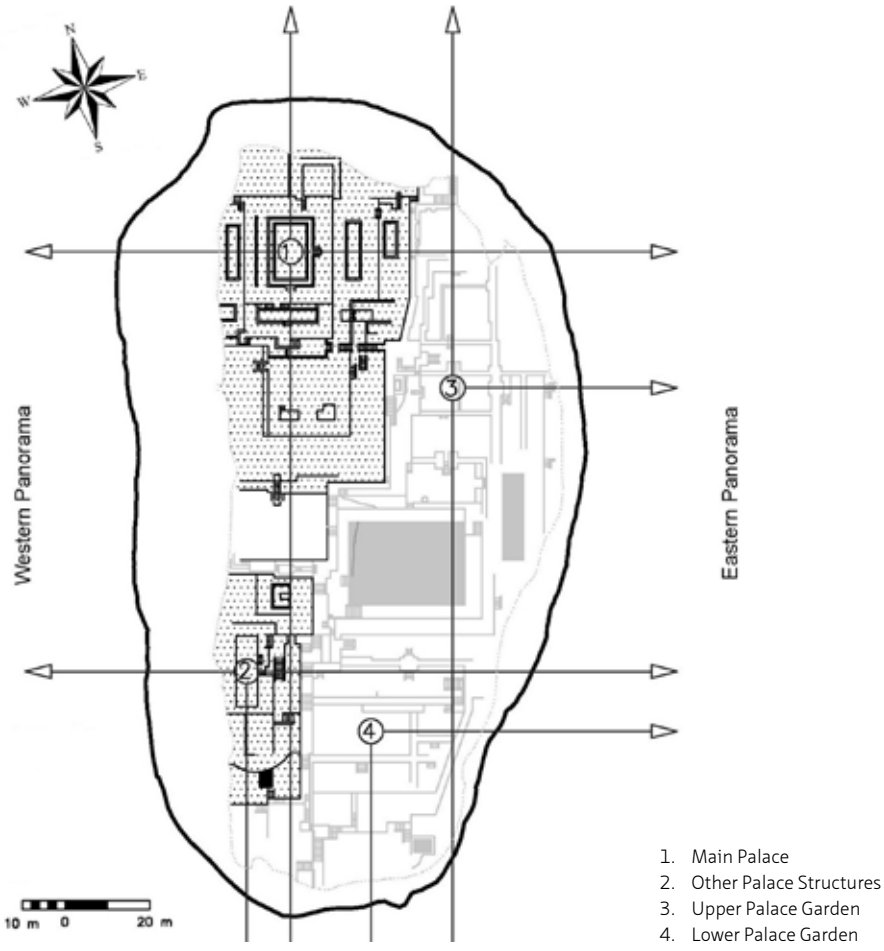
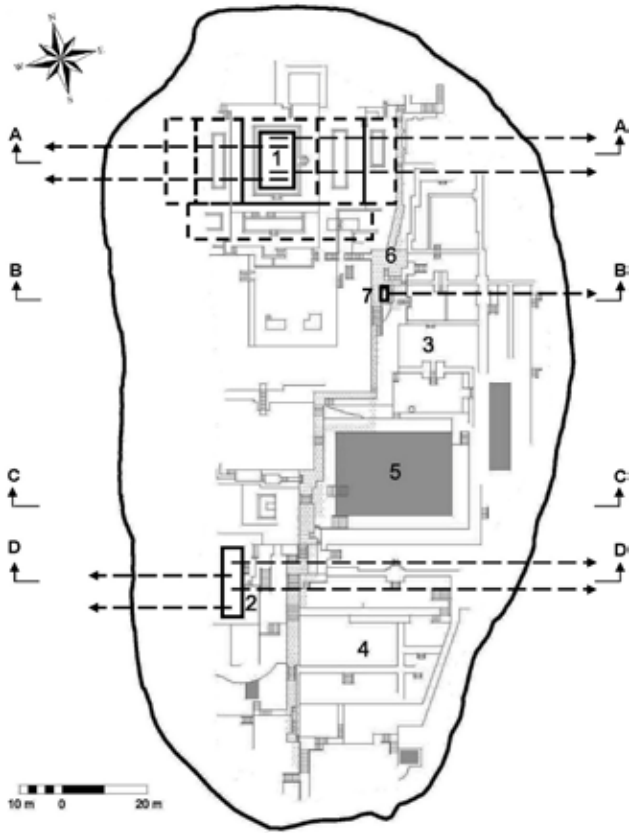


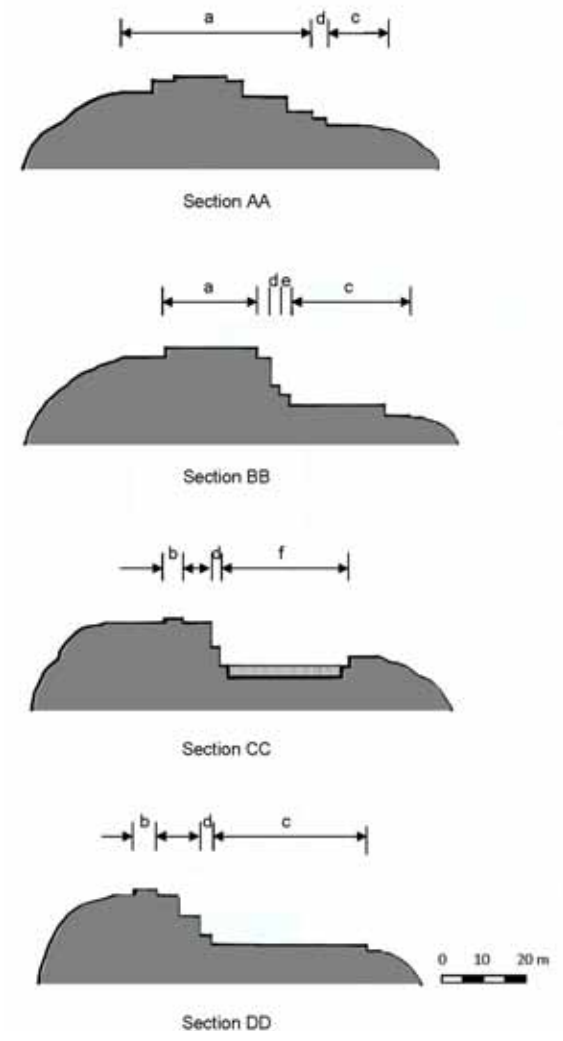
Figure 5.20
Direction of panorama from different levels of the rock summit

Most of the buildings on the rock summit, such as the central building of the principal royal residence and the structure on the southwest quadrant, have a north-south orientation (figure 5.21). Although this orientation has made the long sides of the buildings exposed to both east and west directions, where heat absorption is more in relation to the movement of the sun under tropical conditions, it enabled the maximum views of both the eastern and western panoramas. By positioning the palace garden in the eastern half of the rock summit and the pleasure garden in the inner western precinct, the views from the palace buildings of the eastern and western panoramas were mainly directed through these gardens to capture the great spatial depths gifted by nature to the scheme. Similarly, the orientation of the rock-cut seat on the rock summit, which is located at the western edge of the palace garden and provide a view towards the eastern panorama, also explains this consideration of the designers (figure 5.22). This suggests that the western and eastern panoramic views of the natural and agricultural landscape are important factors in the orientation of the buildings on the rock, as well as in the location of the palace garden and pleasure garden.



1. Main Palace
2. Other Palace Structures
3. Upper Palace Garden
4. Lower Palace Garden
5. Pool
6. Limestone paved Central Pathway
7. Rock-cut Seat

Figure 5.21
Plan of the rock summit showing the buildings and the rock-cut seat oriented towards eastern and western panoramas



a. Main Palace
b. Other Palace Structures
c. Palace Garden
d. Limestone paved Central Pathway
e. Rock-cut Seat
f. Pool

Figure 5.22
Cross sections through the rock summit showing the position of the built features in relation to the panoramic view

Compared to the ground below the base of the rock in the eastern direction, where it almost abruptly meets the virtual plain, that in the western direction descends smoothly to meet the virtual plain (figure 5.23). This topographic feature of the inner western precinct has made it possible to regulate and activate various hydraulic features through force of gravity and pressure, by laying in a series of descending terraces. Therefore, this shows that it was a deliberate decision to lay out the water-associated garden features in the western precinct. Similarly, the urban elite and nobility, who were basically the non-agrarian community, are zoned within the outer eastern precinct, which sits on the limestone belt and is not conducive to agrarian function.

Figure 5.23
Cross section through the rock and hilly terrain in east-west direction (looking north) showing the smooth descent of the hilly terrain on the western side in comparison to that of the eastern side (vertical scale exaggerated)

§ 5.2.3 Axial Arrangement

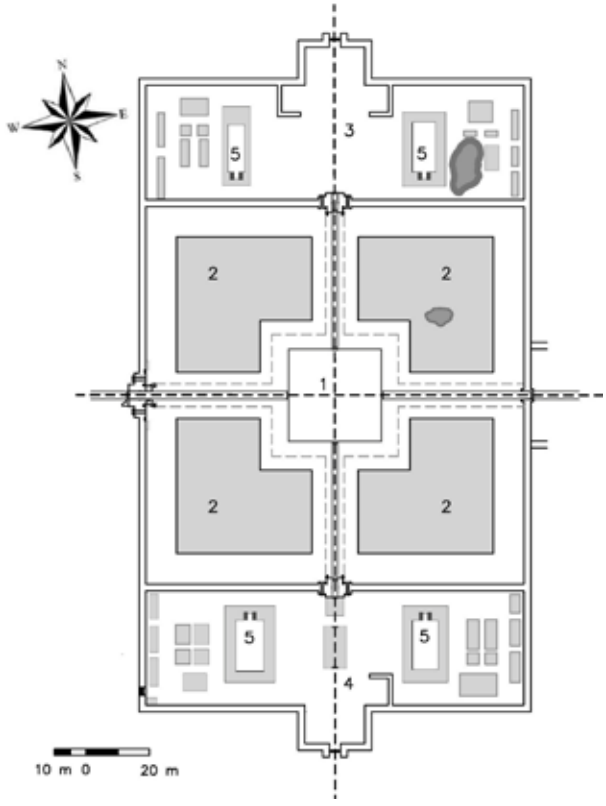
5.2.3(a) Overall Layout

The plan form of the overall layout, which consists of a series of rectangular and elliptical enclosures, is arranged in a single axis by extending the common minor axis of the natural plan configuration of the rock summit and that of the hilly terrain in both east and west directions. Since the geomorphologic characteristics of the natural landscape offer the best views of the rock from the eastern and western plains below, the extension of the formal layout on the plain in east and west has made the rock the dominant element of the overall layout. This also indicates that the formal interventions to the natural and agricultural landscape are in a direction perpendicular to that of the major natural axis of the landscape. As such, the extension of the minor natural (east-west) axis beyond the hilly terrain can be explained as a design decision to heighten the dominance of Sigiriya rock in the overall composition, and hence it becomes the major axis of the 'built landscape'. However, this axis, which is confined to the boundaries of the formal layout between the eastern outer rampart and the western outer rampart, has no bearing on the wider landscape context. In contrast, the north-south oriented natural axis of the scheme continues visually beyond the boundaries of Sigiriya proper into the natural landscape, and it is this axis that anchors the scheme in the wider landscape context. Moreover, the north-south axis, which axially arranges the Lion Plateau with the rock, also strengthens this aspect. Therefore, the north-south axis becomes the 'external axis', while the east-

west axis assumes the 'internal axis' of the scheme (figure 5.19). This north-south and east-west axial formation, which intersects at the rough geometric center of the rock, makes Sigiriya rock the central object of the overall scheme.

5.2.3(b) The Four-quartered Feature

The study of the compound associated with the four-quartered feature shows that it consists of three compartments: two rectangular compartments attached to the opposite sides of a central square compartment. These three compartments are arranged linearly in a north-south running transverse axis to the east-west axis of the overall layout. The transverse axis intersects the east-west axis at the center of the square compartment, where there was originally a pavilion surrounded by a square pool with cardinally oriented causeways linking the pavilion with the surrounding area of the compartment. This axial formation, therefore, makes the compound associated with the four-quartered feature a dominant element of the western precinct (figure 5.24).



1. Moated Central Pavilion
2. L-shaped Pond
3. Northern Outer Compartment
4. Southern Outer Compartment
5. Pavilion

Figure 5.24
Axial arrangement of the compound associated with the four-quartered feature

5.2.3(c) The Rock Summit

The brick-built embankment, which separates the upper western and lower eastern levels of the rock summit and traverses the entire north-south length of the rock summit, and the limestone-paved central pathway, laid out halfway up along this embankment to link the upper and lower levels of the rock summit, do not follow the contour lines of the natural embankment. This embankment and the pathway follow a staggered north-south direction and suggest that it was a design decision to rotate the northeast-southwest directed natural morphological axis of the rock summit to be aligned with the north-south orientation of the buildings on the rock summit, and thereby to enhance the panoramic views in both east and west directions (figure 5.25). Although the organizing lines of the structures and terraces on the rock summit follow the north-south and east-west axial directions of the overall scheme, no axial arrangement is present in its layout. The imaginary point of intersection of the north-south and east-west axes of the overall layout (the rough geometric center of the rock summit) is not highlighted by any of the features, while the axial lines of the overall layout do not correspond with any specific organizing lines of the rock summit. Therefore, the north-south and east-west axial formation of the overall layout do not order any of the built elements on the rock summit.

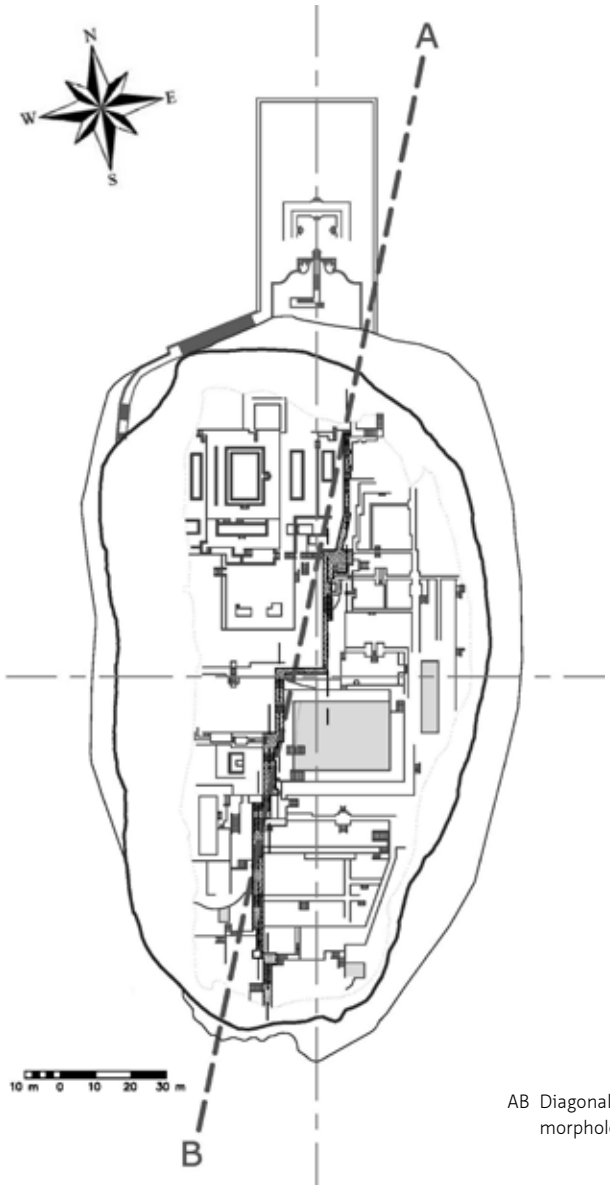


Figure 5.25
Staggered north-south axis created by the brick embankment and the limestone paved pathway

§ 5.3 Geometry of the Scheme

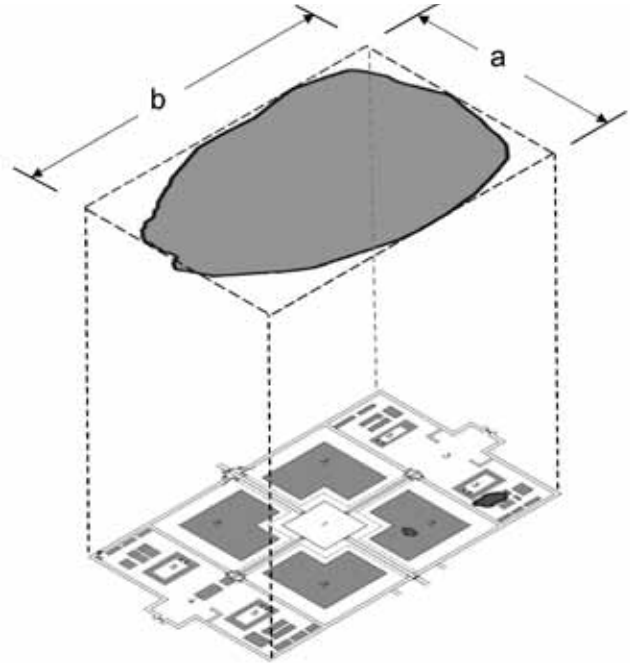


Figure 5.26
Dimensional relationship of the cap-rock and the four-quartered feature

In order to analyze the geometric relationship of the layout, the survey map covering the western half of the hilly terrain and the pleasure garden of Sigiriya (Somadasa, 1982) and other maps available at the Central Cultural Fund's Sigiriya site office were studied, together with on-site field measurements taken at the site (figure 5.27). The comparison of the north-south and east-west maximum dimensions of the natural plan configuration of the upper geological unit (the 'cap rock') of Sigiriya rock, with the corresponding centerline measurements of the plan of the rectangular compound that is associated with the central four-quartered feature, shows that they are almost equal (approximately 200 meters by 120 meters, respectively, figure 5.26). If the maximum east-west dimension of the plan configuration of the 'cap rock' (F1G1, see figure 5.28) and that of the above rectangular compound (C1D1) is taken as **a** (approximately 120 meters), the east-west distances between the pronaos projection of the western arm of the outer rampart and the western arm of the middle rampart in the western precinct (A1B1), and between the western arm of the middle rampart and the western limit

of the above-interpreted rectangle (B1C1), also become ***a*** each, while the east-west distances between the eastern limit of this rectangle and the pronaos projection of the walled-in hilly terrain to the west (D1E1), and between this pronaos projection and the westernmost edge of the 'cap rock' (E1F1), become 2***a*** each. This shows that most of the distances between elements in an east-west direction are based on the modular length ***a***.

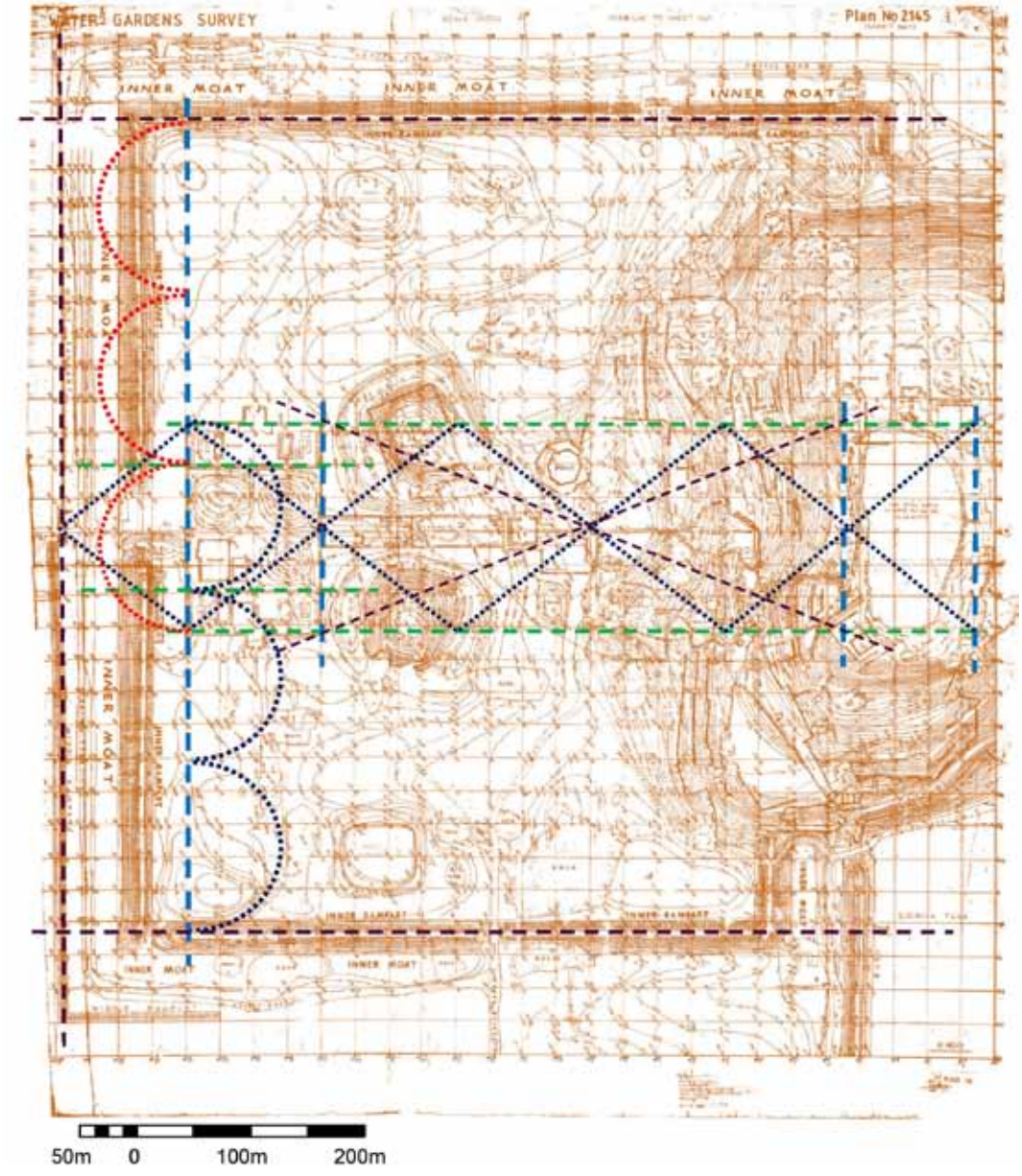


Figure 5.27
Geometric analysis of the scheme

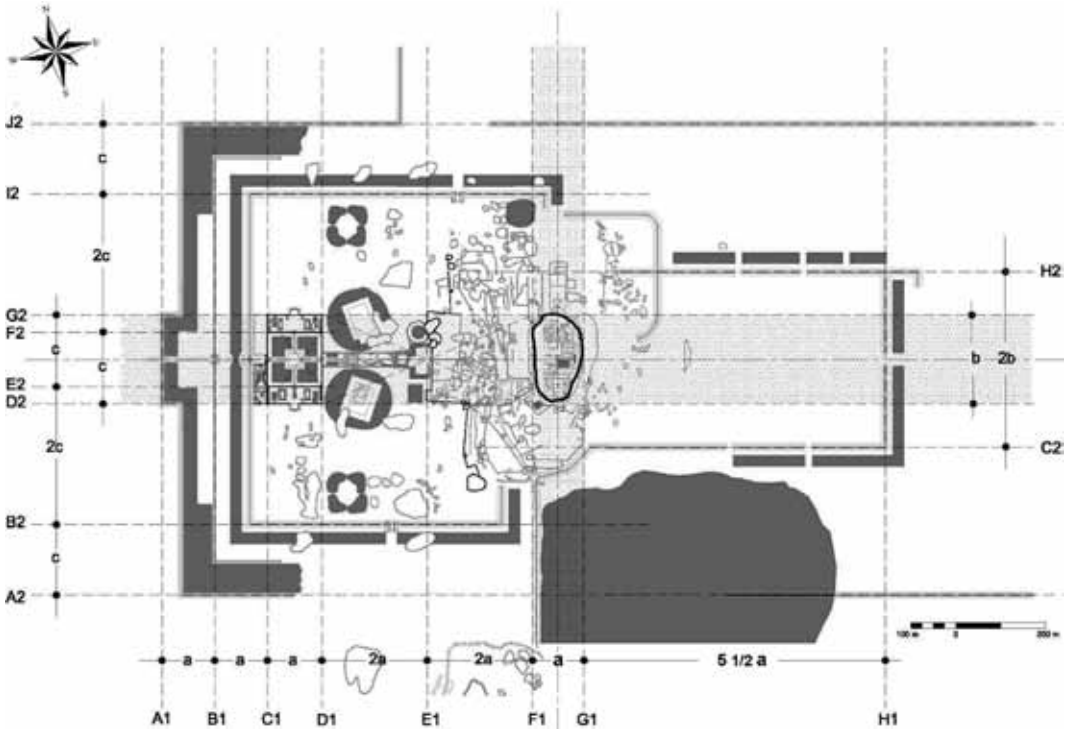


Figure 5.28
The geometric grid

If the maximum north-south measurement of the plan configuration of the 'cap rock' and the corresponding measurement of the above rectangular compound (D2G2) is taken as ***b*** (approximately 200 meters), the north-south length of the pronaos projection of the outer rampart in the western precinct and that of the walled-in hilly terrain at the west also become ***b***, while the north-south distance between the northern and southern arms of the inner ramparts, which define the inner eastern precinct (C2H2), become 2***b***.

The detailed examination of the geometry of the rectangular compound associated with the four-quartered feature indicates that it is comprised of a central square (***a*** x ***a***) and two smaller rectangles, each measuring ***a*** x (***b***-***a***)/2 (= 120 meters by 40 meters approximately). This large rectangle (figure 5.29) can also be interpreted as being composed of two identical rectangles (ACFH and BDEG) measuring ***a*** x (***a***+***b***)/2 (= 120 meters by 160 meters approximately) with an overlapping square (BCFG = ***a*** x ***a*** = 120 meters square approximately), which is the four-quartered feature at the center. If the measurement of the long arms (AC and EG) of the above-interpreted rectangles is taken as ***c*** = (***a***+***b***)/2 = 160 meters approximately), the northern and southern arms of the inner and outer ramparts are ordered in such a way that the

distances between each of these elements and the above-interpreted rectangles (ACFH and BDEG) are seen as a multiplication of ***c*** (see figure 5.28). This indicates that most of the measurements and proportions between material elements (especially the ramparts and walls that define the limits of various precincts and enclosures) of the overall plan are related to the measurements of the compound associated with the four-quartered feature. As far as the measurements and proportions of this rectangular compound are concerned, this rectangle can also be interpreted as the abstracting and geometrizing of the irregular plan configuration of the natural rock. This suggests that the measurements and proportions related to the above material elements are derived from that of the central rock. This system of measure and proportions further indicates that a grid system exists in the ground plan of Sigiriya in both north-south and east-west directions. In the east-west direction the grid module of the plan is **a** (approximately 120 meters), while that of the north-south direction is ***c*** or (**a**+***b***)/2 (approximately 160 meters).
Further analysis of the geometry of the scheme (figure 5.30) suggests that the layout, of the western precincts in particular, can be interpreted as a system of overlapping and expanding rectangles, whose grid module is again **a** x (**a**+***b***)/2 (approximately 120 x 160 meters). The basic module originates at the center of the large rectangle.

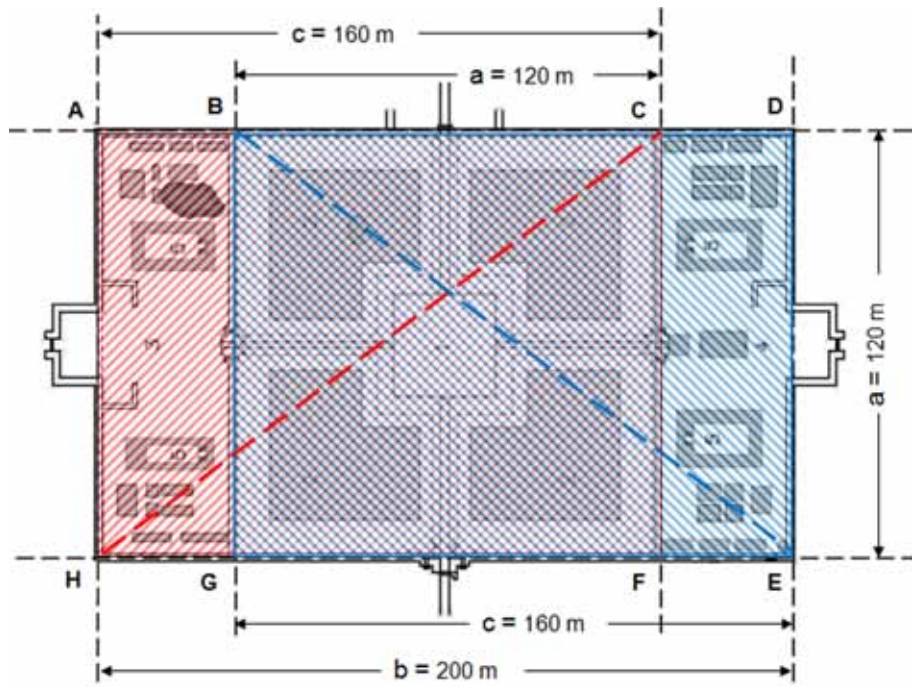


Figure 5.29
Geometric analysis of the rectangular compound associated with the four-quartered feature

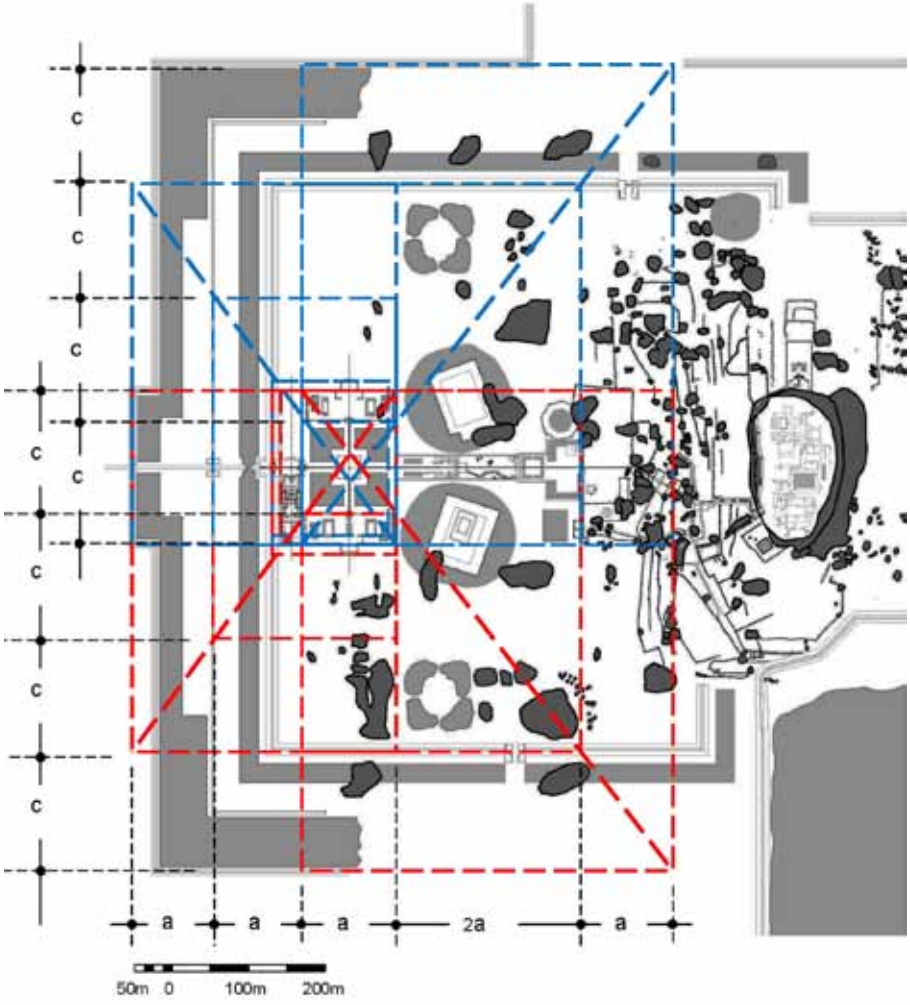


Figure 5.30
Grid plan as a system of overlapping rectangles

This analysis also shows that the grid system creates two central bays in north-south and east-west directions across the rock. On the other hand, north-south and east-west axes of the scheme do not assume the grid lines of the geometric plan; instead they remain as imaginary lines that bisect the above central bays across the rock to regulate the whole geometric system.

§ 5.4 Symmetry and Asymmetry

§ 5.4.1 Symmetry

5.4.1(a) Overall Layout

The rectangular enclosures extending in east and west directions beyond the hilly terrain are symmetrically placed on the extended natural east-west axis created by the somewhat irregular natural plan configurations of the hilly terrain and rock summit. The moats and ramparts defining the rectangular precincts are also ordered symmetrically through the east-west axis of the scheme (figure 5.31). The eastern and western gateways/entrances to the rectangular enclosures and to the elliptical enclosure associated with the hilly terrain, the central east-west axial zone including the axial pathway of the pleasure garden, are also symmetrically placed on the central east-west axis. This indicates that the overall scheme has a strong symmetry in relation to the east-west axis, which contributes to incorporating and compositionally balancing the irregular natural elements of the scheme, such as the hilly terrain and the rock.

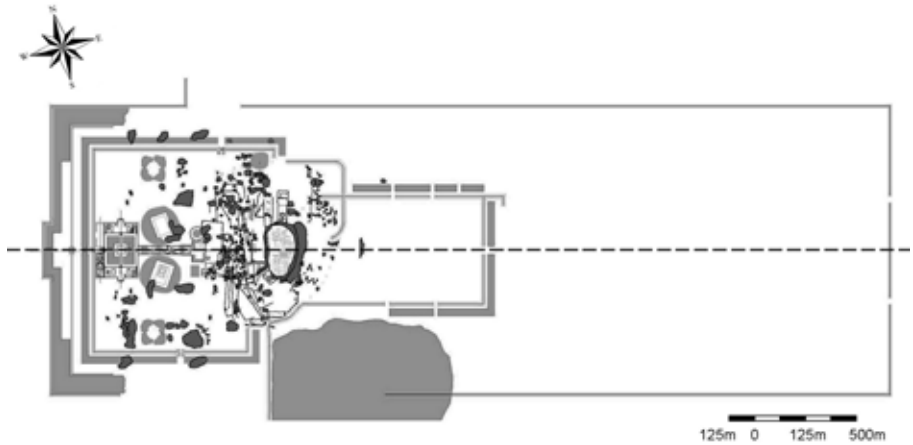


Figure 5.31
Layout showing the strong symmetry along the east-west axis

Features such as the moated islands, ponds, pools and fountains of the pleasure garden are laid out as pairs on either side of the central east-west axis. Except for the positioning of the entrances across the moats and certain areas of the layouts of the retaining walls, the two moated island structures (so-called 'summer palaces') on either side of the east-west axis are also seen as having mirror symmetry about the same axis. The positioning of the entrances across the moats to these island structures is decided by the availability of existing rock outcrops at the site. Compared to the other enclosures of the overall formal layout, therefore, a strong symmetry prevails in the pleasure garden. Since the layout incorporates the natural rock and the hilly terrain on which it stands without the least alteration to such features, the extensive use of symmetry to order the overall layout explains that symmetry is used to balance the irregularities of these natural features.

Although the overall formal layout has a strong symmetry in relation to its east-west axis, certain corresponding parts of the layout of the moats and ramparts on either side of the east-west axis disturb perfect symmetry. For instance, the continuity of the northern and southern sides of the inner moat defining the pleasure garden are interrupted at several locations due to the presence of natural rock outcrops across them; the lengths of the southern sides of the inner moat and inner rampart are less than their northern counterparts due to the location of Sigiri Mahavava to the south; unlike the northern side of the outer rampart, the continuity of its southern side is interrupted again due to the overlapping of the Sigiri Mahavava with Sigiriya proper; and unlike the northern segment of the inner rampart at the eastern precinct, its southern counterpart continues in a southwesterly direction to join the earthen bund of Sigiri Mahavava.

The location of the entrances to the two moated island structures (so-called 'summer palaces') and some of the structures within the two outer compartments associated with the four-quartered feature of the pleasure garden, which are positioned away from the central east-west axis, indicates that such features are also not symmetrically arranged in relation to the east-west axis (figures 5.32, 5.33). All these indicate that the idealized symmetry of the layout is increasingly affected by the natural and/or agricultural features towards the northern and southern edges of the plan. Therefore, this suggests that the perfect symmetry gradually diminishes to a visual symmetry from the central east-west axis towards the boundaries of the plan in both northern and southern directions.

Beyond the boundaries of the scheme, the natural and agricultural landscape takes its own asymmetrical layout. This diminishing symmetry from the central east-west axis in both north and south directions makes the built landscape blend and merge with the natural and agricultural landscape in a harmonious manner without confrontation. It also shows that the natural and agricultural features are not altered to give way to the idealized symmetry, but are incorporated into the scheme in an increasing manner towards the northern and southern edges of the plan. In this light, such an attempt cannot be explained as a mere use of available natural features by the designers, but rather as a deliberate decision or a design technique to reduce, gradually, the perfect symmetry to a visual symmetry.

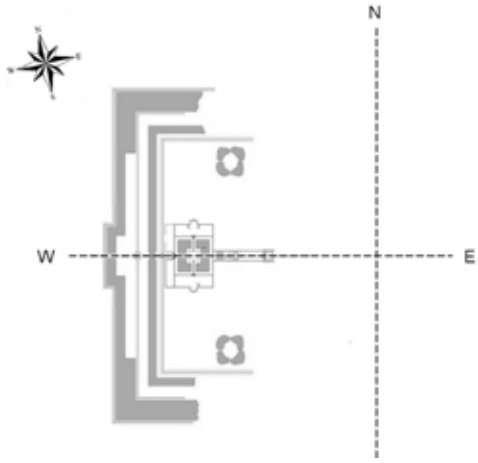


Figure 5.32
Elements related to symmetry through east-west axis

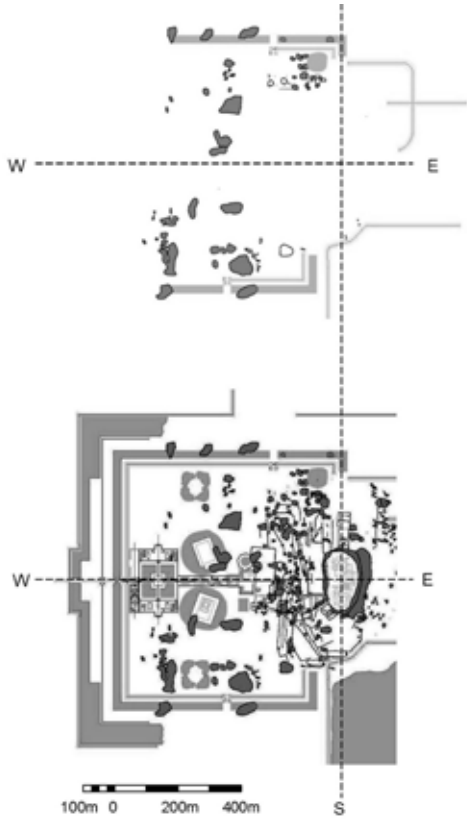


Figure 5.33
Elements that distract symmetry through east-west axis

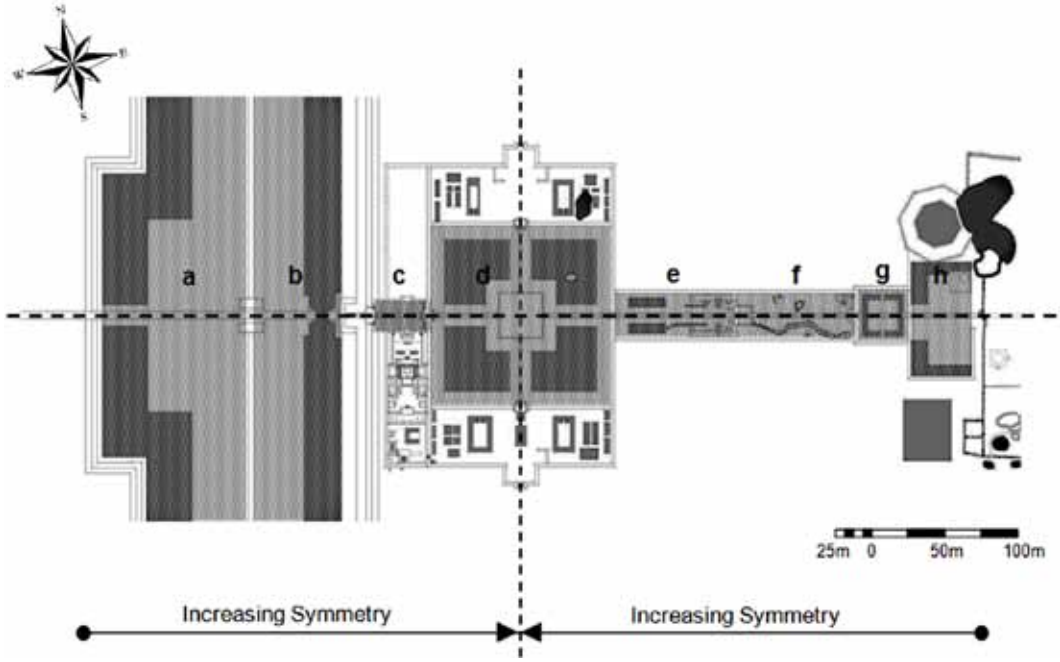


Figure 5.34
Symmetry of the axial zone

The central east-west axial pathway in the western rectangular precincts is laid through a series of axially arranged compounds (figures 5.34, 5.35). The segment of this pathway to the extreme west (from the western entrance of the outer western precinct to the western entrance to the pleasure garden) runs along the minor axes of symmetry of a series of north-south oriented subcompounds and features, which are defined by walls and/or composed of sheets of water (a, b). The second segment of this pathway from the western gate of the pleasure garden to the western limit of the compound associated with the four-quartered feature runs across an enclosure oriented in a west-east direction (c). Since this segment of the pathway is laid along the major axis of symmetry of the compound, it has an increasing symmetricity along the centerline of the pathway than to the extreme west, which in contrast is laid along the minor axes of each subcompound. The pathway through the third compound from the west, which is the four-quartered feature, is laid along its east-west axis of symmetry (d). Compared to the featureless compound to its immediate west, the four-quartered feature originally consisted of a central pavilion surrounded by four L-shaped ponds and four cardinally oriented causeways. This square compound with the four-quartered

feature creates perfect symmetricity along the central line of the east-west pathway. To the east of the four-quartered feature is again a narrow compound oriented in the west-east direction. This compound is in two split-levels: lower western and upper eastern (e, f). The pathway through this compound is laid along its major axis of symmetry. The mirror symmetrical arrangement of various features about the east-west axis in the lower western level again creates symmetricity along the centerline of the pathway. Since some of the features on both sides of the axis on the upper eastern level are not mirrored about the east-west axis, in contrast to the lower western level, it has a diminishing symmetricity along the centerline of the pathway. The easternmost compounds in the western plain are composed of two subcompounds: a smaller square to the west (g) and a larger rectangle to the east (h). Since the larger rectangle is oriented in a north-south direction, the pathway through this rectangle is laid along its minor axis of symmetry. Therefore, the symmetricity along the centerline of the pathway further diminishes in the east direction through this compound. Bordering the walled-in enclosure to the west and the above rectangular compound to the north are a large octagonal pond and a towering natural boulder, which forms the backdrop to the pond, but both features are not mirrored to the south about the centerline of the pathway. The rectangular pond and the walled-in enclosure by integrating a cluster of boulders of relatively smaller scale located to the south of the centerline of the pathway, however, do not form identical pairs with those to the north. Such non-identical features located at either side of the extreme edge of the east-west axial pathway further reduce the symmetricity.

Therefore, the degree of symmetricty along the axial pathway of the western rectangular precincts gradually increases from the west to east up to the four-quartered feature to make it the climax of symmetrical order, and again gradually diminishes in an eastward direction to the eastern limit of the axial zone. This makes the four-quartered feature not only the central element of the east-west axial zone, but also the dominant one, which provides an overwhelming sense of order. The east-west oriented transverse axis of symmetry across the four-quartered feature also shows that symmetricity increases from both the northern and southern limits of the compound to the center of the four-quartered feature to enhance this overwhelming sense of order.

Figure 5.35
Axial pathway through the pleasure garden (photo: Dominic Sansoni/ThreeBlindMen)

5.4.1(c) The Lion Plateau

The plan configuration of the Lion Plateau, defined by the parapet wall, together with the elements within it including the Lion-Staircase-House, which is built against the northern rock face as the forepart of a colossal lion figure, are symmetrically arranged in relation to the north-south axis. Since the elevational profile of the northern rock face seen from the Lion Plateau is highly irregular as compared to that of the western rock face seen from the west (figures 5.36, 5.37), the use of symmetry has therefore balanced the irregularities of the northern rock face.

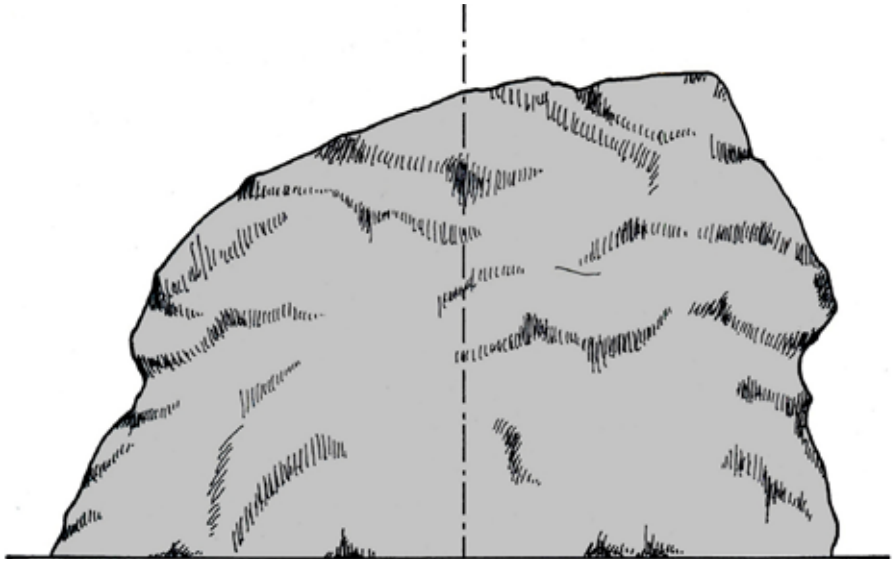
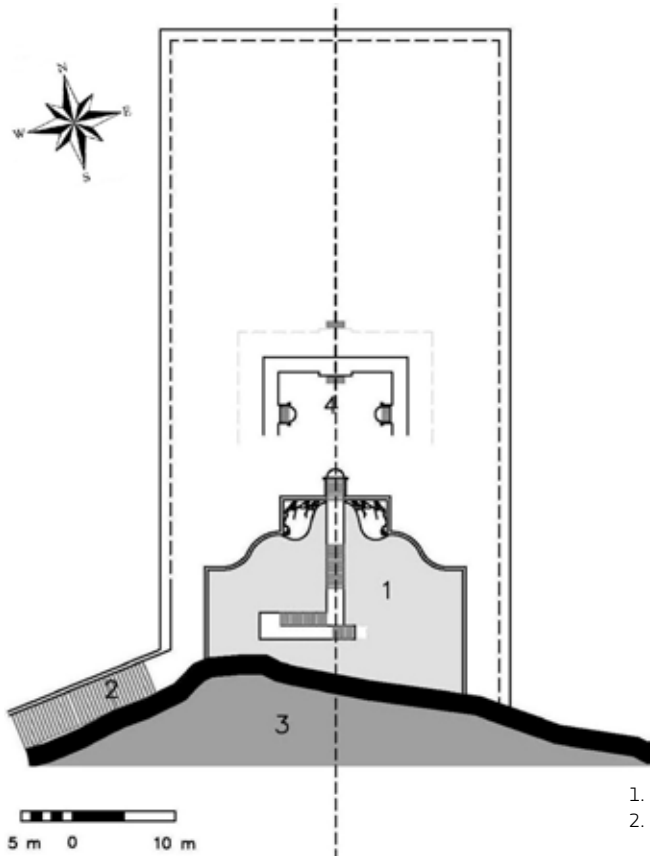


Figure 5.36
Northern rock face showing the irregular elevational profile



1. Lion-Staircase-House
2. Pathway/Stairway associated with Mirror Wall
3. Main Rock
4. U-shaped Structure

Figure 5.37
Plan of the Lion-Plateau showing the symmetry along the north-south axis against the northern rock face

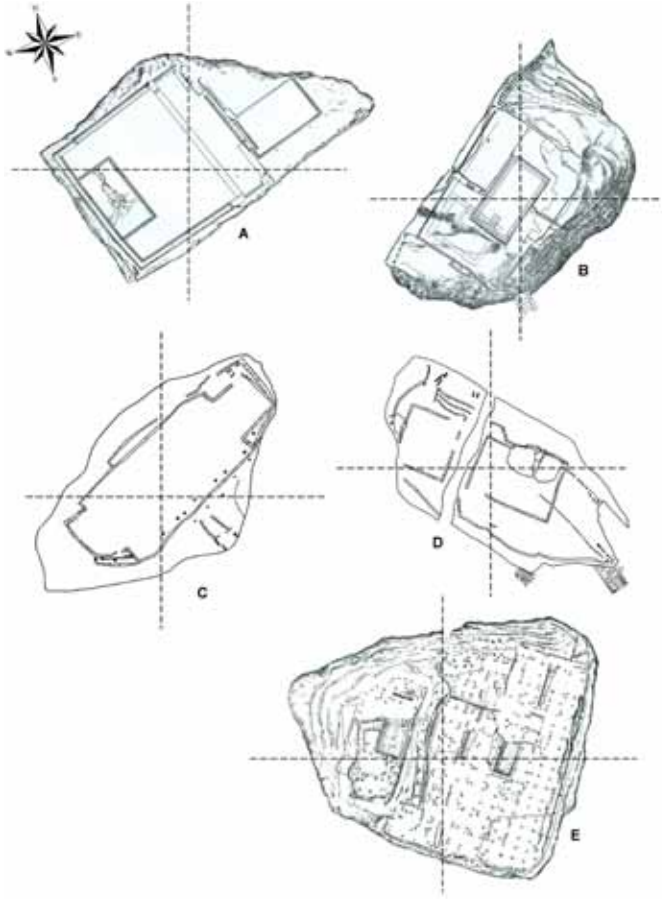
However, in contrast to the east-west axis, there is no dominant symmetry in relation to the north-south axis of the overall scheme. As far as symmetry is concerned, the north-south axis is thus subordinated to the east-west axis to highlight the east-west oriented built axis.

§ 5.4.2 Asymmetry

5.4.2(a) Hilly Terrain

The hilly terrain, which consists of clusters of boulders of varying size and appearance, presents a highly irregular and rugged topography and morphology. Natural courtyards, alleys and arches are formed by these clusters of boulders. Most of these boulders were earlier utilized by monks of a Buddhist monastic settlement as cave dwellings. As seen at numerous boulder-associated monastic landscapes of the early historic period (3rd/2nd century BC to 1st century AC), such as Mihintale and as evident from the archaeological research carried out at the hilly terrain of Sigiriya (Bandaranayake, 2010b:115), the area would have been originally utilized with minimum disturbance to the natural setting for the monastic needs of Buddhist monks. This area was absorbed by Kasyapa's designers by utilizing it as the inner city, by constructing structures on top of the boulders, plastering and painting the soffits of the cave shelters, laying out pathways linking various clusters of boulders and constructing retaining walls of the terrace structure.

The organizing lines of the pathways and terraces of this area do not at all correspond to the directions of the north-south and east-west axial lines of the overall layout, but rather follow the natural morphology to enhance the natural landscape qualities of the hilly terrain. Study of the remains of buildings and other structures that were built upon the boulders (such as the Audience Hall, Cistern Rock) and the cut-marks on numerous other boulders, which served as footings for the foundations of the buildings and structures built upon them, also suggests that the orientation of these buildings and structures was dictated not by the overall axial directions, but by the buildable areas on top of the boulders (figure 5.38). Compared to the rigid symmetry of the axial zone within the pleasure garden, this area is freed of the rigidity of the overall symmetrical plan with fuller respect to the characteristics of the existing natural landscape. Therefore, control of the composition of various natural and built elements within the hilly terrain has been achieved through asymmetrical planning, where the elements are held by the contours of the natural morphology (figure 5.39).



A. Audience Hall
B. Cistern Rock
C. Boulder B 7/8
D. Boulders B4 & B5
E. Preaching Rock

Figure 5.38
Plans at the top level of the selected boulders of the hilly terrain. The remains of the structures and the cut-marks upon the boulders show that the orientation of these structures was dictated not by the overall axial directions, but by the buildable areas on top of the boulders. (plans to different scale; the dotted lines indicate the direction of the axial lines of the overall layout; for the locations of the boulders see figure 5.39)

Here, the articulation is more free and the views are of infinite variety. Each boulder may be seen and enjoyed for itself or its relationship to other boulders, rather than for its relationship to a prescribed plan as experienced within symmetrically laid-out enclosures at Sigiriya. The marrying of built features with the natural features, such as boulders and site topography, demonstrate the exceptional sensitivity of the designers and hence that nature takes center stage in the hilly terrain. Although no evidence exists other than the cut-marks on the rock surfaces for the brick masonry to support the superstructure of the built elements on the boulders (as seen at Kaludiya Pokuna at Mihintale, for instance, where the natural boulders are utilized to construct structures upon them) (figure 5.40), it is reasonable to assume that these design interventions at Sigiriya were also carried out with great sensitivity, without destroying the natural

qualities of the boulders or the surrounding environment. With the exception of those of the Lion Plateau, the features within the hilly terrain in contrast to those within the plain, therefore, escape from the central east-west axis of symmetry of the overall scheme and present an asymmetric planning, which is totally different to that of the plain below.

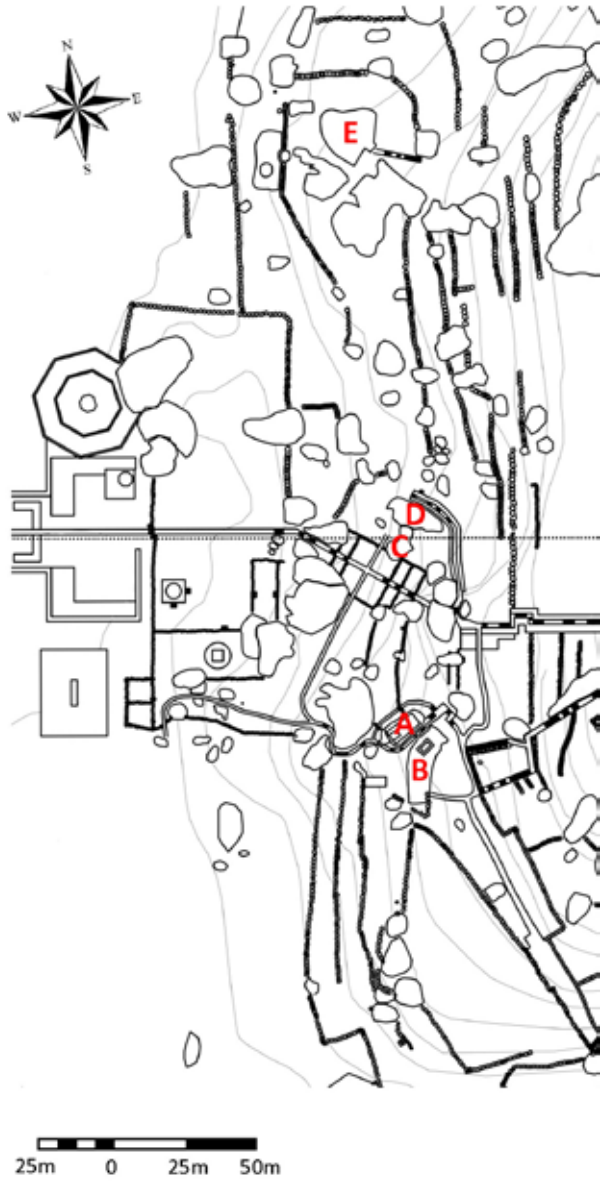


Figure 5.39
Asymmetry of the hilly terrain

Figure 5.40
Structure on top of a boulder at Kaludiya Pokuna Monastery, Mihintale

5.4.2(b) Rock Summit

Analysis of the plan of the rock summit shows that the brick embankment and the limestone pathway traversing the whole north-south length jointly create a dominant dividing line across the rock summit. However, it does not divide the plan configuration of the irregular rock summit into two physically identical parts. Compared to the organizing lines of the elements within the hilly terrain, those on the rock summit are created by the buildings, terraces, ponds, pools and pathways that are aligned with the north-south and east-west axial lines of the overall layout, but they do not show any symmetrical arrangement. Therefore, the layout of the rock summit also shows an asymmetrical layout. In this context, the alignment of the organizing lines of the elements within the rock summit with the north-south and east-west directions could be explained as a response to enhance the panoramic view in both east and west directions.

However, closer analysis of the ordering of the elements within the rock summit shows that there is some hidden order in its layout. For instance, although the brick embankment and the central limestone pathway do not jointly divide the rock summit into two identical physical parts, it visually divides the area into two parts that are roughly equal in terms of surface area. The areas of the northwest and southeast are

roughly equal, while the northeast and southwest are also similar in surface area (figure 5.41). This shows that there is a diagonal relationship of spaces within the rock summit on either side of the dividing line. Similarly, the main palace building and the rock-cut pool, which are the dominant elements of the rock summit, are also placed diagonally on either side of this dividing line. Although they do not form identical pairs on either side of the dividing line, they create equilibrium through asymmetrical balance (figure 5.42). This indicates that in contrast to the highly asymmetrical layout of the hilly terrain, the elements on the rock summit are asymmetrically balanced diagonally on the dividing line jointly created by the brick embankment and the central limestone pathway.

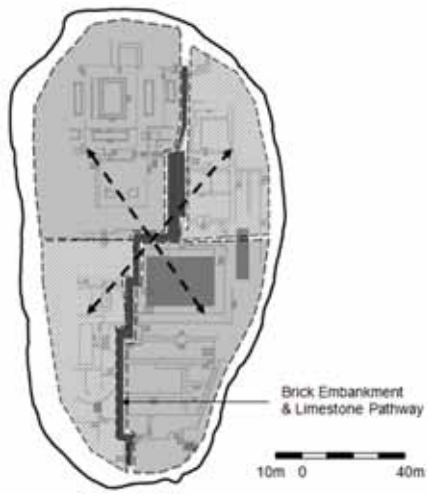


Figure 5.41
Asymmetrical balance of various spaces of the rock summit

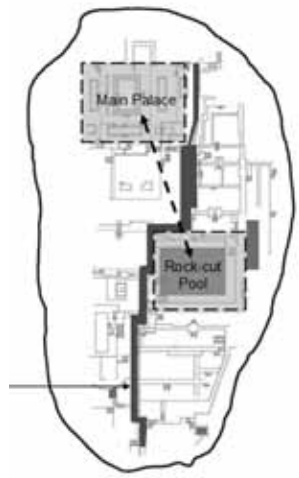


Figure 5.42
Asymmetrical balance of various elements of the rock summit

5.4.2(c) Route through the Hilly Terrain

Just outside the western entrance to the hilly terrain are the above-described octagonal pond and the towering boulder to the north, and the rectangular pond and a walled enclosure with a cluster of boulders to the south of the entrance. Although they do not form identical pairs on either side of the gateway, equilibrium is achieved similar to the layout of the rock summit through asymmetrical balance (figure 5.43). If the layout of the Buddhist monastic site of the post-Kasyapan phase is ignored, the natural arrangement of boulders within the compound formed by the pronaos projection

of the walled-in elliptical enclosure also creates an asymmetrical balance on either side of the pathway, which leads from its western entrance in an eastward direction (figure 5.44). The next segment of this pathway from this area leading to a natural boulder arch (Boulder Arch No. 1) is laid out through a series of narrow terraces (figures 5.45, 5.46). These terraces are enclosed by high walls by incorporating the natural boulders of varying size and shape on either side of the pathway, which again creates an asymmetrical balance on either side of the pathway. These walls on either side of the pathway to a great extent shut out the highly asymmetrical layout beyond the enclosed pathway within the hilly terrain. The highly asymmetrical layout can only be experienced if one moves away from this enclosed pathway. This indicates that in contrast to the highly asymmetrical layout of the hilly terrain, an asymmetrical balance prevails within the enclosed pathway from the western entrance to the hilly terrain, at least up to the Boulder Arch No. 1. The asymmetrical balance indicated at the western limit of the hilly terrain can be explained as a means to hint at what prevails within the enclosed pathway through the hilly terrain and on the rock summit.

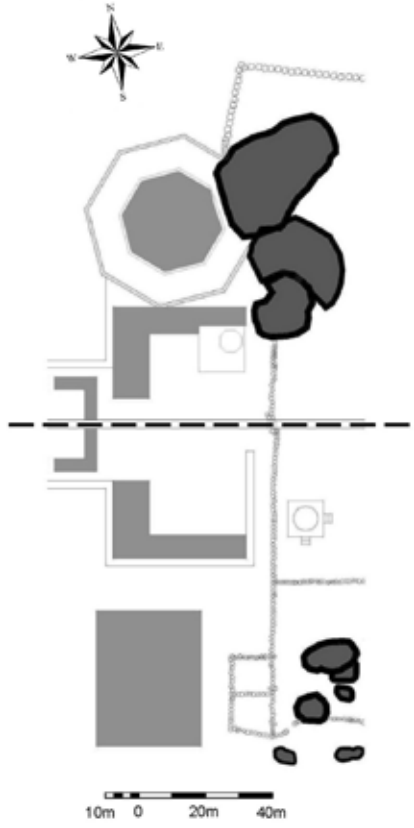


Figure 5.43
Asymmetrical balance of the elements near the entrance to the hilly terrain

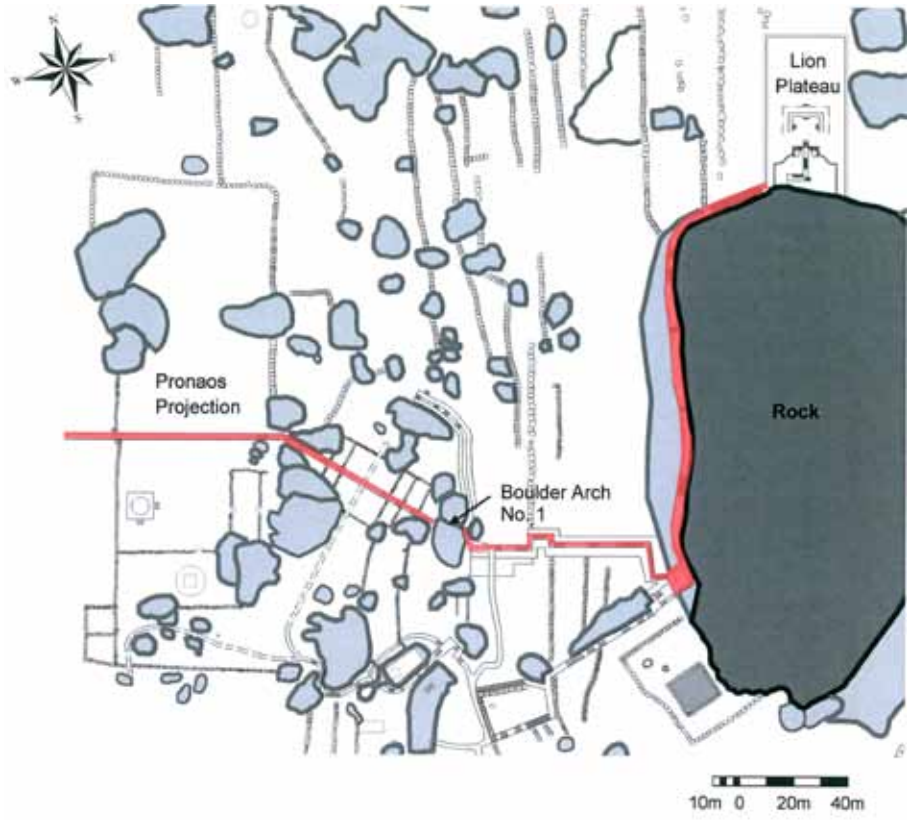


Figure 5.44
Pathway through the hilly terrain towards the rock summit through the Lion Plateau

Above the boulder arch, the pathway first assumes a covered steep stairway to meet the pathway associated with the Mirror Wall, which is set along the western rock face. This pathway associated with the Mirror Wall then leads up to the Lion Plateau, which is again enclosed by a high parapet wall. The zigzag pathway above the Lion-Staircase-House was also built as a continuation of the pathway associated with the Mirror Wall. The height of the Mirror Wall, which is more than the average eye level (figure 5.66), indicates that the pathway above Boulder Arch No. 1 to the rock summit also shuts out the asymmetry of the hilly terrain. The pathway across the hilly terrain and above the Lion-Staircase-House can therefore be interpreted as a covered corridor to link the palace complex at the summit with the highly symmetrical pleasure garden through the Lion Plateau, which is also symmetrical. In this light, the Lion Plateau functions as a major pause within this long corridor (figure 5.44).

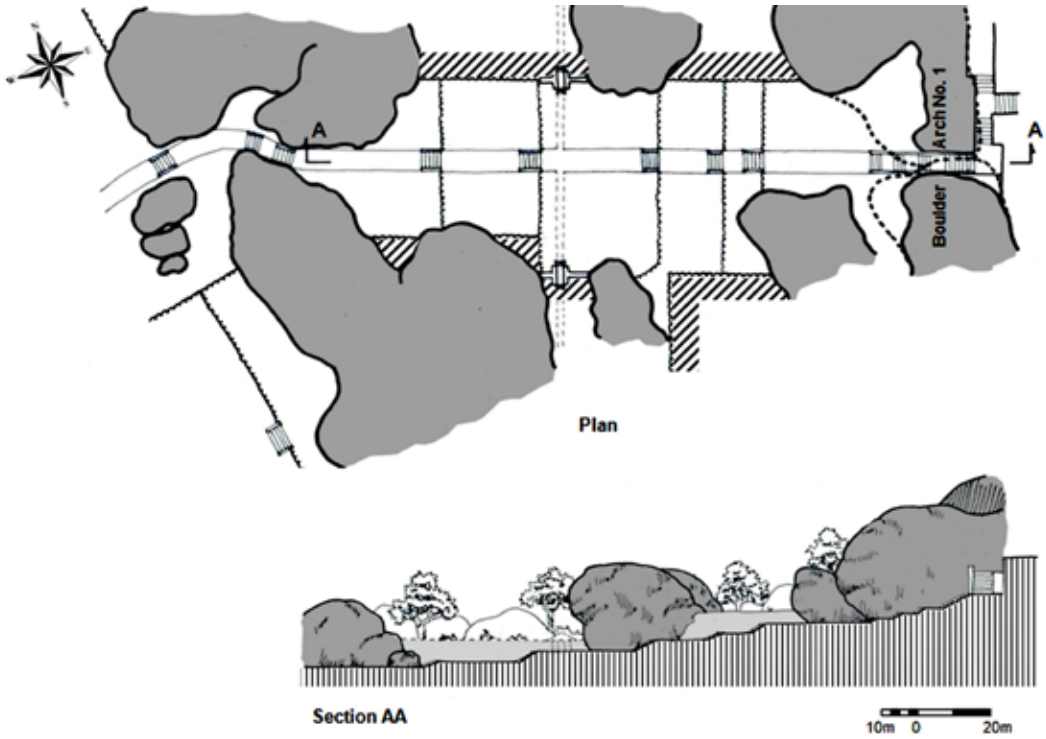


Figure 5.45
Pathway from the pronaos projection of the hilly terrain up to Boulder Arch No. 1

Figure 5.46
View of the pathway across the hilly terrain leading up to Boulder Arch No. 1

§ 5.5 Incorporation and Organization of Spatial Entities

By positioning the palace complex at the highest elevation above the surrounding landscape, the outer landscape beyond the physical boundaries of the built landscape to the horizon becomes part of the spatial scheme. The outer landscape, which has an extensive panoramic depth, consists of natural landscape (undulating topography, tropical forest cover, for example) as well as built and agricultural landscapes (monasteries, fortifications of Mapagala, agricultural tanks, fields, settlements). The north-south orientation of most of the palace buildings on the rock summit, which offers maximum views in both eastern and western directions from these buildings, is a design decision to spatially and visually link the palace buildings with the eastern and western panoramas. The pleasure garden laid out in the inner western precinct and the palace gardens on the lower eastern half of the rock summit provide appropriate foregrounds to the western and eastern panoramas, respectively, so that the effects of the spatial depth of the panorama is enhanced (figure 5.47). The rock-cut seat, positioned against the brick-built embankment and located just below the eastern edge of the central pathway overlooking the palace garden towards the eastern panorama, further indicates that the spatial link between the rock summit and the eastern panorama was established through the palace garden. The east-west axis of the western rectangular precincts provides visual direction from the palace towards the western panorama. By laying the central pathway halfway up along the brick-built embankment, which separates the palace buildings and the palace garden, the views from the palace buildings towards the eastern panorama are not obstructed by pedestrian movement on the rock summit (figures 5.48, 5.49). Therefore, the positioning of this central pathway is also a design decision to facilitate this spatial link. All this indicates that the palace garden on the rock summit establishes a spatial and visual link of the palace with the eastern panorama, while the pleasure garden in the inner western precinct establishes a spatial and visual link of the palace with the western panorama. Therefore, these two gardens link the palace and the surrounding outer landscape in a meaningful manner, and hence the palace does not appear to meet the surrounding outer landscape as a confrontation. This suggests that the laying out of the pleasure garden and the palace garden were design decisions to incorporate the panorama (outer landscape) into the scheme. The inner and outer eastern precincts, on the other hand, which are located at a distant lower level and lack significant architectural layouts unlike that of the pleasure garden, are not capable of providing appropriate foregrounds to establish spatial and visual links between the palace and the eastern panorama. As such, the inner and outer eastern precincts do not perform a significant role in respect of the spatial scheme and are hence reduced to mere features in the eastern panorama.

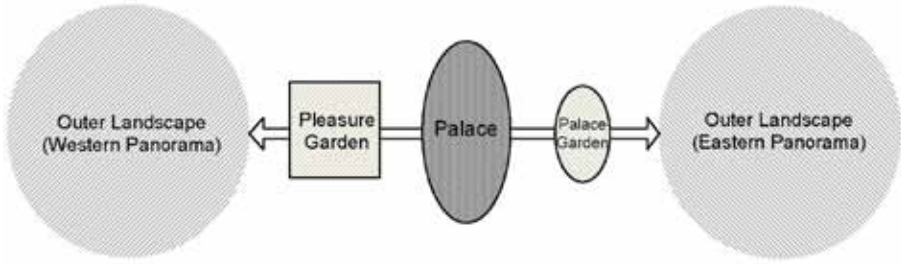


Figure 5.47
Spatial entities of the scheme and their schematic relationship

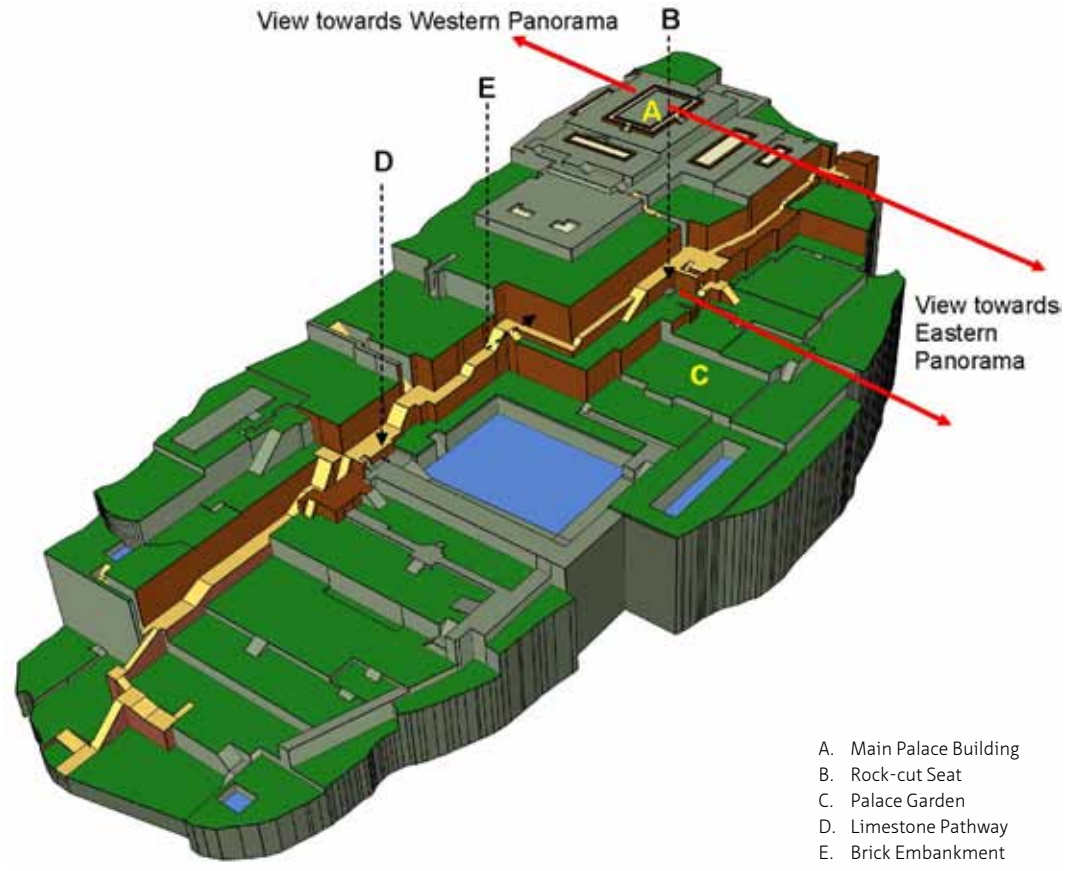


Figure 5.48
Axonometric view of the limestone-paved central pathway in relation to the eastern and western halves of the rock summit

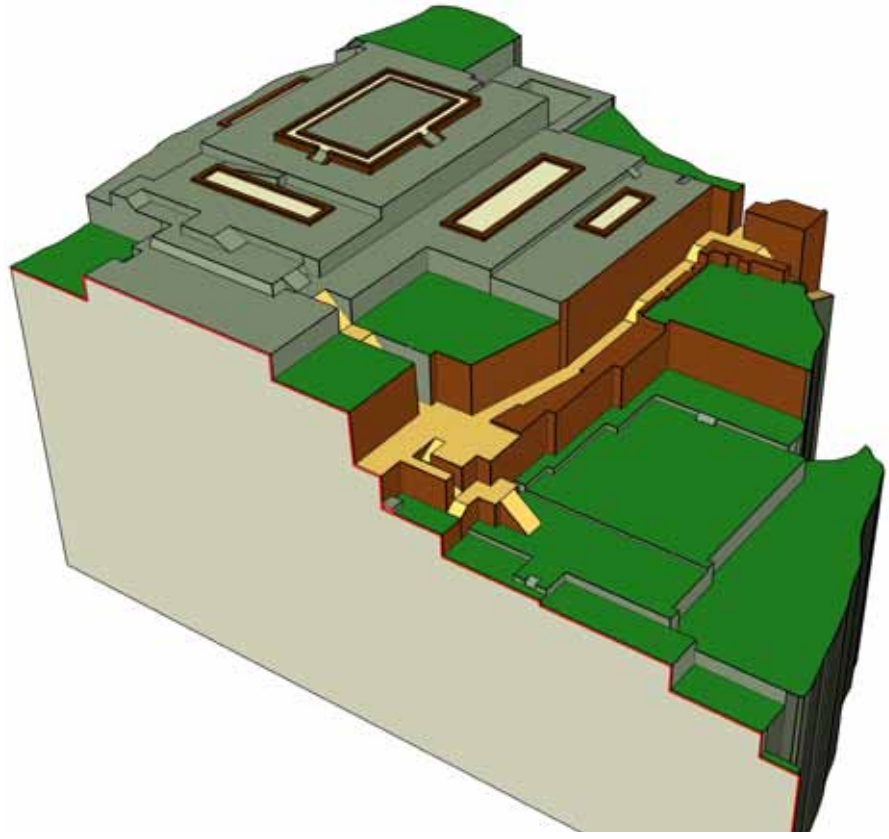


Figure 5.49
A sectioned axonometric view of the limestone-paved central pathway in relation to the eastern and western halves of the rock summit

All this indicates that the spatial structure is composed of three major autonomous spatial entities organized in the hierarchical order of the palace, garden and panorama (open landscape) in both east and west directions. The palace occupies the center of the spatial structure and hence becomes the major and central object in the space.

§ 5.6 Treatment of Panorama/Horizon

In the previous section the analysis focused on the role the formal layout of the eastern and western precincts plays in the spatial treatment of the panorama and horizon. The geometric analysis of the scheme (section 5.3) shows that the horizontal distances between the western edge of the western precinct and the four-quartered feature (PQ), between the four-quartered feature and the eastern limit of the pleasure garden (QR), and between the eastern limit of the pleasure garden and the center of the rock (RS) are equal (2.5 **a** of figure 5.28). When viewing the western panorama from the palace on the rock summit, the following can be observed in respect of its constructed picture plane (figure 5.50):

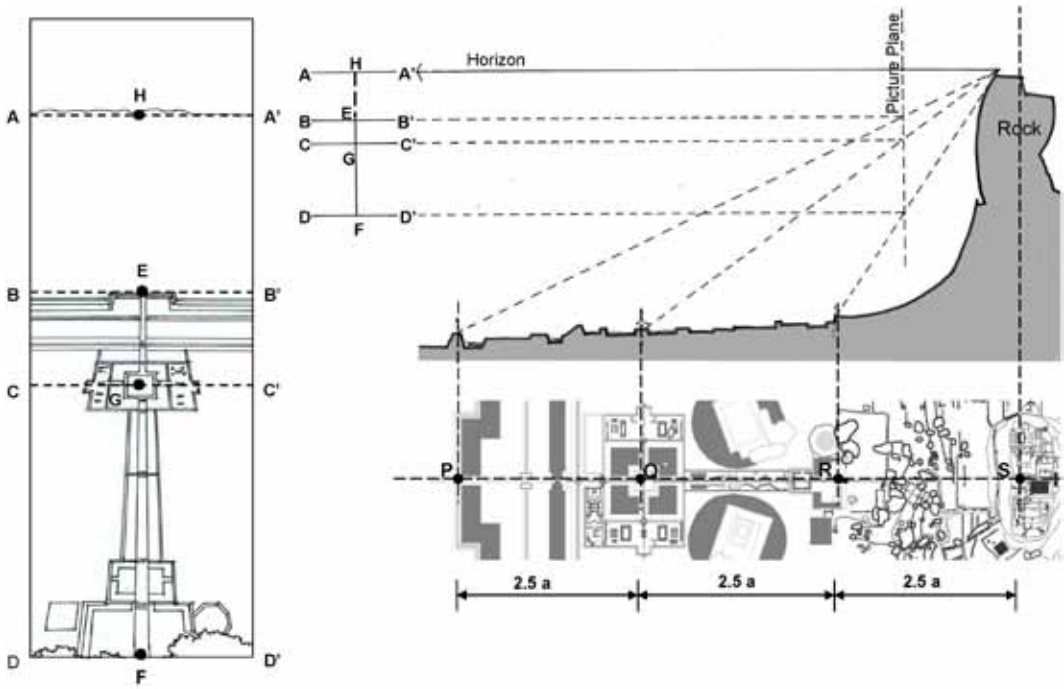
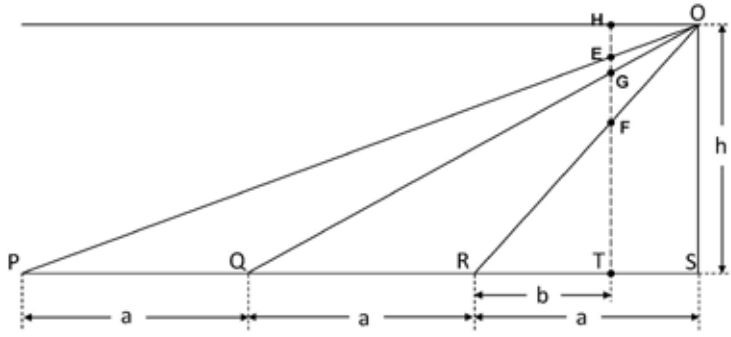


Figure 5.50
Picture plane of the western panorama from the rock summit (vertical scale of the section drawing exaggerated)

- horizon (AA') becomes its top horizontal line[77]
- eastern limit of the pleasure garden (DD') becomes its bottom horizontal line
- western edge of the outer western precinct (BB') is composed in between horizon (AA') and bottom of the picture plane (DD') with EF:EH=2:1
- transverse axis of the four-quartered feature (CC') is composed at the exact middle between the horizon (AA') and the bottom of the picture plane (DD') with GH:GF=1:1
- east-west axis of the western rectangular precincts is composed between the horizon (AA') and the bottom of the picture plane (DD') with EF:FH=2:3
- central island pavilion of the four-quartered feature is composed at G, the intersection of CC' (transverse axis) and EF (main east-west axis)

77 In the construction of the perspective picture plane, the height of the view point determined the size of the perspective depth measurement (such as AB, BC, CD of figure 5.50) and the effective picture plane height. When the height of the view point increases, the size of the perspective depth and effective picture plane height increases proportionately, so that the image as a whole is magnified (and therefore clearer), but the proportions remain the same. Therefore, in the graphic construction for the perspective analysis of a profile, the vertical scale can be exaggerated with regard to the horizontal scale (see Steenbergen and Reh, 1996:179).



FT / RT = OS / RS; FT / b =h / a; FT = bh / a
GT / QT = OS / QS; GT / (a+b) = h / 2a; GT = (a+b)h / 2a
ET / PT = OS / PS; ET / (2a+b) = h / 3a; ET = (2a+b)h / 3a
EF = ET-FT = (2a+b)h / 3a – bh / a = 2(a-b)h / 3a
EH = OS-ET = h – (2a+b)h / 3a = (a-b)h / 3a
GH = OS – GT = h – (a+b)h / 2a = (a-b)h / 2a
GF = GT – FT = (a+b)h / 2a – bh / a = (a-b)h / 2a
FH = OS – FT = h – bh / a = (a-b)h / a

Therefore, the view towards the western panorama from the palace on the rock summit consists of the four-quartered feature, with its central island pavilion composed at the midpoint between the horizon and the eastern edge of the pleasure garden due to the perspective effect. The horizon of the western panorama, which becomes the top horizontal line of the picture plane, is also highlighted as the ultimate boundary of the spatial scheme. This also shows that although the east-west axis in the western precinct does not extend to the horizon, it covers two thirds of the distance between the bottom of the picture plane and the horizon. This suggests that the axis in the western precinct is one of the dominant elements in the overall spatial composition, which provides visual direction towards the western panorama.

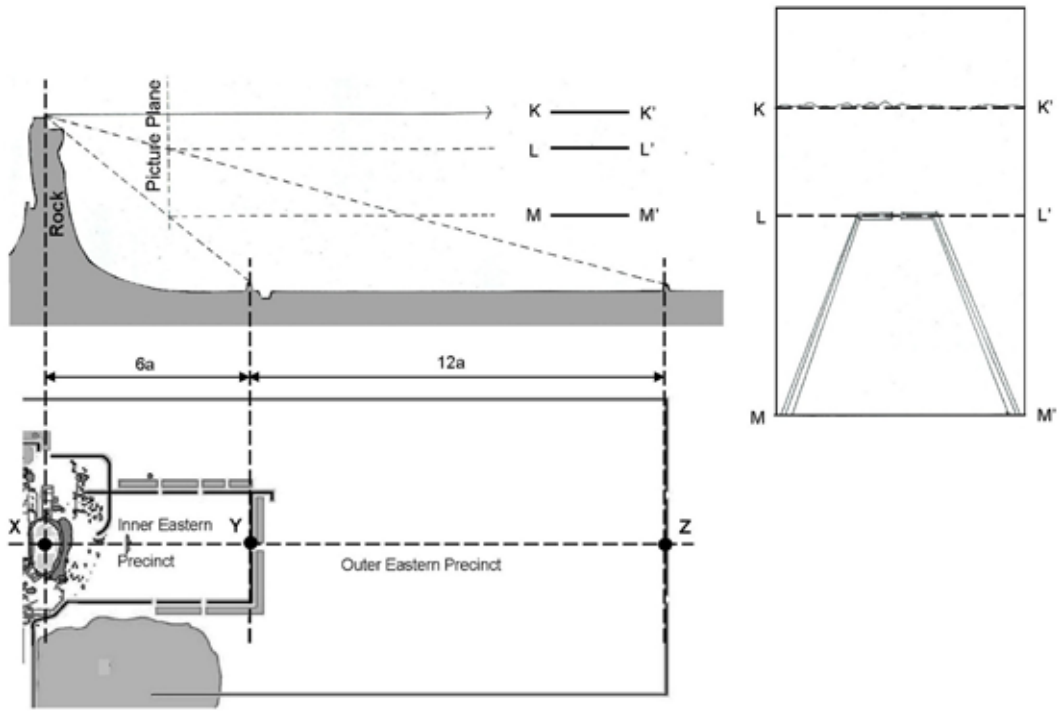


Figure 5.51
Picture plane of the eastern panorama from the rock summit (vertical scale of the section drawing exaggerated)

The geometric analysis of the scheme also shows that the horizontal distance between the center of the rock and the eastern edge of the inner eastern precinct (XY) is 6**a** (figure 5.28). The distance between the eastern edge of the inner eastern precinct and the eastern edge of the outer eastern precinct (YZ) becomes twice the distance of XY, which is 12**a**. When viewing the eastern panorama from the palace on the rock summit, the following can be observed in respect of its constructed picture plane (figure 5.51):

- horizon (KK') becomes its top horizontal line
- inner eastern precinct is hardly visible and hence it is not part of the eastern panorama
- western limit of the outer eastern precinct (MM') becomes its bottom horizontal line
- eastern edge of the outer eastern precinct (LL') is composed in between horizon (KK') and bottom of the picture plane (MM') with the distances between MM' & LL' and LL' & KK' being 2:1

A comparison of the picture planes of the eastern and western panoramas shows that the formal layout of the east and west of the rock on the plain below covers two thirds of the distance between the bottom of the picture planes and the horizons in both directions. Therefore, from the palace building there is a balance of the panoramic compositions in both eastern and western directions. This suggests that although the overall formal layout is not symmetrical along the north-south axis of the scheme, and the eastern half of the outer rectangular compound extends further in an eastward direction than the western half, it is a deliberate attempt to achieve a compositional balance in terms of the perspective effects from the rock summit.
However, in comparison to the western panorama, that to the east lacks monumental architectural elements such as the four-quartered feature and the axial pathway. Since the outer eastern precinct has not been subjected to vigorous archaeological investigation, it does not allow us to see the compositional elements and by what means they are organized in the composition to enhance the eastern panoramic view from the rock summit.

In contrast to the eastern and western panoramas, where built features form part of their composition, the natural panoramas in north and south directions from the rock summit extend to the diffused horizon and the Matale Foothills, respectively (figures 5.52, 5.53).

Figure 5.52
Natural panorama in the north direction

Figure 5.53
Natural panorama in the south direction

Although the basements of the palace buildings and terrace structures together with the rock-cut seat on the rock summit have survived to provide evidence of the panorama-oriented composition, their superstructure is unfortunately missing, and thus also an understanding of how the panorama/horizon was architecturally treated from both the interior and exterior spaces of the rock summit, through three-dimensional spatial design. The present remains also do not allow us to understand the specific architectural devices and elements used by the designers to frame and enhance the great spatial depths offered by the eastern and western panoramas. Although Bandaranayake (2010a:31-32) does not provide the logic behind his conjectural reconstruction of the buildings on the rock summit, the so-called 'sunset pavilion' for instance, they open up towards the panorama by means of shaded colonnaded pavilion-type structures. Architectural elements such as colonnaded balconies and roof terraces, as indicated in facades of buildings from relief fragments and miniature relief shrines from urinal stones found at Anuradhapura and ancient mural paintings from Polonnaruva and Kandy (but dating from a period later than the 5th century AC), and openings such as doors and windows similar to those of the entrance porch at Yapahuwa (figure 5.54), would have probably performed a specific role with regard to the architectural treatment of the panorama/horizon.

Figure 5.54
The entrance porch of the Yapahuwa royal complex (13th century), which provides access to the palace on the rock summit. Located at an elevated plateau of the hill on which Yapahuwa rock stands, the remains of this porch still show how the panorama/horizon was architecturally treated from its interior

The central limestone pathway, which is situated at midlevel along the massive brick-built retaining wall and traverses the whole of the north-south length of the rock summit, also offers views of the eastern panorama (figure 5.48). Unfortunately, the present remains of this pathway hardly provide material evidence to establish whether it was originally designed to be an open or a covered walkway. If it was a covered walkway, to provide shade against the extreme heat of the sun (by a lean-to roof built against the brick embankment and supported by a colonnade at its eastern edge, like the long frontal verandahs of the ancient cave temples, which also acted as covered walkways, as seen at Dambulla, for instance), it would have presented a stunning experience to users of this pathway of the eastern panorama through a series of views framed by the colonnades, due to the staggered nature of the pathway.

§ 5.7 Spatial Depth

The western face of the main rock above the hilly terrain has a concave surface and projects out as it rises above its base. The whole of the north-south length of this rock face and a significant area of the northern rock face was originally plastered. The golden and bluish-colored ladies carrying flowers are painted on this whitish plaster. The figures are covered in clouds below their waists, as if they are floating in the sky. This concaved great tapestry of painting rises above the parapet wall (Mirror Wall) of the pathway to an average height of about 40 meters above the upper limits of the hilly terrain, as if the sky emerges above the horizon. Therefore, when viewed from the western precincts, this plaster band, which merges with the eastern sky, gives an impression of an illusionary space above and beyond the Mirror Wall. Similar artificial devices, such as interior garden sceneries and exterior perspective paintings framed through the pilasters and artificial sets in a theater, were used in ancient Roman gardens and in later French landscape designs, respectively, to create illusionary space (Jashemski, 1979:55-87; Steenbergen and Reh, 1996:145). Similarly, the great tapestry of plaster band on the natural concave rock face and the Mirror Wall are used at Sigiriya as screens, one behind the other to achieve this effect. The recently identified painted figures of ladies on the external plaster of the Mirror Wall (Wagaachchi, 2005) also indicate that the whole of the external surface of this parapet wall facing the west was also plastered with ladies, which provides added evidence to heighten this illusionary space. As such, the plaster band on the western rock face and the parapet wall running on the total north-south length of the rock can be interpreted as architectural devices used to create illusionary space, which provides spatial depth from the pleasure garden. This illusionary space, in turn, visually and spatially separates the palace on the rock summit from the land, and hence gives a floating effect from below to the skyward abode of the king. The ladies

painted on this plaster band, as if they are floating in the clouds between the upper limits of the hilly terrain and the palace, also greatly contribute to achieve this effect. As the actual proportions of the painted figures are smaller than life size, when seen from the inner western precinct, their size also enhances the great spatial depth from the inner western precinct.

Since the continuity of the east-west axis across the pleasure garden is visually blocked by the presence of the enormous rock mass of Sigiriya, this illusionary space also provided great spatial depth to the pleasure garden. This illusionary aspect of the three-dimensional space is further dealt with under subheading 5.8 Scenography of Movement.

§ 5.8 Scenography of Movement

5.8(a) Axial Pathway

Since the pleasure garden is about three meters higher than the outer western precinct, and the inner rampart rises to a further height of more than four meters above the level of the pleasure garden, there is no hint of a formal garden in the inner western precinct, to an observer approaching from the western gate at the outer rampart. Looking east from this point (A) along the east-west axial line, the inner rampart, hilly terrain and the Mirror Wall rise one behind the other as a series of screens (figures 5.55, 5.56). Seen behind this series of screens, the plaster band on the western rock face, which originally rose to a height of about 40 meters above the Mirror Wall, gives the effect of the sky emerging behind these screens to create an illusionary space behind the hilly terrain and to give a floating effect to the palace on the rock summit. As the observer progresses along the axial line towards the east, the hilly terrain and the Mirror Wall will be increasingly covered behind the inner rampart, and at one point (B), the top horizontal line of the inner rampart becomes the visual horizon to this illusionary space. When progressing further in an eastward direction along this axial line, the plaster band will also be increasingly covered by the inner rampart, and at a certain point (C) the inner rampart visually provides a monumental podium for the palace to stand. Further moving along this axial line, the view of the palace will also be cut off behind the inner rampart and only the sky above the palace, the real empty space, will be visible above the rampart.

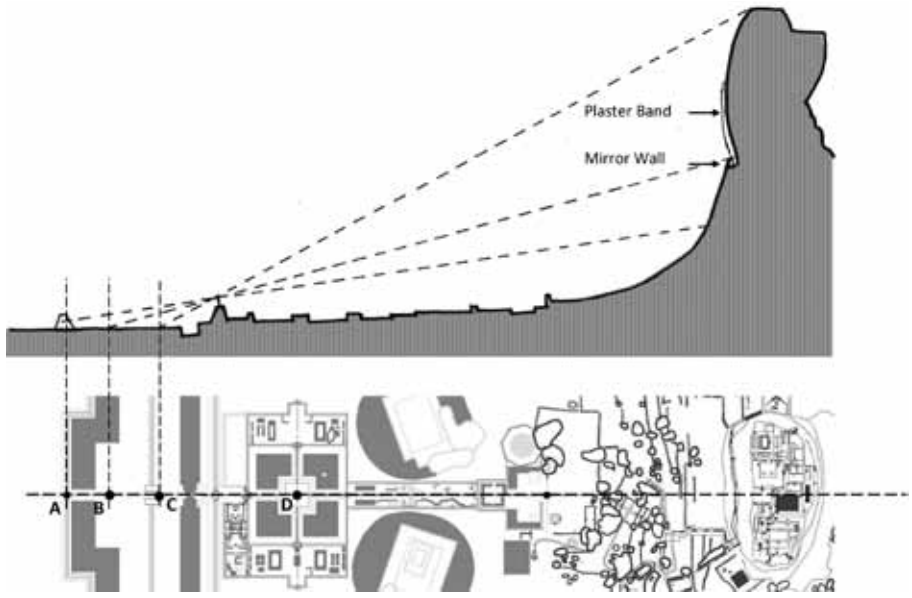


Figure 5.55
Section showing different views composed when moving from the outer western precinct towards the rock on the east-west axis (vertical scale exaggerated)

Since the pleasure garden is about three meters higher than the outer western precinct, and the inner rampart rises to a further height of more than four meters above the level of the pleasure garden, there is no hint of a formal garden in the inner western precinct, to an observer approaching from the western gate at the outer rampart. Looking east from this point (A) along the east-west axial line, the inner rampart, hilly terrain and the Mirror Wall rise one behind the other as a series of screens (figures 5.55, 5.56). Seen behind this series of screens, the plaster band on the western rock face, which originally rose to a height of about 40 meters above the Mirror Wall, gives the effect of the sky emerging behind these screens to create an illusionary space behind the hilly terrain and to give a floating effect to the palace on the rock summit. As the observer progresses along the axial line towards the east, the hilly terrain and the Mirror Wall will be increasingly covered behind the inner rampart, and at one point (B), the top horizontal line of the inner rampart becomes the visual horizon to this illusionary space. When progressing further in an eastward direction along this axial line, the plaster band will also be increasingly covered by the inner rampart, and at a certain point (C) the inner rampart visually provides a monumental podium for the palace to stand. Further moving along this axial line, the view of the palace will also be cut off behind the inner rampart and only the sky above the palace, the real empty space, will be visible above the rampart.

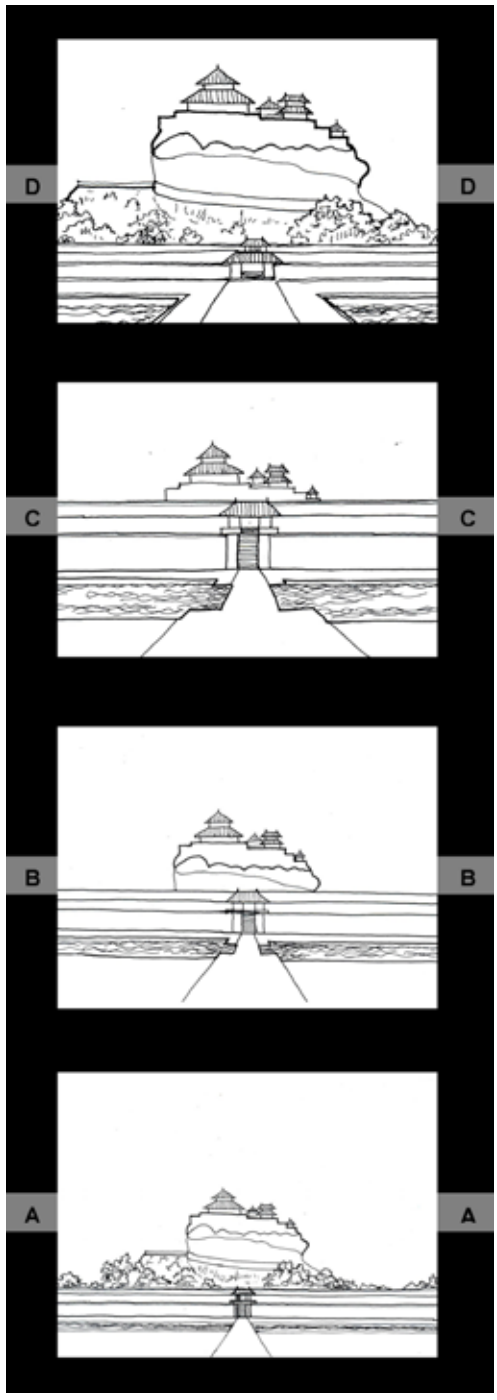


Figure 5.56
Different views composed from stand points A, B, C and D on the axial pathway (structures on the rock summit are conjectured)

Since there is no suggestion of the presence of a formal garden in the inner western precinct from the outer western precinct, it appears as a surprise to the observer as he reaches the gateway up on the inner rampart, by crossing the inner moat and then ascending the flight of steps built into the projected retaining wall of the inner western precinct. The hilly terrain, the Mirror Wall and the plaster band on the western rock face will again be visible from this vantage point to re-create the illusionary space. As he walks along the axial pathway in an eastward direction, he also feels the increasing symmetry of the axial zone. When on the central pavilion of the four-quartered feature (point D), the perfect symmetry of its plan gives the observer the experience of an overwhelming sense of order. The palace, which seems to be floating in the sky, becomes the main actor on stage, and will never be lost sight of when within the axial zone of the inner western precinct. The high inner rampart enclosing the pleasure garden, which does not provide views of the outer western precinct, further strengthens the dominance of the rock. Although the present natural vegetation of the pleasure garden allows views of Pidurangala rock over the rampart and somewhat distracts the visual focus of Sigiriya rock, Dissanayake (2003:225) suggests that the area beyond the axial zone within the pleasure garden, which functioned as spaces for garden sports, had thick vegetation. Therefore, it is reasonable to assume that the original planting scheme would have prevented such outside views from the pleasure garden in order to focus the view on the rock and the palace complex upon it. The northern and southern arms of the western segment of the inner rampart, the Mirror Wall and the plaster band on the rock face, which are placed one behind the other on the east-west axial line, act as a series of screens in front of the plastered and painted band of the rock to create an illusionary spatial effect from the outer and inner western precincts. Although the numerous north-south running walls of the axial zone have now been reduced to ruins, their thicknesses suggest that they originally stood to a considerable height to play the role of screens against the axial line to achieve the illusionary spatial effect. The east-west axis within the western precincts, therefore, provides the visual interplay of various elements to heighten these illusionary spatial effects. On the other hand, these spatial effects created along the west-east direction towards the rock further strengthen the scheme's rock-oriented composition.

This compositional technique of the three-dimensional space, where the great plaster band on the rock face was composed as a cloud below the rock summit and rises above a series of architectural devices in the foreground to give a floating effect to the palace complex, shows similarities to the painterly technique of the individual paintings of the ladies on the plaster band, where a cloud is composed below the waist level (figure 5.57). Unfortunately, the whole plaster band has not survived, and so it is impossible to understand how it was three dimensionally treated in the whole architectural composition. Similar examples showing this painterly tradition are fairly common, the best examples being from the 17th and 18th century mural paintings of the Kandyan period (figures 5.58. 5.59). Although the architectural devices used are somewhat different to those at Sigiriya, a similar technique of architectural composition can

be found at the royal precinct at Kandy, designed during the last decade of the 18th century and first decade of the 19th century. At Kandy – with the large sheet of water of the man-made lake in the foreground of the royal precinct, with a series of architectural foregrounds (such as the walakulu bemma (cloud drift parapet wall) and diyareli bemma (wave swell parapet wall)) rising one behind the other over the sheet of water of the lake, as a base for the royal precinct, as in a stage set with reflections of the parapet walls and the palace buildings on the water (figure 5.60) – the royal precinct was deliberately designed to appear like an abode floating in the sky (De Silva, N., 1993:159). In this respect, Sigiriya presents the earliest surviving example in Sri Lanka, if not in Asia, of a technique of architectural composition that gives a floating effect in three-dimensional form, which is very similar to a technique common in Sri Lanka's painting tradition.

Figure 5.57
A painting of a lady on the rock face (note the cloud composed below the waist) (photo: M. W. E. Karunaratne)

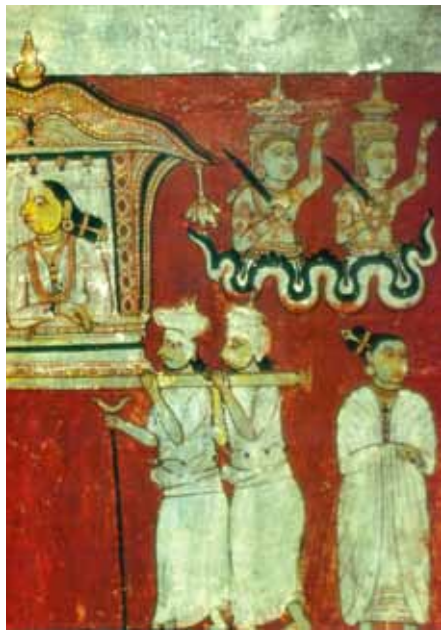


Figure 5.58
A mural painting from Suriyagoda Temple near Kandy (18th century) showing the painterly technique of using cloud to give floating effects (courtesy: Bandaranayake, 1986a)

Figure 5.59
A mural painting from Dambulla Cave shrine (18th century) showing the painterly technique of using cloud to give floating effects (courtesy: Chutiwongs, Prematilleke and Silva, 1990b)

Figure 5.60
Royal precinct of Kandy showing the floating effects (note the parapet walls)

5.8(b) Routes through the Hilly Terrain

The positioning of the route from the western gateway to the hilly terrain up to the Lion Plateau through the pathway associated with the Mirror Wall indicates that it does not take the shortest and easiest locus between the two points. If a route with a flight of steps were constructed along the slope of the hilly terrain in a northeasterly direction to directly link the Lion Plateau, the enormous cost, labor and engineering problems of constructing a pathway halfway up along the rock would have been avoided. However, a close analysis of the natural site conditions of the hilly terrain in relation to the pleasure garden suggests that this pathway is laid out in such a manner that it is hidden behind the clusters of boulders of the hilly terrain (figures 5.61, 5.62). As this route reaches the upper limits of this terrain, and where there are not enough boulders to cover the pathway, the route takes rather a zigzag form to be hidden behind the boulders, which are at a lower elevation (figure 5.63). Therefore, this pathway is hardly noticeable from the western precincts. Likewise, the route from the southern gateway of the pleasure garden up to the beginning of the pathway associated with the Mirror Wall through the hilly terrain is also deliberately shut out of sight from the western precincts by taking advantage of the topographical features of the hilly terrain. It could be reasonably assumed that the original vegetation pattern on the hilly terrain would have also contributed to provide added cover to these pathways. Moreover, the Mirror Wall of the pathway, which is about two meters high, and therefore more than the average height of a person, also deliberately shuts out of sight pedestrian movement. Therefore, this indicates that pedestrian movement within the hilly terrain up to the Lion-Plateau is shut out of sight from the western precincts. As such, when viewed from the western precincts, the hilly terrain seems to be a human-free zone. The peripheral wall around the base of the hilly terrain would have also given the impression that the hilly terrain is not freely accessible from the plain. This deliberate positioning of the routes through the hilly terrain and the high parapet wall of the Mirror Wall also avoids providing live scale to the painted figures on the plaster band on the rock, which are in reality smaller than actual human proportions. This is an important condition to create the spatial illusion from the western precincts.

Figure 5.61
Route across the lower half of the hilly terrain in relation to the topographic features

Figure 5.62
Semi-aerial view of the hilly terrain showing the route covered by boulders (photo: R. Swathe Inc.; courtesy: Bandaranayake 1993b)

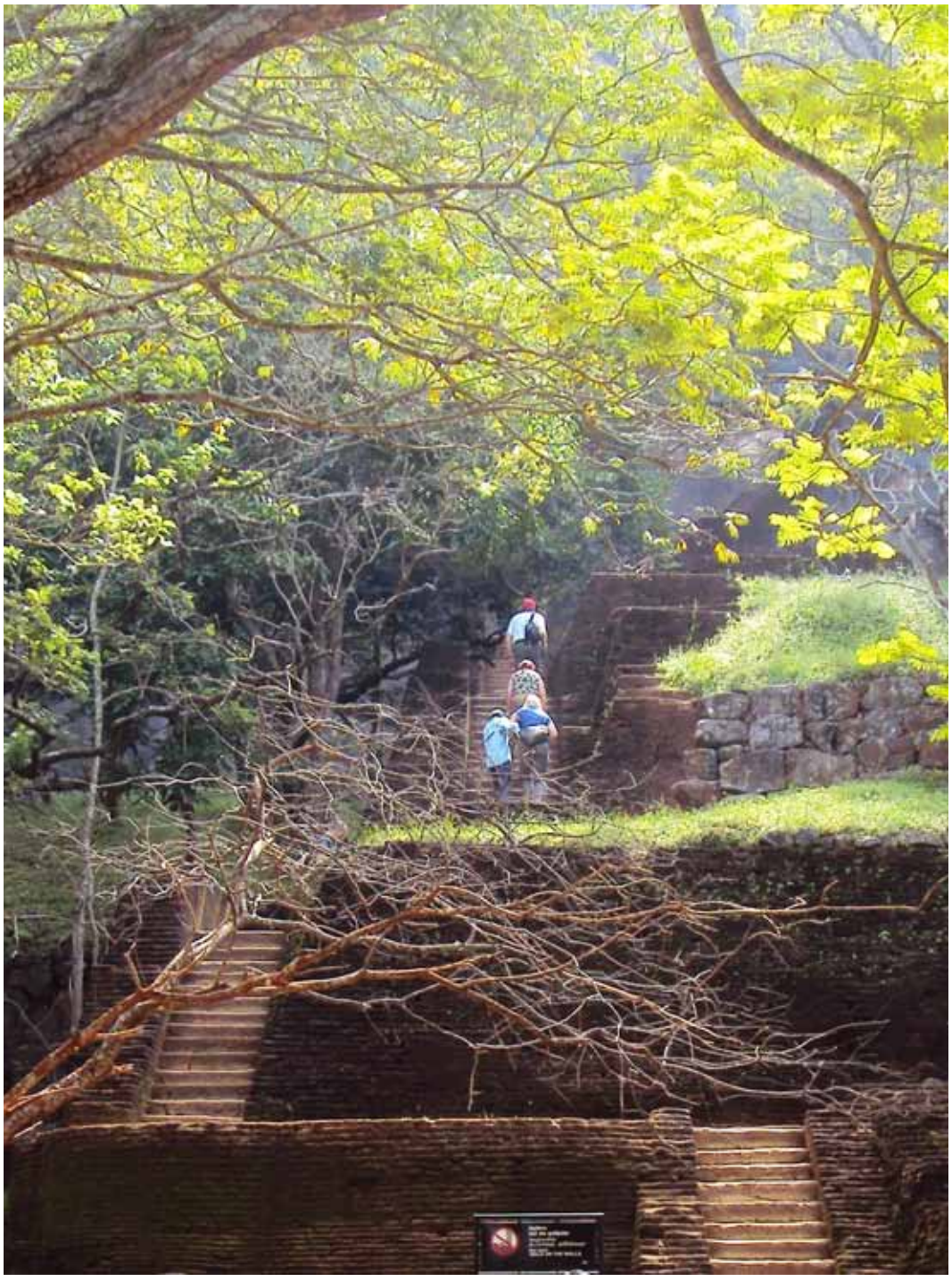
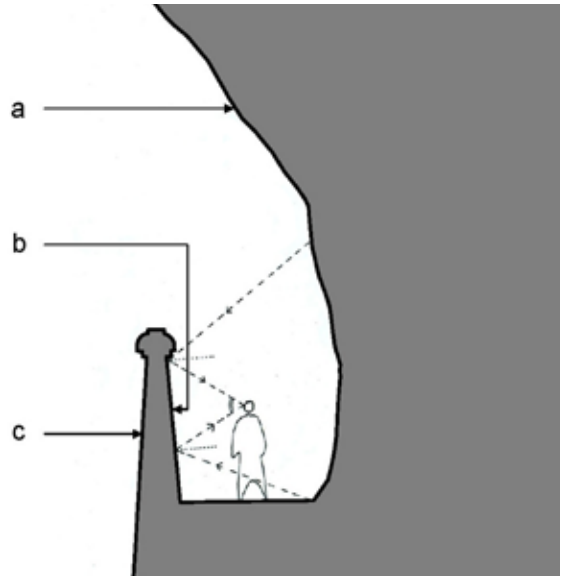


Figure 5.63
The route across the upper half of the hilly terrain (note the zigzag form of the route)

However, after the observer advances through the western gate to the hilly terrain (inner city), due to the laying of the route covered by the clusters of boulders, the view of the central rock itself is also cut off from sight. Therefore, the spectator-stage relationship, which is so dominant along the axial pathway in the western precincts, is now lost. Since the observer is surrounded by varying sizes of rock masses in this boulder-dominated landscape, a new relationship begins to form, as if the spectator is now within the stage surrounded by many actors. Here, the boulders forming the focus of the composition like the main actors on stage will become the stage set for the next scene as the spectator moves freely through the hilly terrain (figure 5.64, 5.65). The asymmetrical planning of the layout also greatly contributes to achieve this free design. Here, the circulation is more free and the views are of infinite variety. Each boulder in the landscape could be seen and enjoyed for itself or its relationship to other boulders or landscape elements. The numerous paintings on the plaster that covers the rock ceilings of these boulders would have given a dramatic effect to the whole spatial experience. The spectator is, therefore, set free to discover the landscape for himself. In order to heighten this effect, the observer is offered a specific view of neither the central rock nor that of the formal layout of the pleasure garden, which is located at a lower elevation than the hilly terrain. Therefore, the spatial design of the hilly terrain remains introverted in character. Even when walking along the pathway associated with the Mirror Wall towards the Lion Plateau, although this elevated pathway, like a balcony, has the great potential of providing an overview of the formal layout of the pleasure garden and of the western panorama, the high parapet wall constructed on its western edge deliberately prevents such views. However, the reflective plaster on the interior surface of the Mirror Wall of this pathway would have compensated the above natural views by mirroring the plaster band (possibly with the painted figures at the lower levels), that is on the rock surface, as if the observer is walking through a much wider space, flanked by the floating Sigiriya ladies (figure 5.66). The emotional graffiti inscribed by the later visitors to the site also indicates the stunning spatial and visual effects experienced by them at this location, when most of the plaster on the western rock face together with the paintings and also the reflective surface of the Mirror Wall were in a much better state of preservation than at present.

Figure 5.64
Different views with regard to the changing composition of the boulders

Figure 5.65
Plan showing different view points along the routes across the hilly terrain



a. Painted figures on the rock plaster
b. Reflective plaster
c. Mirror Wall

Figure 5.66
Section through the pathway associated with the Mirror Wall showing that a considerable area of the plaster on the lower part of the rock face is reflected by the reflective plaster on the inner face of the Mirror Wall

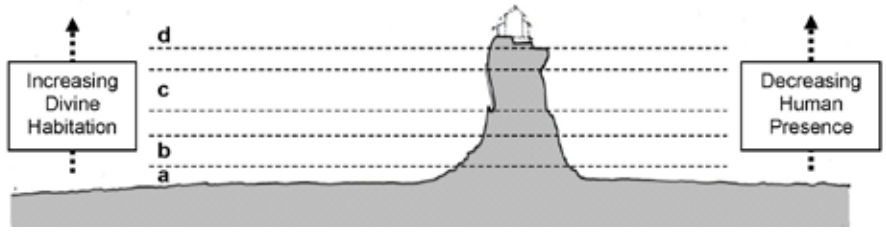
Although the parapet wall around the periphery of the Lion Plateau has not survived to its original height at present, the Mirror Wall, which winds around the northwest corner of the rock to connect the parapet wall of this plateau, indicates that the same height would have continued around the Lion Plateau. If the zigzag stairway above the Lion-Staircase-House was also a continuation of the pathway associated with the Mirror Wall, with the same height of its parapet wall, it is reasonable to assume that the view of the formal layout of the scheme and of the panorama was not provided until the observer reached the rock summit. From the palace, which is the highest vantage point of the whole scheme, the formal layout and the panorama are suddenly unfolded in all directions. The observer now finds a new spatial relationship, this time with the open landscape. This is a large, live and natural landscape theater with the urban and suburban settlements, monasteries, agrarian settlements with their fields and reservoirs, together with their respective actors, all playing their real and respective roles. The palace garden and the pleasure garden assume stage sets in this immense landscape theater. Therefore, this long spatial corridor, commencing from the western edge of the hilly terrain right up to the rock summit, shuts out the overview of the formal layout of the pleasure garden and the panorama to unfold the drama from the rock summit.

§ 5.9 Visual Structure

§ 5.9.1 Visual Layers

When viewed from below, the whole scheme can be interpreted as consisting of several distinctive visual layers (figure 5.67). The lowest layer, which consists of natural and agricultural landscape and the rectangular precincts of the formal layout, is associated with the animals, agrarian population as well as the urban elite and nobility, and hence represents the world of humans and animals. The hilly terrain, on which the rock stands and where any view of human movement is deliberately cut off from the plain below, by the laying of pathways hidden behind boulders, represents a human-free visual layer. The plaster band on the rock face above this layer gives an illusionary space and visually separates the palace from the land. The ladies painted in the plaster band give the impression that they are floating in the sky. The use of clouds to horizontally separate different layers is a common painterly technique of Sri Lanka's mural painting tradition (figure 5.68). With regard to Sri Lanka's painting tradition, Bandaranayake (1986a:28) also observes that the 'use of clouds is not only a compositional device, but a well established symbolic motif in the representation of celestial regions ...' The cloud

drift parapet wall introduced as an architectural device at Kandy's royal precinct (figure 5.69) is another example of such a technique used in architectural composition. The palace occupies the topmost visual layer, which is visually detached from the land. This indicates that there is a bottom-up vertical sequence of visual structuring system of the landscape with decreasing human and at the same time increasing divine habitation from the virtual plain up to the rock summit (figure 5.70). This visual structuring of the landscape resembles the subdivision of the world of sensation (laukika): the world of animals and humans, the heavenly abodes of the world of gods high up on the Mount Meru of the cosmic landscape, together with the atmospheric region above the rock summit, the higher Brahma heavens, as per Buddhist cosmography[78] (Adikaram, 1946:153-154; Duncan, 1990:43).



a. Plain (animals, agrarian population, urban elite and nobility)
b. Hilly Terrain (deliberate cut off of the human presence)
c. Plaster Band (illusionary space)
d. Palace Complex on the Rock Summit

Figure 5.67
Bottom-up layering system of the landscape (vertical scale exaggerated)

78 For more details see section 2.1.3.

Figure 5.68
Mural paintings of the Dambulla Cave shrine (18th century) showing clouds used to horizontally separate different layers (courtesy: Bandaranayake 1986a (left) and Chutiwongs, Prematilleke and Silva, 1990b (right))

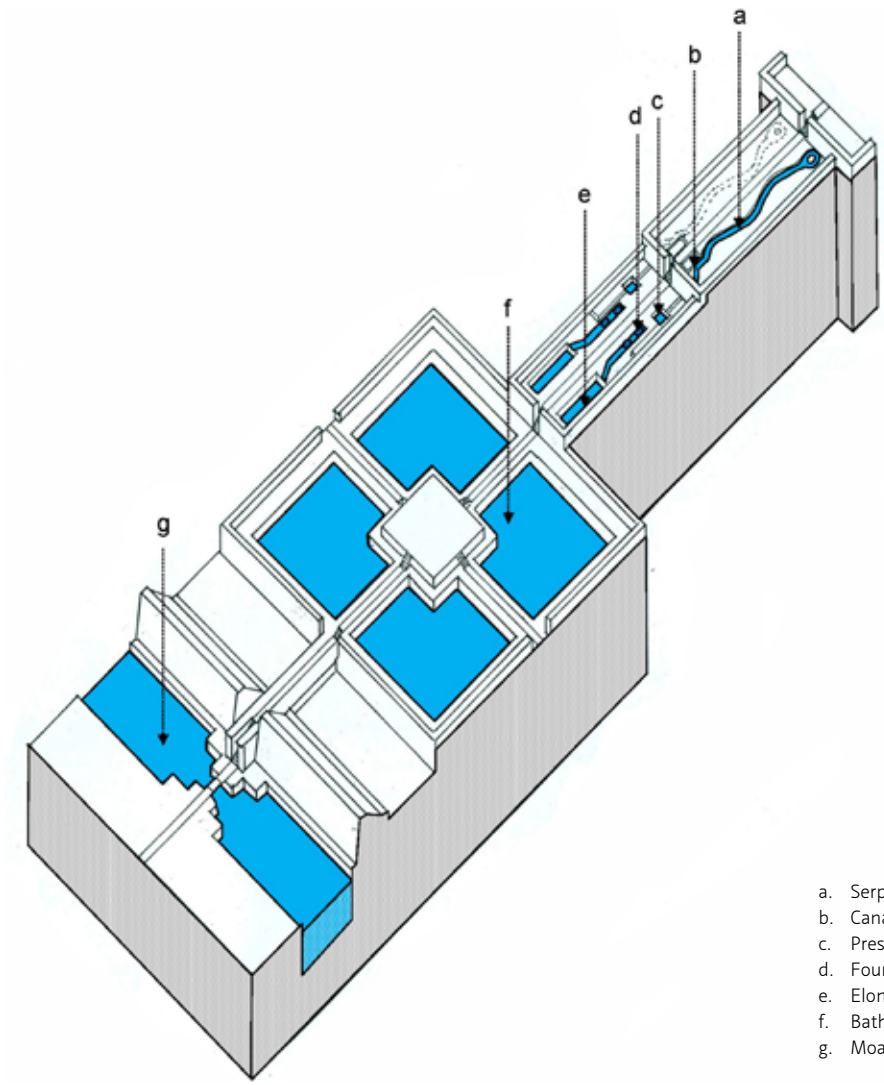
Figure 5.69
Cloud-drift parapet wall, Kandy

Figure 5.70
The visual image of Sigiriya

§ 5.9.2 Hydraulic Elements

The gentle fall of the natural ground within the axial zone of the pleasure garden has been formalized into a succession of terraces with slight level changes that step down in a westward direction. These terraces were used to regulate and activate different hydraulic elements of the scheme. The area to the south of the east-west axis within the axial zone consists of several hydraulic elements, such as the serpentine stream, pressure chambers, fountains, pond, pools and inner moat, arranged linearly in an east-west direction. The flow of water in the serpentine stream is canalized into a pressure chamber to activate the fountains. The water that sparkled from these fountains flows westwards and cascades into an elongated pond. The large bathing pools of the four-quartered feature fed by a system of underground conduits are located on a lower level to that of the elongated pond. The excess and flushed water from these pools then finds its way into the inner moat (figure 5.71). These hydraulic elements, which create audio and visual effects, therefore give water a different form and movement within the axial zone. If this linear arrangement of hydraulic elements is compared with that of the agricultural landscape outside the formal layout, the serpentine stream, pressure chambers, pond, pools and the inner moat could be interpreted as representing the natural river or stream, the hydraulic elements to canalize water of natural rivers or streams, the man-made reservoir to store water, the flooded fields fulfilling a utilitarian function, and the water course that takes the excess water to the next tank or to the ocean (figure 5.72). Therefore, this suggests that the linear sequence of hydraulic features within the axial zone of the pleasure garden is a miniature representation of the linear cascading sequence of the hydraulic features in a typical agrarian landscape of Sri Lanka. This sequence also underlines the philosophy of water conservation and management of the ancient Sri Lankan agro-based society that 'every drop of water that falls on the island

must not flow into the ocean without serving its people'.[79] The incorporation of fountains as an additional feature into this sequence suggests that hydraulics was also appreciated as an aesthetic entity by royalty before it was used for a utilitarian purpose.



a. Serpentine Stream
b. Canalized Diversion
c. Pressure Chamber
d. Fountains
e. Elongated Pond
f. Bathing Pool
g. Moat

Figure 5.71
Linear sequence of hydraulic features within the axial zone (vertical scale exaggerated)

79 For more details see section 2.1.6.

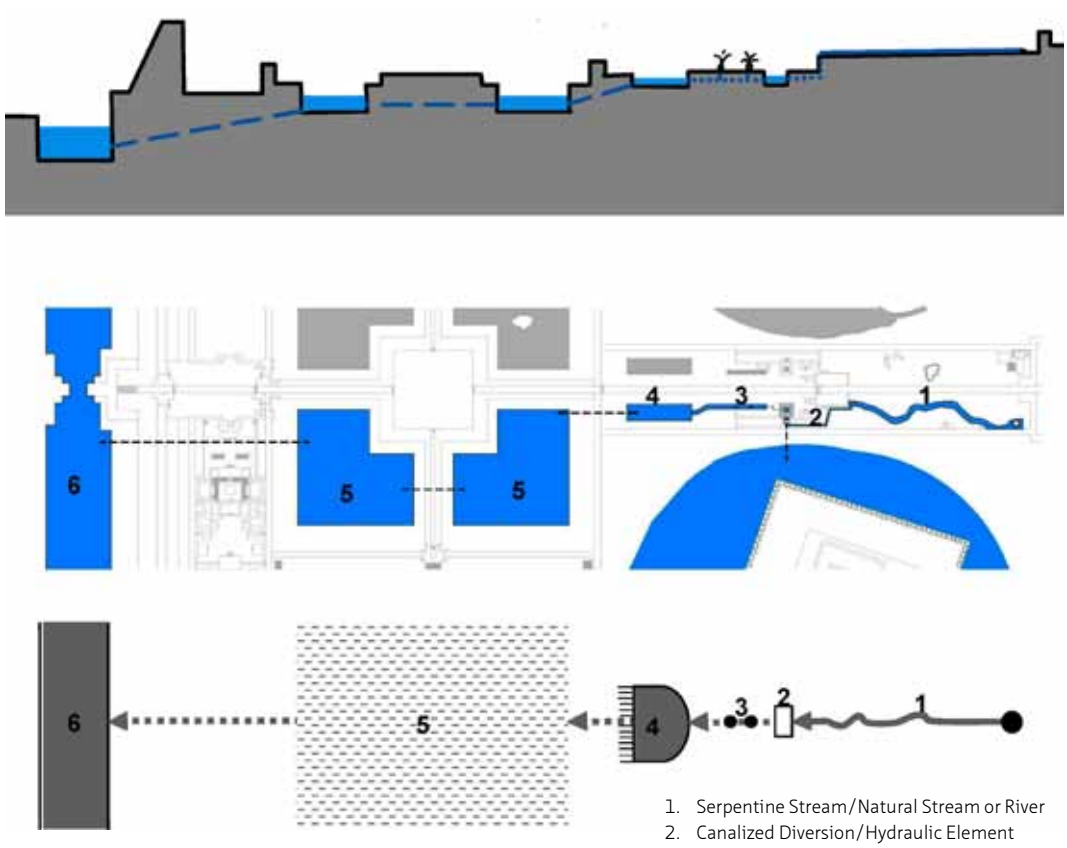


Figure 5.72
Comparison of linear sequence of hydraulic features within the axial zone with hydraulic features of a typical agrarian landscape

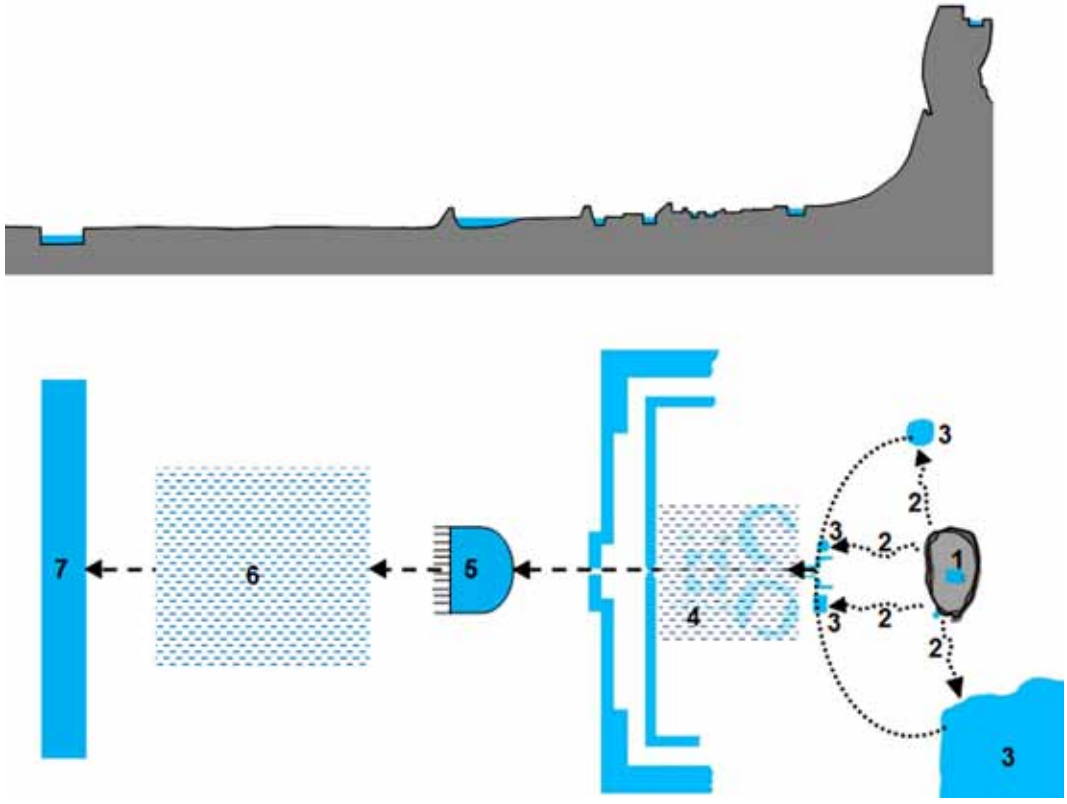
In the same way, the large rock-cut pool on the rock summit together with rock-cut vertical drains on the central rock and on boulders of the hilly terrain (figure 5.73), Sigiri Mahavava and large water-retaining structures located around the base of the hilly terrain,[80] the pleasure garden and moats of the western precincts, which are

80 Ellepola (1990:197) notes that the elevation of the Sigiri Mahavava is similar, if not higher, than those of the chain of garden pools lying immediately below the hilly terrain on the inner western precinct, and is therefore easily irrigated by a water supply from Mahavava, and suggests that there is the possibility of underground conduits linking these pools with Mahavava.

dominated by water features, the reservoirs beyond the formal layout, the paddy fields of the agrarian landscape, and the two irrigation systems of Kala Oya and Yan Oya in the wider landscape context represent the source, the natural water cascades of rivers and streams, lakes, aesthetics, water storage, utilitarian need (fields) and back-to-nature sequence of the hydrologic cycle (figures 5.74, 5.75). These features are visually arranged from the rock summit, where the king resides, to the open, natural and agricultural landscape through the pleasure garden mainly in an east-west direction, as if the water originates from the rock summit. Since Sigiriya rock is symbolically located on the hydrographical hub of the island's two extensive natural-cum-agricultural drainage networks,[81] this visual structuring of hydraulic features provides added meaning to this pictorial image of the scheme.

Figure 5.73
Rock-cut vertical drains on the rock boulders of the hilly terrain

81 For more details see section 5.1.2.



1. Rock-cut pool on the rock summit: Source
2. Water cascades and other elements: Natural cascades
3. Sigiri Mahavava and ponds located around the base of the hilly terrain: Lakes
4. Pleasure Garden: Aesthetics
5. Artificial Reservoirs: Water storage
6. Paddy Fields: Utilitarian needs
7. Kala Oya/Yan Oya Irrigation System: Back to nature

Figure 5.74
Sequence of hydraulic features of the overall scheme (macro scale)

Figure 5.75
Sequence of hydraulic features in Sigiriya's wider landscape context (courtesy: Bandaranayake 1990b)

This suggests that the elements within Sigiriya proper and wider landscape context are visually structured as per the cosmic pattern in both micro and macro scales to represent the hydrologic cycle that produces fertility on earth. Therefore, it reflects the ecological characteristics that are so essential to the agrarian community, for whom water is the essential commodity, where the monsoon was uncertain and crop failure due to drought common.

§ 5.9.3 Natural and Built Elements

The study of the visual aspect of the natural and built elements as a bearer of image and meaning of the scheme shows that Sigiriya rock, which is an enormous mass, occupies the center of the scheme. The boulders scattered within the hilly terrain are less in volume than the central rock, and the volume of the rock masses diminishes gradually from the center towards the periphery of the formal layout. On the other hand, the rock-cut pool on the rock summit, the four pools associated with the four-quartered feature, the moats and man-made reservoirs in the wider landscape context show that there is a gradual increase in the sheets of water from the center of the rock towards the periphery of the formal layout (figure 5.76). Therefore, this visual structuring system of decreasing solids, and at the same time of increasing liquids from the rock summit to the edge of the plan, further reinforces the idea that the water originates at the center of the scheme and flows downwards for the benefit of human beings.

The main palace buildings are constructed on top of the main rock, while the other buildings within the inner precinct (hilly terrain) are built upon boulders of smaller size. At the pleasure garden in the plain below, the buildings are mostly built as water-surrounding pavilions/structures. The whole complex is also practically surrounded by moats (figure 5.77). Therefore, the scheme is visually structured in the sequence of decreasing rock-associated structures and at the same time increasing water-associated structures from the center to the edge of the formal layout to enhance the above image.

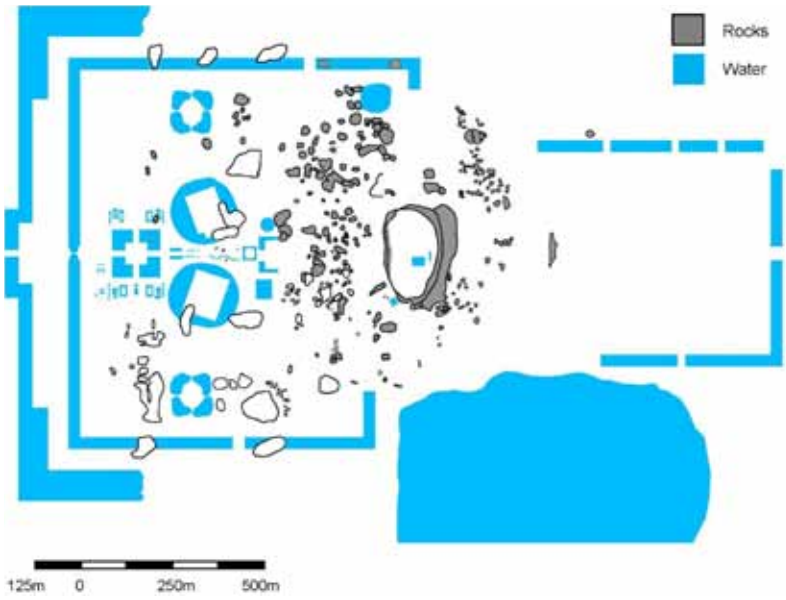


Figure 5.76
Diminishing volume of rocks and increasing sheets of water from the center towards the periphery of the formal plan

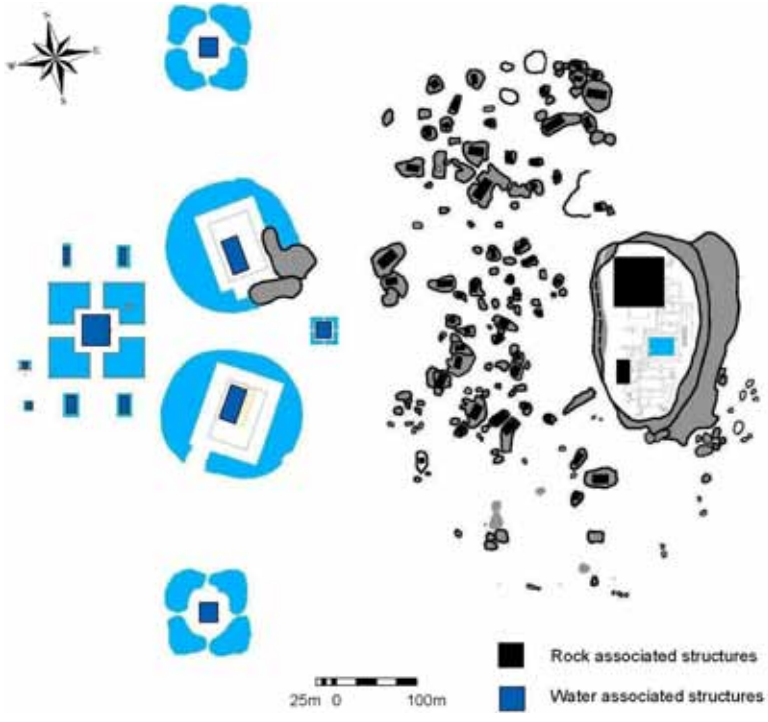
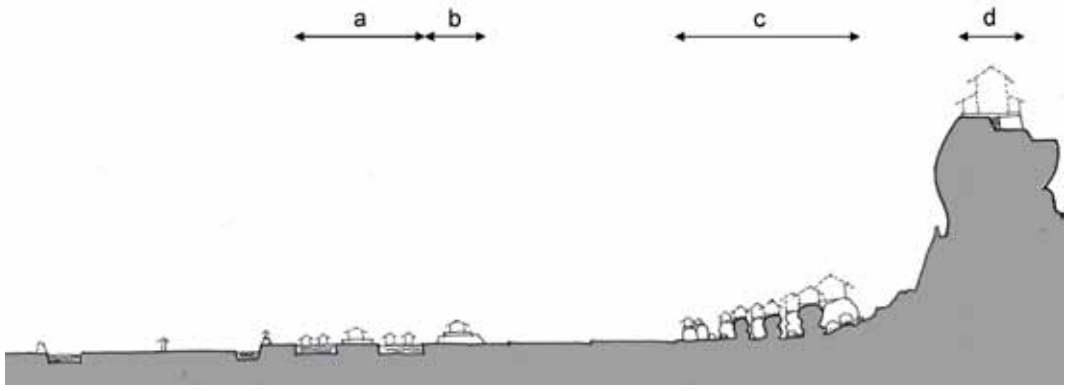


Figure 5.77
Diminishing rock-associated and increasing water-associated structures from the center towards the periphery of the formal plan

The buildings and structures within the pleasure garden were mostly single story, while the presence of remnants of the internal staircase of the main palace building on the rock summit indicates that it was a storied structure. The areas of the ground floors of the buildings within the pleasure garden are less than that of the main palace building on the rock summit. Similarly, the buildings within the pleasure garden occupy lower levels, while the elevation of those within the hilly terrain that were built upon the boulders become increasingly higher towards the base of the rock, and the main palace building occupies the highest elevation of the scheme (figure 5.78). Therefore, this shows that the size, scale and elevation of the buildings within the scheme are structured in an increasing manner to make the palace the climax of the visual structure. This also highlights the palace on the rock summit as the focal point of the overall scheme.



a. Four-quartered feature
b. 'Summer Palace'
c. Boulder-associated Structures
d. Main Palace

Figure 5.78
Increasing size, scale and elevation of the buildings from the periphery towards the center of the formal plan

§ 5.10 Activities and Functional Elements

§ 5.10.1 Programmatic Domains

The study of the programmatic domains of the scheme suggests that the palace, which was the domain of the king, occupies its highest level. It is also the innermost enclosure of the scheme. The inner city, which occupies the hilly terrain, is exclusively for royal functions and hence part of the programmatic domain of the king. The precincts located on the plain immediately beyond the hilly terrain (except the pleasure garden) were the domain of the urban elite and nobility, while the outer landscape was mainly the domain of the suburban and agricultural populace or the 'common man' (figure 5.79). This horizontal and vertical sequence of organization of functional spaces reflects the social hierarchical structure of ancient Sri Lanka. The palace on the rock summit takes full control of the whole landscape that it surveys. This structuring system of the programmatic domains provides the king with an overview of the rest of the programmatic domains, and at the same time the visual presence of the ruler to the rest of the social strata.
It is interesting to note that the Buddhist monasteries of Pidurangala and Ramakele, which are the domain of Buddhist monks, are also located within the outer landscape. On the other hand, the rock summit and the hilly terrain, which are the programmatic domains of the king, are asymmetrical in layout, while those of the urban elite and nobility are symmetrical in layout. This shows that symmetry and asymmetry have also been used to distinguish the programmatic domains within the formal layout.

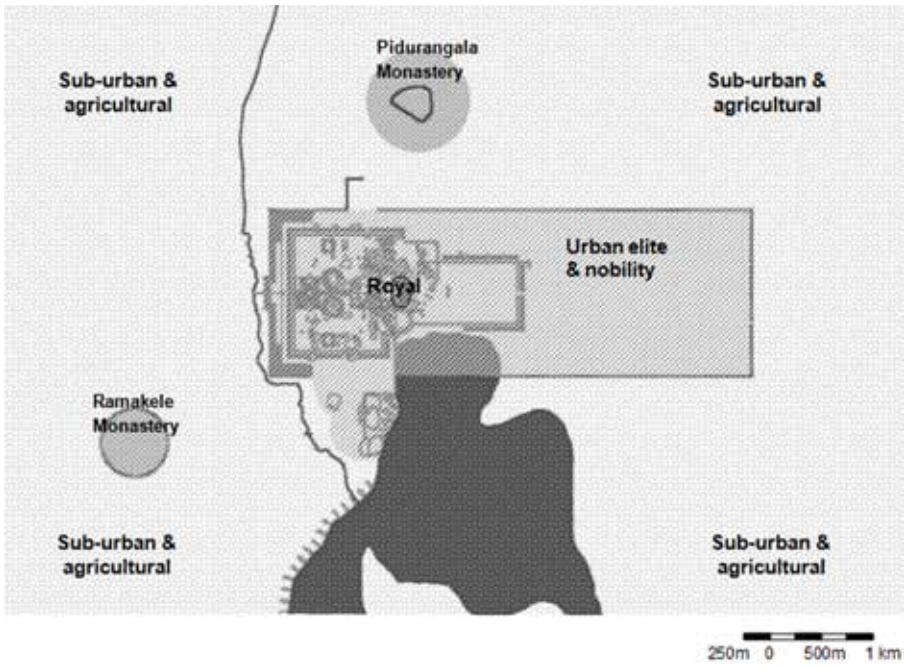


Figure 5.79
Programmatic domains of the scheme

§ 5.10.2 Pleasure Program

Overlooked by the palace, the axial location of the pleasure garden immediately outside the hilly terrain (inner city), but within the walled-in city, suggests that it is one of the major spaces in the overall programmatic form of the scheme. This is in contrast to the location of pleasure gardens at the established political center at Anuradhapura, which are located beyond the city walls and very much away from the city center in insignificant location (figure 2.7).

The study of the layout of the pleasure garden shows that most of the water-associated elements, such as ponds, bathing pools and water-surrounded pavilions, are concentrated within the axially arranged central zone. Compared to this zone, the two outer areas to the north and south beyond the axial zone within the pleasure garden consist of only a few water-associated elements: a summer palace close to the axial zone and another moated island (probably an island structure) on either side. Moreover, the axial zone was well demarcated from the rest of the zone by a thick wall (figure 5.80). Bandaranayake (1984:7) identifies these two distinguishable zones as the 'water

garden' and 'parks', respectively. Dissanayake (2003:225) suggests that the outer zone originally consisted of thick vegetation. Therefore, the presence of two types of gardens further suggests that the central axial zone and the two zones on either side of it were for water sports *(diya-keli)* and garden sports *(uyan-keli)*, respectively, which are vividly described in Sinhala literary works.[82] The zoning of the space for water sports on the principal axis flanked by the spaces for garden sports also confirms the importance placed on water sports over garden sports in the overall pleasure program of royalty.

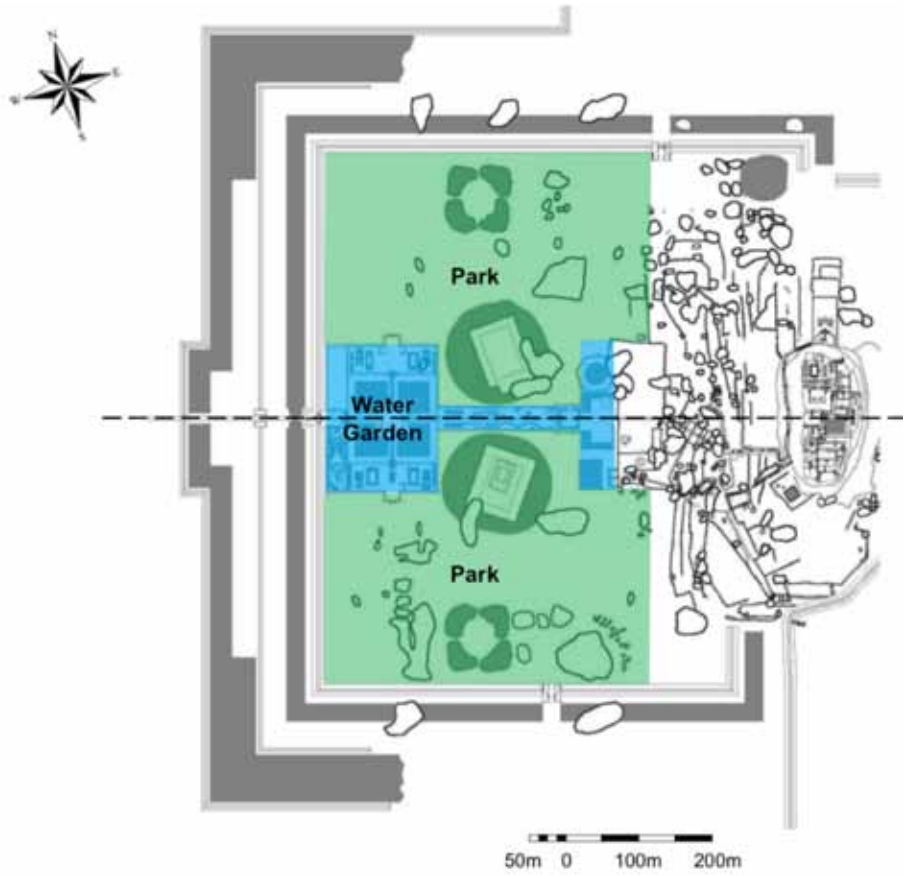


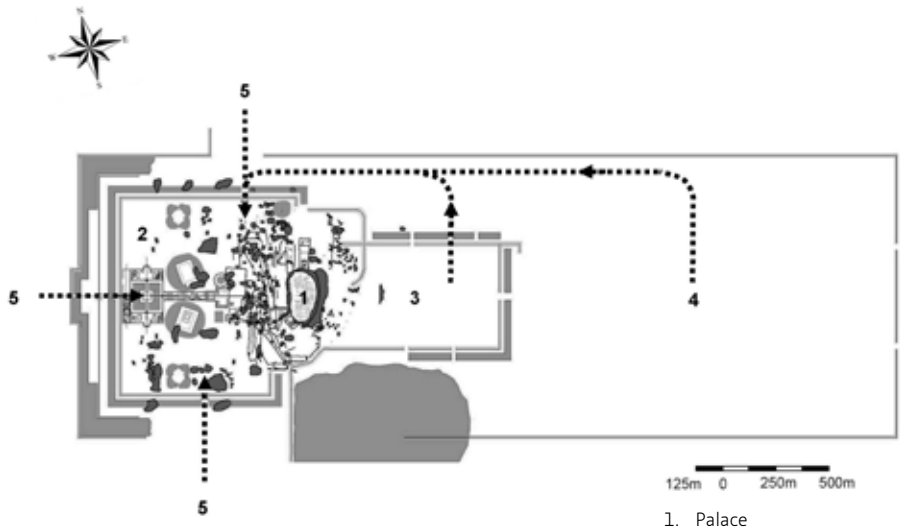
Figure 5.80
Pleasure garden showing the areas for water sports and garden sports

82 See Gooneratne (1983) and Dissanayake (2003:224-242).

§ 5.10.3 Functional Relationship of Spaces

5.10.3(a) Overall Complex

The pleasure garden is directly linked to the hilly terrain and the palace on the rock summit. The inner and outer eastern precincts on the other hand do not have direct physical links with the palace. The pleasure garden, which has entrances at the north, south and west sides of the rampart that defines its limits, allows physical links with both these eastern precincts as well as the outer landscape (figure 5.81). Therefore, this suggests that the links of the two eastern precincts and the outer landscape with the palace are allowed only through the pleasure garden. Therefore, the pleasure garden becomes an important element of the program form in establishing functional relationships between the palace and other spaces. On the other hand, the two eastern precincts, which are suggested by Bandaranayake (1993b:114-116) as inner city and outer city and by Karunaratne, P. (1994) as ceremonial park and inner city, respectively, do not become significant elements of the program form.



1. Palace
2. Pleasure Garden
3. Inner Eastern Precinct
4. Outer Eastern Precinct
5. Outer Landscape

Figure 5.81
Functional relationship of various spaces of the scheme

5.10.3(b) Pleasure Garden

The northern and southern gateways to the pleasure garden have wide openings and had massive timber doorways, even considering the chariots driven by horses or elephants that entered this precinct. Although these entrances are presently in a ruined state, the remains suggest that they functioned as properly guarded gatehouses. In contrast to these two entrances, that to the west, which is set on the east-west axis, is small in scale, but has triple openings. It is positioned at a higher elevation and reached by a flight of steps from the outer western precinct after crossing the inner moat, suggesting that this approach is meant only for pedestrians. The width of the central opening of this gateway is larger than those of the secondary openings on either side of it. Therefore, from this western gateway, three separate but parallel avenues continue in an eastward direction. The wall demarcating the western boundary of the four-quartered feature also has a gateway with triple openings. However, the eastern gateway to the four-quartered feature has only a single doorway. The gateway to the inner city (hilly terrain), which is also set on the east-west axis, has a single doorway. Therefore, the decreasing number of doorways beyond the central pavilion associated with the four-quartered feature in a further eastward direction indicates that pedestrian movement beyond the center of the compound associated with the four-quartered feature is relatively restricted (figure 5.82). Therefore, this shows that the pleasure garden is for the multitude of people, and the movement beyond it towards the hilly terrain and the rock summit, which are the domains of the king and the royalty, are restricted.

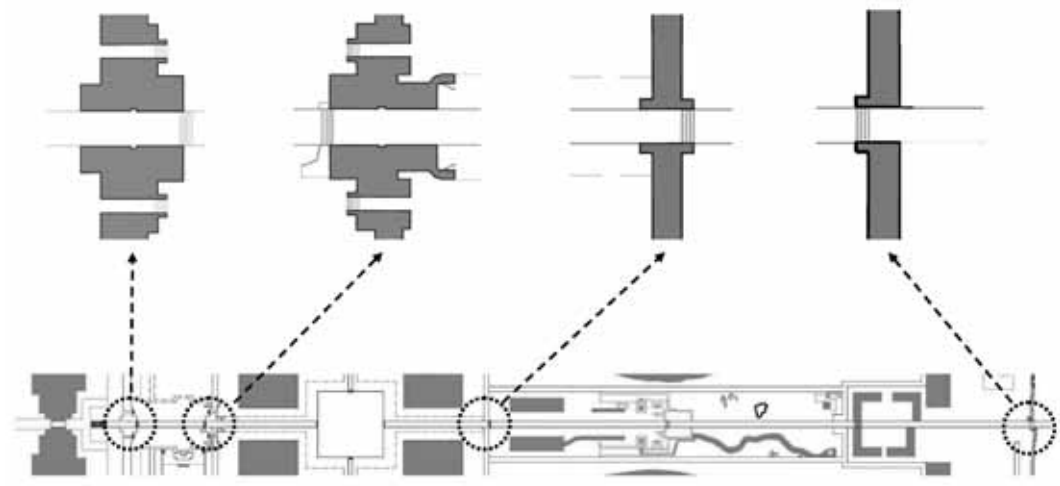


Figure 5.82
Axial pathway through the pleasure garden up to the western limits of the hilly terrain showing the decreasing number of openings associated with gateways leading towards the hilly terrain

5.10.3(c) Compound Associated with the Four-quartered Feature

The rectangular compound associated with the four-quartered feature is composed of three spaces: the central square enclosing the four L-shaped ponds with the central pavilion, and two rectangular enclosures attached to the north and south sides of the central square enclosure along the north-south transverse axis. The L-shaped bathing ponds of the central square enclosure are of immense proportions so that it could be used by a multitude of people. The central square enclosure has access from all four sides. The gateways, each with triple openings at the northern, southern and western sides, indicates that they were meant to allow a multitude of people to this central enclosure from respective directions. From the triple openings of each gateway, three separate but parallel avenues continue as causeways towards the pavilion at the center of the enclosure with the central avenue from each direction running at a higher level than those on either side of it (figures 5.83, 5.84). The avenues at different levels were probably meant for people of different social strata. Compared to these gateways with triple openings, the one on the eastern side of the compound associated with the four-quartered feature, which is connected with the route from the palace on the rock summit through the hilly terrain, has a single opening. It was to provide access to the king and possibly a select number of members of his royal court. Therefore, this compound provides a destination from all directions from other programmatic domains. Unlike the palace complex on the rock summit and the hilly terrain, the central square enclosure associated with the four-quartered feature indicates its public accessibility and reception. Dissanayake (2003:231) suggests that the pleasure gardens also functioned as spaces for official receptions and entertainment. The members of the rest of the social strata, nobility in particular, and state guests were probably received here by the king and interacted. The central pavilion surrounded by the L-shaped ponds could be the space where the king, who resides in the aerial palace, would symbolically interact with the 'public'. The two rectangular compartments attached to the north and south sides of the central square enclosure would have also been used in a great many ways for dining, relaxing, and so on.

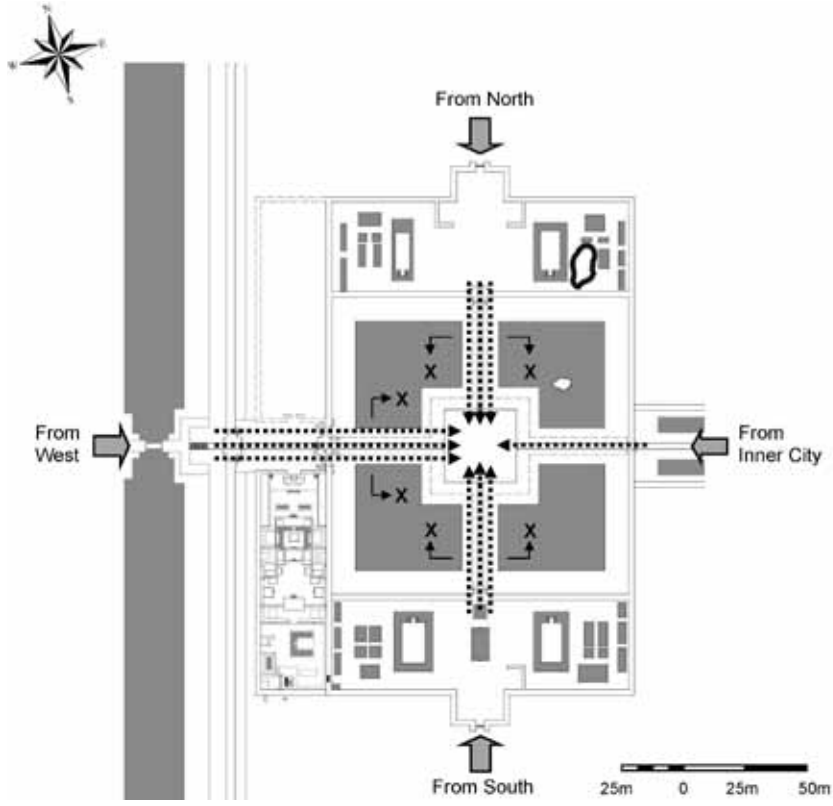


Figure 5.83
The avenues and entrances leading to the rectangular compartment associated with the four-quartered feature

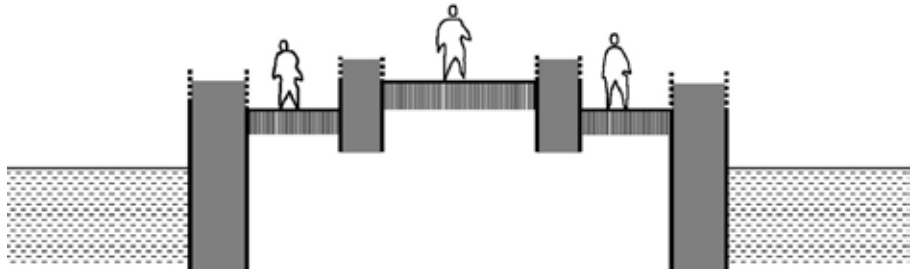


Figure 5.84
The triple avenues (section XX of Figure 5.83) leading towards the pavilion at the center of the enclosure associated with the four-quartered feature

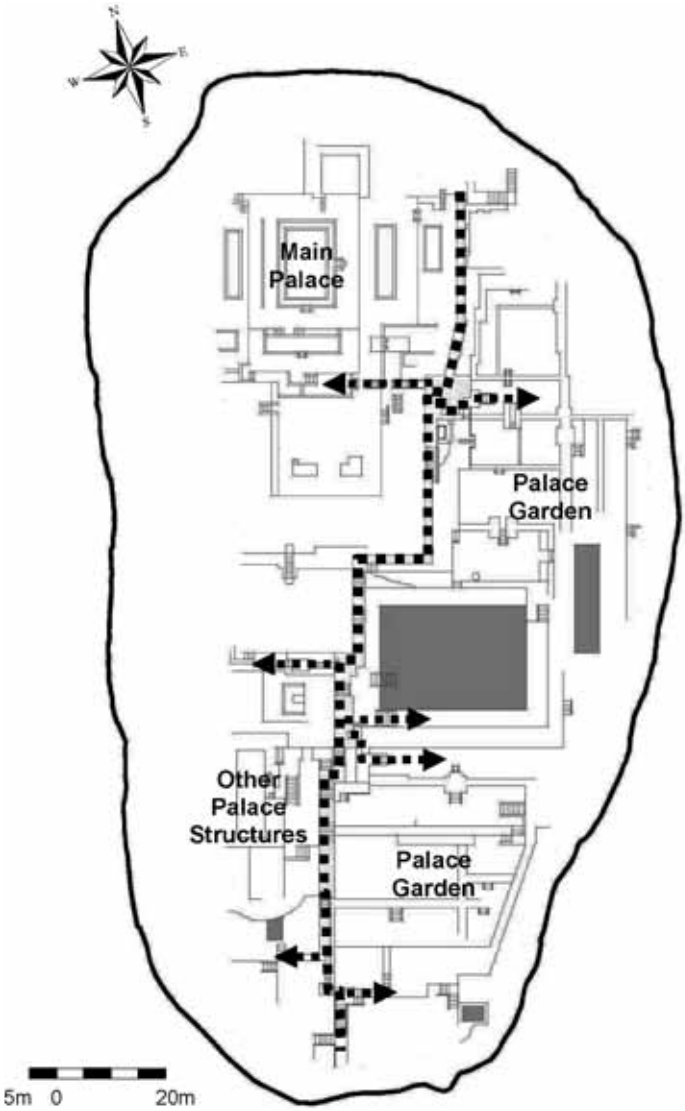


Figure 5.85
Central limestone pathway as the direct physical link between palace buildings and palace garden of the rock summit

The flight of steps set off from the central limestone-paved pathway constructed between the western and eastern halves of the rock summit suggests that palace buildings had a direct physical link with the palace garden (figure 5.85).

6 Conclusions

§ 6.1 Landscape Design Characteristics of Sigiriya

Since the main objective of the present study is to read Sigiriya as a landscape architectonic design, it is intended under this subheading to identify its landscape design characteristics based on the observations of the analysis carried out in Chapter 5. These characteristics will be presented together with the design tools, principles/ rules and techniques utilized by the designers of Sigiriya under the four aspects: the basic form, spatial form, metaphorical form and programmatic form.

§ 6.1.1 The Basic Form

6.1.1(a) The Design Responses at Sigiriya Reflect the Internal Logic of the Natural Landscape

The remarkable geomorphologic characteristics associated with Sigiriya rock – a visually independent rock pillar rising almost 180 meters above the surrounding (virtual) plain, dominating the entire landscape and offering a 360° panoramic view, its somewhat flattened, buildable summit to construct a palace upon the rock, the almost vertical walls on all sides of the rock giving the impression of inaccessibility and soaring effects – would have been the main considerations for selection of the particular site at Sigiriya to establish Kasyapa's new political center. The symbolic positioning of the rock on the hydrographical hub for the island's two extensive natural-cum-agricultural drainage networks, whose ultimate limits are the Arabian Sea to the west and Bay of Bengal to the east, and the presence of surrounding natural-cum-agrarian landscape with agrarian infrastructure and settlements, which served to strengthen the pictorial image of the new political center, would have undoubtedly given added reasons for the selection of this site. The orientation, axial formation and proportional relationship of the overall scheme were also determined/derived by that of Sigiriya rock.

Since the major lines of vision of the site with regard to the dominance of the rock from the plain below and panoramic view from the rock summit, due to the natural

morphologic and topographic characteristics offered by the site, are in both to the east and west directions, the design interventions upon the natural landscape were both east and west of the rock. The physical boundaries of the layout to the north and south sides were determined by the topographical features of Pidurangala and Mapagala, respectively, which obstruct the hilly terrain upon which the rock stands, to descend to the virtual plain. The eastern limits of the moated inner eastern precinct is determined by the wide limestone belt which runs in a south-north direction to the east of the rock, and hence was a physical obstruction for the continuation of the moat in a further eastward direction. The western limits of the layout are determined by the presence of the Sigiri Oya. However, unlike those of other sides of the layout, the consideration of the designers here was not mainly due to the physical obstructions, but to deliberately locate Sigiri Oya outside the layout to discharge water associated with the moats and hydraulic features of the pleasure garden to the Sigiri Oya, and to make it part of the structured hydrologic cycle to strengthen the pictorial image of the scheme. The outer eastern precinct, which sits on the limestone belt and is not suitable for agricultural activity, has been assigned for the urban elite and nobility, a community not directly associated with agrarian function. The eastern limit of the outer eastern precinct is determined to achieve a perspectival balance of the panorama from the rock summit. As such, the designers made the outer rectangular compound not symmetrical along the north-south axis, but its eastern half was deliberately extended in a further eastward direction to achieve this effect.

The location of the principal palace building on the highest elevation of the rock summit, which offers a 360° panoramic view of the natural and agricultural landscape, shows the exploitation of the site characteristics for the maximum advantage by the designers. The orientation of the palace buildings in the north-south direction, which enables the great panoramic spatial depth offered in both east and west directions, suggests that the view offered from the rock summit is one of the major determinant factors for such a design decision. Although such interventions would have undoubtedly made the designers find technical solutions and incur extra expenditure to overcome the problems created by exposing the buildings directly to heavy wind and harsh northeast monsoon rains, particularly the principal palace buildings that consisted of storied structures and were located on the northwest quadrant of the rock summit, and to the direct sun by exposing the long sides of the buildings, this shows that the design responses are mainly influenced by the view rather that climatic/ environmental and economic factors.

The natural morphologic features of the rock summit, which splits it into upper west and lower east levels, have also been exploited to position the palace buildings on the highest elevation and palace garden on the lower level to be a foreground and a visual link between the eastern panorama with the palace buildings.

The boulders scattered on the western slopes of the hilly terrain are also exploited to the maximum to lay the pathways hidden behind them, in order to shut out human movement within this area to facilitate achieving illusionary effects and the expected visual structuring system of the scheme.

Compared to the eastern slopes of the hilly terrain and the inner eastern precinct, the topography of the western slopes and the inner western precinct provides different elevations to activate the hydraulic features through regulated gravity and pressure. Therefore, the designers preferred the inner western precinct over the inner eastern precinct to have the water-associated features for pleasure and aesthetic purposes as well as to lay out a linear sequence of hydraulic elements to represent the hydrologic cycle.
The natural features and morphology of the site are least altered in laying out the scheme. For instance, the plan configuration of the enclosures defining such natural features as the rock summit and hilly terrain do not assume geometric plan, but follow their natural plan configuration to enhance the natural features. The natural terrain and especially the boulders have been well incorporated as major features of its design.
The compositional balance/control of the irregular topographical features of the hilly terrain and the rock summit have been achieved with minimal intervention to the site, by employing both mirror symmetry and asymmetrical balance. Even the construction of the staggered limestone pathway in a north-south direction, which deliberately rotates the northeast-southwest oriented natural morphological axis of the rock summit, is a compromise between the irregular topography and the desire to enhance the panoramic view in both east and west directions.
Therefore, the design responses at Sigiriya reflect the internal logic of the natural landscape and its landscape design, and is mainly an adaptation to the natural landscape of the site. Most of the design solutions indicate that the characteristics of the natural, agricultural and monastic landscape layers underneath Kasyapa's architectural layers reflect on the landscape design. The remarkable geomorphologic characteristics of the natural landscape associated with Sigiriya rock, therefore, would have undoubtedly been an inspiration for its designers.

6.1.1(b) Hierarchic Ordering System and the Axial Arrangement of Various Enclosures and Their Material Elements to Emphasize the Rock and Palace Complex as the Dominant Element of the Overall Composition

The scheme consists of several enclosures that are defined by walls, ramparts and moats. The horizontal sequence of concentric-cum-linear arrangement of the enclosures, both in east and west directions from the base of the rock, made the palace complex sitting upon it the central and innermost enclosure. In the vertical sequence of organizing enclosures, the rock summit occupies the central and highest elevation of the overall composition. This horizontal and vertical sequence of hierarchic ordering of various enclosures has therefore emphasized the rock and the palace complex as the dominant element and the focal point of the overall composition.
The rock, hilly terrain and various rectangular enclosures that extend in both east and west directions from the base of the hilly terrain are axially arranged by extending the natural east-west axis of the site. This axis also orders the material elements within these enclosures, such as the principal gateways and entrances facing east and west of the eastern and western precincts, the pronaos projections, the central axial pathway

traversing the east-west length of the pleasure garden, and so on, by placing them on the east-west axis. The north-south axis of the scheme, which is also derived by the natural features of the site, axially arranges the Lion Plateau with the rock. It also regulates the positioning of such material elements as the great lion figure and the flight of steps/entrances that punctuate the north-south oriented approach up to the Lion-Staircase-House. This north-south and east-west axial formation, which intersects at the center of the rock, further emphasizes the rock and the palace complex as the central objects of the overall composition.

6.1.1(c) Use of Symmetry and Asymmetry to Balance/Control the Composition of the Scheme

Since the scheme incorporates the somewhat irregular Sigiriya rock and the hilly terrain, the compositional balance of the overall layout has been achieved by means of ordering a series of enclosures using symmetry. Therefore, the east-west axis of the scheme assumes the symmetry axis to regulate such elements as the moats and ramparts defining various precincts, the compound associated with the four-quartered feature and garden elements such as the moated island structures, ponds, pools and fountains of the pleasure garden. The symmetricity is achieved either by placing the enclosures/elements on the axis or by mirroring them as identical pairs on either side of the axis. The balance of the highly irregular elevational profile of the northern rock face above the Lion-Plateau has also been achieved by ordering the plateau and the elements within it using the same technique. The dominant great lion figure composed against the northern rock face and set on the north-south axis of symmetry has greatly heightened this compositional balance. Therefore, symmetry has been used as a design tool/instrument as well as a design technique to give a compositional balance to the overall scheme, as well as to its various parts. In addition to creating a pleasing effect to the composition, symmetry has provided the formality and orderliness to express the state of stability needed by a royal center. The strong axial symmetry of the overall formal layout in an east-west direction, which subordinates the north-south natural axis, also deliberately orients the composition in the east-west direction to enhance the panoramic view from the rock summit and the view of the rock from the plain below in both east and west directions. In contrast to the rectangular precincts, the control of the composition of the hilly terrain and the rock summit, which present irregular topographical features, has been achieved through asymmetry. Instead of creating identical pairs on either side of a central axial line by transforming the hilly terrain through significant interventions, the designers controlled its composition through the use of highly asymmetrical planning, where both natural and built elements are incorporated together and held by the contours of the natural morphology. The design technique used to control the composition of the irregular rock summit is the asymmetrical balance. Here, equilibrium has been achieved of the elements that are diagonally placed on either side of the dividing line jointly created by the brick embankment and the central limestone pathway that traverse the whole north-south length of the rock summit. The asymmetrical

balance is often difficult to accomplish and, therefore, Sigiriya showcases a rare example of such a design technique and speaks of the creativity of its designers during the 5th century AC, to control a composition while preserving the natural landscape with minimal interventions to the natural features of the site. Besides allowing greater plan flexibility, the asymmetrical planning seen at Sigiriya, therefore, demonstrates that its landscape design was developed in sympathy with and fuller respect for its natural landscape qualities.
With regard to the ceiling painting in the rock shelter, popularly known as the Cobra-hood Cave (figure 6.1), Bandaranayake (1986a:33) comments,

'The paintings combine geometrical shapes and motifs with free and complex rendering of characteristic volute or whorl motif. It is nothing less than a masterpiece of expressionist painting, deploying considerable imaginative range and artistic virtuosity in a way not seen elsewhere in the surviving paintings of the Sri Lankan tradition.'

Therefore, this painting composition also shows some close conceptual similarities to the symmetrical-cum-asymmetrical architectural composition of Sigiriya. The other important aspect of the composition at Sigiriya is the skill of the designers in merging symmetrical composition of the built landscape with the outer landscape by gradually reducing the perfect mirror symmetry to a visual symmetry towards the boundaries of the layout. This has made the symmetrical layout of the scheme merge and blend with the natural unordered outer landscape in a harmonious manner without confrontation.

Figure 6.1
Part of the ceiling painting of Cobra-hood Cave (photo: Gamini Jayasinghe; courtesy: Bandaranayake, 1986a)

The least interventions carried out at the hilly terrain, without its whole transformation, where the boulder-associated monastic landscape had been originally established but was in disuse by the time Kasyapa's designers arrived at the site, reflects the earlier concept of minimum disturbance to the natural environment that was practiced by the predecessors to Kasyapa's designers. This landscape was not only retained but greatly enhanced through the use of highly sophisticated asymmetrical design techniques. All this indicates that the landscape design of Sigiriya brings one in closest harmony with nature, which reflects the attitude of ancient Sri Lankans towards nature.

6.1.1(d) Proportional Relationship of the Scheme to Control the Composition and to Give It a Monumental Scale

The analysis shows that the ground plan of the built landscape has a geometric ordering system derived from the measurements and proportions of the natural cap-rock, so that there is a proportional relationship between different elements and parts of individual elements as well as the layout as a whole. The designers used the geometric grid as an instrument/tool, whose grid module is based on the measurements of the rock to present the parts and the whole layout in an aesthetically satisfying proportional relationship in a mathematical reciprocity in order to harmonize the built elements with the natural rock. By dictating the measurements of the grid module that is derived from the rock, and laying over it on the built landscape, an order is imposed by the rock upon the surrounding landscape. Therefore, the geometric ordering system symbolically establishes the authority of the king who dwelled on the rock summit, over those who reside within various precincts and enclosures of the layout. This shows that as much as the designers used hierarchy, axiality and symmetry/asymmetry to control the composition, they used proportions to the same effect.

The size relationship between the natural rock and such built elements as the compound associated with the four-quartered feature and the overall layout, which are based on expanding rectangles based on the grid module derived by the monumental proportions of the rock, also shows that the designers gave the scheme a monumental scale to express royal grandeur.

On the other hand, the grid module that is derived from the central rock and laying it upon the irregular landscape with insurmountable barriers reflects the high level of scientific knowledge and skill with regard to measuring and setting out of monumental complexes during the 5th century AC.

6.1.1(e) Use of Axis, Symmetry and Geometry to Emphasize the Rectangular Compound Associated with the Four- quartered Feature as the Dominant Element of the Western Precincts

The compound associated with the four-quartered feature is positioned on the precise midpoint of the segment of the east-west axis within the western precincts, from

the western limits of the outer western precinct to the eastern limits of the pleasure garden. The north-south oriented transverse axis of this compound intersects the east-west axis at the center of the four-quartered feature. The east-west axis of the scheme and the north-south orientation of the transverse axis of the compound also become symmetry axes to order elements within it using mirror symmetry. This axial formation, therefore, empowers the compound associated with the four-quartered feature as the dominant element of the western precincts. The arrangement of various elements within the axial zone with a gradual increase of symmetricity from the western edge of the outer western precinct in the eastward direction to the center of this compound, and the gradual decrease of symmetricity in the eastward direction up to the eastern limits of the pleasure garden, made the compound a climax of symmetricity and gave an overwhelming sense of order to emphasize the compound as the dominant element within the western precincts. The measurements and proportions of this compound correspond with those of the abstracted and geometrizied plan configuration of the natural 'cap-rock' to make it the physical geometric representation of the organic form of the rock. This rectangular compound thus assumes the source and measuring stick to lay the geometric grid over the built landscape to become the dominant element of the geometric grid of the western precincts.

§ 6.1.2 The Spatial Form

6.1.2(a) The Panorama-oriented Spatial Composition Is Organized in the Hierarchical Order of the Palace, Garden and Outer Landscape to Emphasize the Palace as the Central Object of the Scheme

The scheme consists of three distinct spatial categories: the palace (principal palace building on the elevated western half of the rock summit), the garden (both the palace garden on the lower eastern half of the rock summit and the pleasure garden) and the outer landscape (panorama) beyond the formal layout. Since the palace is located on the rock summit, which is the highest level of the overall scheme, and due to the geomorphologic setting, the optical boundaries of the scheme are not confined to the physical boundaries of the formal layout, but extend up to the visual limits of the outer landscape. The palace buildings are specifically oriented for the enjoyment of the panoramic view and the great spatial depth offered in the outer landscape, particularly in the east and west directions. Composed in the directions of the eastern and western panoramas from the palace, the palace garden and the pleasure garden provide architectural foregrounds to eastern and western panoramas, respectively, to visually link the outer landscape with the palace. The construction of the great brick embankment in a north-south direction to lay out the palace garden at an elevation

lower than that of the palace, and situating the limestone pathway at midlevel of this embankment to prevent obstructions due to pedestrian movement between the palace and the palace garden, visually connects the palace with the eastern panorama.
The compositional balance achieved between the eastern and western panoramas from the rock summit by using the formal layout in the plain as part of its composition, where they extend to an equal distance in terms of the perspectival effect towards the horizon in both eastern and western panorama, also makes the palace the central object of the panoramic composition. The view from the rock summit towards the western panorama shows that due to the perspectival effects, the east-west axis of the western precincts is one of the dominant elements of the spatial composition, as it gives direction to the horizon in the western panorama from the rock summit. Similarly, the compound associated with the four-quartered feature with its central pavilion is visually composed at the exact midpoint between the horizon and the eastern edge of the pleasure garden. The central position of this compound due to the perspectival effects, therefore, enhances the spatial integration of the foreground and the western panorama. It also becomes the reference object to observe the panoramic landscape and to enhance its spatial depth. As such this compound, which is the dominant material element, also becomes one of the dominant spatial elements of the scheme.
Therefore, this panorama-oriented, centralized hierarchic ordering of spaces in the sequence of the palace, garden and open landscape, particularly in both the east and west directions, has emphasized the palace on the rock summit as the central object of the overall spatial composition. The great brick embankment, which separates the palace and the palace garden, the limestone pathway built at the midlevel of this brick embankment, the rock-cut seat and the terrace structure of the palace garden on the rock summit, together with the east-west axis and the compound associated with the four-quartered feature within the pleasure garden, are the major spatial elements of the overall spatial form.

6.1.2(b) Illusionary Effects of the Three-dimensional Space

The designers have employed a special technique of composition similar to the painterly technique of composition commonly used by artists of Sri Lanka's mural painting tradition to visually and spatially separate the palace on the rock summit from the land to give a floating effect to the aerial palace, and to create an illusionary space from the western precincts. The north-south running rampart walls, the Mirror Wall and the great tapestry of painting on the rock face are placed one behind the other in a transverse direction to the east-west axis, as in a stage set, to achieve this effect. Composed of a succession of terraces that gently ascend in a west-east direction along the east-west axis, the axial zone of the pleasure garden also heightens this effect.

6.1.2(c) The East-west Axis as the Spatial Axis of the Scheme

Since the east-west oriented main axis within the axial zone is the line along which the illusionary effects are created and also the line of movement to provide visual interplay of various elements in the scheme to heighten the illusionary effects, it assumes the major line of the three-dimensional space within the western precincts and hence the spatial axis of the scheme. Although the overwhelming presence of Sigiriya rock makes a natural interruption to the visual continuity of this axis across the great rock mass in a further eastward direction, the illusionary effects created within the western precincts, in addition to giving great spatial depth to the pleasure garden, therefore makes this spatial axis gradually dissolve towards the rock without an abrupt termination. The gradual decrease of symmetry along this axis from the center of the four-quartered feature in a further eastward direction to reduce it to an asymmetric balance at the eastern end of the pleasure garden and its ultimate disappearance among the asymmetrical layout of the hilly terrain further help to achieve this effect. However, the axial arrangement of the eastern precinct and the built elements within it make the main axis reappear beyond the rock in a further eastward direction, thus ensuring the continuity of the main axis in the whole scheme by running 'over' the rock summit.

6.1.2(d) Reversibility of the Spatial Composition

From the rock summit, the scheme has a panorama-oriented spatial composition in the sequence of the palace, garden and the panorama in the hierarchical order of increasing dominance. From the plain below, the scheme also has a rock/palace-oriented spatial composition in the hierarchical order of reverse sequence. Therefore, the landscape design of Sigiriya has a reversible spatial composition depending on the view point.

6.1.2(e) The Dramatic Composition

In contrast to the prescribed visual interplay of various elements along a central line to create illusionary effects from the western precincts, the natural boulders of picturesque appearance and varying size of the hilly terrain are composed using a technique of free design, which is held by a series of picturesque scenes. The asymmetrical layout, which orders the natural and built elements in relation to the contours of the natural morphology, also contributes to achieve this effect. As the spectator moves freely through the hilly terrain, the boulders forming the focus of one scene are reduced to a stage set for the next scene to make it a dramatic composition.

6.1.2(f) The Scenograhic Route through the Hilly Terrain up to the Rock Summit as a Spatial Element to Link the Illusionary Space with the Real and to Unfold the Reality from the Rock Summit

In contrast to the illusionary effects from the plain below, the whole composition is revealed from the rock summit and the reality regains in the panorama. This shows that a drama is created for the countrymen from below to project a specific image of the ruler, while the king reserves the right to have the overview of the real drama of the natural and man-made landscape that he rules. The scenographic route from the eastern limits of the pleasure garden up to the rock summit through the hilly terrain and then along the pathway associated with the Mirror Wall and the zigzag stairway above the Lion-Staircase-House has been designed with an introverted character to deliberately prevent outside view. It is only from the palace on the rock summit, the highest vantage point of the whole scheme, that the overall scheme is suddenly unfolded in all directions. Therefore, the scenographic route through the hilly terrain up to the rock summit is specifically designed to reveal the real drama of the natural landscape theater, and hence remains as a spatial element to connect the illusionary space with the real.

§ 6.1.3 The Metaphorical Form

The Hierarchic Ordering of Metaphorical Elements to Emphasize the Supranatural, Heavenly Domain of the King

The bottom-up vertical sequence of the visual structuring system of the scheme consists of several visual layers arranged along a visual vertical axis formed by the rock in the order of the virtual plain, the hilly terrain, the plaster band with painted ladies and the palace complex on the rock summit, reflecting decreasing human presence and at the same time increasing divine habitation, which is similar to the subdivision of the cosmic landscape as per Buddhist cosmography. This hierarchical order of the visual layers makes the palace the dominant metaphorical element of the overall composition. The use of a visual structuring system based on cosmography was also probably intended to suggest the 'divine' status of the king.
The sequence of linear arrangement of hydraulic elements reflecting the cosmic pattern, which represents the hydrologic cycle that produces fertility on earth, and the philosophy behind ancient irrigation engineering to irrigate the land, is visually structured from the rock summit to the open landscape through the pleasure garden as if the water originates from the rock summit. The programming of hydraulic elements to give water different forms and movement within the axial zone of the pleasure

garden suggests that hydraulic engineering had not been applied by the ancient Sri Lankans only for utilitarian purposes, but also for aesthetics. This also showcases that the state of the art in hydraulic engineering had reached full maturity during the time of the laying out of Sigiriya in the 5th century AC. The visual structuring system of decreasing masses of solids (rocks) and at the same time of increasing sheets of water from the center (rock summit) to the edges of the plan also reinforces the idea that the water originates at the center of the scheme and flows in the direction of the outer landscape for the benefit of human beings. The visual structuring of the scheme in the sequence of decreasing rock-associated structures and increasing water-associated structures from the center towards the edge of the plan further enhances this idea. The gradual increase in scale, size and elevation of the structures from the edges of the formal layout up to the center of the scheme also makes the rock/palace the climax and the dominant element of the overall visual composition.
Therefore, this visual structuring of various metaphorical elements makes the scheme a rock-oriented composition and hence emphasizes the supranatural, heavenly domain of the king and visualizes the unification of both local and cosmic orders. The axial zone, through which the cosmic waters flow from the rock summit to the outer landscape, the main rock, boulders, hydraulic elements, sheets of water, rock/boulder and water-associated structures, palace complex, hilly terrain, painted plaster band, man-made reservoirs and agricultural fields of the outer landscape become significant metaphorical elements of the visual composition.

§ 6.1.4 The Programmatic Form

6.1.4(a) Hierarchic Ordering System of Programmatic Domains to Emphasize the Omnipresent Eye of the Authority Who Rules All Functional and Cultural Activities

The scheme consists of several programmatic domains that are organized both vertically and horizontally in the sequence of the palace, inner city, outer city, suburbs and the natural-cum-agrarian settlements in the hierarchical order of decreasing dominance from the center to the visual boundaries of the scheme to emphasize the palace as the dominant programmatic domain, which also reflects the social hierarchy in the decreasing sequence of the king, nobility and populace. The elevated and centralized location of the palace complex, which is the symbolic representation of the king, to be constantly visible to the rest of the programmatic domains, reflects the authority of the ruler and the total control of the rest of the programmatic domains. Such an ordering system would have also made it possible for the king to efficiently rule the rest of the social strata through his symbolic presence. On the other hand, the

rock and hilly terrain, which are associated with the programmatic domains of the king, are freed of rigidity of the symmetrical layout of the plain (the domains of the urban elite and nobility), and reflect the total detachment and independence of the king from the rest of the systems. Therefore, the programmatic composition of Sigiriya speaks of 'authority' over the rest of the social strata and emphasizes the omnipresent eye of the authority who rules all functional and cultural activities. This shows that the emphasis of the palace complex as the dominant element of the overall composition is common to the basic form, spatial form and programmatic form. Such characteristics make the landscape design of Sigiriya closer to the landscape model of Sakran discourse on kingship than to that of the Asokan discourse.

The relegation of the Buddhist monasteries to the outer landscape, which gives less importance to Buddhist monks in the hierarchic order of the programmatic domain, reflects the insignificant role played by Buddhist monks in the affairs of the state during the reign of Kasyapa. This is in contrast to the ordering of programmatic domains at the city of Anuradhapura, the established political center before the founding of Sigiriya as Kasyapa's new center of political power, where several large-scale Buddhist monasteries are arranged encircling the citadel, reflecting the influential role played by Buddhist monks in the spiritual guidance of the nation and as advisers to the king.

6.1.4(b) Pleasure Garden as a Significant Programmatic Element of *Otium* and Sensual Pleasure, Opposite to *Negotium*

The significant position given to the pleasure garden in the overall programmatic form at Sigiriya by ordering it immediately outside the hilly terrain (inner city) within the fortified city, along the major east-west axis of the scheme, which is in contrast to the insignificant position of the pleasure gardens in relation to the overall city plan of Anuradhapura during the same period, reflects the major emphasis given by Kasyapa for *otium* and sensual pleasure as against *negotium*. Therefore, the programmatic composition also showcases the deliberate program of pleasure-associated intent and probably its symbolic significance related to rainmaking and the prosperity of the kingdom (see Dissanayake, 2003:238). The pleasure garden, which acts as the spatial link between the palace and the outer landscape in the spatial form, also assumes the major space where the king interacted with certain sections of the social strata (nobility, harem, and so on, as indicated in the literary works) through pleasure activities.

The zoning of the area dominated by bathing pools and other water-associated features within the central axial zone, flanked by two identical zones of less association of water features within the pleasure garden, emphasizes the central zone and reflects the importance given to water sports over garden sports in the overall program of pleasure activities of royalty.

The compound associated with the four-quartered feature, which is the dominant material element (abstracted and geometrizied representation of the organic form of

the rock to lay the geometric system over the formal layout), as well as the dominant spatial element that integrates the foreground and the panorama and the reference object to observe the panoramic landscape, also becomes the dominant programmatic element for the king to symbolically interact with the rest of the social strata.

§ 6.2 Sigiriya and Other Landscape Traditions: A Comparison of Landscape Designs

As indicated under 1.3.1 of Chapter 1, one of the scientific objectives of the present study is to position Sigiriya in the global landscape design context by comparison of the landscape design with those of other international landscape traditions. Such a comparison will, on the other hand, explore both the general and specific landscape architectonic elements, aspects, characteristics and qualities. Since any design is deeply embedded in the physical, historical, social and cultural contexts, the comparison of designs of different contexts will only be possible by abstracting such designs devoid of such contexts (Steenbergen and Reh, 2003:17). Since the methodology of the Delft tradition of research allows such scientific comparisons by reducing the landscape architectural designs to abstract schemes, and the West European landscape tradition comprising all influential periods – the Italian Renaissance villas (15th-16th century), French baroque gardens (17th century) and landscape gardens of the English revival (18th century) – has been extensively researched by applying this methodology, this attempt will be limited to a comparison of Sigiriya with the compositions of the West European landscape tradition analyzed by Steenbergen (1990), Van der Ree, Smienk and Steenbergen (1992), Reh (1996) and Steenbergen and Reh (1996, 2003). Moreover, this will only be a restricted comparison at a pure design instrumental level and hence without conclusions about cultural significance and value.

Natural Morphology, Position

The central position of the vertical rock chimney of Sigiriya and the palace located upon its summit, 180 meters above the surrounding plain, make the rock and palace dominate the entire composition. Although the 'house' of the Italian Renaissance villas is generally situated well above the floor of the outer landscape, its location at one end of the layout does not allow the 'house' to dominate the composition. For instance, although Villa Medici is situated about 250 meters above the floor of the Arno valley, its 'house' is positioned at a halfway level up the slope of a hill. Therefore, its composition is not reversible from a standpoint from the outer landscape, as is that of Sigiriya (figure 6.2). However, a centralized composition, similar to that of Sigiriya begins to appear at such Palladian villas as Villa Emo and Villa Rotonda in Veneto during the second half

of the 16th century, which is the concluding phase of the Italian Renaissance. At Villa Rotonda, for instance, the 'house' is positioned on a relatively high ground above the surrounding flat landscape to emphasize the 'house' as the dominant element of the overall composition (Steenbergen and Reh, 2003:105-121).

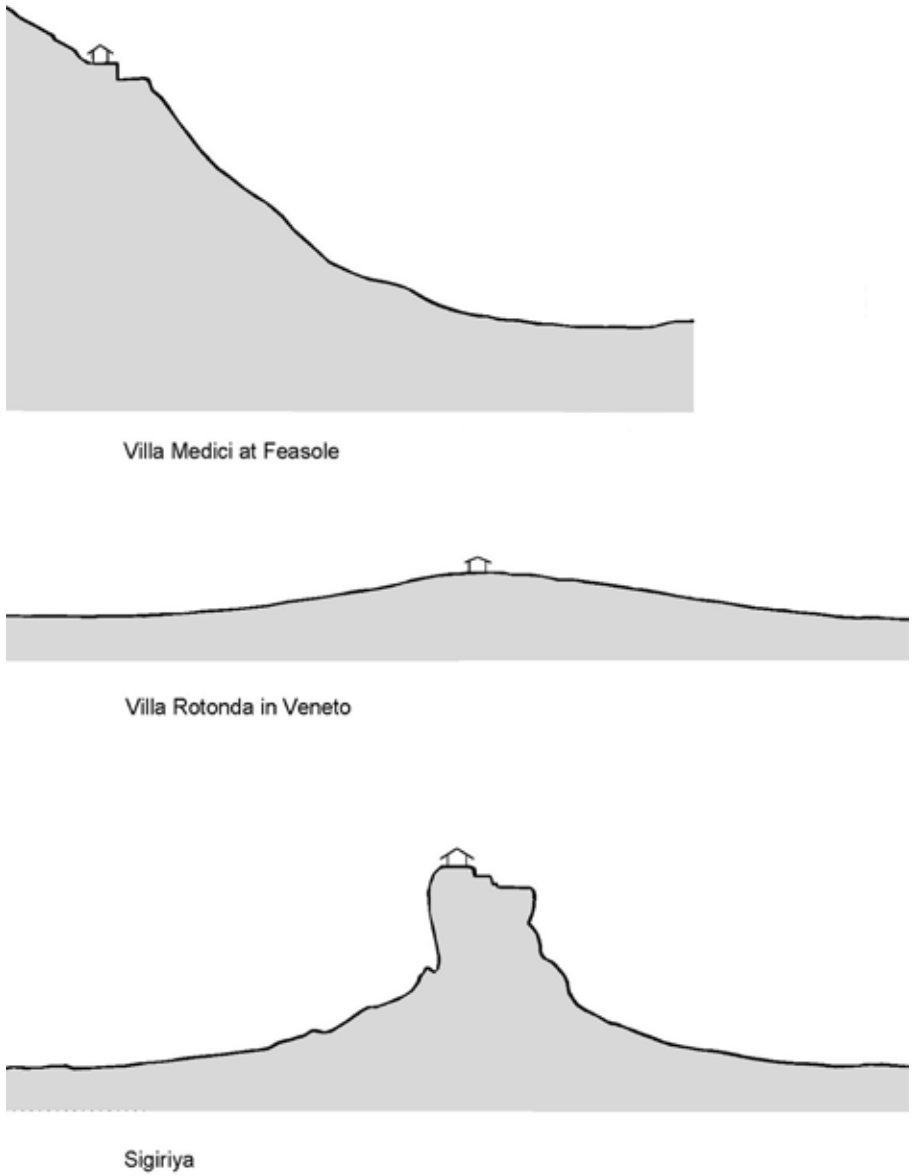


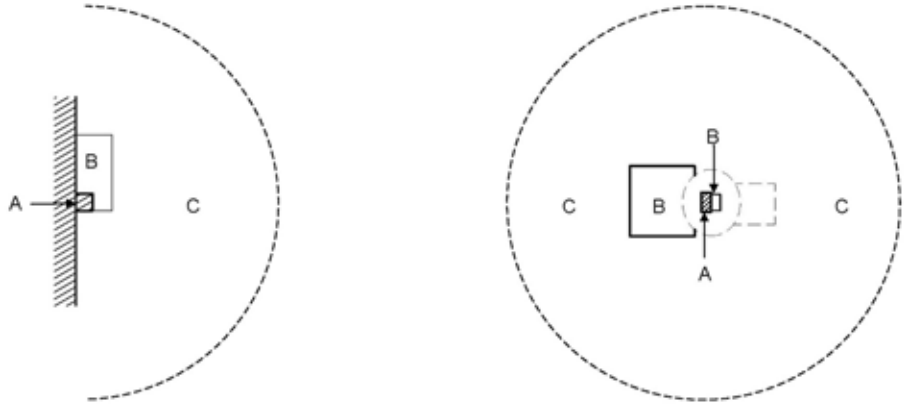
Figure 6.2
Italian Renaissance villas and Sigiriya: position of the 'house'/palace in relation to natural morphology of the site (schemes to different scales)

Geometric Ordering System, Proportions

Another parallelism between Sigiriya and Italian Renaissance villas is their geometric ordering system. At Villa Medici, for instance, the geometric system is derived from the measurements and proportions of the 'house', which is the representative center of the villa, and also from the existing slope and the possibility of building terraces on the sloping terrain (Steenbergen and Reh, 2003:35, 38-39, 42), while that at Sigiriya is derived from the rock itself as well as the natural topographical, geological and hydrological features of the site. In both cases, the grid module is laid upon the built landscape to impose an order by the 'house'/rock upon the landscape, so that there is a proportional relationship between different elements, parts and the built landscape as a whole.

Domains and Scales

At Sigiriya and Italian Renaissance villas (Steenbergen and Reh, 2003:39), the spatial structure is composed of three distinct spatial categories organized in the sequence of the palace/'house', garden and the open landscape (panorama) in the hierarchical order of increasing dominance. The garden is the visual and spatial link between the palace/'house' and the outer landscape. Such a composition of both Sigiriya and the Italian Renaissance villas have made the optical boundaries of the schemes not confined to the physical boundaries of the formal layout, but deliberately extended all the way to the outer landscape. However, at Sigiriya there is a marked domain (outer precincts to east and west) between the palace and garden and the outer landscape. The scale of the palace and the garden at Sigiriya is much greater than those of Villa Medici. On the other hand, at both Sigiriya and the Italian Renaissance villas, the open landscape is a live theater of vast scale compared to the other two domains (figure 6.3). At Italian Renaissance villas, such as Villa Medici, the verticality of the terrace structure together with the 'house' are primarily tuned to the panorama across the valley of the Arno and the city of Florence (Steenbergen and Reh, 2003:35). At Sigiriya the verticality of the brick embankment, which separates the palace garden by locating it at a lower level to that of the palace, together with the central limestone pathway built into the embankment, are also primarily tuned to the panorama across the palace garden and the pleasure garden.



A. 'House'/Palace
B. Garden
C. Open Landscape

Figure 6.3
Villa Medici at Feasole and Sigiriya: the structuring of the spatial domains (the size of the 'house' and the garden of Villa Medici is five times magnified)

Symmetry, Asymmetry

As far as mirror symmetry is concerned, the play between symmetry and the site condition is also an important theme at Italian Renaissance villas (Steenbergen and Reh, 2003:86-91, 166-167), such as Villa Lante at Bagnaia and Villa d'Este at Tivoli. However, clear parallelisms exist between Sigiriya and French baroque gardens, such as Vaux-le-Vicomte, where a compositional balance of the irregular sites is achieved through mirror symmetry (Steenbergen and Reh, 2003:144, 147, 165).
Since the compositional principles developed at the landscape gardens of the English revival reflect a move away from the formal geometric layout with the fragmented rational and formal elements held together by the contours of the natural morphology, the symmetry disappears among the physical and geographical line of forces of the natural landscape, which is a 'decomposition' of the formal model of axial symmetry (Steenbergen and Reh, 1996:14-15). This is somewhat similar to the compositional principles of the clusters of boulders of the hilly terrain at Sigiriya, where the symmetry gives way to asymmetry and the use of the technique of free design, in which the elements are also held by the contours of the natural morphology of the hilly terrain. However, at Sigiriya such a composition is confined only to a specific part of the layout and gives an introverted character rather than an extroverted one. On the other hand, the asymmetrical balance has been used to control the composition of the rock summit at Sigiriya.

The axis is also used at Sigiriya and Italian Renaissance villas to arrange and order various enclosures and material elements. At Villa Giulia in Rome, for instance, a series of enclosures and material elements are arranged with the 'house' along a single architectonic axis (Steenbergen and Reh, 2003:77-83), whereas at Sigiriya its north-south and east-west bilateral axial formation not only arranges and orders various enclosures and material elements, but gives rise to a centralized hierarchic composition. Although the centralized hierarchic composition is not preferred by architects of the Italian Renaissance villas, at Palladian villas such as Villa Rotonda and Villa Emo in Veneto (Steenbergen and Reh, 2003:113-121), the bilateral axial formation that intersects at the center of the 'house' shows that such principles begin to appear during the concluding phase of the Italian Renaissance (figure 6.4). On the other hand, the treatment of the axis at Sigiriya is very much different to that of the French baroque gardens at Vaux-le-Vicomte in Melun and Versailles (Steenbergen and Reh, 2003:137-167, 185-199), where the axis dominates all the way to the visual boundaries of the scheme to become an autonomous element of the composition. The axis at Sigiriya and Italian Renaissance villas (Steenbergen and Reh, 2003:29), on the other hand, remains as one of the elements around which the plan is composed.

The comparison between Sigiriya and French baroque gardens shows some parallelisms in the treatment of the axis in their spatial structure. At French baroque gardens, such as Vaux-le-Vicomte and Versailles (Steenbergen and Reh, 2003:141-168, 185-199), the axis assumes the centerline of the three-dimensional space, extending all the way to the horizon. This spatial axis is used as the scenographic route along which illusionary space is created by means of a central perspective structure. It is the axis of movement to provide a visual interplay of various elements to highlight illusionary aspects for the total length of the axis. At Sigiriya also the east-west axis as the centerline of the three-dimensional space is active, but only within part of the scheme – a certain length within the western precincts – where illusionary space is created by artificial means and also assumes the axis of movement to provide a visual interplay of various elements. From the rock summit the axis as a spatial element is active within the western precinct at Sigiriya to give direction to the horizon in the western panorama (figure 6.5). Steenbergen and Reh (2003:29, 30) point out that where special perspective effects have been used at Italian Renaissance villas, such as those at the Villa Giulia in Rome, or the perspective distortion of the cascade at Villa Aldobrandini at Frascati, the axis remains linked to the special development of one of the parts of the scheme.
At French baroque gardens, the composition resulting from the spatial axis is oriented in one direction (from the house towards the garden) through neutralizing the perspectival reduction, and hence its composition is not reversible in the opposite direction due to the great perspective reduction (Steenbergen, 2008:192-193). However, at Sigiriya the spatial effects through the scenographic route from the outer

western precinct up to the rock summit through the hilly terrain are organized to reveal the composition gradually from a rock-oriented to a panorama-oriented composition. This makes its composition flexible in both directions, and hence its composition is reversible.

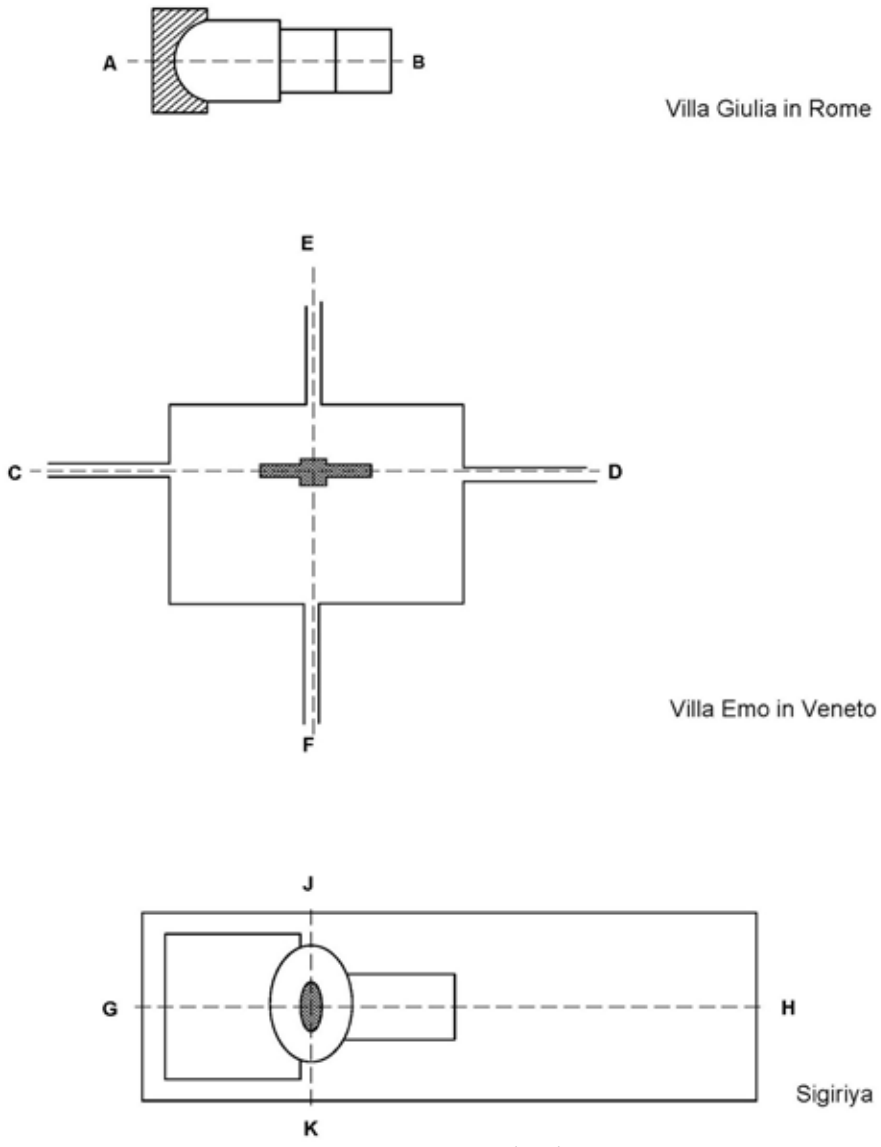


Figure 6.4
Axis of Italian Renaissance villas and Sigiriya in relation to the ordering of compartments and elements (schemes to different scales)

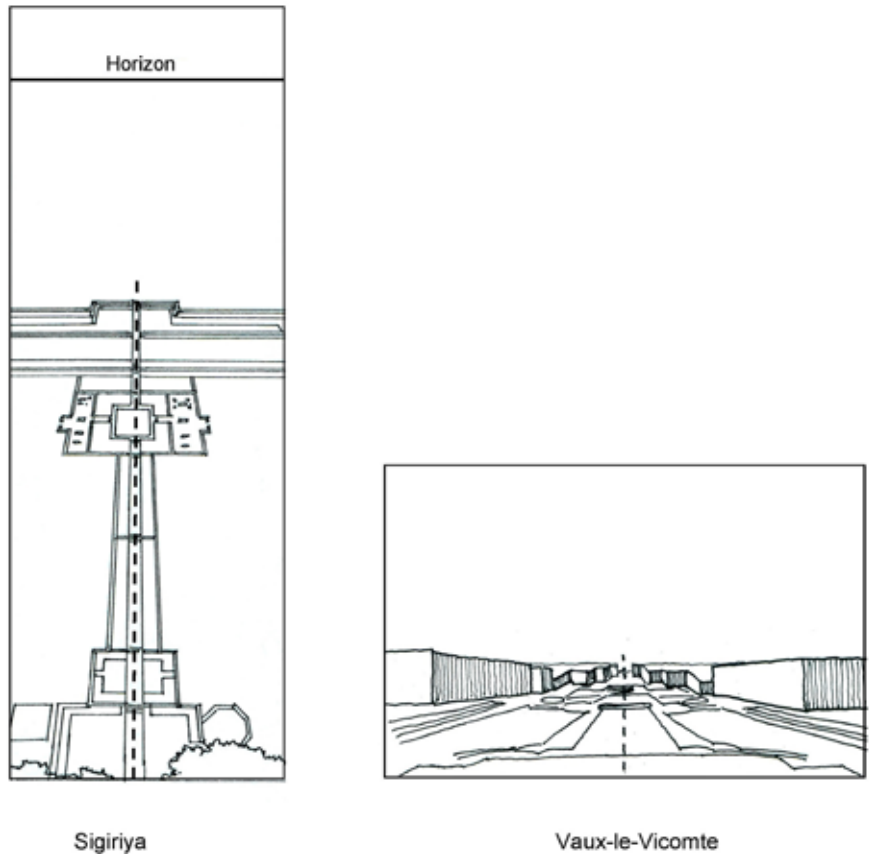


Figure 6.5
Spatial axis of Sigiriya and the French baroque gardens in relation to the panorama/horizon

Illusionary Effects

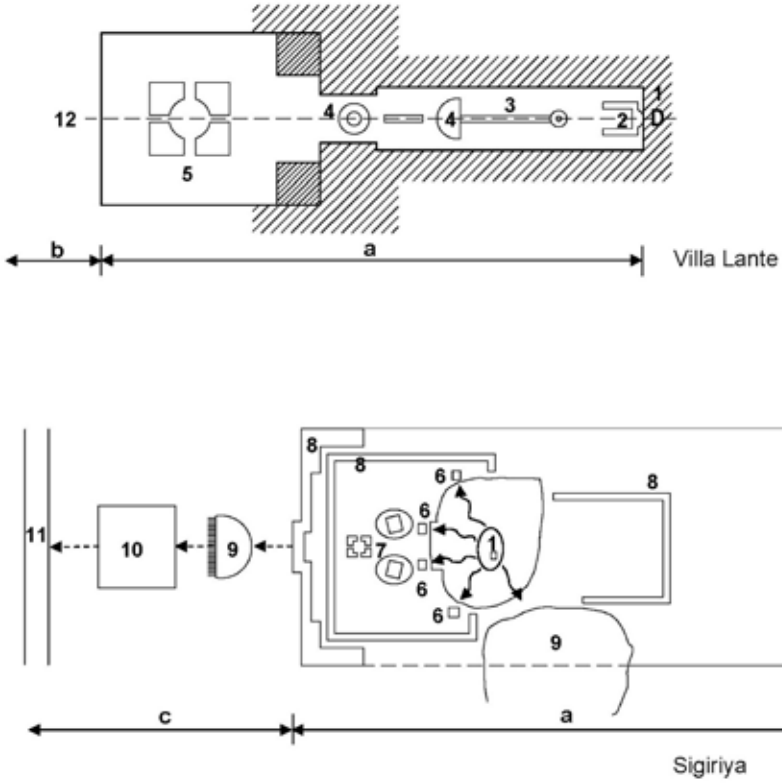
At Sigiriya the floating effect of the palace on the rock summit and the creation of illusionary space from the western precincts was achieved by the composition of the great tapestry of painting on the rock summit. The series of screens, including the Mirror Wall, which are placed one behind the other as in a stage set in the transverse direction to the main axis for the great tapestry of painting to rise behind, also heightens this illusionary effect of the three-dimensional space. At French baroque gardens, the illusionary effects are created by means of perspective constructions. At Vaux-le-Vicomte, for instance, the horizon is artificially brought within the garden boundary, while the spatial depth cannot be gauged due to the perspectively manipulated sequence of spaces within the layout (Steenbergen and Reh, 1996:15; 2003:155-161).

Metaphorical Structure

At Italian Renaissance villas, the metaphorical elements are ordered in relation to the axis and structured in pictorial gradation of naturalness from the 'house' in the direction of the open landscape to strengthen the panorama-oriented composition of the scheme (Steenbergen and Reh, 2003:43), while at the French baroque gardens they are ordered on the axis and structured in a hierarchical sequence of increasing naturalness in the direction of the horizon (Steenbergen and Reh, 2003:161). At Sigiriya the metaphorical elements – such as several visual planes along a visual vertical axis formed by the rock in the bottom-up vertical sequence of decreasing human presence, and at the same time increasing divine habitation, while the sequence of the linear arrangement of hydraulic elements from the rock summit to the outer landscape, the sequence of decreasing rock-associated structures and increasing water-associated structures arranged from the center towards the edge of the plan, and the gradual increase in scale, size and elevation of the structures from the edges of the formal layout up to the center of the scheme – are structured to strengthen the rock and palace-oriented composition in both vertical and horizontal directions as an image of 'supernaturalness'.

Hydrologic System

The comparison between Sigiriya and Italian Renaissance villas (Steenbergen and Reh, 2003:43) shows some parallelisms in the ordering of the hydraulic elements in relation to the axis to form a hydrologic system from spring to reflecting pond to be integrated into their geometric and spatial system. However, as seen at Villa Lante at Bagnaia, for example, the hydrologic system neither extends up to nor incorporates the hydraulic elements within the outer landscape (Van der Ree, Smienk and Steenbergen, 1992:177-182). At Sigiriya the hydrologic system is linearly arranged from the rock summit all the way to the open landscape through the axial zone of the pleasure garden to represent the hydrologic cycle, from 'source to back to nature' sequence. In this system, the agrarian hydraulic elements within the outer landscape are also incorporated to play a significant role, and hence the hydrologic system of Sigiriya links the palace, garden and outer landscape in a single visual scheme. At French baroque gardens, as seen at Versailles, for example, although the open agricultural landscape is not part of the scheme, the hydrologic system is arranged through the axial zone from 'spring to ocean' sequence ending at the horizon (Steenbergen and Reh, 1996:15, 2003:198-199), and therefore shows some parallelism with that of Sigiriya (figure 6.6).



a. Formal layout
b. Urban landscape
c. Agricultural landscape
d. Horizon (visual boundaries of the scheme)

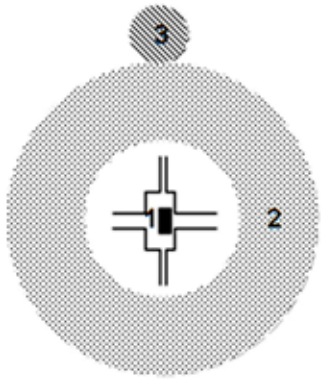
1. Pool on the higher elevation
2. Spring/Fountain
3. Cascade
4. Pond
5. Reflecting Pond/Pool
6. Water retaining structures
7. Water garden
8. Moat/Canal
9. Artificial Reservoir
10. Paddy Fields
11. Stream
12. 'Town'

Figure 6.6
Ordering of the hydraulic elements at Villa Lante, Sigiriya and Versailles (schemes to different scales)

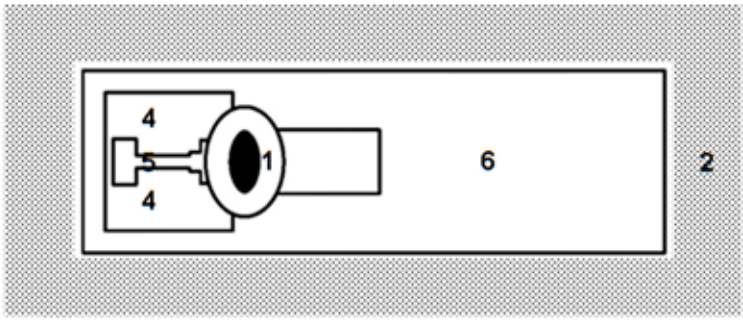
Programmatic Zoning

The ordering system of the programmatic zones at Sigiriya, where the palace occupies the elevated and centralized location of the scheme in relation to rest of the programmatic zones with hierarchical order of increasing dominance from the periphery up to the center of the composition, shows some parallelism to that of the agricultural villas of Veneto. At Villa Emo and Villa Rotonda, for instance, the 'house' occupies the centralized and somewhat elevated location to command a better view of, and to be seen from, the farmlands managed by the 'landlord', which were situated on the flat landscape surrounding the 'house' (Steenbergen and Reh, 2003:107). At Sigiriya and the agricultural villas of Veneto this ordering system symbolizes the total control of the landscape (figure 6.7). On the other hand, the decision by Louis XIV to make the royal residence at Versailles the capital and seat of government, by shifting the entire government machinery and zoning the town behind the chateau (palace) on a lower elevation to house the nobility, civil servants, burghers and merchants, where the monarch had an overview of the entire layout of the total landscape, including the urban panorama, also shows a parallelism with Sigiriya in respect of the ordering system of the programmatic zones (Steenbergen and Reh, 2003:188-194). The pleasure garden of Sigiriya, which is axially arranged and programmatically linked to the rest of the programmatic domains, is the major space for pleasure activities. This ordering system is similar to that of the French baroque gardens at Vaux-le-Vicomte and Versailles, where the axial zone was the major space in which ceremonial functions took place (Steenbergen and Reh, 1996:15).

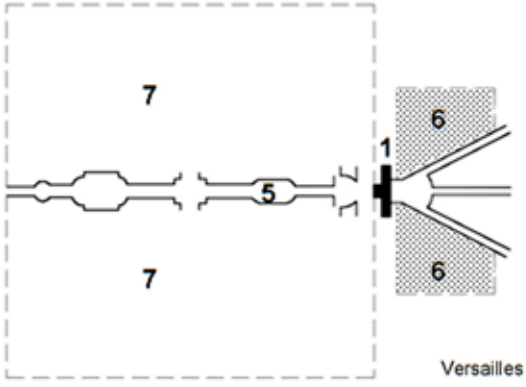
Therefore, the above comparison suggests that the designers of Sigiriya share many design instruments with those of the Italian Renaissance villas. Some of the design instruments developed by the designers of the French baroque gardens are also found at Sigiriya. However, they are limited to some parts of the composition of Sigiriya, and hence their effect is less on the overall composition. Therefore, as far as the use of design instruments and design aspects is concerned, the landscape design of Sigiriya ranks closely to that of the Italian Renaissance villa of the West European landscape design tradition. This also shows that many compositional rules/principles, design instruments/tools and techniques that were developed at Italian Renaissance villas (15th-16th centuries) of the western landscape tradition existed during the 5th century in Asia, as displayed by the landscape design of Sigiriya. The parallelisms between the landscape design of Sigiriya and those of the West European tradition also underline the fact that some of the design innovations of the West European landscape tradition from the 15th to 18th century were already in existence in the 5th century landscape design of Sigiriya. On the other hand, the present study shows that some of the design instruments at Sigiriya, such as the compositional balance using asymmetrical balance, the integration of natural elements into the geometrical ordering system, the use of screens to achieve illusionary effects and the reversibility of the composition, are not found within the West European landscape design tradition. This makes Sigiriya typologically different from the West.



Villa Emo in Veneto



Sigiriya



Versailles

1. 'House/Palace' (dwelling zone)
2. Agricultural zone
3. Village
4. Pleasure Garden
5. (Axial zone) Representation zone
6. Elites' zone
7. Forestry

Figure 6.7
Programmatic zoning at Villa Emo, Sigiriya and Versailles (schemes to different scales)

§ 6.3 Sigiriya as a Landscape Architectonic Composition

'Composition' as an artistic ideal is the way in which the parts and elements are assembled and combined according to the rules of the program, construction, visual communication and building process into an architectonic whole. Composition integrates and activates all the above aspects into a structure or form that permits reading and interpretation, over and above the boundaries imposed by the program or the construction (Steenbergen, 2008:17). In this sense the composition is at the core of architectonic design and determination of the architectonic quality.

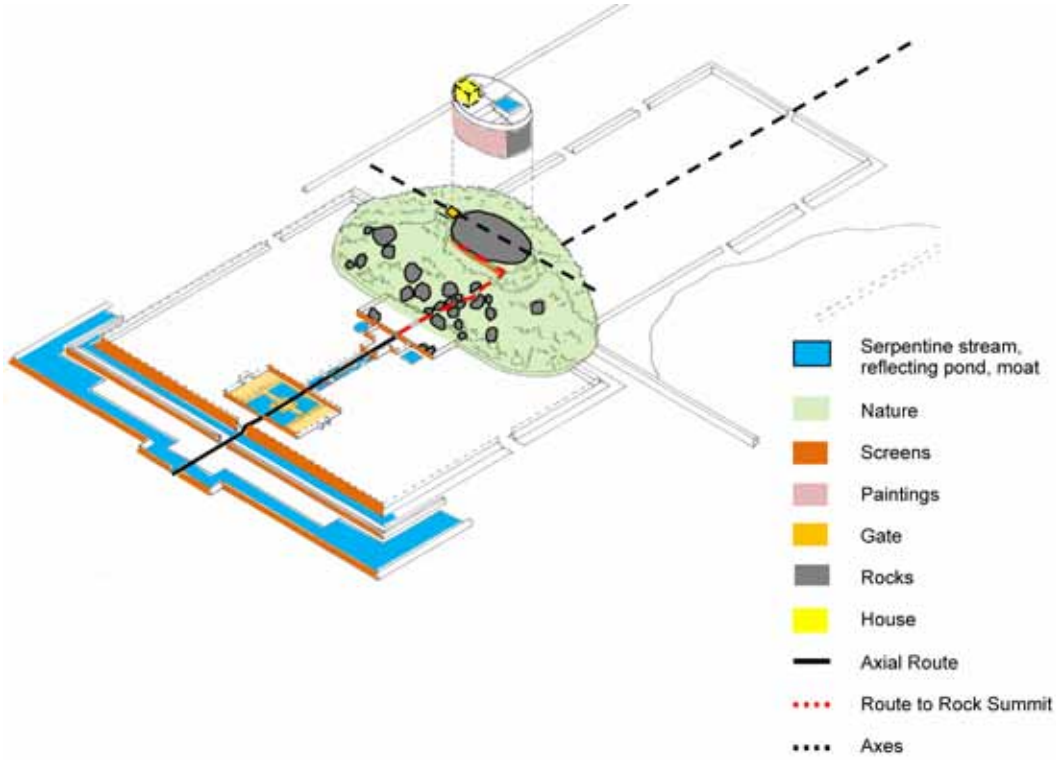


Figure 6.8
Compositional scheme A: 'Domain'

The analysis carried out in Chapter 5 made it possible to identify a number of essential elements that are/were active in the spatial operation of the design (active compositional elements). The compositional scheme (figures 6.8, 6.9) shows these active compositional elements in relation to one another. With regard to the qualities of landscape architectonic composition, Steenbergen and Reh (2003:388-389) use the standards stipulated by the Roman architect Vitruvius (1st century BC), that is '*utilitas*', '*firmitas*' and '*venustas*' or utility, solidity and beauty.[83] These themes enable one to see how various aspects, layers and elements enhance each other and fit together to assemble a coherent landscape architectonic composition.

Utilitas: The analysis shows that there is a clear functional zoning with different functional domains with some of the domains, the pleasure garden in particular, having a multifunctional character. There are also deliberate degrees of mixing between individual, collective and public activities in each of these functional domains. The landscape design of Sigiriya, while facilitating the enjoyment of nature, sensual pleasure and leisure *(otium)* and the king's efficient rule of the country *(negotium),* also provides a planned balance between *otium* and *negotium*. This functional organization is clearly expressed in both the ground plan and the spatial structure of the complex.

Firmitas: The composition integrates everlasting geological features (central rock pillar and the geomorphology of the wider landscape setting) in a basic geometric pattern. The composition has a very strong but yet simple basic pattern (axes, rocks), so that it can be reduced to the basic elements without losing its fundamental dramatic power. There is also a strong formal coherence between different elements and layers of the plan; they are complementary to one another and reinforce each

83 Steenbergen and Reh (2003: 389) define the three terms as follows:

'Utilitas' refers to the relation between otium and negotium. Otium is the measure for the manner in which room is made in the program form for cultural reflection and a meaningful encounter with nature and individual and collective forms of being outdoors, and how these relate to the negotium, economic utility. The definition of the public domain affords an insight into the manner in which the spatial form is balanced and geared to public functions.

'Firmitas' refers to the relation between stability and the openness to incorporate change. The functional stability of the program form and the ecological stability of the spatial form are standards for sustainability. The compositional stability affords insights into the sturdiness of the composition, the degree to which it can accept spatial dynamics without breaking up.

'Venustas' refers to the relation between the architectonic form and the content of the landscape. The genius loci afford insight into the manner in which the design anchors the basic plan in the topography and connects it with the natural substratum. This is a measure of the local specificity or originality of the design. The metaphorical structure expresses the various interpretations and materialization of nature, and is the measure for 'readability' and the degree to which the designed landscape can be experienced and understood. The spatial dynamics afford insight into the spatial effects of the architectonic composition.

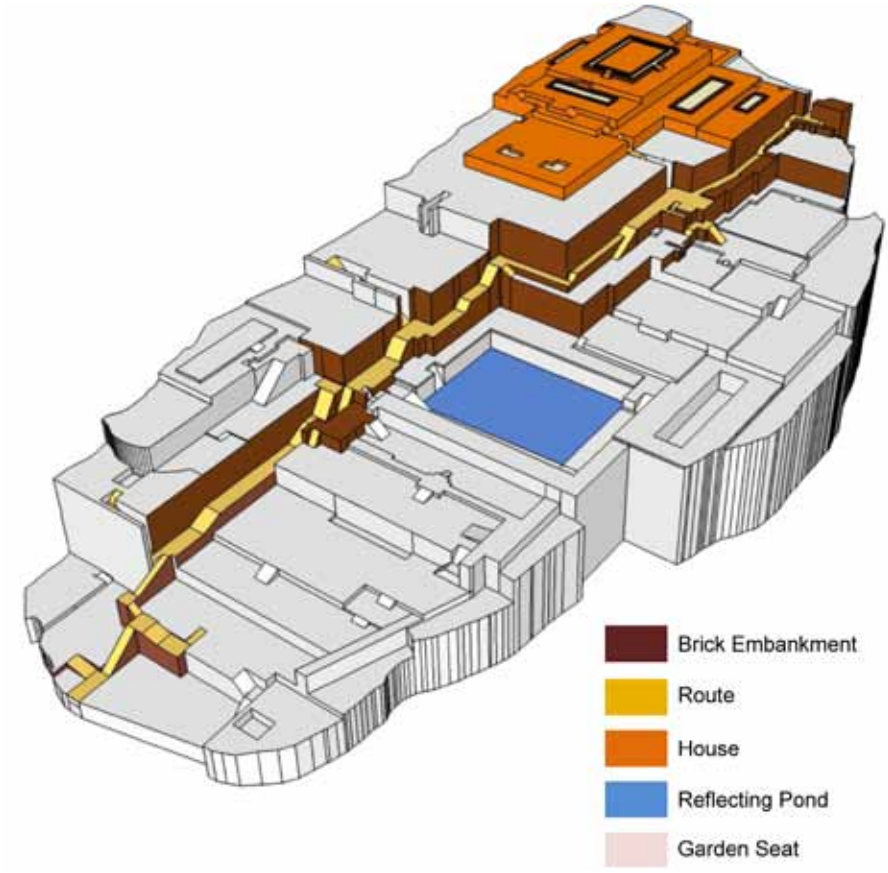


Figure 6.9
Compositional scheme B: 'House and Garden'

other (for instance, the divisions and measurements of the ground plan have their own meaning, but are also a necessary condition for the unfolding and sequence of spaces, as well as for the observation of the panorama from the rock summit; the position of the pleasure garden just outside the hilly terrain along the principal axis has a specific role in the spatial structure but also facilitates the interaction of different social strata in the programmatic structure; the four-quartered feature has different meanings and roles to play in material, spatial and programmatic structure). The composition is based on long-term functional, social and cultural elements that are influenced by the traditional attitude towards nature, cosmology, discourse on kingship and the philosophy of water management of society. As such the composition has a stable and durable character.

Venustas: The basic plan of Sigiriya is anchored in the (natural) topography by a careful geometrization of local natural features. These are slightly transformed and nevertheless skillfully exposed in a new dramatic way. This gives Sigiriya a high degree

of local specificity and originality. The spatial effects of Sigiriya are organized in scenographic sequence – view points and panoramas that reveal the composition step by step from a rock-oriented to a panorama-oriented one. Thus, the composition spans all scales of human perception. The metaphoric interpretation and materialization of nature culminating in the great tapestry of the painted plaster band on the rock face and the (original) water features add a specific cultural way of reading, understanding and dramatizing nature and the natural conditions.

All these point out that the landscape design of Sigiriya constitutes multiple design layers and multiple layers of significance. The present study, therefore, demonstrates that the various aspects, layers and elements enhance one another and bind together, thus assembling an architectonic composition with material-spatial-metaphorical-functional coherence. Although such observations would naturally tend to raise questions as to who and with what professional background designed Sigiriya (an architect? landscape architect? did landscape architecture exist as a specific design discipline during 5th century AC Sri Lanka?), how the complex was actually designed (the design process?), it is not the intention of the present study to answer such questions; the facts regarding these might be forever lost in time and history. Whatever the answers are, the present study clearly shows that Sigiriya can certainly be read as a real landscape architectonic composition. It has both general and very specific (unique) landscape architectonic elements, aspects, characteristics and qualities. In this sense Sigiriya can be considered a (unique) landscape architectonic design.

7 Perspectives

§ 7.1 Conservation, Presentation and Management

As discussed under 3.2 of Chapter 3, the conservation and presentation programs carried out so far within the formal layout of Sigiriya are primarily an attempt to restore the ground morphology, as exposed through archaeological excavation, with the primary objective of enhancing the antiquarian character of the property. As such, except the elements that are related to visitor circulation and to practical reasons, such as pathways, stairways and terraces, the overall policy adopted with regard to the formal layout is 'minimal' intervention to the fabric of the material remains. However, the present study points out that besides archaeo-historical value, Sigiriya has landscape architectural value reflected by several attributes.

Although the overall policy with regard to the conservation, presentation and management of a heritage site has to be based on its overall importance as determined through the analysis of all the heritage values attributed to the site, what is attempted here is to re-examine the validity of some of the interventions carried out at Sigiriya and to discuss the policy issues and make suggestions based on the outcome of the present study, for the consideration of heritage professionals in reformulating overall policy and programs for conservation, presentation and management of Sigiriya as a heritage site.

The Lines of the Formal Layout Corresponding to Those of the Natural Topographical Features

The north-south and east-west axial lines of the formal layout are derived from the natural plan configurations of the hilly terrain and the cap-rock. The wall demarcating the hilly terrain on which the rock stands and the outline of the compound on the rock summit are the major lines of the formal layout that correspond with the outer limits of the hilly terrain and of the cap-rock, respectively. Except for a small segment of the wall demarcating the hilly terrain that has been conserved, its considerable length is still in ruins with stonework deteriorated. Although there is hardly any evidence of the original height of the parapet wall surrounding the rock summit, the series of cut-marks on the edges around the entire rock summit, to receive the brick masonry, is quite evident to restore the compound to a certain height. Therefore, a conservation program aimed at strengthening such lines of the natural topographic features will highlight the origin of the north-south and east-west axial formation of the formal layout.

Axial Arrangement

As pointed out in 5.2.3 of Chapter 5, the east-west axis of the overall scheme is designed to be confined only to the boundaries of the formal layout to become the 'internal axis' of the scheme, while it is the north-south axis (natural axis) of the scheme that extends beyond the boundaries of the formal layout as a visual axis to anchor the scheme in the wider landscape context to become the 'external' axis. However, the laying out of the new approach to the site, together with the location of the new Sigiriya village including a Buddhist monastery and tourist facilities beyond the western boundaries of the formal layout in line with the east-west axis to terminate at a newly built stupa (a ritual structure) of the Buddhist monastery, have made this axis extend into the outer landscape (figure 3.14). Therefore, these interventions beyond the formal layout contradict those of the original design, and hence create issues regarding the authenticity expressed through 'form and design'. The scale of these interventions is also relatively irreversible.

Although the conservation work so far at the western precincts has highlighted the east-west axis of the formal layout, hardly any effort has so far been made to highlight the north-south oriented natural axis of the scheme. The Lion Plateau, together with the surrounding parapet wall and the structures that are axially and symmetrically arranged upon it, was originally designed to achieve this. Therefore, it is suggested to have a conservation program to highlight the north-south oriented natural axis to strengthen the scheme's axial formation and thereby to further enhance Sigiriya rock as the central object of the overall composition.

The consolidation work carried out on the brick embankment that separates the upper west and lower east levels of the rock and the central limestone pathway on the rock summit has not been effective in highlighting the series of staggered north-south oriented axes. Therefore, it is also suggested to have a conservation program to restore the brick embankment together with the limestone pathway as a single entity to highlight the north-south orientation of this element.

Symmetry

As pointed out in this study, the rectangular compound associated with the four-quartered feature is the climax of the symmetrical order along the axial zone from the western limit of the formal layout to the eastern limit of the inner western precinct. The present policy adopted for interventions to the site is to confine conservation and presentation work mainly to the area south of the east-west axis and to leave the surface and subsurface remains of the opposite side of the same axis for future investigation and interpretation. Although this policy has presented the visitor with the contrast of corresponding 'untouched' and conserved features on both sides of the axial pathway, which are symmetrically located, the impact of the symmetrical order in the progression through the axial zone is not fully effective. Therefore, it is suggested to

revise the existing policy on interventions to conserve and present the features on both sides of the axial pathway, for the whole east-west length of the axial zone, to heighten the effect of symmetrical order of the compound associated with the four-quartered feature. The area beyond the axial zone in the north could be left as per the existing intervention policy of the site.

Panorama-oriented Spatial Composition

The present study points out that the pleasure garden laid out in the inner western precinct and the palace garden on the rock summit act as architectural foregrounds to spatially and visually link the outer landscape with the palace on the rock summit. Although the rectangular compound associated with the four-quartered feature is composed at the exact midpoint between the horizon and the eastern edge of the pleasure garden with regard to the constructed picture plane, the present ruined condition of this compound and the conservation work carried out so far of the compound have not adequately highlighted it as the central object of the western panorama. As suggested under c. above, a conservation program for the four-quartered feature will re-establish its role as the dominant element of the western panorama to enhance the spatial integration of the foreground and the western panorama.
The consolidation of the remains and the layout program so far carried out at the palace garden are also not effective enough to heighten the palace garden as an architectural foreground to link the eastern panorama with the palace. Therefore, it is suggested to have a program to conserve and lay out the palace garden to achieve this effect. The terrace structure and the limestone pathway, which is visually hidden behind the brick-built embankment on the rock summit and which facilitated this panoramic view, is also suggested to be included in this program.
The present conservation policy adopted for the outer landscape is to treat it as a 'setting' to Sigiriya proper and to offer a pleasing view of the panorama from the rock summit. In order to preserve such aspects, 9,400 hectares of land, which conforms to the local administrative boundaries of Inamaluva Korale, have been gazetted under UDA law. From a heritage management point of view, this area is also considered as a 'buffer zone' for the heritage site of Sigiriya. However, the present study points out that the panoramic view of the natural and agricultural landscape, whose boundaries extend all the way to the horizon, covers a much larger area than the already gazetted area (figure 7.1). This suggests that the present boundaries are arbitrarily decided. Moreover, the present study points out that the outer landscape comprised of natural and agricultural features with agrarian settlements is not a buffer zone, but a major spatial component of the overall scheme. Therefore, it is suggested to extend the present boundaries of the UDA declared zone to cover the whole panoramic view for its planning control and to carry out a program of conservation with a policy of preserving the outer landscape as a major spatial component of the overall scheme.

The natural landscape (undulating topography, rock outcrops, tropical forest cover) as well as the cultural landscape (historic monasteries, artificial reservoirs and irrigation network constructed for agricultural purposes, rice fields, traditional agrarian settlements) should be treated in this conservation program as important features of this spatial component. On the other hand, its conservation policy should not lead to freezing development within the area, but to allow socio-economic growth of the community with the development of civil and tourist infrastructure to cater to residents as well as tourists (such as the establishment of modern townships, roads, electric and telecommunication facilities, tourist hotels, guest houses). However, such facilities need to be located in such a way as to be covered under thick green tree canopies or hidden behind the large rock outcrops that protrude above the landscape, by carrying out a view-shed analysis of the topography to maintain the visual image of the scheme. Such structures as telecommunication towers, the modern Buddha image of the Buddhist monastery associated with the new Sigiriya village, which is of colossal scale and thereby protrudes above and disturbs the natural setting, are suggested to be taken out of this area to improve its visual integrity. On the other hand, civil and tourist infrastructure facilities should not be located to obstruct the views of the rock from the plain.
In order to have regulatory control of the outer landscape, it is suggested to declare the whole panoramic landscape under the UDA law as a special development area. As a management strategy, the outer landscape could be subdivided into two concentric zones – the middle ground beyond the built landscape and the area associated with the horizon – and to have different guidelines for their control.

As far as the built landscape is concerned, only the area covered by the hilly terrain, including the rock, and the few meters beyond the middle rampart of the western precinct are declared under the Antiquities Ordinance (1940, revised 1998) for its legal protection and control. This means that part of the outer western precinct with outer moat and rampart, and both the inner and outer eastern precincts with their moats and ramparts, are not under the protection of the Antiquities Ordinance. Although the whole area of the built landscape is covered under the Fauna and Flora Protection Ordinance (1937, amended 2009) as the Sigiriya Sanctuary, whose focus is primarily the legal protection of fauna and flora of the area and not the cultural aspects, it is suggested to declare the whole built landscape demarcated by the outer ramparts on all sides under the protection of the Antiquities Ordinance.
The airstrip at Kimbissa, located in the western panorama along the direction provided by the east-west axis, is another incompatible construction within this outer landscape. Although at present it is unnoticeable from the rock summit and the military air base associated with this airstrip is not an active center, its strategic location in relation to the whole country could make it be developed into a major military air base or, on the other hand, a civilian airport with cultural tourism in mind. In this light, it is suggested to relocate the airstrip along with the air base outside the area of the panoramic view of the outer landscape.

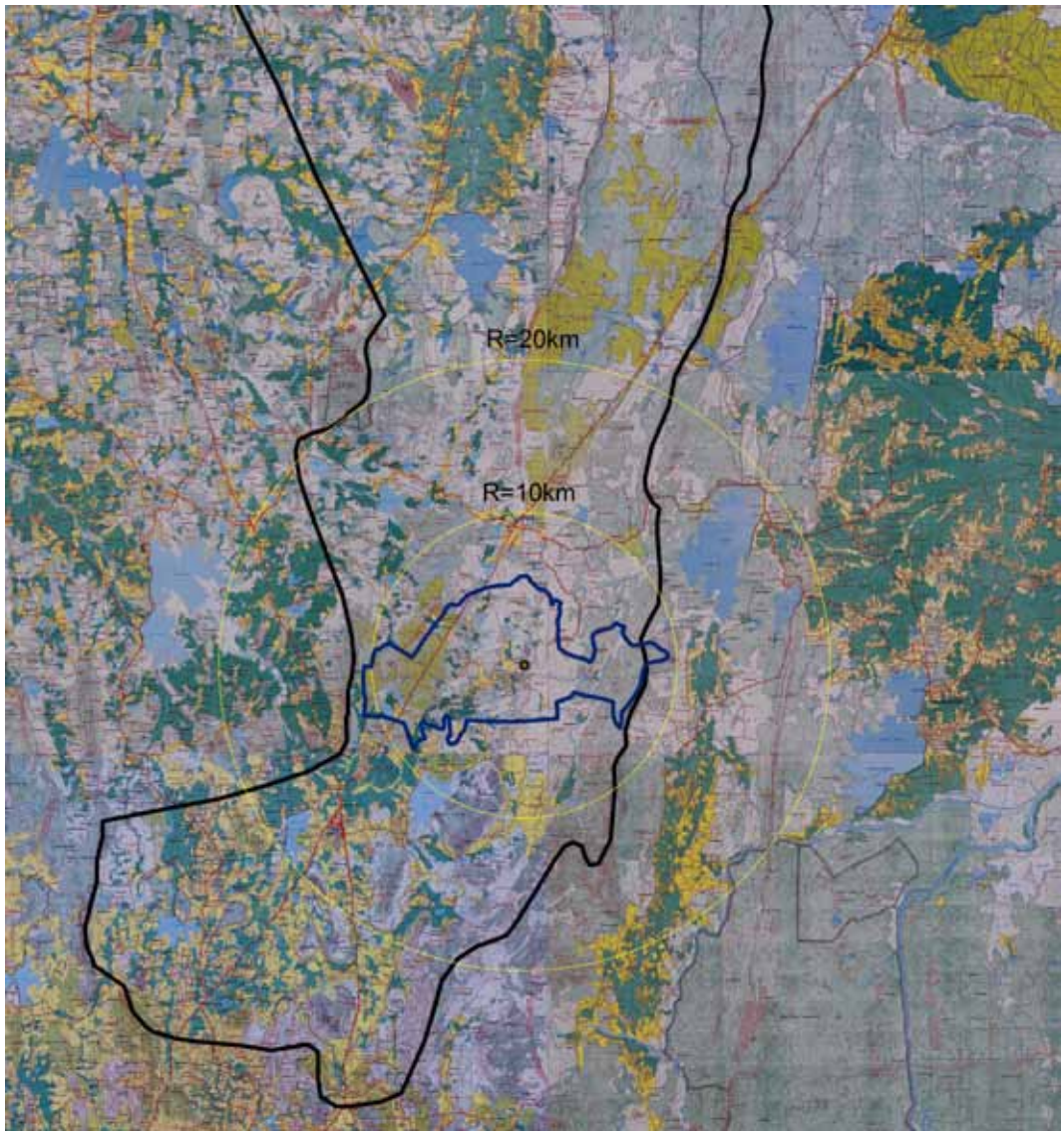


Figure 7.1
Optical boundaries of the scheme (black color) and the UDA declared area (blue color)

Under 5.6 of Chapter 5, it is pointed out that the rectangular compound associated with the four-quartered feature is composed at the center of the picture plane. The central position of this compound between the horizon and the eastern edge of the inner western precinct integrates both the foreground and the panorama to strengthen the spatial structure of the scheme. However, the location of the new Sigiriya village beyond the western boundaries of the formal layout along the east-west axis in the

open landscape has made it a dominant element. Therefore, it competes with the rectangular compound associated with the four-quartered feature and thereby disturbs the original spatial treatment of the western panorama and hence raises issues related to authenticity expressed through 'form and design', as well as 'location and setting'. This also shows that the location of the new Sigiriya village in relation to the original scheme is unjustifiable. Since the scale of interventions at the new Sigiriya village is relatively irreversible at present due to social and practical reasons, it is suggested to explore the possibilities of creatively integrating these new elements into the outer landscape, without hiding or camouflaging in the conventional manner, so as to reduce its dominance in the western panorama. In the same way, the extended east-west axis could also be decomposed and reduced like an axis in the English landscape garden.

The Illusionary Space

As pointed out in 5.7 of Chapter 5, the immense plaster band, which originally covered the whole of the western rock face, was meant to rise behind the Mirror Wall. Therefore, the plaster band, which merges with the eastern sky, has given an impression of an illusionary space above and beyond the Mirror Wall. However, the surviving patches of the original plaster band at present are not of adequate size to convey the totality of this effect. Although the reproduction of the plaster on the missing areas of rock face will re-create this effect, such an intervention will greatly affect the archaeo-historical value of the property and raises issues regarding the condition of authenticity expressed in 'materials and substance', and hence, such an intervention should not be attempted.

The Boulder-associated Landscape

As pointed out under 3.1.2 of Chapter 3, the survey carried out by Sunnemark and Wik (1997) on the cut-marks in one of the boulder clusters within the hilly terrain, to map the structures on top of these boulders, shows that the built elements at the ground level are related to the structures on top of the boulders. Although the present conservation policy adopted at the boulder-associated landscape is to consolidate the remains that are unearthed from the excavations, there is no serious attempt at conserving and presenting these remains by studying and interpreting them in the context of the buildings on top of the boulders. Although only the cut-marks to receive the brick work are the main evidence of such structures, they will provide valuable data in this regard. As a first step, it is suggested to document and study the cut-marks on each of the boulders within the hilly terrain and study and interpret the remains that have survived at the ground level. Such an attempt will certainly provide scientific information to conserve and present the hilly terrain in a meaningful manner.

As pointed out in 5.9 of Chapter 5, the scheme has a bottom-up visual layering system with decreasing human habitation and increasing divine habitation from the plain up to the rock summit, which reflects the Buddhist cosmography. In order to strengthen this visual and pictorial image, the hilly terrain on which the rock stands is deliberately kept as a human-free visual layer, and therefore the pathways across this area were laid hidden behind such topographic features as boulders and the natural cladding given to the hilly terrain by the thick vegetation to cut off the view of human movement. Therefore, it is suggested to preserve the present jungle cladding of the hilly terrain as it is. Any new intervention that is necessary to cater to practical demands has to be located in such a way as to shut out its view from the plain below, as well as from pedestrians moving up and down the pathways in the areas above the plain. Although the Central Cultural Fund has introduced a new pedestrian circulation pattern to avoid visitor congestion and human cross traffic movement, especially along the pathway associated with the Mirror Wall, due to the large volume of visitors to the site, by introducing a pathway as a loop to link the bottom of the stairway, which winds around the northwestern edge of the rock, and a point just above Boulder Arch No. 1, it is well hidden behind the boulder-strewn and jungle-clad western escarpment and thus preserves the visual and pictorial image of the scheme.

The present study also points out that the Mirror Wall, which is taller than an average human height, is also a deliberate design decision to facilitate the shutting out of human movement within the upper visual layers of the scheme. However, the conservation policy adopted so far at the site, which discourages reconstruction, has made the missing segments of the Mirror Wall to be linked with the surviving segments with steel bridges. Such a policy has, therefore, made visitor movement along this pathway exposed to viewers from the plain below, thereby disturbing the intended visual image of the scheme. Therefore, it is suggested to have a conservation program to rectify this situation and to enhance the original architectural function of the Mirror Wall as a screen to shut out human movement.

The modern spiral staircases leading from the pathway associated with the Mirror Wall up to the 'fresco-pockets' not only expose visitor movement, but greatly affect the visual integrity due to the verticality of its construction. Since the paintings of Sigiriya are one of the major visitor attractions of the site, there is a practical need to provide visitor access to these pockets, and therefore, as a compromise, alternative strategies need to be worked out and an appropriate proposal implemented to at least minimize this situation.

As pointed out in 5.9 of Chapter 5, the serpentine stream, ponds, pools, fountains and moats within the formal layout, and the streams, artificial reservoirs and paddy fields within the outer landscape, are visually integrated in both micro and macro scale to represent the hydrologic cycle, which is part of the visual and pictorial scheme. Therefore, the activation of such hydraulic features within the formal layout and the rehabilitation and sustenance of features in the outer landscape will greatly strengthen

the visual structuring system of the scheme. The rehabilitation of the network of artificial reservoirs including Sigiriya Mahavava, on the other hand, will also solve the problem of a shortage of water for irrigated agriculture within the outer landscape, which in turn will prevent the local community from abandoning their traditional livelihood based on agriculture and help to retain its present land use. Therefore, such an intervention will undoubtedly contribute to preserve the agro-based elements of the visual scheme.

Open/Built-up Space Relationship

The present conservation and presentation policy adopted at the site does not help to understand the open/built-up space relationship, which contributes to visualize the three-dimensional aspects and programmatic form of the scheme. As pointed out under 5.10 of Chapter 5, the rectangular compound associated with the four-quartered feature in the inner western precinct is the dominant programmatic element for the king to symbolically interact with the rest of the social strata during water sports and other festivals connected with water. Moreover, the idea of the central island structure has also not been highlighted through conservation. The attempt made by Byrom (1986) to reconstruct the superstructure of the buildings of the outer compartment of the compound associated with the four-quartered feature invites a rethink of the open/built-up space relationship of the axial zone, particularly the compound associated with the four-quartered feature and the Miniature Water Garden. Moreover, the specific design of the triple pathways leading from triple openings of the gateways at the north, south and west ends of the compound towards the central island structure, with the central pathway slightly elevated more than the pathways flanking it, has not been conserved to express the hierarchical position of the programmatic element. Therefore, it is suggested to carry out comprehensive investigations to establish such facts so as to enable conservation and presentation of the compound associated with the four-quartered feature. In the same way, the conservation and presentation work carried out at the rock summit has also not highlighted the open/built-up space relationship, which is very much confusing, especially for laymen. Therefore, it is also suggested to carry out comprehensive investigations to establish such facts to conserve the present remains on the rock summit to heighten this aspect.

Vegetation of the Pleasure Garden

Under 5.10, the central axial zone and the two identical zones that flank the axial zone of the pleasure garden are interpreted as the areas associated with water sports and garden sports, respectively. However, the present vegetation in the zone associated with garden sports does not in any way reflect its original vegetation or the planting scheme due to the change of vegetation as a result of many centuries of neglect

and disrepair. Although the present policy on vegetation at Sigiriya is to retain and protect the indigenous forest species that have organically evolved up to now without attempting any reconstruction scheme, it is suggested to reintroduce, if possible, the original vegetation and planting scheme through scientific research to provide meaning to the pleasure garden. Therefore, as a first step, it is suggested to carry out in-depth scientific research through archaeological means (archaeo-botanical studies?) and extensive literary studies on planting schemes of the pleasure gardens in Sri Lanka and South Asia.

On the other hand, it was pointed out under 5.8 of Chapter 5 that the visual focus of Sigiriya rock is at present distracted from the axial zone of the pleasure garden due to the views of Pidurangala rock, as it provides views outside due to a lack of vegetation on the zone associated with the garden sports. Therefore, the introduction of vegetation to this zone will prevent such outside views from the pleasure garden to focus the view on the rock and the palace complex upon it.

§ 7.2 Scientific and Methodological Aspects of the Research

The research methodology used for the present study, which follows a technical-analytical approach where landscape design is anatomized in to four aspects (basic form, spatial form, metaphorical form and programmatic form) has made it possible to look differently at a historical example from the conventional art-historical approach to bring positive results. As shown in Chapter 3 almost all studies related to the built landscape of Sigiriya have been approached from art-historical perspectives, and there is hardly any serious study on the landscape design of Sigiriya from a spatial-technical viewpoint. The present study, therefore, fills this gap in research related to the historical built heritage of Sigiriya. It also shows that in the absence of written and archival documentation about the site, this methodology could be applied to sites of an 'archaeological' nature, where considerable information is provided through their architectural remnants.

Due to the relatively better state of preservation of the morphologic characteristics and the ground plan of Sigiriya proper and of the geomorphology – the cultural and agricultural landscape of Sigiriya's wider landscape context for the past 1,500 years – the analysis of the basic form was very successful. Although the analysis with regard to the spatial form was also successful to a considerable extent based on the information provided by the surviving architectural remnants, insufficient three-dimensional spatial data on the planting scheme, open/built-up spatial relationship, arrangement of spaces, positioning of openings, entrances, volumetric spaces, roof form, special architectural devices within the individual structures, particularly those of the palace building on the rock summit, has not allowed a complete analysis of the spatial form of Sigiriya. Compared to archaeological sites in Europe, such as Villa Hadriana

(2nd century BC) in Tivoli, Rome, where some spatial (three-dimensional) elements have survived due to the use of durable construction materials and techniques, to understand its spatial form, the present remains of Sigiriya have been reduced to terraces and basements of buildings due to the use of timber for their superstructure, which is a perishable building material under tropical weather conditions. This is a challenge faced by researchers in most of tropical Asia related to historical built heritage, where timber was extensively used for the superstructure. Being an 'archaeological' site, where original color and texture of the built elements are not intact, all the data required for a complete analysis with regard to the metaphorical form of Sigiriya is also not available. Due to the lack of conclusive data/interpretation of the site in the identification of various functional spaces and the specific activities related to the program, including how daily life was organized at Sigiriya, the analysis with regard to the programmatic form to see the balance between *negotium* and *otium* is also incomplete and had its limitations. As mentioned under 1.4 of Chapter 1, due to the limited material evidence, it is stressed again that the outcome of this study should not be treated as final, but has to be elaborated on in the future with the exposure of more data at the site employing advanced archaeological methods that will be developed.

On the other hand, due to the availability of comprehensive and precise measured drawings and site surveys of the European examples, which facilitate the effective utilization of the analytical tools of this research methodology, the analysis of those examples suggests that it gives better results. Compared to the degree of advanced systems in recording of the European examples, such aspects related to Sigiriya could be called 'basic'. The survey map (scale 1:1,000) with 50-centimeter contour intervals, which was carried out in 1982 at Sigiriya before the commencement of the UNESCO-Sri Lanka Cultural Triangle Project, is the only detailed topographic map available for the study of geomorphology of Sigiriya proper. However, this survey, which was limited to the rock and the western precincts of the formal layout of Sigiriya, is also without the contour survey of the main rock and the boulders within the site, and hence is of limited use for the morphologic analysis of such a complex site. Although data from the Geographic Information System (GIS) covering the Sigiriya region obtained through aerial surveys by Sri Lanka's Department of Survey (scale 1:10,000) were useful in creating three-dimensional terrain models and other maps to analyze Sigiriya in the wider landscape context, such data was found to be totally inadequate in creating detailed three-dimensional terrain models and other maps as analytical tools for the study of Sigiriya proper. For instance, the attempt to create analytical drawings of the hilly terrain using view-shed analysis to study the positioning of the pathways through the hilly terrain in relation to its topographic features (to show how these pathways were deliberately hidden behind the boulders and other landscape features to shut out human movement from the plain), was unsuccessful due to inadequate GIS data of the hilly terrain. This suggests that this research methodology could be applied in the most successful manner for the analysis of landscape designs, provided that the level of their documentation is of the highest order. Therefore, the present study stresses the need

and importance of comprehensive documentation of historic built landscapes for their effective analysis using this research methodology.

Despite the inadequacy of some data and lack of comprehensive documentation of the material remains for the analysis, the overall outcome of the present study shows the effectiveness of this methodology in exposing the richness in the composition of Sigiriya's landscape architectonic design.

This research methodology developed at the Delft University of Technology in the Netherlands has so far been predominantly used for the analysis of European gardens and landscapes, most of which are living historical examples. Most of the architectural elements of the analyzed European gardens and landscapes are considerably well preserved. These examples provide a wealth of scientific data on the architectural theories, philosophies and approaches related to their design through drawings, sketches and text, together with engravings for the analysis. In most cases original designers are known together with their other projects. Sigiriya on the other hand offers a contrasting example, which is mostly an 'archaeological' site, with comparatively few surviving architectural remnants, and providing relatively limited information to understand its design. Compared to the western examples, most of which are from the Renaissance period (15th century onwards), with the only exceptions being the medieval gardens of Europe (10th-14th century), Sigiriya is an example from the distant past (5th century AC). Moreover, Sigiriya belongs to a cultural context in South Asia that is very different to those of Europe. Therefore, Sigiriya is very different to the examples analyzed so far in terms of age, degree of preservation as well as cultural and geographical contexts. Despite such differences, the results of the present research also demonstrate the effectiveness of this methodology in analyzing not only western landscape compositions. Therefore, this methodology seems to be of universal applicability for the research on landscape architecture.

The results of the present study also indicate that it has contributed to the development of the existing research methodology. The technique of asymmetric balance to control the composition at Sigiriya, for instance, has refined its existing analytical instruments. The technique of design to create illusionary effects of the three-dimensional space at Sigiriya using screens (including the Mirror Wall) and the great tapestry of painting that are placed one behind the other as in a stage set, on the other hand, points out that the existing methodology has been extended with new analytical/design instruments. The present study also demonstrates the extent of importance of the results of the analysis to understand the landscape architectural value of the site in reshaping policy related to and making suggestions for the conservation and presentation of Sigiriya as a heritage site, as well as its protection and management as a green monument. In this regard, it demonstrates that the existing research methodology has been given a new application in the conservation, presentation and management of a historical built landscape.

§ 7.3 Sigiriya in the Local and Global Design Context

§ 7.3.1 A Sri Lankan Tradition of Landscape Design?

In order to achieve the main objective, the present study has mainly read Sigiriya as a landscape architectonic design in order to identify its design characteristics. If one returns to the central issue mentioned under 1.2 of Chapter 1, the present research is only a point of departure in the process of answering the research questions mentioned therein. As stated in the same subheading, the next step is to carry out separate studies on landscape designs of other significant historical built landscapes of Sri Lanka to identify their own characteristics of landscape design. A comparison of characteristics of all these landscape designs, including Sigiriya, will ultimately provide insight into answering the research questions mentioned under 1.2 of Chapter 1. Since the methodology adopted for the present study has delivered positive results, it could be used to analyze Sri Lanka's other historic built landscapes, such as Ranmasu Uyana, Isurumuniya, Vessagiriya and Pancavasa monasteries at Anuradhapura, Dipuyana at Polonnaruva, Galabedda in southern Sri Lanka, Ritigala, Arankele, Kaludiya Pokuna at Mihintale, the royal precinct at Kandy, and the royal capitals at Yapahuwa, Dambadeniya and Kurunegala to understand the characteristics of landscape design. Since the availability of spatial-technical information of each of these sites is a prerequisite to apply the methodology, it is also suggested to have a program of documenting such information of these historic built landscapes before the analysis.

§ 7.3.2 Landscape Design in the Global Context

Under 6.2 of Chapter 6, it was pointed out that only the West European landscape tradition covering the Italian Renaissance, French baroque and English Revival has been extensively researched to reduce individual designs to active compositional schemes, which allows typological comparison. Therefore, the present efforts in positioning Sigiriya in the global landscape design context have to be limited to a comparison of Sigiriya with those of the West European landscape tradition. Therefore, it is also suggested to initiate a series of research studies on different landscape traditions around the globe, such as those of ancient Rome and India, China, Japan, Korea, Moghul India and Pakistan, and Moorish Spain for typological comparisons with that of Sigiriya, which will ultimately position Sigiriya in the global

landscape design context. Such a series of studies will also help to establish both the parallelisms as well as differences of each landscape tradition and to see how landscape architecture as a design discipline has evolved throughout the historical period in a global sense.

Such a series of studies will also ultimately generate design knowledge on historic built landscapes. As history has witnessed, as Moghul architects did with the ancient Persian gardens, and even in modern times as architect Edwin Lutyens, for instance, did with the Moghul gardens (when designing the garden for the Rashrapati Bhawan, the viceroy house for the British Raj in New Delhi, India) (Moore, et al., 1997:188-189), this will lead one not to copy the designs of a bygone era, or not merely to stimulate present day designers, but to professionally equip already existing design knowledge to create anew.

List of Figures

(Photographs and drawings by the author unless otherwise credited)

Summary (Samenvatting)

De koninklijke tuinen van Sigiriya:
Analyse van de landschapsarchitectonische compositie

Inleiding

Uit overblijfselen en historische en literaire documenten lijkt naar voren te komen dat er sinds de derde eeuw voor Christus of nog eerder talrijke koninklijke parken en bossen evenals Boeddhistische kloosterlandschappen in Sri Lanka hebben bestaan. De beroemdste hiervan zijn de paleistuinen van Sigiriya, een relatief zeer goed bewaard gebleven landschap dat teruggaat tot de vijfde eeuw na Christus. Hoewel er diverse wetenschappelijke onderzoeken zijn gedaan naar bepaalde aspecten van Sigiriya en andere gebouwde landschappen, is er tot dusverre nog geen serieus en diepgravend onderzoek gedaan dat antwoord kan verschaffen op de vraag of Sri Lanka zijn eigen landschapstraditie had, en of de historische voorbeelden die wij kennen, waarvan Sigiriya er een is, daar een product van zijn. Om dergelijke vragen te kunnen beantwoorden moet er afzonderlijk onderzoek worden verricht naar het ontwerp van het landschap van Sigiriya en andere gebouwde landschappen in Sri Lanka om de ontwerpkenmerken hiervan in kaart te brengen en te vergelijken. Omdat het niet mogelijk is om een dergelijk project binnen het kader van één onderzoek uit te voeren, zal dit onderzoek in eerste instantie gericht zijn op Sigiriya, met als doel dit te interpreteren als een landschapsarchitectonisch ontwerp met speciale aandacht voor de architectonische middelen (ontwerpmiddelen, -principes/regels/technieken, etc.) die de ontwerpers hebben gebruikt om de elementen in de compositie te plaatsen/te organiseren en zo inzicht te krijgen in de kenmerken van het ontwerp.
Dit onderzoek wil niet alleen de hierboven genoemde onderzoeksvragen beantwoorden, maar heeft daarnaast nog twee secundaire doelstellingen, namelijk Sigiriya een plaats geven in de internationale landschapsarchitectonische context door het ontwerp van het landschap van Sigiriya te vergelijken met voorbeelden uit de West-Europese traditie, en de bevindingen van dit onderzoek gebruiken om beleidskwesties te bespreken en suggesties te doen die erfgoedspecialisten kunnen gebruiken bij het opnieuw invullen van het lokale beleid met betrekking tot behoud, presentatie en beheer.
In hoofdstuk twee wordt de algemene cultureel-geografische, technische en historische context van dit onderzoek uiteengezet met aandacht voor de omgeving, de topografie en de bewoners, de houding ten opzichte van de natuur, de kosmologie, het koningschap, stadsplanning en architectuur, irrigatietechnologie, de vrijetijdsbesteding van de koninklijke familie en externe culturele en commerciële contacten in de loop van de geschiedenis van Sri Lanka. Daarnaast verschaft dit hoofdstuk een basisinleiding over Sigiriya, het onderwerp van dit onderzoek, met speciale aandacht voor de geschiedenis en de fysieke kenmerken van deze plek. In

hoofdstuk drie wordt ingegaan op het beleid en benaderingen met betrekking tot behoud, presentatie en beheer van Sigiriya, plus de werkwijzen en conclusies van eerdere onderzoeken en interpretaties van Sigiriya, met als doel vast te stellen of die benaderingen geschikt zijn om een methodologisch kader te bieden voor deze analyse van de materiële overblijfselen in Sigiriya. Er wordt aangetoond dat onderzoek naar het landschapsontwerp van Sigiriya zich tot dusverre heeft gericht op archeologisch materiaal vanuit een historische, sociologische, sociaalhistorische en semiologische invalshoek. Hoewel dat onderzoek een bijdrage heeft geleverd aan de erkenning van het historisch belang van Sigiriya, komt daaruit niet naar voren waarom Sigiriya zo belangrijk is vanuit het perspectief van het landschapsontwerp.

De methode

In hoofdstuk vier wordt dan ook onderzocht welke methodologieën onderzoekers op internationaal niveau hanteren bij het bestuderen van landschapsontwerpen, teneinde een geschikte methodologie te vinden voor dit onderzoek. Uit het onderzoek naar de methodologieën die op internationaal niveau worden gebruikt voor onderzoek naar landschapsontwerpen blijkt dat slechts enkele publicaties een technisch-analytische benadering kiezen om inzicht te krijgen in dit onderwerp. Een van deze methodologieën, die is ontwikkeld aan de TU Delft, maakt gebruik van gedetailleerde, nauwkeurige analytische hulpmiddelen in combinatie met een breed overzicht voor de analyse en vergelijking van ontwerpen uit alle belangrijke periodes uit de West-Europese landschapstradities. Om het landschapsontwerp 'omgekeerd' te interpreteren, wordt het landschapsarchitectonische ontwerp conceptueel opgedeeld in 'basisvorm', 'ruimtelijke vorm', 'metaforische vorm' en 'programmatische vorm'. Gezien de positieve resultaten die deze methodologie oplevert en de verschillen tussen de geanalyseerde voorbeelden en Sigiriya wat betreft de mate van behoud, de beschikbaarheid van wetenschappelijke gegevens, de aard van de locatie etc., zijn de aandachtspunten en hulpmiddelen voor de analyse voor dit onderzoek aangepast. Voor deze analyse zijn topografische kaarten, hoogtekaarten, driedimensionale digitale terreinmodellen van de geomorfologie, plattegronden, doorsneden, axomometrieën, uitvergrote dwarsdoorsneden met perspectiefconstructies, kaarten en doorsneden met zichtlijnen, perspectieftekeningen, foto's etc. gebruikt.

Basisvorm

Uit de analyse in hoofdstuk vijf blijkt dat de ontwerpresponsen die we in Sigiriya aantreffen de inwendige logica van de natuurlijke omgeving weerspiegelen, waarbij het landschapsontwerp grotendeels is aangepast aan het omringende natuurlijke landschap. De compositie integreert prominente geologische kenmerken (de centrale rotspilaar en de geomorfologie van de wijdere omgeving) tot een basaal geometrisch patroon. De basisindeling van Sigiriya is in de (natuurlijke) topografie verankerd door middel van een zorgvuldige geometrisering van de lokale natuurlijke

omgeving, wat Sigiriya een hoge mate van lokale specificiteit en originaliteit verleent. De symmetrische/asymmetrische ontwerptechnieken wijzen erop dat het landschapsontwerp van Sigiriya de mens in diepe harmonie met de natuur brengt, wat een weerspiegeling is van de houding van de oude Sri Lankanen ten opzichte van de natuur. Uit analyse is verder gebleken dat de ontwerpers een geometrisch raster als instrument/gereedschap hebben gebruikt, waarbij de rastermodule is gebaseerd op een geabstraheerde, geometrische weergave van de natuurlijke rotsbodem.

Ruimtelijke vorm

Schematisch treffen we een panoramische, ruimtelijke compositie, ingedeeld op basis van de hiërarchische volgorde van paleis, tuin en omringend landschap, met name in oostelijke en westelijke richting, om de centrale ruimtelijke positie van het paleis te benadrukken. Als gevolg van deze indeling vallen de optische grenzen van het ontwerp niet samen met de fysieke grenzen van de formele indeling, maar worden ze verlegd naar de visuele grenzen van het omringende landschap. De ontwerpers hebben een speciale compositietechniek gebruikt die doet denken aan de schildertechniek die in Sri Lanka veel werd gebruikt door traditionele muurschilders. Deze techniek scheidt het paleis op zijn rots zowel visueel als ruimtelijk van het land, waardoor het paleis lijkt te zweven en in westelijke richting de illusie van ruimte ontstaat. Het ontwerp is niet alleen een panoramische ruimtelijke compositie (vanaf de top van de rots gezien), maar ook – vanaf de grond bekeken – een ruimtelijke compositie met de rots als oriëntatiepunt, waardoor het landschapsontwerp van Sigiriya een omkeerbare ruimtelijke compositie is, afhankelijk van het gekozen gezichtspunt. De ruimtelijke effecten van de indeling zijn ondergebracht in een scenografische sequentie, gezichtspunten en panorama's, waaraan stap voor stap is af te lezen hoe de compositie verschuift van een op de rots georiënteerde compositie naar een panoramagerichte.

Metaforische vorm

Uit de analyse blijkt dat er verticaal sprake is van een bottom-up sequentie van visueel structurerende systemen, bestaande uit verschillende visuele lagen die zijn verdeeld langs een visuele verticale as gevormd door de rots. Dit is een weerspiegeling van de afnemende aanwezigheid van de mens en, tegelijkertijd, de groeiende aanwezigheid van het goddelijke – wat doet denken aan de indeling van het kosmische landschap in de Boeddhistische traditie. De hiërarchische volgorde van de visuele lagen maakt het paleis tot het dominante metaforische element in de compositie als geheel, waarschijnlijk om de 'goddelijke' status van de koning te suggereren. Ook de hydraulische elementen zijn visueel gestructureerd, van de top van de rots via de lusthof naar het open landschap, alsof het water aan de top van de rots ontspringt. Dit weerspiegelt de kosmische ordening: de waterkringloop die de aarde vruchtbaar houdt en de filosofie achter irrigatietechnieken uit de oudheid. De grote schilderingen op de

rots benadrukken de bovennatuurlijke, hemelse aard van het domein van de koning en verbeelden de vereniging van de lokale en de kosmische orde.

Programmatische vorm

Het ontwerp bestaat uit een aantal programmatische domeinen die zowel verticaal als horizontaal zijn georganiseerd in de hiërarchische volgorde van paleis, binnenstad, omringende wijken, buitenwijken en natuurlijke/agrarische nederzettingen. De hiërarchische ordening neemt af wanneer we van het middelpunt naar de visuele randen van het geheel gaan, ter benadrukking van de dominante positie van het paleis als programmatisch domein. Een dergelijk geordend systeem zou de koning in staat hebben gesteld om de overige lagen van de samenleving efficiënt te leiden door middel van zijn symbolische aanwezigheid. Er is bewust gekozen om in elk functioneel domein individuele, collectieve en openbare activiteiten te combineren. Op die manier maakt het landschapsontwerp van Sigiriya het zowel mogelijk om van de natuur, sensuele genoegens en vrije tijd (otium) te genieten als, voor de koning, om het land efficiënt te besturen (negotium), zodat er een balans ontstaat tussen otium en negotium.

Conclusies en perspectieven

In hoofdstuk zes wordt het landschapsontwerp van Sigiriya vergeleken met voorbeelden uit de West-Europese landschapstraditie door het ontwerp te abstraheren. Uit die vergelijking blijkt dat het landschapsontwerp van Sigiriya en die van de Italiaanse villa's uit de renaissance een groot aantal ontwerpinstrumenten gemeen hebben. Daarnaast treffen we in Sigiriya ontwerpinstrumenten aan die ook zijn ontwikkeld door de ontwerpers van Franse baroktuinen. In Sigiriya zijn echter ook ontwerpinstrumenten gebruikt die het ontwerp een andere typologie geven dan die van westerse ontwerpen. Dit onderzoek bewijst dat Sigiriya kan worden geïnterpreteerd als een volwaardige landschapsarchitectonische compositie. Het is mogelijk gebleken om een aantal essentiële elementen te identificeren die een actieve rol spelen/speelden in de ruimtelijke werking van het ontwerp (actief ontwerpelement). Het landschapsontwerp van Sigiriya vertoont een sterke formele samenhang tussen verschillende elementen en lagen uit de compositie, die elkaar aanvullen en versterken. Daardoor ontstaat een architectonische compositie die bestaat uit meerdere belangrijke ontwerp- en betekenislagen, met zowel algemene als zeer specifieke (unieke) landschapsarchitectonische elementen, aspecten, kenmerken en kwaliteiten.
De bevindingen van dit onderzoek stellen ons in staat het landschapsarchitectonische belang van Sigiriya op waarde te schatten en een aantal suggesties te doen met betrekking tot het behoud, de presentatie en het beheer ervan. Verder komt uit dit onderzoek naar voren hoe effectief de gehanteerde methodologie is bij het verkennen van de rijkdom van de compositie van het landschapsontwerp van Sigiriya. Dat een methodologisch kader dat hoofdzakelijk is ontworpen voor de studie van Europese tuinen en landschappen ook zijn vruchten afwerpt wanneer dit wordt

toegepast op Sigiriya, een archeologische locatie uit het verre verleden, ontstaan in een Zuid-Aziatische culturele context, duidt erop dat dit methodologische kader universeel toepasbaar is bij onderzoek naar landschapsontwerpen. Uit dit onderzoek blijkt dat een bijdrage is geleverd aan de verdere ontwikkeling van de bestaande onderzoeksmethodologie door de daarbij horende analytische instrumenten te verfijnen en de methodologie aan te vullen met nieuwe instrumenten voor analyse en ontwerp.

Daarnaast heeft de voor dit onderzoek aangepaste methodologie een kader heeft opgeleverd voor onderzoek naar de andere historische tuinen en landschappen van Sri Lanka. Op termijn zal dat inzicht verschaffen in de typologische aspecten van een mogelijke Sri Lankaanse traditie in het landschapsontwerp, waarmee antwoord wordt gegeven op de vragen die aan het begin van dit onderzoek zijn gesteld.

Curriculum Vitae

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1963: Born in Colombo, Sri Lanka
1981-1984: Undergraduate studies (B.Sc) in Built Environment at University of Moratuwa, Sri Lanka
1986-1987: Postgraduate studies (M.Sc) in Architecture at University of Moratuwa, Sri Lanka
1989-2009: Project Manager, Assistant Director and Director Conservation at Central Cultural Fund, Sri Lanka
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1995, 1996, 1999 & 2003: Research Fellow, Faculty of Architecture, Delft University of Technology, the Netherlands
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2000: Expert of the ICOMOS for the Evaluation Mission to She-Phoksundo National Park in Nepal for its World Heritage nomination
2004: Training course on Preservation and Restoration of Cultural Heritage in the Asia-Pacific Region conducted by the UNESCO and ICCROM in Nara, Japan
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2009-to date: Assistant Secretary General of the National Trust, Sri Lanka
2009: Expert of the ICOMOS in the joint UNESCO/ICOMOS Reactive Monitoring Mission to World Heritage Site of Paharpur, Bangladesh
2010: Resource person and lecturer for Advance Course on Conservation and Restoration Techniques of Traditional Architecture for the Asia-Pacific Region, organized by the UNESCO in Suzhou, China
2012: UNESCO's international expert resource person to provide technical advice to Myanmar's Department of Archaeology in preparing management plans for the World Heritage nomination of Pyu Ancient Cities in Myanmar

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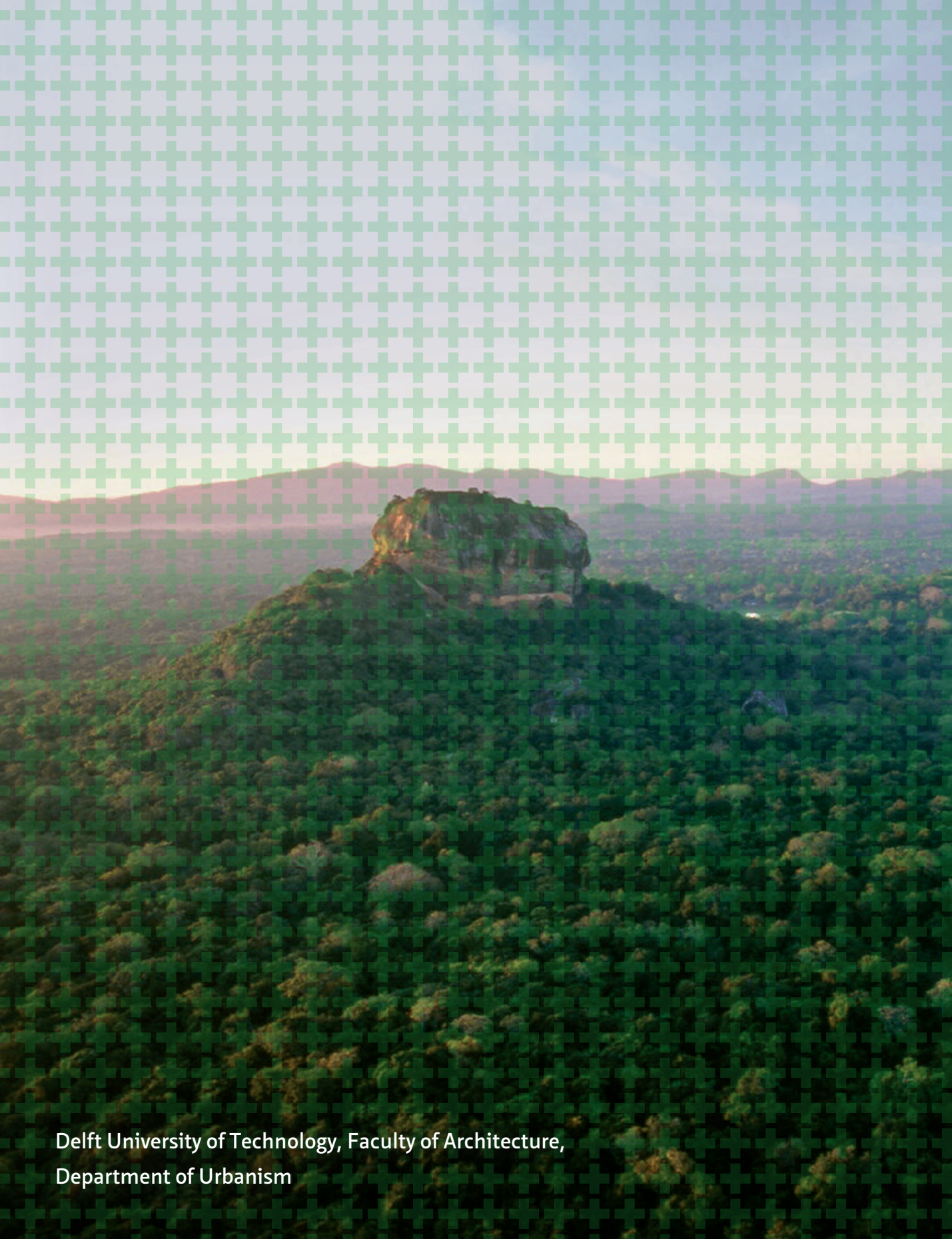

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