The Architectural World of India

India is one of several countries that had a strong impact on Le Corbusier. The Indian Subcontinent contains a variety of regions and has enjoyed a diverse history over the last 4500 years. Relationships between humanity and nature have been both harmonious and affluent. We may observe a multitude of architectures that express the cosmological blessing of the diversity of life. On the other hand, we may also envisage India as an epitome of the problematics of the modern world. India may therefore be conceived of as containing examples of everything.

In this issue, Indian architects and researchers, including B. V. Doshi and A. Raje, the fathers of modern architecture and architectural education in India, and George Michell, a well-known researcher on the subject of Hindu architecture, together with various Japanese architects and researchers provide us a glimpse into the diverse architectural world of India.

As interest in South Asia is increasing, and this year marks the 50th anniversary of the establishment of diplomatic relations between Japan and India, we hope that these timely articles will provide readers with an opportunity to consider both the origin and future of architecture through the architectural dimensions of India, without being restricted by the frame of national boundaries.

The English version of the articles in this feature on Indian architecture will be available for viewing at the following web site a few months from now :
http://news-sv.aij.or.jp/jabs/s1/sub3-2.pdf


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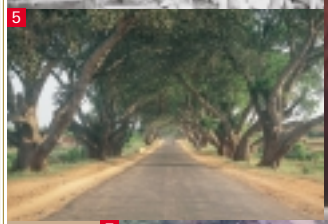
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AN INTRODUCTION TO THE SPACE, FORM AND MEANING IN INDIAN ARCHITECTURE: The Mountain, Water, the Earth and Architecture

By Terukazu Nii and Vasanti Menon Nii, Architects

The unending invasions of the Indian sub-continent and the mingling of people has ample evidence in the existence, on the Indian sub-continent, of various languages of Aryan, Dravidian, Austro-Asian and Tibet-Burmese origin, further divided into different languages. Over its vast geographical expanse, with links stretching across 4500 years, different cultures interwove, the diversity and co-existence of different cultures brewing into a vital energy.

It is said that to explain Hinduism as a generally understood "religion" is difficult. Evolving from Indian culture, its social organization, customs and system of production, and by even influencing deep inner sentiments, it has become a general term conveying a complex cultural entity. With the end of the Indus civilization, probably supported by the Dravidians, the local faith, with its roots in the Indus civilization, and Brahminism of the Aryans fused to create the foundation for Hinduism. Later, as a spiritual revolution Buddhism and Jainism were born, and time saw the inflow of Islam. In a history where outsiders came to be settlers of the Indian sub-continent, the English were a sole exception.

When travelling, one comes across large trees sheltering shrines and various animals, like langurs (monkeys) and squirrels, colorful parrots and peacocks, humped bullock and camels, wild boar and goats, some even spilling onto the road. Living means the co-existence of diverse forms of life. A rich food chain exists and the notion of everything being inter-linked in an all-inclusive cycle can be strongly felt. An understanding of Nature as an organic whole in which existence and phenomena is a repetitive process of life and death; or the cosmology that unifies Nature inside and outside all life - these can actually be comprehended from the relationship between the river, the mountain, the Earth and man. Even when everything has perished and time has passed, great architecture still conveys a cosmology, which has been partially outlined here.

THE INDUS CIVILIZATION

Besides Mohen-jodaro and Harrapa, the valley of the Indus River nurtured many cities. The ruins of Dholavira, located where the dried up river of Ghaggar-Hakra (Saraswati River) flowed into the marshland of Kutch, were made public two years ago. These cities did not have royal graves or palaces or shrines, but planned residential districts, granaries, factories and workshops, water tank and community hall, planned within a well-equipped gridiron street network; cities with a high level of administrative faculty and public sense. Particularly amazing is the drainage and sewage treatment system. Even in the case of Lothal, with its large harbor where ships from the Arabian Sea moored, individual septic tanks that drained into a planned underground drainage system were constructed (photograph 1), treated water probably returning underground or to the sea. Here there was a consciousness towards water that went beyond sanitary concerns. The ruins of the city show liberally used burnt brick. While on one hand, compared to the present day brick they are of admirable strength, on the other hand, like the other three great civilizations, its forests having vanished, it is a desertifying region.

THE COSMOS AND THE CENTRAL AXIS (AXIS MUNDI)

Around 1000BC, a city- civilization evolved along River Ganga. Yet, from Vedic times, by constructing a cosmic model, architecture had already taken upon itself the role of conveying a non-manifest world. Going beyond the simple animism of seeing the Natural world as a

living body, the ancient Indian saw the natural world as having mutually the same form and function relationship as in the human body, and the same cosmic composition as in Man.
From the Indus period, the tree and water were worshipped. In the Vedic times, two concepts, one of 'skambha' (a column) being the center of the Earth, and the other of a cosmic vertical axis linking the earth and sky, fused giving rise to the veneration of the tree. The tree offers blossom and fruit, purifies air with oxygen, induces rain, provides shade, a home and nourishment for man and other living beings, and heat in the form of fuel. It matures, replicates and completes a regenerative cycle. Thus, from ancient times the fact that the tree was considered a symbolic cosmic axis can be understood. Circumambulating around the tree as a form of worship became the prototype for the 'chaitya' (venerable object) or temple.
One of the legacies of Buddhist architecture is an ancient Buddhist temple complex located in Sanchi (drawing 1, pageOO). The pagoda ('stupa'), for consigning the remains of Buddha, originated in the burial mound merging with the cosmic axis, and in form represents the Sumeru mountain that supports the sky. Around this form ran a magnificent fence, protecting the holy domain. Moving clockwise around the circular form, the worshipper becomes one with the spiritual cosmos the 'stupa' symbolizes. On four 'torana' (portals) defining the four cardinal directions, as a picture scroll, Buddhist tales are highlighted in sculptural relief inlay, overflowing with the power of life. In one such depiction, Buddha has been symbolized by the Bodhi tree, around which animals have gathered (photograph 2). Denying animal sacrifice and self-centered humanism, it lauds the dignity and co-existence of all living beings.
In early 5th century, free- thinking individuals became active, bringing about a revolt against the supremacy of Brahminical rituals. About the same time as Buddhism, Jainism also was born. It preached non-killing (taking no life) and ahimsa (non-violence), which strongly influenced particularly Gandhi. In the 'pols' (commonly owned, high density housing districts with organic street spaces) of the walled old city of Ahmedabad, where many Jain followers reside, in the center of its open spaces, 'chabutri' are often constructed (photograph 3, page OO, OO). This tower offers fresh food and water to the birds, driven away when the forests vanished with the building of the city. Meant as a tree, a cosmic pillar has been erected, a symbolic expression of awareness of the pain caused, resembling a gesture of mitigation for damage incurred from development.
The Indian highway has unpaved tracks along side for animals & cattle, rain- water draining underground and into water canals on either side, trees forming a canopy overhead (photograph 5). Trees are also located at the core of courtyard houses in the settlement of Datia, (photograph 7). In the shade of the tree, with pleasant breeze and sunlight, looking for food and rest, man and animals gather and interact without barrier, giving rise to a rich exchange between man and Nature (photograph 4, pageOO).
The interior space of the Hall of Private audience in Fatehpur Sikri is remarkable. Sikri is the international city in red sandstone, built by Akbar, the third emperor of the Mugal Empire (photograph 6, cover). Akbar, with the motive of integrating and bringing together various religions and cultures, reflects a diverse world- view in his city, which he built with great restraint to a human scale.
Along the diagonals of a cube extend four bridges, four advisers seated at its four ends. At the center, supported by a circular column, sits the Emperor, an arrangement allowing him to attend to different unaffected opinions from below and from all four advisers. Conceptually, it is simultaneously a tent-like space of the Central Asian nomads, a rigorous geometrical Islamic composition, a symbolic Hindu mandala with its energy center as the essence of the Universe, and the Buddhist and Hindu central axis of the Universe portrayed in its central column. The central column evolved from its formal prototype, the 'chabutri', explained above.

THE SACRED PRICINCT OF WATER

Flowing down from the Himalayas, where the meandering River Ganga changes course to north - south is the oldest living Indian city of Varanasi, continuing from 10th century BC. Along the river's western bank runs a natural low and continuous levee, its ridge and the river's water surface facing the East. Structures stand on the ridge like a continuous train, to the west of which lies the city. Narrow by-lanes from the city lead up to the ridge where one is confronted by a dramatic view of the Sun as it rises from across the expansive water surface.
Water from the ocean evaporates, confronts the Himalayas, converts to rain and wets the Earth. Thus the river links the mountain and the ocean, life circulating along with its water. At the magnificent 4.8 kilometers long 'ghat' (a stepped ablution place), man climbs down to this water descending from the Himalayas and becomes one with it (photograph 8, 9). Just as life is born from water in the maternal womb, so man returns to his mother, the river, and is reborn, pure as a new- born. Sanctified water bodies as the nuclear spaces of


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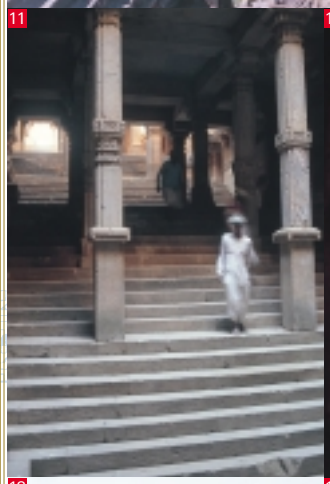
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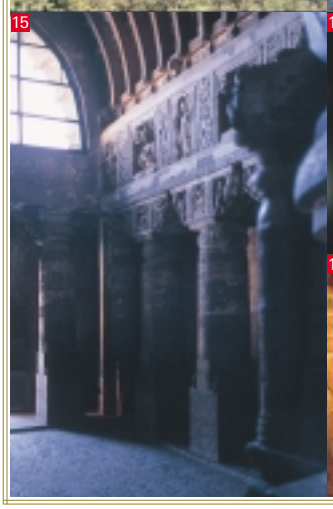
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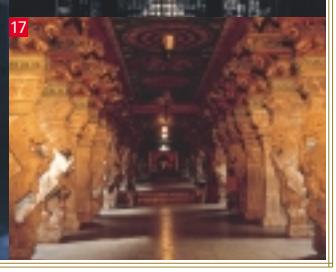
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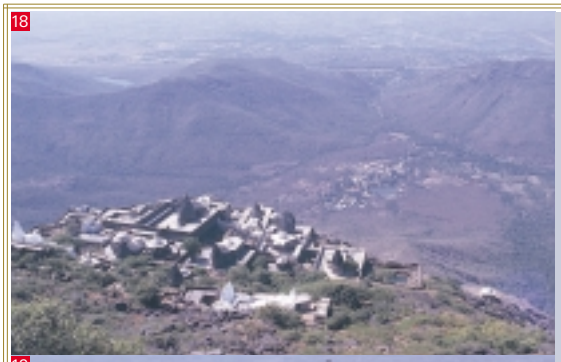
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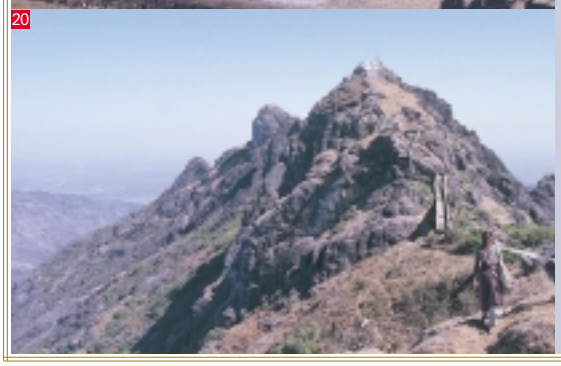
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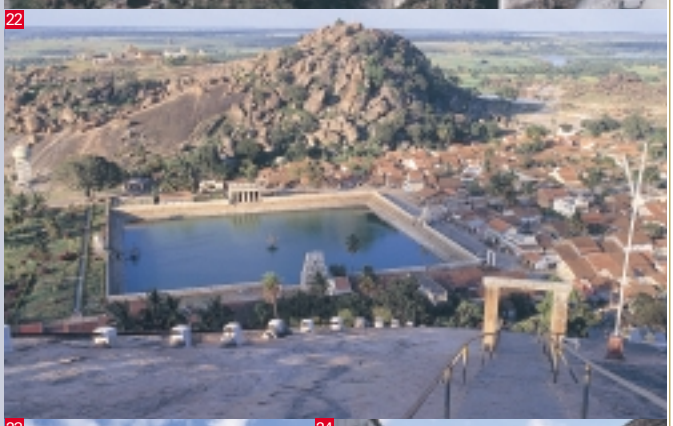
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everyday life can be seen scattered all over India.
The Vedic myth of the emergence of the Sun from the primordial ocean is suggested at Modhera's Sun temple (drawing 2, photograph 10). Along an east-west axis, the temple's 'shikhara' (tower) rises to the heavens, and facing it in a symbiotic relationship is a 'kund' (stepped tank) of water dug into the earth. At the dawn of the equinoxes, horizontal sunrays reflect over the life-giving water, and from the temple gateway, penetrate the mandapa (fore pavilion) and illuminate the 'garbagriha' (womb sanctuary). Sunlight and its shade created by the vertical facets of the walls and the horizontal steps around the 'kund' makes this union of water and the temple-mountain for the Sun-deity all the more spectacular.
Climbing down to the underground water level to venerate water are imposing step wells built around Gujarat and Rajasthan (page OO, cover, photograph 11). One is struck with wonder by the fact that there exists architecture so intimate to the people. The pilgrimage to the water, beginning from strong light and shadows, gradually leads to a tranquil and shaded underground pool, a drama of gradation of air and light. Intensely carved to the bottom of the well, variation in the water level always offers a complete experience. At a great depth in the well is carved a relief of a pair of fish (photograph 12). While referring to life and its origin, the symbolism of fish in water also expresses a total oneness or complete harmony of living beings with the outside environment.

THE INDIVIDUAL AND THE UNIVERSE: BECOMING ONE WITH THE EARTH

The Jains and the Buddhists attempt to go beyond the phenomenal world, deep into the cosmic world with architecture created and enveloped within the earth. At Ajanta, chaityas and viharas (monasteries) are cut side-by-side into live rock along a horse shoe-shaped gorge overlooking the serpentine Waghora river flowing below (photograph 13). The underlying principles of temple planning at Sanchi have been incorporated into the rock- cut forms here, the original forms of timber construction monumentalized and sublimated in everlasting stone. Frescoes and sculptural reliefs here are the basic source of eastern art. The horse- shoe shaped window above the entrance to the dark chaitya's interior illuminates the world of enlightenment, a projection of the inner world (photograph 15). As seen in an early example at Bhaja, the rock-cut temple (chaitya) may be interpreted as the womb of the earth (photograph 14, drawing 3).
The Hindu temple is overflowing with sculpture of a multitude of animals, humans and divine beings belonging to the mythological world ranging from the seas to the heavens. One sees small clusters of mountain peaks build up to a large central mountain, the symbolic Mt. Meru as the symbolic central axis of the universe. A formal and rhythmical analogy of the natural world, a homologous cosmos has been minutely portrayed (photograph 20, 21, cover).
Moreover, the complex symbolism not only expounds ways of everyday living, but also formally translates concepts of Hindu thought. One is gradually introduced into the dark, deep, non-visual inner world of the 'garbagriha' or sanctuary in the center. Drawing close, one is made aware of its radiating energy behind all the concentric visible forms. Sculpture and space, light and darkness, air and sound, the sense of touch, taste and smell, all aspects of sensory perception are aroused in the meditative process of making the individual aware of the central divine presence with which he finally unites (enlightenment) at the central sanctuary. Here is a space that prepares one to proceed beyond the phenomenal world into that of ultimate truth (photograph 16, 17).

THE MOUNTAIN TEMPLE CITIES OF THE JAINS:

The Jain temple resembles the Hindu temple, only the central Jain divinity and therefore the sanctuary often faces all four cardinal directions (chaumukh), the whole temple's spatial geometry thereby evolving in four directions (drawing 4). On the same sacred mountain sites, over centuries, time and over, architecture has been built and torn down. Consciously relating to a vast topographical scale, erection of the architecture has enhanced the inherent strength of the place, its mountains and valleys.
After a steep and tortuous climb, one arrives at the temple city on Mt.Girnar, the main complex standing on a precipice, facing the

valley and protectively overlooking the historical city of Junnagadh (photograph 18,19). Proceeding further, one arrives at a Hindu temple at the peak (photograph 20). Physical exertion from climbing brings about an acute awareness of the natural world within and without the physical body, providing mental preparation for uniting with the divine presence at the top of the mountain.

At Mt. Shatrunjaya (near Palitana), within protective fort-like walls and bastions, several hundred temples run in an 'S' shaped train across two ridges and a valley, forming a heavenly temple-city (photograph 21). The temple complex of Shravana Belagola in south India, comprises of temples located on two adjacent granite hills with the valley in between holding a man-made water tank, a vast sacred domain held together in tension atop the breathtaking scene of the granite hills (photograph 22). On one peak, surrounded by a walled circumambulatory path open to sky, is a temple, the small courtyard of which houses a gigantic monolithic 'sky-clad' statue of Gomateshwara (nudity expressing non-possession) standing in meditation. Ones' constricted field of vision so far is suddenly forced vertically up to the statue and towards the floating clouds and unlimited sky beyond (photograph 23, 24).

'LIGHT, WIND AND WATER'-THE GARDEN OF PARADISE

Without using iconography, but instead, using calligraphy, geometrical discipline and symmetrical spatial compositions as principles of beauty evolved the world of Islam. Prayer is offered in an open space facing the direction of Mecca. As opposed to confronting the center of the universe in womb-like cavernous space, open structural elements like large domes, arches and 'iwans' (partially outdoor spatial element that originated in Persia, with arched opening and vaulted ceiling) gave rise to transparent, extroverted structures that laid emphasis on outdoor spaces (photograph 27). The garden, with the sound of running water and rustling leaves, permeated with scents of the greens carried by the winds, becomes a meditative space, a very important place for meditative contemplation for the king. In the centre, as symbolizing four rivers originating from the Waters of Life and flowing in Paradise, four perpendicular water channels become the central axes in the 'char baug' (the four quadrant garden). According to Islam, at the intersection of the water channels, man meets God.

When the Mugals invaded India, encountering the local symmetrical mandala, not only did they reinforce their own compositional concepts, but by influencing one another, each developed their own sensibilities regarding architectural form, and finally produced Indo-Islamic architecture (page OO). Equipped with the arch and the decorative arch, the dome and the 'chatri' (pavilion), pillared halls and the 'jali' (perforated screen), and the masterful handling of water, Indian architecture produced unique developments.

Fatehpur Sikri expresses that under Mugal rule, whether one was Muslim or Hindu, everyone was equal, an unrelenting effort pursued by the lofty-minded and liberal Akbar (drawing 5, cover, photographs 25~9). Released from the compositional techniques of mirrored symmetry and severe geometry, Islamic architecture henceforth puts heart and soul into developing the free plan. With many focal points and courtyard spaces, adapting to the rise in the topography and shifting axes diagonally, an order in its very characteristic orientation has lead to a brilliant layout for the complex. Without strong controlling axes or symmetrical layouts, the spaces have no ranked hierarchy in their interrelationship. Enhancing undulations of the terrain and forming a series of views and change in scene, its meandering paths of movement always invite surprise. Here, various classical styles like Islam, Hindu and Buddhist etc, provincial styles as in Gujarat and Kashmir, architectural styles of neighboring countries like Turkey and Persia, all fused. The Hindu and Islam master craftsmen and builders bound together various worlds, all realized in red sandstone. The theme of the spaces are wind, water and light (photographs 25, 28, 29).

Around the same period as Sikri, in South India, the wooden architecture of Padmanabhapuram may be cited as an example in architectural diversity (photograph 30).

(English text translated by Vasanti Menon Nii)

1…As a guide to Indian architecture, are the following:
*'A Guide to Indian architecture' (in Japanese) by Takeo Kamiya,
Published by 'TOTO Shuppan'
*'Penguin Guide to the Monuments of India' (in English) by G.Michell, P.Davis
2…As an enquiry into the impact of Indian architecture on Le Corbusier:
*'Le Corbusier-architecture, furniture, the person, complete travel diary' (in Japanese);
Essay on Le Corbusier's works in India, by Terukazu Nii & Vasanti Menon,
Published by Ex-Knowledge

BEYOND SUSTAINABLE CITIES: APPLIED STRATEGIES FOR REGIONAL AND GLOBAL SUSTENANCE

By Balkrishna Doshi, Architect

Past century can be credited with giving birth to many new ideas, visions, ways of living and working. I am sure it can also be credited with almost as many reconsiderations and revaluations of thoughts and practices. One of these is the faith in technology as the panacea of all problems of mankind and a means to human progress.

Arising from that faith in technology are the principles of modern city planning and architectural theory and practice which dominated the 20th century. These, we all know, are being revalued since last two decades and are being rejected on various grounds. At present, the city planning and architectural theory and practice, like all other disciplines, is being viewed from a holistic perspective.

This perspective is a result of the new understanding we are acquiring about the relationship of man and nature. The man made system and the natural systems are now increasingly viewed from the aspect of environmental and ecological balance. This of course has very serious implications for architects and planners by way of resource conservation and energy efficiency of the built environment. As I understand, 40% of the world's energy consumption is governed by architects' and planners' decisions. For us in India these issues assume a serious dimension. This is owing to the size of the country and the large population. We are now more than a billion. These numbers are taking a great toll of the resources and environment of India, with very little effort made for conservation or regeneration of natural resources.

When we read our ancient literature we find the country generously gifted with forests. It was a civilization based on the forest, agriculture and industry. All the crafts, and all those artifacts that one finds in the museums indicate a harmonious relationship between the place, the place of work, the place of living and also the place of activity. It was not only an agrarian society, but a growing society which was developing several technologies. But as the years went by, the wholesome life of the community crumbled. The man's relationship with nature and land came to an end. With science and technology man has tried to control and conquer nature. Nature is to be overcome and not worked with. With the massive industrialization of the last two centuries, the harmonious relationship between man and nature was totally broken.

India became a part of the process of industrialization under the British rule itself. As a British colony, Indians could not choose the path of development and progress they desired. Finally this opportunity did become available to them in 1947 when they gained freedom from the British.

There were a few great personalities who were important at the time of Indian independence. The central figure was Mahatma Gandhi. He always professed self- sufficiency and empowerment of the villages. He talked about decentralization and small being beautiful. While Jawaharlal Nehru, on the other hand, was extremely advanced in his outlook and he believed in large industrial empires in public sector. The third person was Sardar Patel who knew the backbone of the community i.e. the ecosystem, the agriculture, the poor man, his energy and employment. So here was a group fully aware of the many ways in which the change can take place.

When these visionaries came to power, it emerged gradually that the problems were two fold. One was the unprecedented growth of cities, the resultant issues of urbanization and the post-partition influx of migrants into the cities while the other about the pluralistic value systems emerging from the diverse socio - cultural contexts in which contemporary India coexists with the mythological India. This is not fiction but day to day life and a reality. Religion, myth, reality are all deeply ingrained in our lives and I think it is important to understand this because one cannot break religion-dictated ways of life from work or from daily notions. So one finds this schism between tradition and modernity. This paradox, I think, is very important. And this is one of the aspects of Indian life I consider a vital element to talk about.

Thus one finds a farmer buying a television so he can open his eyes and his mind to the world through this new high technology medium. His own farming practices although, may date back to ancient times. These kinds of contradictions co-exist in India.

In this kind of a situation, what could be the lessons that one can learn and where from can one learn? I think these are the questions confronting an architect or a planner in India. One of the greatest lessons that one can learn is from Jaipur. Jaipur is a city built in 1727 by Maharaja Jai Singh. Jai Singh was a statesman, politician, musician, literary person and one of the greatest astronomers of India who had built many observatories in India. He decided to establish a new city named after him and appointed Vidyadhar as its architect. He also decided to build this city based on certain profound principles that are validated even today. Jai Singh dreamt of an ideal world, the paradise. He desired to bring what is in the cosmos down to the earth, from macro to micro level.

These elements are embodied in a diagram known as the vastu purush mandala. Vastu means the environment, *purush* mean the energy, mandala means the horoscope which keeps the sum total in balance. Jai Singh believed that a sensitive habitat must achieve a holistic balance both outside and inside the biosphere, between flora and fauna. The other elements which he believed to be the backbone of the community, were religious and educational institutions, parks and gardens which would facilitate the congregation and interaction of the people.

He proactively sought to develop institutions which would promote social change and yet retain and nourish the family traditions that are the mainstay of Indian society. To achieve this he mobilized opportunities to generate employment by equipping the citizens with requisite skills. For this he invited craftsmen from many parts of India and made special neighbourhoods for them within his city. This eventually empowered the society and generated taxes necessary for the upkeep of the grand city. Even today, after 280 years, Jaipur has some of the best craftsmen of all kinds. Thus he decided to build his city on these basic tenets and principles.

At Jaipur, the temperatures go as high as 48°C in summer and winters are very cold with temperatures below 10°C. So, Jai Singh carefully considered the orientation of the plan, the goal being to get less heat in intense summer but sunlight in the winter. From these concerns he evolved an implicit orthogonal grid plan on a ridge along the east west axis of the hilly site. He located his palace around a tank. To synergise the new city he absorbed all the existing villages and religious institutions. He also developed a clear and yet interrelated organisational pattern and hierarchy of movement, activities, open spaces and house types.

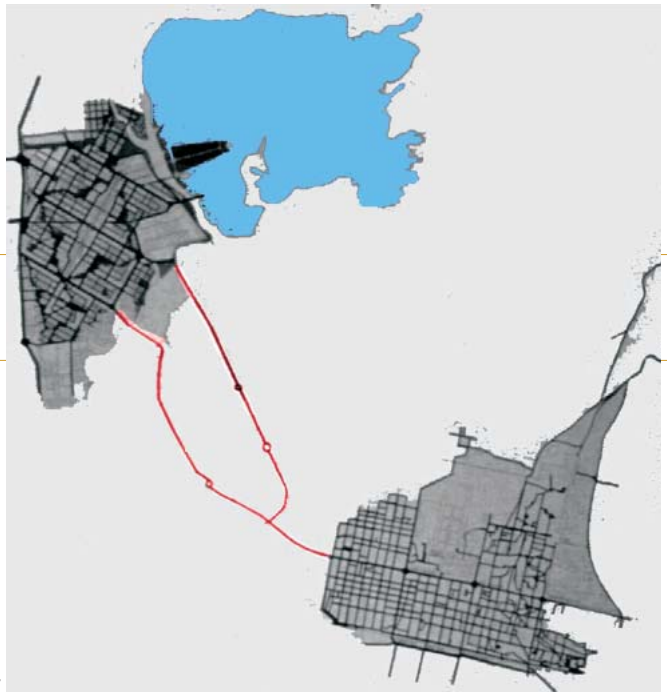
These hierarchical systems are best exemplified in the road network. The main roads are 120′ wide and form the sector boundary at the top of the hierarchy. At the lowest scale, there are 4′ wide service lanes behind individual houses. The realms thus defined, ensured a balance of the private and the public. He developed a comprehensive system incorporating every aspect of city from a macro scale to the micro scale including generic house types using local building materials.

Jai Singh recognised that there has to be unity, but diversity is essential. There has to be a control but there also have to be choices. This led to evolution of a wide matrix of building typologies that offered the citizens multiple choices and yet retained the overall coherence. A generic form was developed around which a system was developed so that a poor man and a rich man would have similar attitudes to lifestyle, living and comforts. One can see at Jaipur the many ways in which variations take place.

So all these complexities were ingeniously used by Jai Singh as assets to develop the city fabric as several layers with a sequential superimposition. As a result, the city became very homogenous. Today, I believe, Jaipur ranks amongst the greatest, livable cities of India.

VIDYADHAR NAGAR, JAIPUR

I and my colleagues had an opportunity to translate some of these lessons into practice in present times when we were assigned the planning of Vidyadharnagar about 3.5 kms north west of the parent city of Jaipur, to accommodate over a hundred thousand population on a 400 hectare site. The northeast periphery of the site was bordered by hills which was all forested at one time. The authorities named this project Vidyadhar Nagar after the architect of the old city. Therefore the project took another significance i.e to link the



❖Fig.1 The relationship between Vidyadharnagar, the new city, and Jaipur

❖Fig.2 Diagrams expressing the essential elements of an energy concious city.

site with the old city and reforest the erstwhile forests on the hills. In short, reversing the whole cycle of development.

Incidentally in 1978 due to deforestation there were flash floods and the north-eastern boundary of site all of a sudden became a deep ravine several hundred feet wide. This implied intervention of larger forces, forces of nature at work. Hence our fundamental premise was to develop this project as an energy conscious city that is in-built with resilience to the greater forces of nature.

In this context, what would be the elements that one follows? The determinants were recognised as the climate, that is the sun, the moon, the water, the city gates and more importantly the *vastu purush mandala* which would balance the whole ecosystem in relation to the man and the environs.

These issues were incorporated, by harvesting and recycling of waste as well as natural resources, to reforest the hills. Therefore all the water used by more than 100,000 inhabitants of Vidyadhar Nagar was to be collected at the sewage plant and treated to green the hill range and also green the city itself. An estimate showed the daily availability of 6.5 million liters of water for recycling. If half of the water is given to the villages in the area, the employment opportunities could be enhanced and the forests revitalised.

The second question was, if one is concerned about energy then one must carefully plan the transportation network. The premise here was to establish **a network which is based on the man as the measure such that no body is more than 250 m from a bus stop.** Then if the bus frequency is adequate, the tendency to use personal vehicles would be discouraged implying reduced congestion and consumption of energy. Further this network was inter linked to the green pathways to get a city form with the CBD along the pedestrian networks. From this emerged an implicit organisation and hierarchy of street network and land use suitable for the cooperative housing to cater to a diverse mix of socio-economic groups of people that was envisaged in the new city.

Having cast the basic city form, I reverted to the built form to seek inspiration from the principles of courtyards and open spaces and trees and gardens. One idea was to create a variety of open spaces, such as the courtyard, the terraces and balconies over looking the gardens to eventually evolve a street as a cluster of houses with courts, gardens and public buildings, a system which is suitable and valid in today's times in terms of the demands of privacy, vehicular access, etc. An energy efficient system that ensured that people consume less commuting time and less energy in cooling their houses with an appropriate orientation giving less sun in summer and yet assuring the sun in winter and the cool breeze in summer.

Since the scope of our work for the project was limited to preparation of the master plan, images were generated of the new city to simulate its urban form with the best of the vernacular and the modern, to make it a place to arrive. A city centered by a retail arcaded bazaar and activity spine, with generous open spaces and trees, with an eclectic mix of energy-efficient house types harnessing resources in the traditional spirit like recycling the rain water collected in a tank in the courtyards in the months of summer.

❖Fig.3 Vidyadharnagar, (left) Concept (right) Masterplan

ARANYA, INDORE

The other project at Indore further articulated the built form to its micro scale. Aranya- low cost housing project concerns with the residential development and social amenities for forty thousand urban poor previously living in slums. To better understand their habitat, extensive studies of existing settlements were undertaken. These included both slums as well as traditional, vernacular neighbourhoods.

Among the traditional neighbourhoods studied some were from Ahmedabad. In the old city of Ahmedabad the pattern of the built-form and the pattern of life are most integrated as a whole. This is the same at Jaipur with similar kind of houses, clusters and neighbourhoods. This is a medieval form. Every neighbourhood here, known as 'pol', has a gate to mark its entrance and territory. In times of crisis, with the closure of the gates, the neighbourhoods function as self-contained settlements capable of sustaining for months together.

A study of these neighbourhoods demonstrated how a variety of spaces emerged from few basic principles of unity and diversity. All the houses have courtyards yet none are the same, though all are similar. Every house has an implicit organisation of public and private spaces. The intent of this hierarchy of spaces was to appoint the private domain for the family, the semi-private domain as the street interface and the most public domain for the whole community, where marriages, social activities, even economic activities could proceed. This sequence has been always practiced and is still valid.

In slums, on the other hand, people, usually migrants, encroach on any available land and then begin to build on their own. There is a conspicuous absence of a formulation of the public and private domains in such developments. All spaces are utilized by the family and the domestic life goes on outside as well as inside. So the living room is very much outside. At every strategic spot, one finds trees with a platform which holds a market, a festival, a music session and many such community events. Essentially these spaces become space of social and economic activities.

The present day plans for the slums disregard this close link between the lifestyle and habitat environment. The authorities take a slum settlement, demarcate sectors with through roads and then groups of houses are divided in a checkered board pattern. Very often, the 'site and service' approach is adopted. The services, mainly the toilet is located in the front so that the sewerage is easily achieved. What the occupants do is first shift the toilet to the back and then build one room, then further add a little more with growing aspirations. These incremental additions to the house continue with changing demands. The plots are generally 20 to 30 m. with an access, connection to sewerage, water supply and electricity. So basic connections are given but the plans are made in army barracks fashion, without realizing that these spaces will never be used.

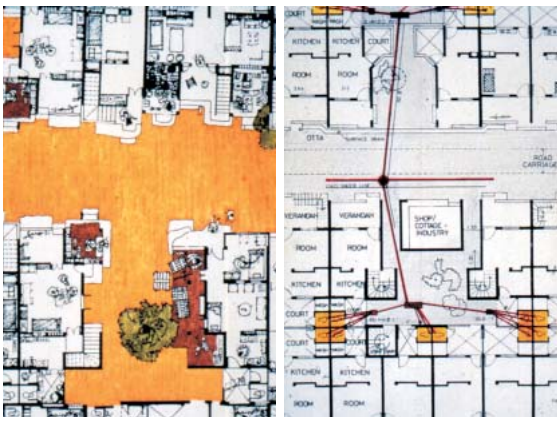
Our study of the open spaces in such projects showed that all these spaces are seldom used. Neither the occupant can afford to plant trees, nor can he maintain them. As opposed to this, the old towns like old Jaipur or Ahmedabad provide better utilised, livable hierarchy of spaces.

In such projects all the houses are self - built gradually over time depending on the income or the ability to get a loan. If the occupant has the necessary money, he builds the house with an internal staircase or has an external staircase to rent the first floor and thereby generate income. The components such as doors, windows, grills etc. are bought separately. **However, they are extremely ingenious and efficient in configuring the individual components and the spaces. These studies and observations became central to our approach in design of Aranya with a site of about 90 ha.**

The brief to accommodate 8000 families out of which about 4500 low income families would have very small houses and the balance would be larger plots to be sold in auction and money earned for cross subsidy. Our task was to plan for a community, a city of 40,000 people, very likely to grow to a total of 80,000 over the next 10-15 years.

Based on the studies of the old settlement patterns and the organisation of the open spaces, the plan for this project was evolved. The green areas and pedestrian pathways were combined with public institutions placed along them. This network was complemented by a vehicular network but with bare minimum width of streets, which were determined on the basis of studies of the existing slum settlements and an understanding of the vehicle types and their frequencies in such localities.

The major emphasis was the economies to be achieved in services since these form a large part of the cost of site and services projects. The conventional architectural, planning and engineering approaches were studied and surpassed with innovative and cost optimising solutions which



❖Fig.4 Aranya-Acluster with 1 manhole for 18 service cores

substantially reduced the network lengths to achieve about 30 % economy. From this evolved an imaginative clustering affording one manhole for eighteen service cores that dictated the organisational pattern and hierarchy of plots, roads and open spaces and activities.

Housing is a process and not a product. To demonstrate this, about 60 simulative houses were built to demonstrate the permutations and combinations of the same framework elements that would evolve from preferences of prospective occupants. These were envisaged to change or modify but the intent was to demonstrate that in mass housing where end user is anonymous, it is possible to have house form variations for personalization and sense of belonging, without losing the overall coherence. The kit of standardised elements that were employed included doors, staircases, railings and openings.

Thus, Aranya is an approach to human settlement which respects the realities and aspirations of the place and people and creates holistic development respecting the resource base of the context. It demonstrates that economics is not a constraint but rather a challenge for creative alternatives. Central to the plan was the concern for appropriate harnessing of the resources which are either being wasted or are depleting.

These very principles also transcend to a larger scale where our job as architects and planners is to evolve energy conscious, sustainable city regions or states. City for over a million, in the I.T. age, within a strong traditional context, is one such challenge we have embarked on currently.

CYBERABAD: VISION 2020

We were comissioned to prepare a development plan for the Cyberabad Enclave in August 2000. Cyberabad is part of an expanding western periphery of the Hyderabad/ Secunderabad agglomeration in the state of Andhra Pradesh. It was envisioned as an icon of the state's commitment to the sunrise information technology related industry, of global investment and the promise of hope, change and empowerment for the impoverished: a beacon of transparent governance for all - a city of the future.

Till very recently all **the attendant ills of rapid urbanization like the lack of adequate infrastructure, ad-hoc governance and general disrepair and despair of most Indian cities in the twentieth century applied to Hyderabad.** But today, a resurgent Hyderabad of the computer and information technology age is again on the global stage. Perhaps this interest is not unusual for a city with a legacy of a global city of earlier times, widely recognised as a "City of gardens" as well as exemplary town planning and design that could be attributed to its' founder, Muhammad Quli. While conceptualising the city he realized that besides the issues of location, form, structure, the urban character and the metaphysical premise of the endeavour, **the most beautiful city cannot become a growing, thriving city if the economic opportunities are not created there, and the governance to sustain them is shirked from.** Thus when the city was ready for occupation, it offered a sound economic base for the population depending on their inclination and skills. That Hyderabad rose to become one of the worlds renowned cities almost 400 years ago and continued to be the political and economic capital of the region is of course testimony to the soundness of it's planning and governance.

The lessons one derives from the eternality of Hyderabad is that the key to the emergence of a successful community is the acknowledgement and harnessing all the potentials for its growth for the development of its residents. Only then will the people establish roots, identify with the place and work diligently to maintain it, as they see their future interlinked with the place. This premise is of course linked to a fundamental attitude of interdependence, plurality, and acceptance of diversity and individual choices.

❖Fig.5 Aranya
(left) Master plan
(right) The life style

If we look at the issue of sustainable development it is obvious that ultimately it is the individual citizen who must practice it as a conscious, deeply ingrained behaviour. This is possible only if every citizen is able to fulfill his basic needs in a dignified manner. A sustainable city cannot happen and work in isolation. Sustainability implies an integrated networking of the entire network of human settlements right from that of a hamlet or village to that of a metro region. Starting from the municipality to the regional government to the federal government, the entire hierarchy of governance also must work harmoniously in an integrated and transparent manner.

With this fundamental vision of a contemporary sustainable habitat, the questions I confronted before embarking on the planning for Cyberabad were: Can cities of tomorrow give choices to all the citizens at all levels, economic and social, to attain their needs? Can this happen across the historic city, the colonial city, post - colonial city and the newly emerging peripheries. Can citizens across the board become truly enlightened and act in a socially responsible manner?

And most importantly what is the image of this future city? How are the technologies of today, eminently the ubiquitous silicon chip, helping to shape it and finally will the unique landscape peculiar to Hyderabad, of balancing rocks, innumerable watersheds and lakes remain? Will concepts of self sustaining infrastructure and best utilization of every resource, be it climate, technology, skills, movement, commerce and management better serve our cities ?

It has to be conceded that the contemporary world has beeen dramatically shaped by the silicon chip.It has ushered in a revolution of connectivity transcending time and space. With increased teleconnectivity, all of us working on our individual acts will be influenced by the rising consciousness of mega-trends whose pattern may be more clearly visible at the global level. However this very facet will also enable us to take decisions appropriate to our local social and cultural milieu. The high-tech and low-tech will not only co-exist but complement each other. The new mantra will be think globally and act locally - empowering traditional, vernacular ways and giving them equal weightage as larger multinational organizations.

In a similar manner, within a single urban region, a variety of experiences undreamt of in the past can emerge, as the urban experience in its daily and weekly routine need no longer be limited to one district similar to many others, but can open itself to the diversity of places and opportunities. Envision a whole city that comprises many places: a regional city adorned by a necklace of urban concentrations, conceived to take advantage of contemporary modes of transportation and communication, and to be fostered by them. From this emerges the new urban environment of multiple and yet diverse nuclei with an increased ability to travel easily from one center to another. This reduces our current need to duplicate services, institutions and business endlessly across the land. Improved access among individual concentrations of activity allow for centers with distinct identity derived from the specific nature of their institutions as well as their unique physical characteristics.

In the course of a single day, one could then choose to experience any one of a whole range of different types of cities and experiences. One may choose to live in dense urban centers, but have easy access to nature - or in the historic quarters, but physically connected by easy and affordable transportation to the diversified economy, social opportunities, and natural amenities of an entire region.

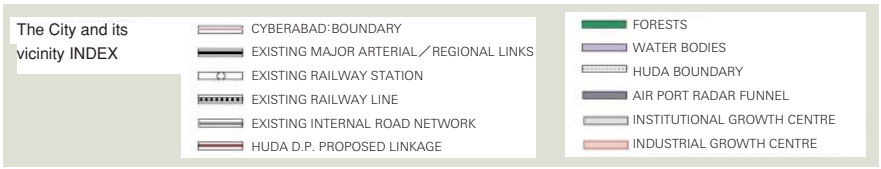
However, Cyberabad's context has to viewed through the prism of the last 50 years of development of our cities. Ad-hoc planning determined by the exigencies of the time, short term measures by both the bureaucracy and the politicians due to limited tenures and no long term accountability give way to many forces contesting the urban realm in our cities. The city then resorts to its periphery compelling the authority to service one more development by an already over stretched physical and social infrastructure. In the absence of an overall plan to guide the development, this spill in the fringes occurs in a random and haphazard manner with a growing series of slums on the edge of our cities and the inherent degradation that goes with it.

This is the situation we were confronted with in Cyberabad. All the lands earmarked for the plan were in private hands and hence a viable mechanism for land assembly for roads, parks, physical and social infrastructure became the immediate priority. Unlike landmark city planning examples of Hyderabad (1595), Jaipur (1725) in medieval times or more recently Chandigarh in 1951 which were all conceived on clear land with only geographical constraints, Cyberabad was to be assembled from fragments of yet to be developed privately owned lands. It had to run the course of a democratic process where the interests of the present and future stakeholders needed to be negotiated, where various claimants for equity contested their claims.

One must recognize that since the last decade or so, with the Indian economy fast integerating with the global economy, there is an ardent aspiration to connect and keep pace with global opportunities and transactions. This demands actions to respond to opportunities almost round the clock. With this precedent, the new vision of the city is to respond to a simultanety of many actions, easing the stress of multiple access to opportunity. The smallest gaps between work and leisure or release of stress have become random as well as accelerated. For such a situation the place of work and the place of living, recreation and culture have to be in tandem, i.e. almost parallel, so that accessibility has to be almost instantaneous. The plan must provide intermingled opportunities of work, leisure, learning and culture.

Along the confluence of the site's valleys along the watersheds and lakes evolves an orthogonal grid plan with a central cross of plazas and linear greens inter-connceting the water sheds and the lakes. This integerates the ecological systems along with the manmade infrastructure, where each adds strength to the other. Parallel to the central cross the residential sectors appear to be the most appropriate solution. This way all socio-cultural and commercial activities can not only go hand in hand but can be performed with the least amount of energy consumption. Cost effective and non-polluting public transport either bus, electric bus, tramway or a LRT will be the mode of such a transport system. Cyberabad's hilly terrain and the water bodies facilitate inter-connectivity and its approach along the major transport connections from the city, air port and the hinterland further enhance this aspect.

The future skyline of Cyberabad will comprise roofs that harvest the rain - water and trap the solar energy for heating or electric generation. The city fabric will be dense, land uses mixed just as it was in the vernacular practice but will now have transport based on electric or solar powered buses, encourage bicycling and pedestrians, the paint on the building will be made up of heat reflecting



❖Fig.6 Cyberabad

material and silicon wafers of photovoltaic cells are likely to be shining on the roof. The growing world wide web will allow designers to learn quickly of innovations in solar panels or windmills or electric buses for mass transport in the remotest part of the world and apply it locally.

In the new city, communities of about 20,000 persons will live together with potential for creative development. Choices of locations, activities and their constant proximity to socio-economic institutions within the existing chaotic development provides access even to the have-nots the same opportunities which in a normal planning framework would not be possible.

Such an environmentally sustainable city within the existing context of unprecedented constraints, can be a solution which might herald a new approach to planning, i.e. linear and orthogonal city plan with control and flexibility to accommodate the existing constraints, and yet creating a new vision of a rapidly traversable garden city offering choices to grow within the available resources. I believe Cyberabad will be the positive opportunity-oriented city for all.

SUSTAINABILITY PRINCIPLES FOR BUILT ENVIRONMENT

What are these basic principles and what would be the nature of their physical manifestation has been the focus of attention in all my work. I have curiously observed both, the Indian habitat traditions and the Modern phase. The future, I have concluded, must draw on the strengths of both. The following articulates in more specific terms these strengths interpreted as the issues that future society must deal with and their implications on the human habitat.

1 From the smallest hamlet to largest metropolis, from a small village tank to a large dam, from a single plant to the largest forest, from a single individual to the largest community, energy and its application varies. It is essential that it should be used judiciously in all respect.
2 To effectively support its use, maximum elements and hierarchy of spaces used in the built / unbuilt forms must be conceived as multi-functional.
3 Since growth and change are inevitable due to changing social and economic conditions, overall form must be flexible to adapt to changing notions of traditions as well as future visions.
4 For effective development, built form should be conceived around community's life style and aspirations. Institutional buildings as engines of growth should become planning focus.
5 Communities thrive when there is a sense of identity and choices of expressions, hence allowance for its manifestations should form part of both structural and institutional planning.
6 Similar to our traditional built form which encouraged individual expression within the community, planning framework must allow such freedom for a very positive interaction.
7 Security encourages growth and participation hence all buildings or spaces should be considered as interrelated, cohesive and conducive to local lifestyle. For personal and group interactions transitional elements should be provided to offer spaces and times for physical and psychological adjustments.
8 Hierarchy in various activities and connectedness of residential, institutional and administrative buildings and spaces would harmonise and minimise a sense of discord between individuals and communities.
9 Individual aspirations and resources should be directed for personal identity within the overall community framework since culture and community organizations are forever and provide mainstay for community and society to grow progressively.
10 Rapid changes in socio-cultural and economic spheres constantly modify our visions of the future. To accept and absorb new visions, our built forms must have sufficient flexibility to up-grade infrastructure, modify forms and space without diluting the essence and values.

This is the framework which must shape the nature of our habitat in the millennium to come and well beyond that. It is now obvious that all our future endeavor must be guided by the principle of sustainable development, through its precise articulation will change over time.

BALKRISHNA DOSHI
Born in Pune in 1927/Works as senior designer in Le Corbusier's atelier, Paris/ Beginning with the School of Architecture &Planning, Ahmedabad, establishes Center for Environmental Planning and Technology (CEPT) and Vastushilpa Foundation for Environmental Studies.
As an architect, educator and academician, receives the Padmashree and Prime Minister's Award from the Govt. of India/ Fellowship of the Graham Foundation/ Honorary fellowship of AIA, the Great Gold Medal for Architecture, Paris/ Doctorate, Honoris Causa from the University of Pennsylvania etc.

HINDU TEMPLES OF INDIA

By George Michell & Snehal Shah

Introduction

One of India's greatest architectural traditions is that linked with Hinduism, a religion that focuses on the worship of powerful gods and goddesses. These divinities are represented by sculpted images and emblems housed in temple sanctuaries. Hindu architecture in brick and stone begins only in the fourth-fifth centuries AD, but has developed more or less continuously ever since down to the present day.

It is hardly surprising, considering the extent of India and the diversity of building materials and techniques, that Hindu temple architecture evolved distinctive regional patterns. These are sometimes classified into two broad categories: Nagara, or the North Indian temple style, and Dravida, the South Indian style. The two temples described here, one at Khajuraho (Madhya Pradesh), the other at Tanjavur (Tamil Nadu), give the best possible idea of how the contrasting Nagara and Dravida styles had developed by the eleventh century.

These particular temples have been selected out of the many thousands that still stand from all periods of Indian history since they represent the climax of the constructional and aesthetic achievements of the Hindu architectural tradition.

In spite of their obvious stylistic differences, the temples at Khajuraho and Tanjavur conform to a set of basic principles that are bound up with Hindu beliefs and practices. Many of these ideas are set down in building manuals known as shastras, while others are to be found in ritual treatises and mythological encyclopaedias.

Such sources give verbal expression to the idea of the temple as a seat of the god or deva-sthanam, where the divinity takes the form imagined by worshippers so that contact can be made between the world of humans and that of deities. It is the formalised worship of the image or emblem of the divinity within the sanctuary that remains the focus of all temple activity. Thus, in the two temples described here, it is the linga, or phallic emblem of Shiva, that is considered the repository of the sacred presence. The linga in both these temples is housed in a small and dark sanctuary, known as a womb chamber or garbha-griha, that resembles a natural cave, being unlit, massive and devoid of decoration.

The doorway to the sanctuary, and indeed to the other parts of the temple, is considered a vulnerable threshold, and is therefore supplied with auspicious protective motifs, including lotus emblems, amorous couples, and guardian figures with weapons.

Above the sanctuary rises the tower of the temple, a symbolic mountain, capped with an auspicious pot finial. This finial is the outer sign of an invisible vertical axis that rises from the middle of the sanctuary to the summit of the tower. It is counterbalanced by a horizontal axis that runs from the outermost doorway or gateway of the temple inwards to the sanctuary, along which devotees pass in their progression towards the sanctuary. The symbolic significance of these complementary axes explains the common features of the plans and elevations of these two temples built in the different Nagara and Dravida styles.

❖Kandariya Mahadeva temple

Photo1 Temple silhouette

Fig.1 Temple plan (bottom half) Ceiling plan (top half)

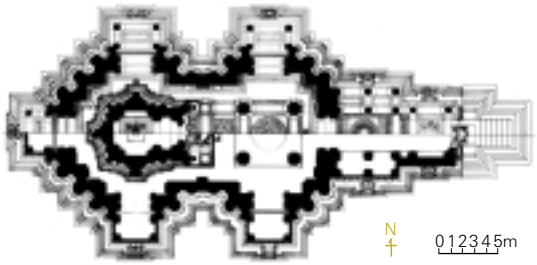


Photo2 Temple detail (Vertically ascending tiers of mythical narrative)

Photo3 Temple detail (Mythological scene of royal court life)

Kandariya Mahadeva temple, Khajuraho

Erected towards the middle of the eleventh century by one of the kings of the Chandella dynasty, this great Shiva temple represents the climax of the Nagara style, the culminating point in a long series of experiments on the part of architects as well as their patrons. The circumstances of plate, time, age and height of mastery of architecture and sculpture confirm that this is one of the unsurpassed achievements of Hindu art. It belongs to the early eleventh century, and is probably the work of Vidyadhara (ca. 1004-35) under whom the Chandella kingdom reached the height of its prosperity.

Taking its name from the word kandara, or cave, the Kandariya Mahadeva temple is the tallest monument at Khajuraho, its spire rising more than 30.5 metres above the lofty plinth on which the temple is elevated. The temple faces east and extends some 30.5 metres in length and 20 metres in width. Like other fully developed Chandella temples at Khajuraho, it consists of a linear east-west sequence of access steps, entrance porch, columned hall with side balconies, and linga shrine with encircling passageway, off which open three additional balconies. These balconies bring porches. The porches serve as balconies with high seating, bringing ventilation and light to the interior.

What distinguishes the Kandariya Mahadeva temple from the other monuments a Khajuraho is its grand scale and elaboration of design and ornamentation. Moreover, its indented plan with numerous projections and recesses create a visual rhythm, accentuated by the bright sunshine and shadow, that is carried up into the elevation of the building.

Undoubtedly, the glory of the temple is its lofty curving tower, crowned by an amalaka, or ribbed circular motif, and pot finial, against which cluster miniature versions of itself to create a mountain-like profile. The component towered elements of the Kandariya Mahadeva expand outwards from the core shaft to create a dramatic geometric massing that is unsurpassed in North Indian architecture.

Equally significant in the overall conception of the temple is the sculptural treatment of its outer walls, which are covered with images of the god Shiva, to whom the monument is dedicated, in the company of consorts, attendants and lesser divinities. Important among the images here are the non manifest-manifest aspect of the god, including those who subdues the blind demon, the cosmic dancer, and the destroyer of the triple demon cities. The sculptures are arranged in three tiers on the outside, amounting to no less than 646 figures in all, not counting the 226 figures of the interior. The famous erotic groups for which the temple is well known are placed on the juncture of the walls of the mandapa and the passageway surrounding the sanctuary, marking one of the most ritually vulnerable parts of the monument. Among the other images are those of female deities, such as the seven mothers, let alone the countless apsaras, or heavenly maidens that attend on the gods, and who are shown in alluring postures that reveal the mastery of the Khajuraho artists in rendering female contours with conscious sophistication and exuberant grace.

Brihadishvara temple at Tanjavur (Tanjore)

Completed only a few years earlier than the Khajuraho temple, in about 1010, this equally imposing Hindu monument is also considered to mark the climax of a building tradition; in this case, the Dravida style of South India. The patron, Rajaraja, was one of the most powerful kings of the Chola kings who governed much of Tamil Nadu in the period between the ninth and thirteenth centuries. This particular ruler's personal involvement in the construction of the monument is recorded in inscriptions that cover the granite basement. They mention Rajaraja gift of a golden pot finial, as well as the large numbers of persons employed in the temples rituals.

Originally dedicated to Shiva under the name of Rajarajeshvara, the Tanjavur temple stands in a vast rectangular compound, entered on the east through a towered gateway known as a gopura. This entrance structure is aligned with the temple itself, the core of which consists of a square linga sanctuary surrounded by a passageway on two levels. Windows on three sides admit light into the passageway, while at the same time giving expression to the luminous energy of the linga radiating outwards. The shrine is approached from the east through a vestibule with side doorways reached by flights of steps. Further to the east are two spacious columned halls, intended for congregational gatherings and public ceremonies. Subsidiary shrines for other divinities, including Subrahmanya and Ganapati, considered the sons of Shiva, and Nataraja, the dance form of Shiva, stand freely within the compound.

Undoubtedly, the most impressive aspect of the temple is the square tower that rises some 66 metres above the ground, directly over the sanctuary. This is built of granite blocks laid without any mortar, cantilevering inwards and hollow on the inside. The tower is carried on walls divided into two storeys, each marked by basement mouldings with animal friezes, pilastered walls with sculpture panels, and overhanging eaves, the upper storey being completed by a parapet of model vaulted roof forms. The walls are rhythmically divided into alternating recesses and projections, the latter punctuated by niches to house carved images of Shiva in different aspects, including Nataraja. They are replaced by guardian figures brandishing clubs beside the window openings in the middle of each side.

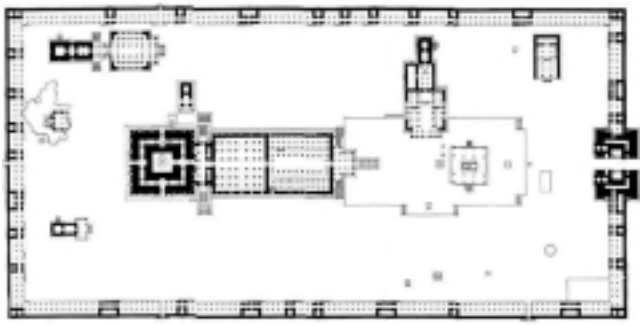
The tower above is a steeply pyramidal composition of thirteen storeys, each with pilastered walls and a parapet of model roof forms, diminishing gradually in scale to create an impression of limitless height. This notion of a multi-storeyed pyramidal tower is, in fact, an essential feature of the Dravida style, dating back to the earliest South Indian temples of the seventh and eighth centuries. Here, the storeyed tower is extended to create a monumental superstructure of unprecedented height and grandeur. At the top is a massive octagonal-to-dome roof, once though to consist of a single piece of stone, but actually fashioned from several tightly fitted sections. Much speculation has taken place about how these stones might have been lifted to such a great height, probably by ropes, scaffolding and sheer manpower, as may still be seen today in India. As to the architect and master masons who were employed in the construction, these remain unknown.

❖Brihadishvara temple

Photo 4 The 13-stoned pyramidal tower

Photo 5 View of the gopura (portal) and the temple

Fig.2 Temple plan



GEORGE MICHELL

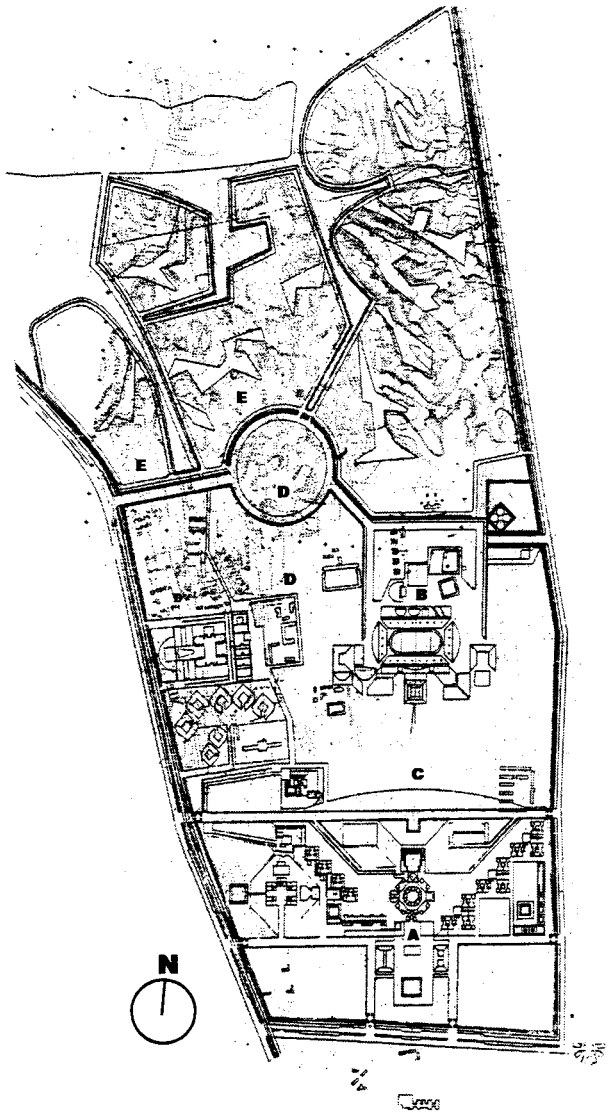
Born in Melbourne in 1944/ Studies architecture there/ Studies Indian and Islamic architectural history at London University/ Travels widely in India and, over the last 20years, has been conducting research at Vijayanagar (Hampi)/ Presently one of the most active historians of Indian Architecture

SNEHAL SHAH

Born in Ahmedabad in 1957/ Graduates from School of Architecture, Ahmedabad/ Studies History and Theory at AA, London/ Works for Mario Botta at Lugano for 2 years/ Presently involved in architectural research & independent architectural practice in Ahmedabad/ Visiting teacher at CEPT, Ahmedabad

FROM THE LEGISLATIVE ASSEMBLY BUILDING WITHIN THE GOVERNMENT CENTER IN DHAKA-BANGLADESH TO THE INDIAN INSTITUTE OF MANAGEMENT AHMEDABAD INDIA. (1962-1976)

By Anant Raje, Architect



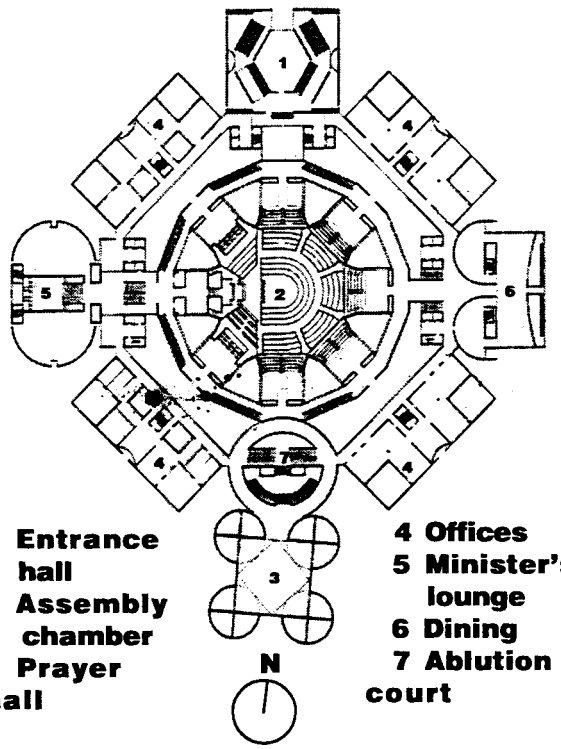
LEGEND
A Citadel of the assmebly
B Citadel of the institutions
C Public park
D Institutional estates
E Residential estates

SITE PLAN REACHING DEFINITIVE STAGE OF THE TWO CITADELS, THE ASSEMBLY BUILDING AND THE HOSTELS FOR THE MEMBERS OF THE ASSEMBLY

The assembly building is a part of a large program. The supreme court, hostels, schools, a stadium, the diplomatic enclave, the residential sectors and market all to be placed on a thousand acres of flat land subject to flood in Dhaka, a part of the delta country caused by the great rivers coming down from the Himalayas to the bay of Bengal. The entire plan of the government center has come out of a belief that the motivations of religious thoughts are communicable and that men came to assemble to touch the spirit of commonness. Kahn also thought by observing the way of religion in the life of the people in Dhaka, that a mosque woven into the space fabric of the assembly would have an effect on the transcendental nature of assembly. In keeping with the belief Kahn brought together the assembly building the mosque, the supreme court and the hostels for members of the assembly creating an ensemble with an independent value within the entire group calling it the 'citadel of the institutions', and the 'citadel of the assembly' and their interrelated nature suggest a completeness causing other buildings to take their distance. The two citadels were arranged on a common axis. The related buildings of the assembly as an intellectual entity are placed on the axis facing the 'citadel of the institutions' other than the assembly.

The core of the assembly building is of course the octagonal assembly chamber with the light shafts bringing the natural light down. The shafts are pulled up framing an important skyline with the circular openings almost 'cyclopean' in proportion. Indirect light from over the structural roof above the

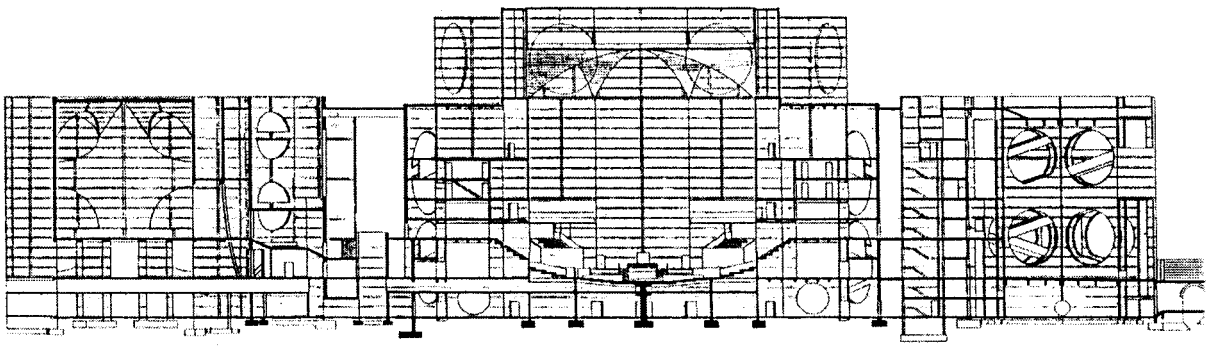
THE ARIEL VIEW OF THE ASSEMBLY BUILDING WITH THE HOSTELS.



PLAN OF THE ASSEMBLY BUILDING AT ENTRANCE LEVEL INDICATING THE TILT OF THE MOSQUE TOWARDS THE RELIGIOUS AXIS

assembly in the form of cross vaults in concrete place the entire assembly chamber in light. The assembly chamber is then the innermost building with circulation by the way of ramps and stairs around it separate it from the rest of the segments on the periphery by way of deep high gorge lit from above give the assembly chamber as a building within a building. The outer periphery is made up of offices, dining halls, conference rooms, meeting rooms, elevator and stair lobbies all within the nine to ten storey building volume. The vertically stacked office blocks are lit through high porches at the corners. In Kahn's works the porches are offering to the sun to cut the glare of harsh sunlight.

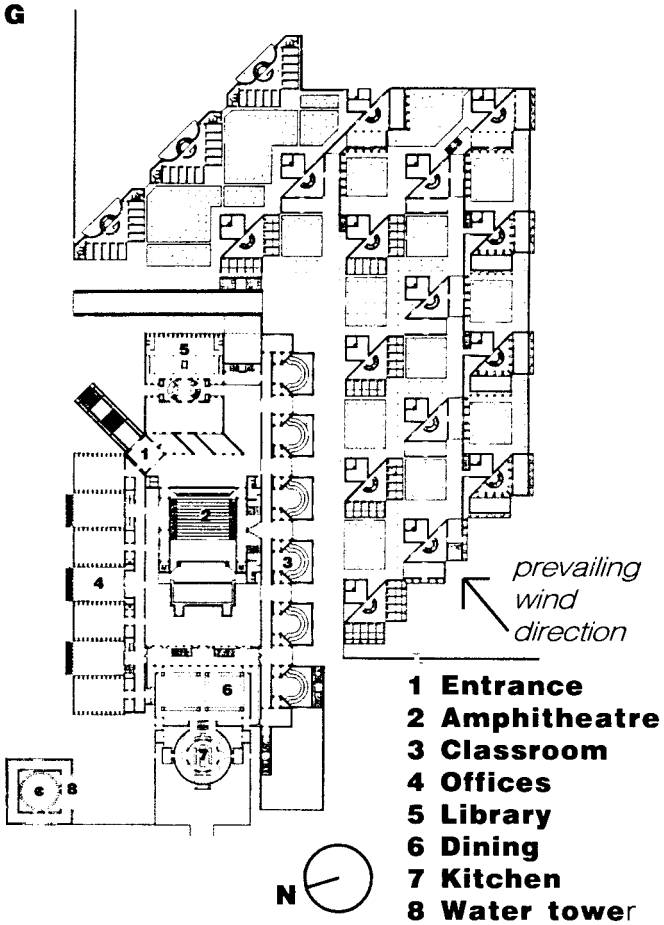
The prayer hall on the southern side is approached by huge ramp. The main entrance to the assembly is located in front of the presidential square which rests on the heavy brick walls, arches and pilasters, all bringing in the echoes of ancient roman construction of Hadrian villa and the baths of Caracalla. A complex circulation plan underneath the assembly building approached through porches made for vehicles under the podiums sorts out entrances to the various spaces provided above.



SECTION THROUGH THE ASSEMBLY BUILDING WITH THE PRAYER HALL ON THE LEFT AND THE ENTRANCE ON THE RIGHT. CROSSS VAULT ROOF OVER THE ASSEMBLY CHAMBER IS VISIBLE.

A VIEW OF THE CROSS VAULTS PLACED OVER THE ASSEMBLY BUILDING

A NIGHT VIEW OF THE ASSEMBLY BUILDING



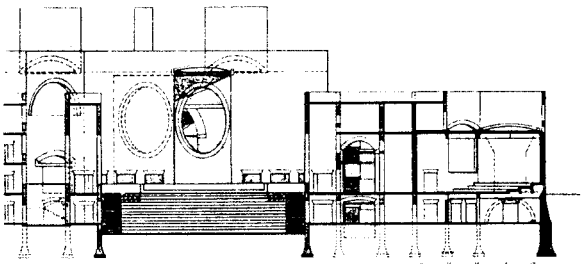
DEFINITIVE PLAN OF THE SCHOOL AND DORMITORIES . AMPHITHEATRE IS DELETED IN THE FINAL CONSTRUCTION AND THE DINIG HALLS SHIFTED TOWARDS RIGHT IN FRONT OF THE DORMITORIES TO KEEP THE LOUIS KAHN PLAZA OPEN

A lake dug up facing the citadel of institutions bringing the hostels at its edge help mark the positions of the institution buildings and takes their distances from the assembly building.

The presidential plaza facing the lake is a major civic element and with the gardens around has become a meeting place for the people. The entire assembly building is made in poured in place fair face concrete with inlay of white marble strips on the inner and outer surfaces to mark the joint between the lift of formwork. The joint has become an ornament. The gray concrete with white marble strips has brought about a haze softening the building mass and its outline, from a distance on the flat horizons, reminiscent of the ethereal quality of the Taj Mahal in Agra – India – both images have a touch of eternity.

The Indian institute of management at Ahmedabad- India is spread on a flat site of 66 acres. The program called for a campus comprising of school building, library, faculty research offices, administrative areas, student dormitories, faculty and support staff housing with sport facilities, dining halls. In all 500 students, 70 faculty members and around 400 supports staff with their families form a neighborhood with bank and post office facilities.

The dormitories and the school building are grouped as one forming a citadel with a dug up lake in an 'L' shape to separate the school and dormitories, from the faculty residences, creating a psychologi-

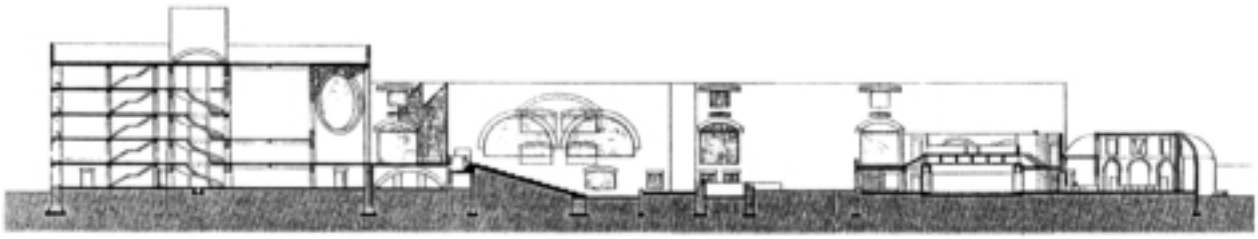


CROSS SECTION THROUGH CLASSROOMS, PLAZA AND A PART OF FACULTY RESEARCH OFFICES LOOKING TOWARDS THE LIBRARY ENTRANCE

cal distance between the two. A loop road off the main street gave access to faculty residences and the other one brought the visitors traffic to the school entry.

It is a way of life as it was, had a far reaching significance of common acceptance no matter how humble, but the way of living asked for the right of privacy.

As in Dhaka assembly in the government center, the " brise soleil " at IIMA buildings became porches in architectural terms. Porches are considered as rooms. The porches as screens



LONGITUDINAL SECTION THROUGH THE LIBRARY, PLAZA AND THE EARLIER PROPOSAL FOR THE STUDENTS DINING HALL

A VIEW OF THE CORRIDOR OUTSIDE THE CLASSROOMS.

A VIEW ACROSS THE LAKE TOWARD THE DORMITORIES.

became exterior walls, which protect the interior building from sun and rain.

The architectural design order is consistent throughout by using brick masonry bearing walls and concrete as a restraining member containing the thrust thrown by the arches used over openings. The restraining member keeps the arch from pushing out and brings it back into the wall. Kahn calls this a composite order. Brick was used for walls and support and since there is no beam, because there is no column the arch became the means to have openings in the wall. The porch as said above also is an interface between the classroom and the living. This as stated by Kahn is a transitional space where living and the learning meet. Each student's room opens directly on to the porch avoiding the need to have the corridors. A meeting with tea is how students describe the porches.

The dormitories and the other residences are turned towards the prevailing wind direction assuring cross ventilation throughout the year. In hot

A VIEW OF THE 'LOUIS KAHN PLAZA'

and dry climate of the north part of the sub-continent. The inner core of the building is a court inseparable from the various spaces and has become a social meeting place. This court on a large scale is a central meeting place of the school building. A place of convocation and that of free expressions occurring by the way of events for the entire campus community. The school court named the "Louis Kahn Plaza" is an enormous room open to the sky with ambulatories forming an edge to it all around encouraging social and community participation in events throughout the year . This is the important room on the campus, the absence of which would leave the inspiration of other buildings on the campus unexpressed

Both in Dhaka and Ahmedabad, which is a major architectural event, expressed through the presence of these buildings, the memory of which has gone into history, just as the memory of Chandigarh. This to a great extent has contributed to the heritage of the country, as did the mughal and the Hindu Temples and palaces before. The new buildings may not be as elaborate and exuberant in their architectural scales and details but has certainly helped in establishing an example of not making isolated statements but making an important Historical connection where the present has brought in the inspiration of the past without any imitations.

Simply stated Kahn regarded Architecture as a model of the underlying principles that govern the universe-The forces that give it order.

This order in regulating design-
Whether humble or noble proportion
Whether a house or an auditorium
Whether a tiny opening or a great arch
Whether brick or concrete,
Underneath all this lies a simple observation:
-That a very close and compact plan not only ensures economy in space utilization, economy in structural design, economy in over all building expenditure, but a meaningful solution to building in a hot and dry climate.

ANANT RAJE

Born in Mumbai in 1929/ Graduates from JJ School of Architecture, Bombay University/ Works at Louis Kahn's atelier, Pennsylvania/ Site architect, development supervisor and liaison between Ahmedabad and Pennsylvania for Indian Institute of Management, Ahmedabad(1966-1999)/ Presently teaches and continues independent practice in Ahmedabad/ Has held exhibition of works in India and abroad/ Receives Gold Medal from Indian Institute of Architects etc

SANCHI: DESIGN OF STUPA NO. 1 - AS AN EXPRESSION OF TRADITIONAL INDIAN ARCHITECTURE

By Atsushi Nonogaki,
Assistant Professor, Nagoya University

In the birthplace of Buddhism, India, there are many important historical sites, but if thinking about Buddhist architecture is the objective, the architectural complex at Sanchi and cave architecture of western Deccan are important. Due to space limitation, only the former will be dealt with here. Among many works of architecture at Sanchi, Stupa no.1 (photograph 1), temple no.17 (photograph 2) and monastery no.45 (photograph 3) are good examples that relate the history of Buddhist architecture. Stupa no.1 will be elaborated later. Temple no. 17 (c. 5th cent. AD) has only the 'garbhagriha' (sanctum) and entrance porch but no super-structure, as an earliest example of the masonry temple architecture of India that later developed centrally around the Hindu temple. Monastery no.45 (c. 10th cent. AD), which in the inner part of vihara has a garbhagriha, the superstructure ('sikhara') of which cannot be differentiated from a Hindu temple, is the embodiment of the trend of Hindu influence on Buddhism.

Stupa no.1, Sanchi

It is not an exaggeration to say that the distinctive features seen in Stupa no. 1 (c. 3rd cent. BC ~ c. 1st cent. AD) can be comprehended as the basis of all of Indian architectural spatial expression, making no distinction between religions, the sacred or the secular. The vedikas or railings surrounding the main body of the stupa are fences used to protect the domain of sacred things like bodhi trees etc., generally called 'chaitya', a universally important spatial compositional element in India. The 'torana' (gateway) is famous for its sculptural relief depicting Buddhist narratives, including the guardian on the side-column or the figure of the nymph on the bracket etc. Its composition survives in the design of the doorway to the garbhagriha of masonry temples later on (especially in north India). Moreover, worshiping the central stupa by moving clock-wise around it along the circumambulating path in the space within the railings is also generally seen in the Hindu temple and elsewhere. The chattra on top of the stupa, which is the symbol of nobility, originates from the umbrella used to shield the noble from strong sunlight. More than religious, it may be said to be a simple form of 'consideration' of the people. The design of the Ashokan pillar in front of the southern 'torana' is the model of columns in all temples. Even the main body of the 'stupa' is not limited to Buddhism alone, and has Jain examples. In other words, the form of 'stupa' no.1 is simply not created from concepts of Buddhism per se. It already existed within the Indian socio-geographical environment, as a basic form for worshiping or venerating monuments or in the bases of daily propitious observations for good omen in day-to-day living space. The content of the sculptural relief or the storage of Buddha's bones are definitely Buddhist elements, but in the architectural design it can even be said to have none whatsoever. But once given form, as is the way of the world, it gained an independent identity and in countries like Sri Lanka, South Asia, China, Japan etc., where Buddhism spread to, it was truly accepted as the symbol of Buddhist architecture and achieved a characteristic evolution of its own. On the one hand, as a result of symbolization of the 'stupa', it lost its actual content and cultural background within India. Hence, it lost its place as the chief object of veneration to the image of Buddha, which provided more concrete possibilities and formal diversity for symbolic expression. Consequently, as serious consideration was focussed on temple architecture to house the image of Buddha, the body of the 'stupa' itself went out of use.

Most of the Indian architectural heritage before the 5th century, including cave architecture, was related to Buddhism. Though they were the fountainhead of Buddhist architecture established as such in countries that it spread to, in India, in addition to 'Buddhist related', they was also important as 'Architecture' that expressed everyday architecture via the presently non-existent wooden framework. Further, through the process of change in the material from 'wood' to 'stone', they sublimated the expression of everyday architecture into the 'traditional expression' that the later developed masonry architecture furnished, undertaking a very important role in the history of Indian architecture, as a consequence. At that point it may also be said that they were like the womb in which 'a classical form' for Indian architecture took shape.

(English text translated by Vasanti Menon Nii)

❖Photograph 1: Stupa no.1

❖Photograph 2: Temple no.17

❖Photograph 3:Monastry no.45

TRANSFORMATION OF ISLAMIC ARCHITECTURE IN INDIA-

FOCUSSING ON TOMB ARCHITECTURE

By Naoko Fukami, Visiting Lecturer,
Institution of Oriental Culture, University of Tokyo

Having to confront a harsh environment, for believers of Islam from West Asia, the fertile Indian sub-continent was a new land that would fulfil the dream of becoming rich overnight. When Islam came into existence in the Arabian peninsula in the 7th century, along the coast of the Indian ocean or by crossing the Khyber Pass, many Muslims, as armies, merchants and religious followers, came into India in search of fame and fortune. Towards the end of the 12th century, when Islam had established its administrative power in the Indian sub-continent, this tendency was severely accelerated. Hinduism and Islam, a polytheist and a mono-theist religion respectively, iconic and non-iconic, the post and beam structural methods and the true arch one, entirely two opposing traditions had to compromise on the Indian sub-continent.

From the mention of Hindu architecture, one recalls massive substance overflowing with liveliness, like the Khajuraho temple. And from the mention of Islamic architecture, one reminds rational space floating with symmetry, like the Taj Mahal. Would not it be? But if one compares the Taj to West Asian Islamic architecture, not only the material and details, but the arrangement of flanking a main building, use of free-standing towers(minarets), negligent treatment of internal spaces etc. may be seen as transformations in India. Let us focus here on tomb architecture as the Taj Mahal was.

In Islam, after death, the corpse would be positioned to receive 'the last judgement'. On the other hand, in Hinduism, the corpse would be cremated and it is thought the soul would be reborn. Hindu believers let the remaining ashes flow into the river, and naturally have no need for tomb architecture to bury the corpse in. Originally, Islamic believers needed a tomb for nothing more than placing the body, but due to common people who believed in holy persons, or rulers who held attachment to the present world, erecting splendid mausoleums came about. Yet, the Islamic tombs in South Asia are distinctively numerous. Not only in numbers, but the diversity of their form and appearance here leads anyone studying Islamic tomb architecture to India.

Why did Islamic rulers who died in India indulge in building tombs? Further, why did Islamic followers become so engrossed in venerating mausoleums for dead saints?
As the metaphor, 'The little island floating on the ocean of Hinduism' expresses, the minority of Muslim rulers, for peacefully preserving one's corpse till the day of final judgement, were probably driven by a need to leave behind a subsistent memorial within the confusion on the earth. The common people being mainly converts from Hinduism, with the same feeling as to shrines, probably venerate holy people, wishing for gain in the present world.

Islamic followers, coming into contact with the philosophy of rebirth in India, overflowing with the power of life, seemingly had but to notice the world after death or the mysterious spiritual power. The diffusion and diversification of tomb architecture may said to be one of the transformation of Islamic architecture in India.

Tomb architecture promoted by the compromise between Islamic and Hindu cultures, also influenced Hindu architecture. The Hindu royalty of the Mughal dynasty, without hesitation, erected memorials called 'chhatri'. Even though it would not hold ashes of the deceased, it took the same form of tomb architecture for Muslims and had a memorial stone like in a tomb stone, with the name of the deceased person engraved on it.

Taking just one example of tomb architecture, the exchange between Hindu and Islam gave both sides new variations. Against the continuing confrontation between Hindus and Muslims, one cannot but look back at the architectural history of both sides, once having progressed along the path of co-existence by attempting transformation on Indian soil.

(English text translated by Vasanti Menon Nii)

❖Tomb of Saint Muhammad Ghaus

❖'Chhatri' in Chanderi Fortress

For the believers of Islam, who believe in the Day of Resurrection, the tomb left on the Earth is the dwelling place after death. On the other hand, for believers of Hinduism, who cut off attachment to the corporal remains, erecting a memorial is a concrete way of linking the deceased with the present world.

❖The Taj Mahal at dawn

STEPWELLS -
COSMOLOGY OF SUBTERRANEAN ARCHITECTURE AS SEEN IN ADALAJ

By Shuichi Takezawa,
Professor, Touhoku Bunka Gakuen University

❖Looking down from ground level towards the holy well

❖From the bottom of the Earth looking at the bottom of the Sky

The step well can be considered to originate from the need to ensure water during the period of drought, and in the deep relationship of faith in the Water God as conspicuous even in the Vedas of around 1000 BC. If we retrospect further, its genesis may be pursued to the Indus civilization of around 2500BC.As is seen in the remains of Lothal or Dholavira (meaning white well), this civilization spread to Gujarat etc in India, not remaining contained within the present territory of Pakistan. To understand the step well, adding to the environmental conditions, considering it within the cultural tradition of a religious belief towards water is necessary. When touring the sites in actuality, many of the step wells were built on land under Islam. Even under subjugation, the tradition of step well building of Hindu origin continued.

Adalaj is a little village near Ahmedabad, the center of the state of Gujarat. Formally, the well here is named Ruda Vav, after its owner, a Hindu queen. It was constructed in the beginning of the 16th century.

The most numerous of step wells are simply rectilinear in plan. Within them, the step well at Adalaj has a cruciform plan. Steps from the east, south and west lead down to meet at the landing, from where the form faces northwards towards the well, steps leading further down to it. The overlap of the cruciform is the landing, a square, but stone beams stretching at 45° across its four corners cuts the sky out in an octagon. The building material of sandstone is bestowed with dense ornament.

Having descended the steps from the south, one crosses the axis formed by the steps descending from the east and the west, and continues downwards. Likewise, one descending stairs in the east turns right and one coming down from steps in the west turns left. Eventually, whichever stairs one climbs down from, man becomes conscious of all the four basic directions at the ground level and continues to physically experience them as he arrives at the bottom of the earth. Already the spatial experience begins to comprehend the world above the ground and that below it, binding them together with a cosmological meaning.

Climbing down facing the well in the interior, a continuous change of scene unfolds. Curbing the inward fall of the walls on both sides are beams stretching across, supported by columns standing between the steps. In the passage space they create a three-dimensional lattice, with the stone floor slabs running across and interrupting light. They create a rhythm of light and shade. Each step of the stairs climbing down strikes the rhythm of walking. This transmits through the entire underground, and along with the rhythm of light and shade, reverberates and spreads.

Upon arrival at the bottom, a square stepped floor descends like a funnel to the bottom-most plane, which is cut out into a circular well. Column and beam, wall and arched openings wind around the square stepped floor, forming a backdrop. The upper part of the well is a vertical space open to the sky. At the four corners of the square are stone beams stretching at 45° , forming an octagonal cut out tubular space. This framed construction continues across four strata, from top to bottom.

At the apex of the octagon are large column heads, which mediate between two adjacent surfaces to form a third surface. Looking up from the bottom of the ground to the level above ground, at the top-most strata of this deep vertical space, is visible the column heads, including which form a 16-sided polygon that is visually close to a circle. Due to this circle, within the gloom the azure blue sky is cut out with lucidity, a white cloud floating across once in a while. Here is the axis binding the underground and the sky, taking upon itself the meaning of a cosmic axis. Water lying dormant inside the earth, the Earth and water become one, and from here stretches the axis to the sky to build a cosmology of the universe.

(English text translated by Vasanti Menon Nii)

THE TRADITION AND WISDOM IN URBAN HOUSING-

HIERARCHICAL COMMUNITY HOUSING SPACES IN THE POLS OF AHMEDABAD

By Shu Yamane, Assistant,
University of Shiga Prefecture

As one walks the Indian city streets, one is engulfed by its eddy of overflowing people, animals, cars, motorbikes and bicycles, all one's senses stimulated by its heated atmosphere of colours, sounds, smells and tastes, blended harmoniously into an energy experienced by many.
The Indian city has such an intense atmosphere. At the same time, in the spaces where its people live, cultivated by a long history and repeatedly woven into its residential spaces, there still survives a hierarchical order. The 'pol' housing of the old city of Ahmedabad is one such extremely interesting example.

Le Corbusier and Louis Khan having built works here, Ahmedabad became the Mecca of modern architecture, while on the other hand, built in the beginning of the 15th century, it also is an old city with a history of nearly 600 years. The street organization is a complex network, broadly divided into three main classifications. 1) Main arterial trunk roads beginning from the various city gates, 2) Roads that divide the urban area into blocks by linking these main roads, 3) Streets that branch off into these urban blocks, sometimes forming cul-de-sacs. Within this classification, the basically residential unit, 'pol' is structured by the third rank of streets.

The 'pol' had a gate at its boundary, all roads within its interior being commonly owned and dividing it into housing clusters to form a residential unit. The word 'pol' originally means 'gate'. Within the pol, the street further branches off into smaller residential cluster units like 'khancho' (meaning 'small open space'), 'khadki'(a house cluster defined by a gate that opens into a common front court) and 'gali'(a narrow lane), the domain of each defined with a gate of its own. Often, at the point of divergence the street narrows, widening into an open courtyard space towards the interior. Further, there are instances of pols containing small pols. Existing large-scale pols contain 20 or so smaller pols. The pols' hierarchical and stratified residential community space organization offers not only the house but well and temple, shrine and community hall, in this way forming a basic unit that supports community life.

The old city centre has the Jammi mosque and the royal tombs, along which lies Manek Chowk, known as the stronghold of the Jain community. It is said that when the city was built, the Jain community, known for its aptitude in trade and finance, was invited to settle here, it now being historically one of the oldest areas. Here very typical pol organization can be seen (diagram). Interestingly, compared to the major Hindu and Islamic areas, a stronger hierarchy can be observed. Killing of life being strictly forbidden by their religion, for protection and to refrain from getting involved in the frequent Hindu-Muslim conflicts around them, the Jains probably had to develop more elaborate spatial stratification. It is impressive to note at the end of a blind alleyway the existence of an entrance to another cul-de-sac known only to the residents, for use as a refuge during emergency. Moreover, within the residential space structure, various spaces like the 'otla'(raised platform before the doorway), 'khadki'(entrance), 'chowk'(courtyard),'parsal'(front room) and 'ordo'(bedroom) are typically located sequentially from the street so that the further inside one approaches the more strongly private the space becomes.

In this way, within the pol, the street system is in keeping with the cluster unit formation, further creating a hierarchy between public and private domains, and so forming a series of hierarchical spaces. Within this system, a variety of scales of open spaces are cleverly located, ensuring a safe and pleasant living space.

❖a housing cluster enclosed by a'khadki'

❖pols of Manek Chowk area, Ahmedabad

The elaborate residential environment of the 'pol' is wisdom developed over a long period of time for the co-existence of various communities and religions in high density urban housing. It even has a strong influence on modern residential planning in India.

(English text translated by Vasanti Menon Nii)

THE SYMBOL OF BRITISH INDIA-
THE COMPLEX OF THE NEW IMPERIAL CAPITAL, DELHI

By Kiyo Iizuka,
Architectural Institute of Japan, Asian Architecture Committee member

❖The overall view from the southeast, New Delhi in1973 (all photographs by author)

❖The Assembly Hall, New Delhi in 1964

❖The North Wing of the Government House in 1964

❖North elevation of the South Wing of the Government House, New Delhi in 1964

The author first visited New Delhi in 1962, 15 years after Indian independence. Thirty odd years after tree plantation, the large luxuriant trees along the streets presented a view befitting its name of the garden city. From the British imperial times, city maintenance has continued, offering an impression of a neat, tranquil and dignified city. British imperial period customs like enjoying tea on the lawn and the English-joke were retained within the Indian life style. Then, to the east of the King's way (presently Rajpath) is the India Gate, towards the east of which is a white marble statue of King George V. Meeting this is a gentle slope leading towards the architectural complex on Raisina Hills (photo 1). Exaltation as the magnificence comes into view is a distinctive planning feature of this city.

Creating a new capital is very rare. For this purpose the Royal Institute of British Architects nominated architect Edwin Lutyens. The foremost theme regarding planning in the Indian subcontinent was coping with the severe natural environment. The second theme was how to symbolize in the architectural design of the Imperial capital, the colonial rule over a heterogeneous socio-cultural country. The former was solved by methods of garden city planning. For the latter, design of an architectural complex, namely the Viceroy's House, the Assembly Hall and the Government House, as a symbolic central core for the entire city was considered, expressing the position of British rule over India. For achieving this, co-operation from architect H.Baker was sought.

By locating the architectural complex on the rise of Raisina Hills, while emphasizing dignity in British control over India, it simultaneously demanded a beautiful view from the design. For this purpose, Lutyens weighed his plan with considerable logic, and with the awareness that it must withstand the passing of a few centuries. For an architectural planning model, he referred to the classical Greek temple architecture, the ancient Roman Colosseum, modern architecture in Europe, Akbar's palace architecture etc, in any case, all sublime architecture of the grand past. As a result, the architectural style that dominated various European cities from the 18th to the 19th century, namely, an aesthetics tending towards a bold classical revivalism was used. By minimizing ornamentation of the exterior of the whole complex, and by using stone produced in north India, formed architectonic beauty and dignity to the whole. Soon after starting construction (in 1913) , partial changes were unavoidable for economic reasons, due to the World War I .However an architectural space displaying a majestic appearance appeared on the top of Raisina Hills.

Considering British experience in India for about 180 years, the new imperial capital was planned and built over 18 years (finished in 1931). 16 years later India became independent and the British withdrew from India. The function of the architectural complex as symbol of imperial British rule of India was not altered and it became the government office of the capital of independent India, displaying the misappropriate authoritative appearance of the British colonial period.

(English text translated by Vasanti Menon Nii)

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THE *MUL CHOK*, PATAN ROYAL PALACE OF NEPAL-

CONSIDERATION FOR THE MEANING BESTOWED BY DEITIES ON THE EMBELLISHED STRUTS TO ARCHITECTURAL SPACE

Takayuki Kurotsu,
Professor, Nippon Institute of Technology

This goddess, mild in form, is the icon of Hindu Deity on embellished in the *Mul Chok*, Patan Royal Palace of medieval Nepal's *Malla* dynasty (photograph 1). Standing mounted on a lion, the Goddess holds weapons of a sword and a cakra in her hands and under her feet she is having the warrior deity (severed head of a buffalo). A gruesome scene of such a massacre is depicted. Based on the mythological tale of the slaying of Demon-King *Mahisasura* who is in the form of a buffalo, the carved sculpture can be judged as an episode conveying the mightiness of the Goddess.

The struts in the courtyard of *Mul Chok* use numerous such icons (photograph 2). At this juncture, if the icons of the Goddess on the struts may be rounded up as the major factor that design-wise distinguishes the function of each building, then what the icon has to offer to the architectural space may be seen.

If one observes the struts lining all four sides of the courtyard of *Mul Chok*, *Siva* and *Bhairava*, the *Asta-matrika* or the Eight mothers goddesses etc are depicted, the divinities being grouped together. This courtyard is one of the Hindu Pantheons, and amongst them, *Siva's* consort *Durga's* carved figurine has been amply used. This appearance is the same as the way in which the *Malla* royal family venerated their community God *Taleju*. In other words, the struts of *Mul Chok* centrally depict mythology related to *Durga*, their main guardian deity of goddess worship.

The strut is a diagonal member that supports the eaves. By sculpting divine statues here, the architectural space is solemnize (photograph 3). By inference, the *Malla* dynasty is lauding the meritorious deeds of the goddess, and by embodying figurines of the royal family's guardian deity in the main architectural space of the Royal Palace, they intended to gain the favor of *Durga*.

If one looks back into the records for the function of *Mul Chok*, it was used as a religious ceremonial space for the *Taleju* faith and the *Kumari* faith or as a diplomatic reception hall for antiwar agreements etc. Even today, with the guardian deity's rituals involving blood held here, it remains centrally important. Every year, during the *Dasain* festival, a water buffalo or goat head is cut down as a sacrifice, and the head is offered with flowers etc to the *Durga*, the blood shedding salutation being held facing the sanctuary. The icons of *Durga* are also displayed on *torana* or the half moon panel over the door leading to the sanctuary. Rituals involving blood are a way of honoring the goddess. In other words, as a religious ceremony during festivals, the mythology-based icon on the strut is materialized. Inversely, along with other Hindu divinities, it may be comprehended that due to the statue being displayed high up on the strut, the courtyard's ceremonial space becomes all the more gorgeously adorned.

In the beginning of the 14th century, along with introduction of the *Malla* royal family to the *Taleju* faith, the Royal Place of Bhadgaon established *Mul Chok* as the space for the worship of *Taleju*. Following this, God *Taleju* was introduced to the Royal palaces of Kathmandu and Patan. By manifesting their guardian deity *Taleju*, namely *Durga*, in *Mul Chok's* courtyard surrounded by struts, the royal family sanctified it and made the courtyard sublime.

❖ Icon of *Durga* on embellished strut

❖Embellished struts supporting the eaves, southern side of the of quadrangle, the *Mul Chok*

❖South side of the quadrangle, the *Mul Chok*

❖Bird's-eye view of the Patan *Darbar*. The second building in the right, with two-stories is the *Mul Chok*

The intention being to gain the favor of the supposedly powerful Mother goddess *Durga*, the architectural space of *Mul Chok* is literally the central structure in the design.

Further, the *Darbar* or old royal buildings of Nepal as an architectural complex comprised of key structural elements called *Chok*, which are architecture and the multi-storied tower (photograph 4). There are timber-and brick constructions which use the traditional building elements of Nepalese architecture as reflected in slanting roofs with deep-set eaves, roofing tiles and walls of brick, wooden struts and wooden windows embellished with carvings. The architectural can be described not only as being unique among the countries of South Asia, but also as of being of inestimable value in term of world cultural history.

References: "*Mul*" has the meaning of "principal" "root" "element" "source" "origin" in Nepalese and Sanskrit. The naming of this structure is probably connected with its importance within the *Darbar*.

(English text translated by Vasanti Menon Nii, revised by the author)

1…Nippon Institute of Technology Research Mission "The royal buildings of Nepal" 1981
2…"A Study on Quadrangle Architecture in the Old Royal Buildings of Nepal" (in Japaħese, Report of Researchers Nippon Institute of Technology, Special Issue) by Takayuki KUROTSU

THE BUDDHIST MONASTERY OF SRI LANKA-

MEDITATION SPACE OF THERAVADA BUDDHISM

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In spite of being strongly influenced by the large country of India, the island country of Sri Lanka, that floats along its southern tip, has continued to set a high value on its distinction from India as its own identity. This can be observed in the country's religion also. Sri Lanka imported Buddhism from India in the 3rd century BC, and while in mainland India, Buddhism continued to transform and finally fell to decline, Sri Lanka assiduously retained the classical Theravada Buddhism of the early period to the present day.

❖Photograph 1: Looking out from the cave monastery, Abhayagirivihara
アバヤギリヴィハーラ寺院にて

❖Photograph 2: The decorated urinal, Western Monastery
ウェスタン・モナスタリー

❖Photograph 3: One example of Western Monastery
ウェスタン・モナスタリー

The original form of Theravada Buddhism (a Hinayana sect) is to practice ascetic exercises in the forest for enlightenment. This form has been handed down to the present day. Within the ruins of the ancient capital, Anuradhapura, which prospered from the 3rd century BC, for 1200 years, here and there still remain primary spaces = caves, where monks of those times practiced meditative training (photograph 1).

The caves, without any wall between their inside and outside, any equipment within, or any carved statue, are utterly bare. The monks here had negated any anxiety about everything concerning food, house and clothing. Even for meditative training, not relying on iconography, with fervent introspective training, they pursued enlightenment. Hence, space for the monks are these bare caves.

But monasteries for meditative training are not limited to caves alone. There are more positive spaces for meditation represented in architecture. The ruins popularly called ‘ Western Monastery’ (photograph 3, old name unidentified), excavated in the western outskirts of Anuradhapura, are thought to be monasteries built around 7~10th century for monks practicing classical Theravada Buddhism in the forests. They were invited to the city by kings fearing the degradation of various temples in advanced cities. There are a total of 14 monasteries in Western Monastery and during the initial phase of excavation, their forms were so distinctive as to be mistaken for palaces. None of the monasteries have stupas or sanctuaries for Buddha's image for their worship. What they do have are some monks' residential buildings and open terraces for meditation. As if built in the mountains, they are built on a mass of exposed rock and as if along a river or lake, they are surrounded by ponds and water channels. Such an expression may be considered an abstraction of the training environment of mountains and forests of ancient monks, but at the same time it may be thought to be a symbolization of their practice of classical Theravada Buddhism itself.

In most of the Western Monastery's architecture there is no kind of sculpture or wall painting, but strangely, urinals alone are decorated with architectural sculpture and holy animals, Buddhist symbols etc (photograph 2). In no splendid temple anywhere in the capital can such profusely decorated urinals be found. Probably, so that the monks are not seduced by the splendor of various temples in the capital, to cultivate a spirit of denial towards them. their impure urinals was made gorgeous. In the 'Western Monastery', the toilet was not just a place for excretion, but also a place for meditative training, a place for establishing the identity of one's own sect to oneself.

There were many forms of Buddhist temple building in ancient and modern times in Sri Lanka. A monastery for meditation, of course, is rare and may be considered special. But in this way, having eliminated various elements and relating to the Nature outside, spaces of monastic architecture are being appreciated by a few modern architects and are being adopted in their residential and other works.

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