

THE HISTORICAL DEVELOPMENT OF DOMESTIC
ARCHITECTURE IN INDIA

By

LYDIA ETTA SONDHI
"

Bachelor of Science

University of Missouri

Columbia, Missouri

1970

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
MASTER OF SCIENCE
May, 1972

Thesis
1972
S698h
Cop. 2

NOV 13 1972

THE HISTORICAL DEVELOPMENT OF DOMESTIC
ARCHITECTURE IN INDIA

Thesis Approved:

Christine X. Salmon

Thesis Adviser

Homer D. Kinney

Leevera Pepin

D. Burham

Dean of the Graduate College

830915

PREFACE

This thesis is concerned with the historical development of the domestic architecture of India. Much research relating to India at the Library of Congress in Washington, D.C. and the library here on the Oklahoma State University campus revealed the fact that domestic architecture in India has never been fully covered. Therefore, this thesis at some points is sketchy. However, a sequel to this study is expected after an anticipated field study in India.

I would like to take this opportunity to express my thanks for assistance and guidance given by my thesis adviser, Mrs. Christine Salmon, Associate Professor, Housing and Interior Design. I would also like to thank Miss Leevera Pepin, ~~Assistant~~ Professor, Housing and Interior Design, and Dr. Florence McKinney, Chairman, Housing and Interior Design, for the time they gave me to be on my committee.

The knowledge and interest of my typist, Mrs. Anna Gleason, is indeed greatly appreciated. Deep appreciation is extended to my husband, Vijay, for his willingness, understanding and help in the preparation of this thesis.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Purpose	3
II. HISTORICAL SURVEY OF DOMESTIC ARCHITECTURE	4
Ancient Hindu Period (3000 B.C.-1200 A.D.)	5
The Indus Valley Civilization (3000 B.C.-1500 B.C.)	5
Vedic Civilization (1500 A.D.-300 A.D.)	8
Medieval Hindu Civilization (300 A.D.- 1200 A.D.)	17
Indo-Islamic Civilization (1200 A.D.-1800 A.D.)	23
Delhi or Imperial Style (1200 A.D.- 1526 A.D.)	26
Provincial Style (1200 A.D.-1526 A.D.)	28
Mughal Style (1526-1803-1857 A.D.)	31
The Development of Southern Indian Architecture (A.D. 600-1800)	38
Modern Indian Civilization (1800 to Present)	41
Portuguese and French Period (1800-1850)	41
English Period (1832-1947)	45
Independent India (1947-Present)	49
III. SUMMARY	57
Ancient Hindu Period (3000 B.C.-1200 A.D.)	57
Indo-Islamic Civilization (1200 A.D.-1800 A.D.)	60
Southern Indian Domestic Architecture (A.D. 600- 1800)	62
Modern Indian Civilization (1800-Present)	63
A. SELECTED BIBLIOGRAPHY	65
APPENDIX A	68
GLOSSARY	71

LIST OF TABLES

Table	Page
I. Types of Low Cost Housing in Hyderabad, 1941	54

LIST OF FIGURES

Figure	Page
1. Ground Plan of an Upper-Class House at Mohenjo-daro . . .	6
2. Interior of a House of the Harappa Culture	7
3. A Village of the Vedic Period (from a relief at Amaravati)	9
4. Vedic Village Showing Gateway and Fence	9
5. Decoration on Village Hut Walls	10
6. Mauryan Empire, 250 B.C.	14
7. Conjectural Reconstruction of the Main Gateway to the City of Kusinagara (c. 500 B.C.) in Bihar (adapted from a Bas-relief on the southern Gateway of the Great Stupa at Sanchi)	16
8. Wooden Door Carved in Deodar Wood	18
9. Gupta Empire 400 A.D.	19
10. India in the Seventh Century A.D.	21
11. Types of Domes	25
12. Delhi: Citadel of Kotla Feroz Shah	27
13. Private Residence of a Nobleman	29
14. Indian Palace: "Man - Mandir Palace," Gwalior	33
15. Bijapur, Mihtar Mahall, Upper Story, Interior	36
16. Delhi Fort, "The Citadel of the Great Moghul" (1639-48) .	37
17. Phases of the Dravidian Order	39
18. Evolution of the Dravidian Capital	40
19. Ceiling Construction of Kandariya Mahadeo Temple c. 1050 A.D.	42

Figure	Page
20. Hindu House: Rajaram Rao's House, Madura	44
21. Palace of Chief at Bhore State near Poona	47
22. Palace of Chief at Bhore State near Poona	48
23. Low Cost Housing in Hyderabad-1941-Class A Public Housing	51
24. Class C Public Housing - Hyderabad - 1941	52
25. Elevation of Front-Class C Public Housing	53
26. House with Interior Courtyard	56

CHAPTER I

INTRODUCTION

"India is a subcontinent of Asia, approximately the size of Europe without Russia" (18). India is a country of many diverse aspects which include the existence of 530 million people living in one country with a heritage of many races; Kolarians, Dravidians, and Aryans to name only a few. It is not uncommon today to hear art historians as well as general historians say:

India is but a purely geographical expression, and has no ethnographical signification whatever. It is inhabited by races of people so different and distinct from each other that to class them together as the Indian race would be incorrect. To speak of a homogeneous Indian art is therefore impossible, the more so, as each race which inhabited the country has its own art history (33).

However diverse we consider India may be, unity and common denominators can be found. Eighty-five per cent of the population is a rural or village population (3). India has been isolated from other parts of Asia by mountain ranges of Afghanistan, Tibet, and Yunnan, by the Arabian Sea and the Bay of Bengal. This isolation has caused a certain amount of inbreeding of ideas and symbols that make for a "Unity of Indian Tradition" (18). However, it must be remembered that India has had invasions from Western and Central Asia from time to time to bring in an influx of new ideas, but so can we say this of Europe which we often consider having a Unity of European Tradition" (18).

On August 15, 1947, India finally attained its freedom to be

called a country and to be governed by its own people. To these people came the task of becoming a unified people; unified in the sense that common denominators would be sought which all Indians might share despite the many diverse aspects that have made up the history of India. This unity exists in the common geographical background which led the people to use the same set of forms and symbols and similar ways of self expression (18).

The main movement of peoples from Asia has been a migration generally from the northwest towards the inner part of the country and then southwards. Every invasion was hemmed in by natural barriers such as deserts, swamps, and hills in the north long enough to become more or less absorbed or 'Indianized' before moving on to the rest of the country.

As new invaders came into the country, a very mixed population resulted which led to a very mixed civilization. The 'European' type invaders were predominate in the northwest, the Mongoloids in the northeast, and the Dravidians predominated the south. In general, this is the case today (13).

As each succeeding set of conquerors became the rulers and subjected their language on the people, quite frequently the conquering rulers had to give in to the masses on a few points such as religious matters. Too, as new invaders arrived, a move down the social scale for the prior invaders was quite probable. But, for periods of time, however brief, certain successive types of Indian civilization and art did exist and however different in character, it had common motifs.

It can be noticed that as India becomes more industrialized and

as those who have money in the country prosper, a tendency arises to become more westernized. Ancient Indian culture is, however, India's background and heritage for a modern way of life. The synthesis of this background and heritage with modern technology will not be witnessed as another Europe or another America.

Purpose

This thesis is an attempt to study the domestic architecture of the people of India in relation to its historical development. Since a field study is not feasible at this time, but anticipated, a broad scope for understanding the domestic development of architecture in India and the history of the country must be viewed. Housing as it exists today is indicative of the Indians' cultural heritage. Therefore, an attempt to view housing will be done by synthesizing information from already published materials.

CHAPTER II

HISTORICAL SURVEY OF DOMESTIC ARCHITECTURE

An overview of India through this study indicates three basic successive stages in political, religious, cultural, and social thought. The first stage begins with the earliest known habitation, approximately 3000 B.C. The second stage opens approximately 1200 A.D. with the beginnings of Moslem influences. The third, and what can be called the Modern stage, begins in 1800 A.D. with established English rule after brief Portuguese and French interludes in India. In each of these three stages, politics, religion, culture, and social thought developed at their own time and way.

In the ancient Hindu period, it is not the state that was notable, but the influence of society, religion and culture. In the second or Moslem period, India was shaken out of the even tenor of its ancient ways into a restlessness that is the note of the public and private life of that period. In the third or modern period, India is brought into contact with Europe, thrown into the stream of world history. It is brought under the rule of the people whom the dominant influence in the life of modern India has become politics and the building of state and government (30).

Southern India developed differently than the rest of the country due to its isolation. For this reason, it does not fall into any of the three successive stages that the rest of India does and will be dealt with separately.

Ancient Hindu Period (3000 B.C. - 1200 A.D.)

The Indus Valley Civilization (3000 B.C. - 1500 B.C.)

The Indus Valley Civilization was a city civilization incorporating at an early date the idea of city planning. This was a civilization of upper class people who ruled over a primitive Indian still at the Stone Age level (18). The Indus Valley Civilization has been compared to that of Mesopotamia and findings show that even at the date of 3000 B.C. the Indus Civilization was very advanced (38). Sites have been excavated at Mohenjo-daro in Sind and at Harappa in the south of Punjab. Percy Brown states in his book entitled Indian Architecture:

Although the investigations have revealed a culture in which the buildings of its people had no great artistic value, the finished quality of materials employed, the high standard of their manipulation, and the stability of the construction as a whole is astonishing (7).

"The houses, often of two or more stories, though varied in size, were all based on much the same plan . . . a square courtyard round which were a number of rooms" (3).

The buildings in the cities of the Indus Valley were plain and without decoration. The houses had no exterior windows and often the entrance was placed in a side street rather than a main street. The ground floor of a small house measured about 27 feet by 30 feet while a larger house was often twice this size. No separate harems or women's apartments (Zenana) have been found which perhaps gives evidence to a high status of women (31). Figure 1.

Matting may have been used on the floors, however, common flooring was beaten earth covered with dried cow-dung. Large pottery jars often served as cupboards and the deep recesses found in walls were probably

fitted with shelves. There were stands in the walls for water jars. Chests were also used for storage. Beds and chairs seem to have been the only furniture.

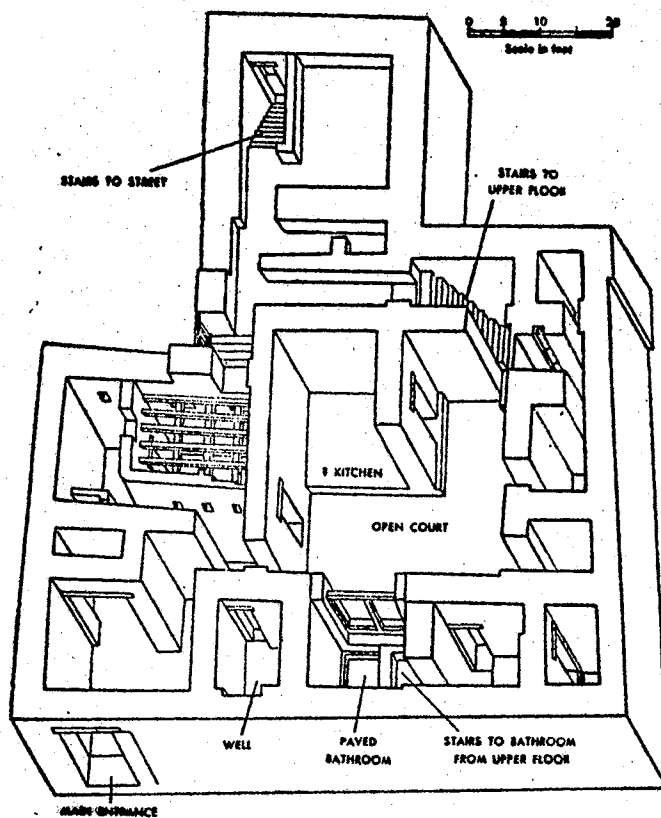


Figure 1. Ground Plan of an Upper Class House at Mohenjo-daro

Cooking was done in the courtyard, however, there were also separate kitchens which had sunken pots with holes in the bottom to take care of waste water which seeped through. All houses had bath-

rooms and latrines. A brick channel ran down every street with tributaries meeting the channel from every house.

Brick was the primary building material and was used for the foundations and walls while dressed wood was used for the upper stories. The post and lintel type of construction is that which has been evidenced with the corbelled arch being found but no use of the true arch. Figure 2. The roofs of the buildings were flat and covered with planking and then beaten earth (7).

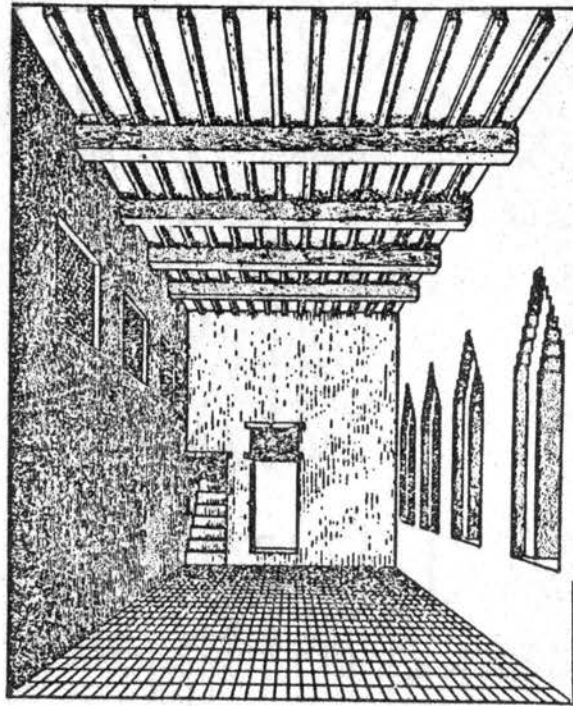


Figure 2. Interior of a House of the Harappa Culture

The history of the Indus Valley Civilization can be traced back to 3000 B.C. and continued until 1500 B.C. when the Aryans dispersed the people and destroyed their cities. After the decay of the Indus Civilization and when the building art next came into view it was not of an advanced nature such as the Indus Civilization enjoyed but rather a more rudimentary form of village huts constructed of bamboo and leaves and hidden in the jungles.

Vedic Civilization (1500 A.D. - 300 A.D.)

These first villages and indications of village life were evidenced in the Vedic Civilization. The Cambridge History of Art comments that there was no evidence of city life at this time and that the village consisted of a certain number of huts (grama) built near each other for the purpose of defense against beasts as well as enemies and also located around a wall or pond. Figure 3. The huts were then surrounded with a fence (27).

This fence took the form of a bamboo railing the upright posts (thabha) of which supported three horizontal bars called suchi or needles, as they were threaded through holes in the uprights. In the course of time this peculiar type of railing became the emblem of protection and universally used, not only to enclose the village, but as a paling around fields, and eventually to preserve anything of a special or sacred nature. In the palisade encircling the village, entrances also of a particular kind were devised. These were formed by projecting a section of the bamboo fence at right angles and placing a gateway in advance of it after the fashion of a barbican, the actual gate resembling a primitive portcullis (gamadvara) (7). Figure 4.



Figure 3. A Village of the Vedic Period
(from a relief at Amaravati)

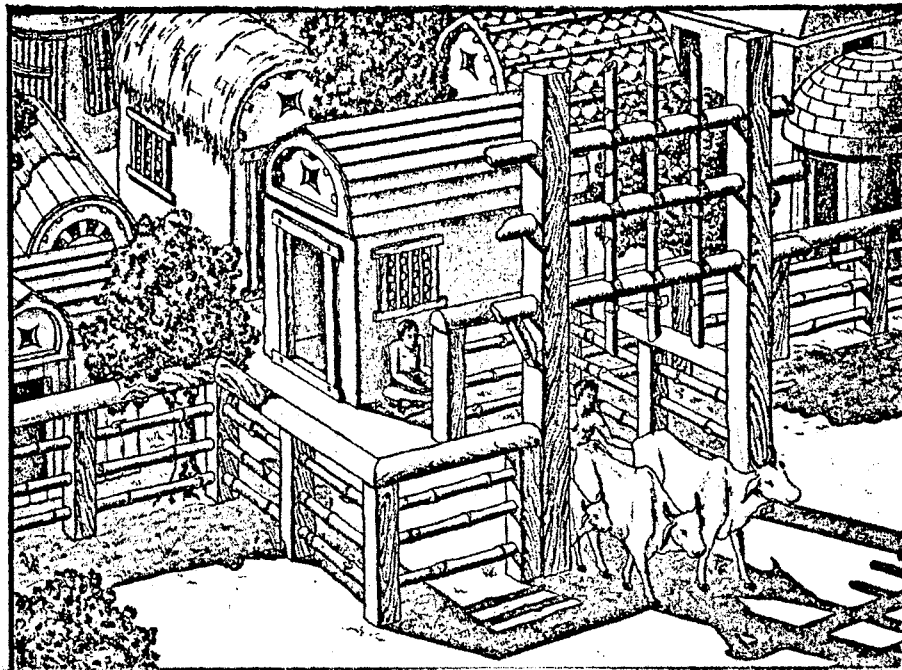


Figure 4. Vedic Village Showing Gateway
and Fence

The Vedic huts within this enclosure were based on a circular beehive pattern with walls of bamboo and covered with a dome like roof of leaves or thatched with grass. The evolution of the Vedic hut went from the circular plan to that of an oval plan with a barrel roof formed on a frame of bent bamboo and then covered with thatch.

Such primitive shapes and expedients as the railings and the gateway, the rounded hut with the heavy eave of thatch, the barrel roof with its framework of bent bamboos, all in a greater or lesser degree influenced the style which followed (7).

Life was still very simple, and there was not much furniture though beds of interwoven rope and footstools were used. The throne was necessary in royal houses as were various forms of ottomans (31).

The decorative character of the huts is suggested to have been designs in color applied to the exterior walls of the huts. This practice is still seen in Indian villages today. Figure 5.

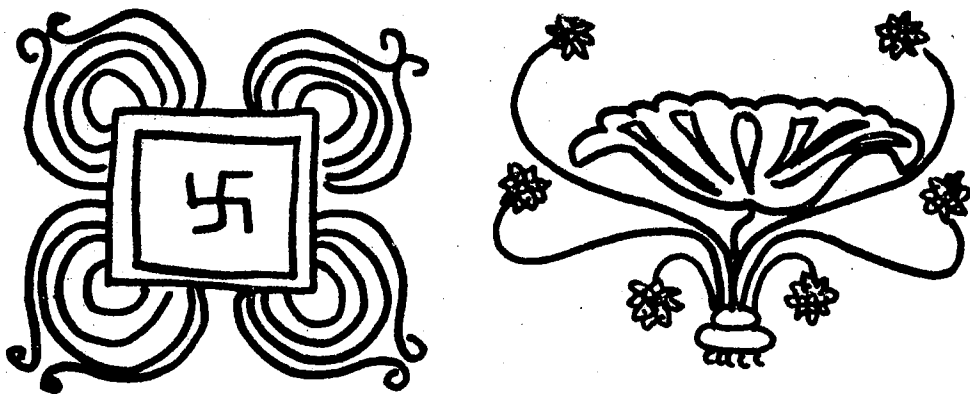


Figure 5. Decoration on village hut walls

This Aryan-Indian civilization witnessed the writing of the first truly Indian literature, the Rig Veda. The Rig Veda showed the life of the people as they lived on the Indus and fought with each other or fought with the 'Non-Aryans,' the Dravidians. Hinduism as a religion has as its foundation the Rig Veda and the later Vedas which depicted rituals that were to be honored.

In the old Aryan colonies the house-father was a husbandman, warrior, and priest. But, by degrees, certain gifted families, who had composed the Vedic hymns or had learned them by heart, were always chosen by the king to perform the great sacrifices. In this way the priestly caste (Brahmins) sprang up. Likewise, as more and more territory was conquered, fortunate soldiers received a larger share of land than others and cultivated it by means of the 'Non-Aryan' peoples. Thus the four castes arose, first the priest or Brahmins, second in order the warriors called Rajputs or Kshatriyas, and third the Aryan agricultural settlers called Vaisyas and finally the Sudras who were conquered 'Non-Aryan' people whose duty was that of serfs (20). The caste system at this time was a very flexible system with easy movement up and down. A definite hierarchy was seen in the caste system. This hierarchy was based on the beliefs of the Brahmins of their supremacy and the Kshatriyas who carried out the defense of the villages. The first two castes were on the top, and the various gradations of workers (Vaisyas and Sudras) were at the bottom of the pyramid (2).

This social stratification affected the building of the villages in Vedic Buddhist and Hindu India (500 B.C. onward). The Brahmins and Kshatriyas occupied the better houses and the workers and traders

were either in small settlements in the same village or in their own separate villages (2).

The Jatakas (writings of the times) clearly show this stratification and segregation. There are many names given to the different villages: Gamaka (small village); Gama (village); Nigama-gama (market village); Kevatta-gama (fisherman's village); Kammara-gama (smith's village); and villages of Brahmins and other castes and classes (2).

The villages began to be relegated to a subservient place as towns developed. This is witnessed in the Arthasastra of Kautilya (321-300 B.C.). No guilds other than local, no buildings for sports or play, no actors, dancers or singers or any other form of entertainment was allowed in the villages. However, the town where the King was to live was described in the later Sutra of Apastaba:

I will now explain the duties of a king. He shall build a town (pur), and a dwelling (vecma), each with a door facing south. The dwelling is within the pur, and to the east of the dwelling shall be a hall called the 'invitation' (guest) place. South of the pur shall be an assembly-house (sabha), having doors on the south and north sides so that it shall be in plain view within and without. There shall be fires in all these places burning perpetually, and offering to the Fire-(god) shall there be made regularly, just as to the sacred house-fire. He shall put up as guests in the hall of invitation learned priests . . . and in the assembly-house he shall establish a gaming-table, sprinkle it with water and throw down on it dice made of Vibhitaka (nuts), sufficient in number, and let Aryans play there (if they are) pure men of honest character. Assaults at arms, dances, singing, concerts, etc., should not take place except in houses kept by the king's servants . . . Let the king appoint Aryans, men of pure and honest character to guard his people in villages and towns, having servants of similar character; and these men must guard a town (nagara) from thieves for a league (yojana), in every direction; villages for two miles (a kos or a quarter of a league). They must pay back what is stolen within that distance and collect taxes (for the king) (27).

Because of rivalry between towns, fortifications had to be supplied. The Maurya Empire (322-185 B.C.) understood the art of fortification well as the Greek Megasthenes reported that the towns and cities were provided with ditches, ramparts, and walls of earth, wood, or brick, having battlements, towers, and covered ways.

Figure 6. "In principle the towns were of rectangular shape and divided into four regions each under an official and composed of wards" (27). One quarter of the city was for the citadel and royal palace, another was for the residences of the upper classes, a third was for the less pretentious housing of the middle class, and the fourth was for the traders with their workshops open to view forming a bazaar (7). The layout of cities at this time is fully described in a Vedic treatise called *Visvakarmaprakasa* attributed to the divine architect Visvakarma. The following is an excerpt from this treatise as translated by Binode Behan Dutt:

(1) First lay out the town and then only plan the houses. Violation of this rule portends and brings evil. (2) First plant the trees and erect the premises thereafter; otherwise they will not look graceful and seemly . . . (3) The houses of Brahmans should be chatuhsala; that is they must occupy the four sides of a quadrangle which is an open space in the centre. Sala means a long structure of one span only. The houses of the Kshatriyas should be trisala, i.e., occupying the three sides of the rectangular plot. The houses of Vaisyas should be dvisala, i.e., forming the two sides of the plot, while those of the Sudras should be ekasala (one side) . . . (4). The imperial palaces should be raised to eleven storeys; the buildings of Brahmans to nine storeys; those of the ordinary kings to seven storeys; Vaisyas and the soldier class (Kshatriyas) should have four-storeyed buildings and Sudras should have their houses one to three storeys high . . . Now in ancient India folkplanning set up an inter-relation between the site, the breadth of a street . . . and the rank of the residents in that quarter. This rule worked out in such a way that the high class people were given premises along the wide thoroughfares, while the low class people were relegated to the comparatively narrow roads, so that in all structures along

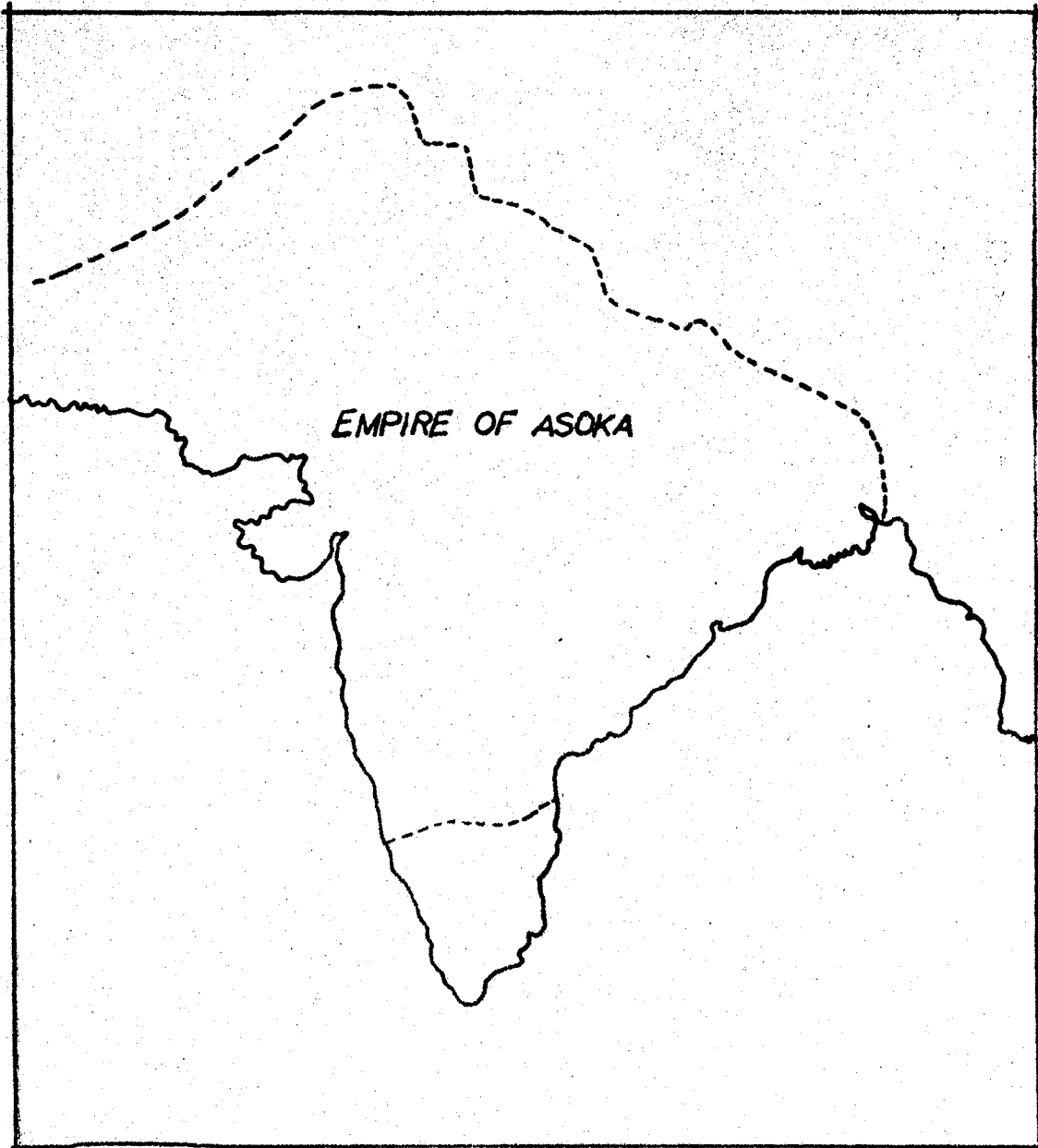


Figure 6. Mauryan Empire - 250 B.C.

the street the number of storeys was the same . . . It is obvious that a definite proportion between the width of streets and the heights of buildings was arranged . . . The height of the walls of the buildings should not be too small or too great (1).

The houses of the cities at this time (c. 300 B.C.) were generally made of wood. There were royal palaces, workshops, storehouses, and prisons, as well as upper, middle, and lower class housing. "There is no mention of the use of stone except for pillars or staircases" (28).

Whatever the material the houses were built of, both the exterior and interior were covered with a fine chunam plaster upon which brilliant frescoes with figures or patterns were executed. The Vinaya gives an elaborate set of directions for preparing the plaster for the frescoes. Four common patterns used were wreath-work, creeper-work, five-ribbon work, and dragon's-tooth-work (28).

Most houses down to Gupta times were built with barrel-vaulted roofs, with gable-ends and often ornate finials. Roofs were both thatched and tiled. Later the high barrel-vaulted roofs gave way to a flatter type, with overhanging eaves. Larger houses of later times usually had raised terraces of flat roofs on which the members of the household slept in hot weather (3). Figure 7.

The entrance to the great houses was through a large gateway. To the right and left of the entrance passage were the treasury and grain stores. The gateway led into an inner courtyard round which were chambers on the ground floor. And above these chambers was a flat roof called the 'upari-pasada-tala' the upper flat surface of the house, where the owner sat usually under a pavilion, which served the purpose of office, dining room, and drawing room (28).

Of the life of the city poor and their homes, little is mentioned

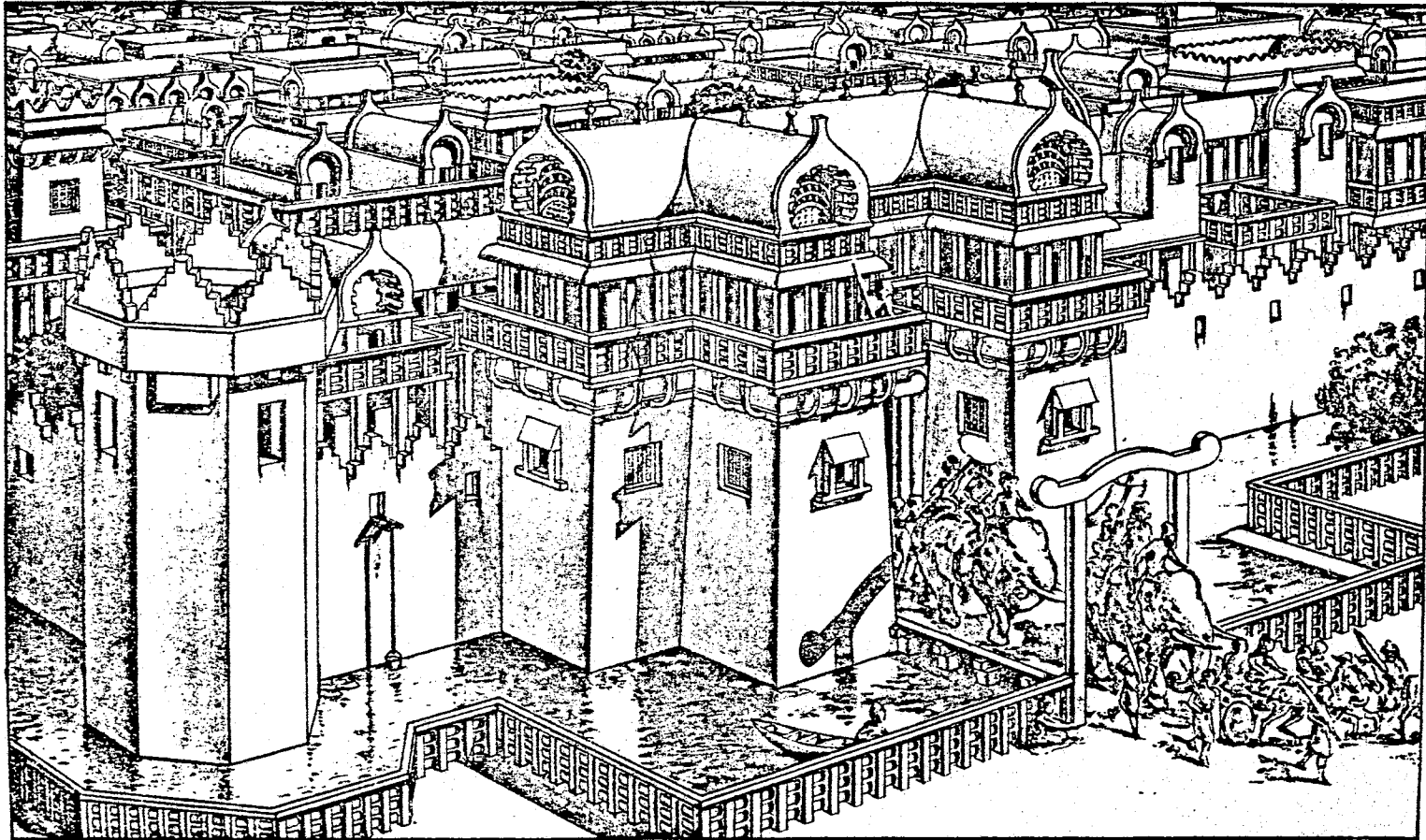


Figure 7. Conjectural Reconstruction of the Main Gateway to the city of Kusinagara (circa B.C. 500) in Bihar. (Adapted from a bas-relief on the southern Gateway of the Great Stupa at Sanchi)

in literature, but the cottages here and there depicted in early sculpture are, like the larger houses, barrel-roofed, and apparently one-roomed. It must be assumed, then, that the poorer people dwelt as they do today, in huts made of wood, reed, or mud brick, and thatched with straw. Many of these city people no doubt had no homes at all, but slept in odd corners of the city with what few possessions that they might have surrounding them.

Wood and stone carving advanced under the Sunga (185-28 B.C.) and Andhra (230-225 A.D.) dynasties. This type of decorative feature began to be seen in the housing of the time particularly around entryways. Figure 8.

Buddha was born in the sixth century B.C. in a feudal society of many republics and petty kingdoms. Buddha early rebelled against the concepts of Hinduism and began to teach in opposition to it. This opposition included the complete dismissal of the caste system. Buddha's influence was not felt a great deal until much later when its effect is seen in the Gupta Empire (300 A.D. - 500 A.D.). Figure 9. At this time the caste system dissolved into a society of many classes which were led by the rich merchants of the city. Buddhism was supported by the mercantile class as well as by the kings and the arts carried the Buddhist theme. The Gupta Empire saw the zenith of Early Indian civilization in which the transformation of the 'Aryan'-Indian Civilization (Vedic, Buddhist) into that of the Medieval Hindu Civilization began to occur.

Medieval Hindu Civilization (300 A.D. - 1200 A.D.)

The house in the Gupta period saw a transition from a building

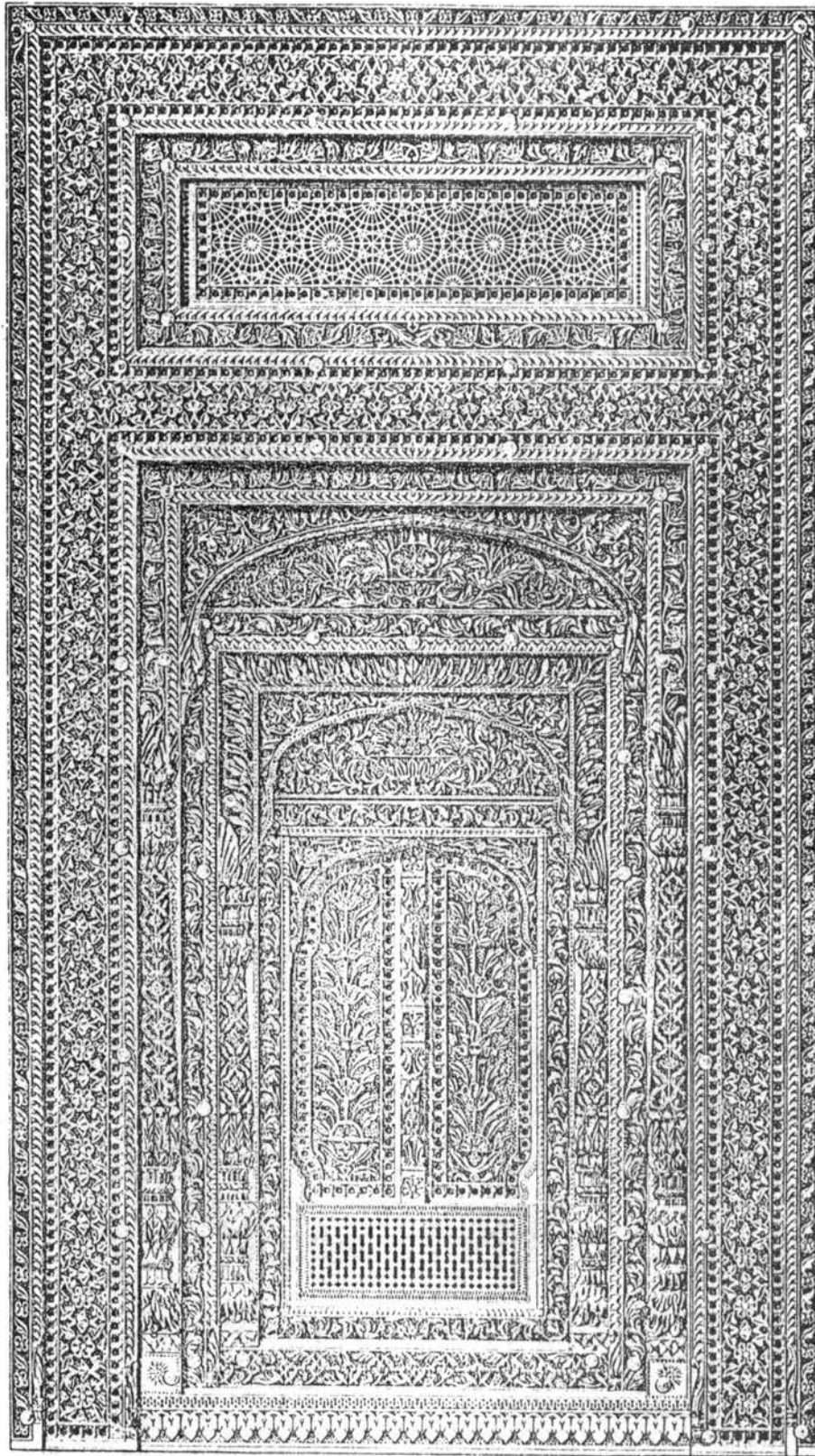


Figure 8. Wooden Door Carved in Deodar Wood

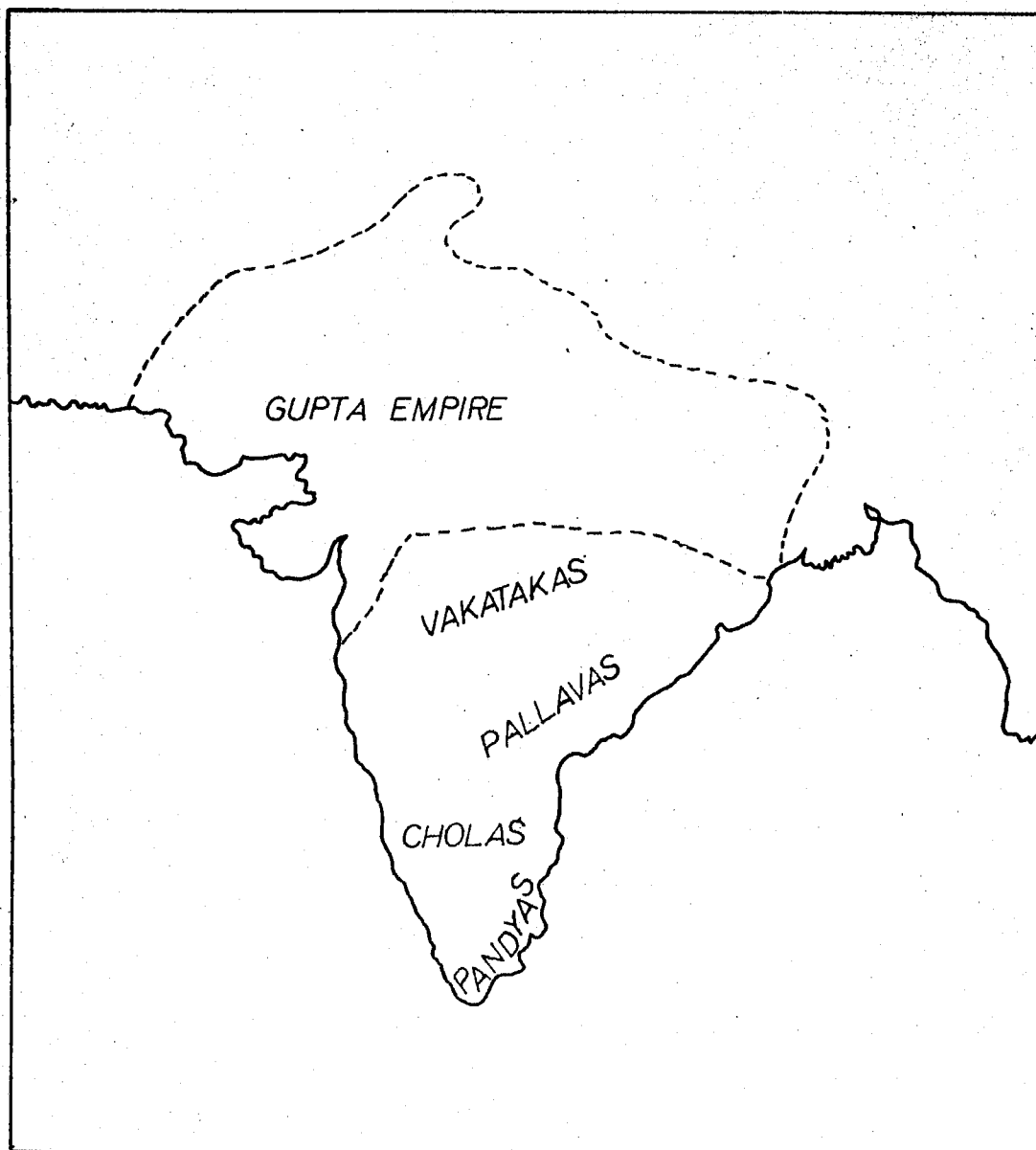


Figure 9. Gupta Empire 400 A.D.

necessary for existence, built of available materials to a building related to the highest magic and religious traits of the time (2). This transition was long in coming and was related directly to various Shastras about creative art and architecture written at the time. The Gupta Empire established a hold on the total of Northern India for a long enough period for the Imperial style of architecture to spread. A respect for technique and analysis was cultivated so that the word classical when applied to this time meant a perfect balance of all the elements that went into making up the culture. The structures of the time did not undergo a revolutionary change, but what occurred was an understanding and adaptation to old forms (2).

In the struggle against the invading Huns and other conquering peoples, the Gupta towns were destroyed, the wealthy mercantile class impoverished and the leadership passed into the hands of the military (18). With the decline of the middle class, Buddhism lost its influence. What ensued from 530 A.D. to 770 A.D. were successive states of which none were large or powerful.

Harsha was one exception to this period. Figure 10. He did manage to control a large portion of India and stressed adherence to Buddhism. Literature and the sciences flourished. However, he did not have quite the same control over India as had the Guptas. After his death in 648 the Rajputs began to become more powerful. A Brahmanical revival set in and Hinduism again flourished. Etiquette and manners became elaborate. Houses were built of mud, stone, or timber and were arranged in rows with lanes and roads running between them. They had lofty terraces and high roofs and arbours. In the home, cane chairs, cots, corded benches, and bamboo couches became common pieces

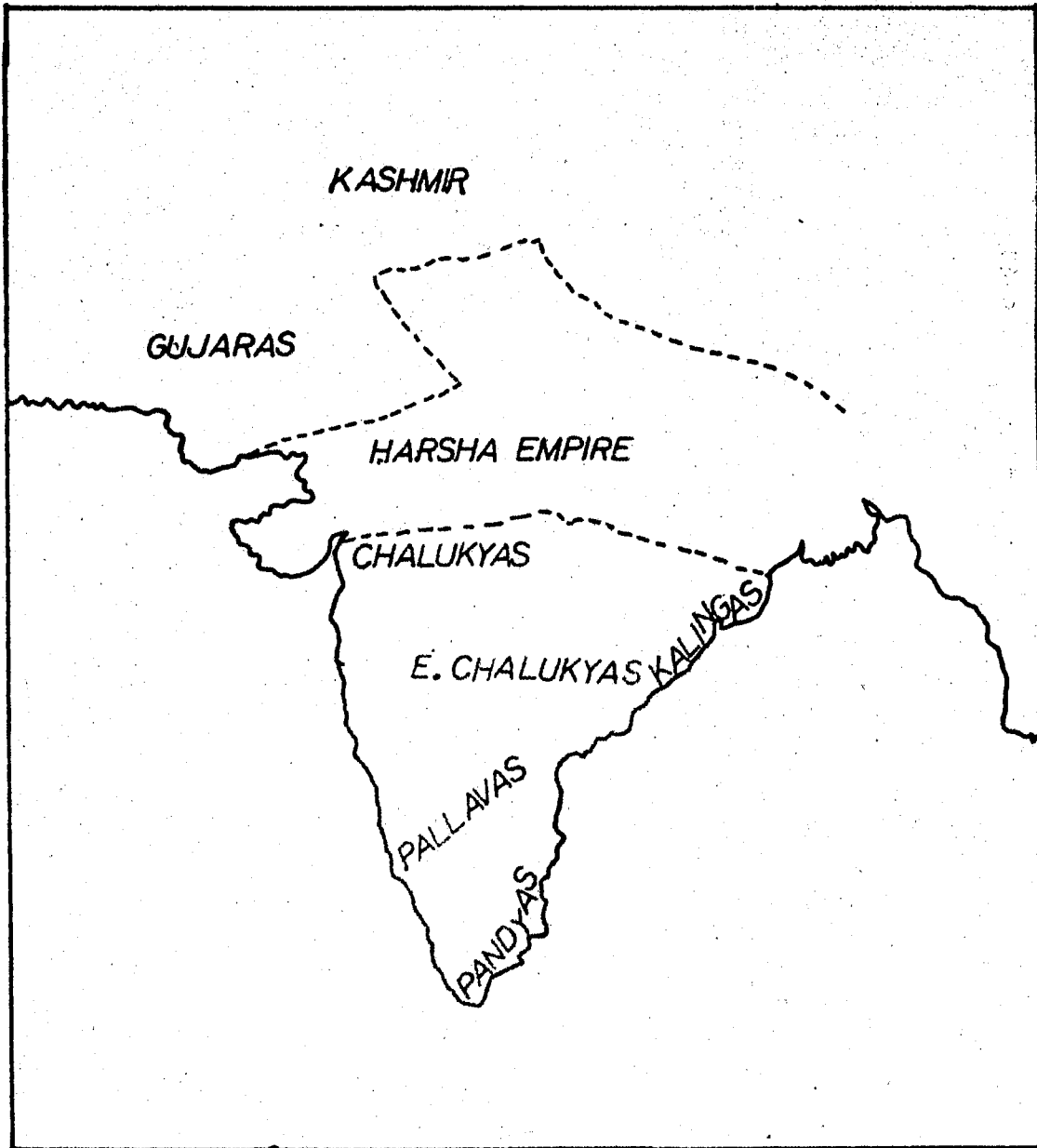


Figure 10. India in the Seventh Century A.D.

of furniture (31).

Hiuen Tsiang traveled in India in the years 629 A.D. to 645 A.D. Upon his return to his native country of China he wrote about these travels in India. Among the chapters he wrote is a portion on the towns and buildings of the country:

The towns and villages have inner gates; the walls are wide and high; the streets and lanes are tortuous, and the roads winding. The thoroughfares are dirty and the stalls arranged on both sides of the road with appropriate signs. Butchers, fishers, dancers, executioners, and scavengers, and so on, have their abodes without the city. In coming and going these persons are bound to keep on the left side of the road till they arrive at their homes. Their houses are surrounded by low walls, and form the suburbs. The earth being soft and muddy, the walls of the towns are mostly built of brick or tiles. The towers on the walls are constructed of wood or bamboo; the houses have balconies and belvederes, which are made of wood, with a coating of lime or mortar, and covered with tiles. The different buildings have the same form as those in China: rushes, or dry branches, or tiles, or boards are used for covering them. The walls are covered with lime and mud, mixed with cow's dung for purity. At different seasons they scatter flowers about. Such are some of their different customs (25).

An extended account of Hiuen Tsiang's travels tells that the beams of the houses were carved with strange figures. The doors, the windows, and the walls were painted many colors; the houses of the "ordinary people" were luxurious on the inside but plain on the outside. The interior and central rooms varied in height and width (21). Basham (3) gives an account in his book on houses around the 800's which further amplifies Tsiang's journal by suggesting that the balconies of the houses overlooked the streets but did allow for privacy in that they were screened with lattices so that the ladies could see out but not be seen (3).

The Medieval Hindu Civilization from 770 - 1200 A.D. began to see a new military class coming to power and history evidenced the impor-

tance of caste again in the form of an inflexible caste heirarchy. As society developed into a rigid heirarchy, innumerable castes arose with each lower one paying deference to its superiors. India became thoroughly divided. The state became a monopoly of princes contending unscrupulously for supremacy. As time went on the civilization degenerated leaving the country ripe for an easy takeover by Muslim conquerors (18).

Indo-Islamic Civilization (1200 A.D. - 1800 A.D.)

Twelve hundred A.D. marks the date of Islamic takeover in India. The Muslim conquerors, mainly Turkish, but later Persians, Arabs, and Negroes, looked down on India as a heathen country to be exploited by any means. They came into and controlled the country in a few strategic areas allowing the Hindu aristocracy to administer their estates if they would but pay tribute (18).

They also allowed the Brahmins to carry on their religious ceremonies if done in an unobtrusive way. However, as time went on a relenting attitude occurred and Hindus were found in such positions as government officials, contractors, and even soldiers while the Hindu women were found in harems. Hindu music, dance, poetry, astrology were encouraged, even if condescendingly. Hindu motifs penetrated more and more into Islamic art (18).

The indigenous architecture of India was trabeate at this time which means that distances were spanned by a beam laid horizontally. The Moslems, however, had developed the arch and brought it with them to India. Percy Brown in his book Indian Architecture, Islamic Period mentions the use of the arch in Indian architecture:

. . . the displacement in Indian architecture of the beam by the arch . . . was however only made possible by the introduction of another material hitherto little known to the indigenous masons, this was a cementing agent in the form of mortar, and so we find for the first time mortar-masonry figuring freely in Indian building construction (7).

Regarding the influence that Moslem architecture had on the total Indian populous, Percy Brown states:

Hitherto the sky-line of the building took the form of flat or low-pointed roofs, and the spire or sikhara. With the Muhammedans came an entire new shape, the dome, so that there was a change from the pyramidal to the ovoid, and before long the characteristic architectural feature of many of the cities and towns and even villages was the white bulbous dome (7). Figure 11.

However, as with any takeover within a country, India did not become completely 'Moslemized' nor did the Moslems remain uninfluenced by the indigenous craftsmen. Shanti Swarup gives a good indication in his book 5000 Years of Arts and Crafts in India and Pakistan of the synthesis that occurred between the Moslems and the Indians in relation to architecture and the arts and has traditionally been called the Indo-Islamic period in India.

And so, while the Indian builders had to work under Islamic dictation and seek inspiration from the architecture prevailing in Persia and Arabia, where brick plaster, and rubble were the building materials, they preferred to look upon their own achievements to serve them as models when planning . . . The Indian masons no doubt accepted some of the general principles of architecture from Western Asia, as also certain essential constructive measures, but they worked them out in accordance with their own technical processes and their own materials. The Muslims themselves realized the advantage of masonry formed of dressed stone and perceived the excellence of the indigenous methods and principles of construction. In fact, such was the spell of the indigenous art that the Muslims unconsciously began to adopt and assimilate the Indian rules and conventions of building, and frequently also its symbols in their most solemn and stately structures.

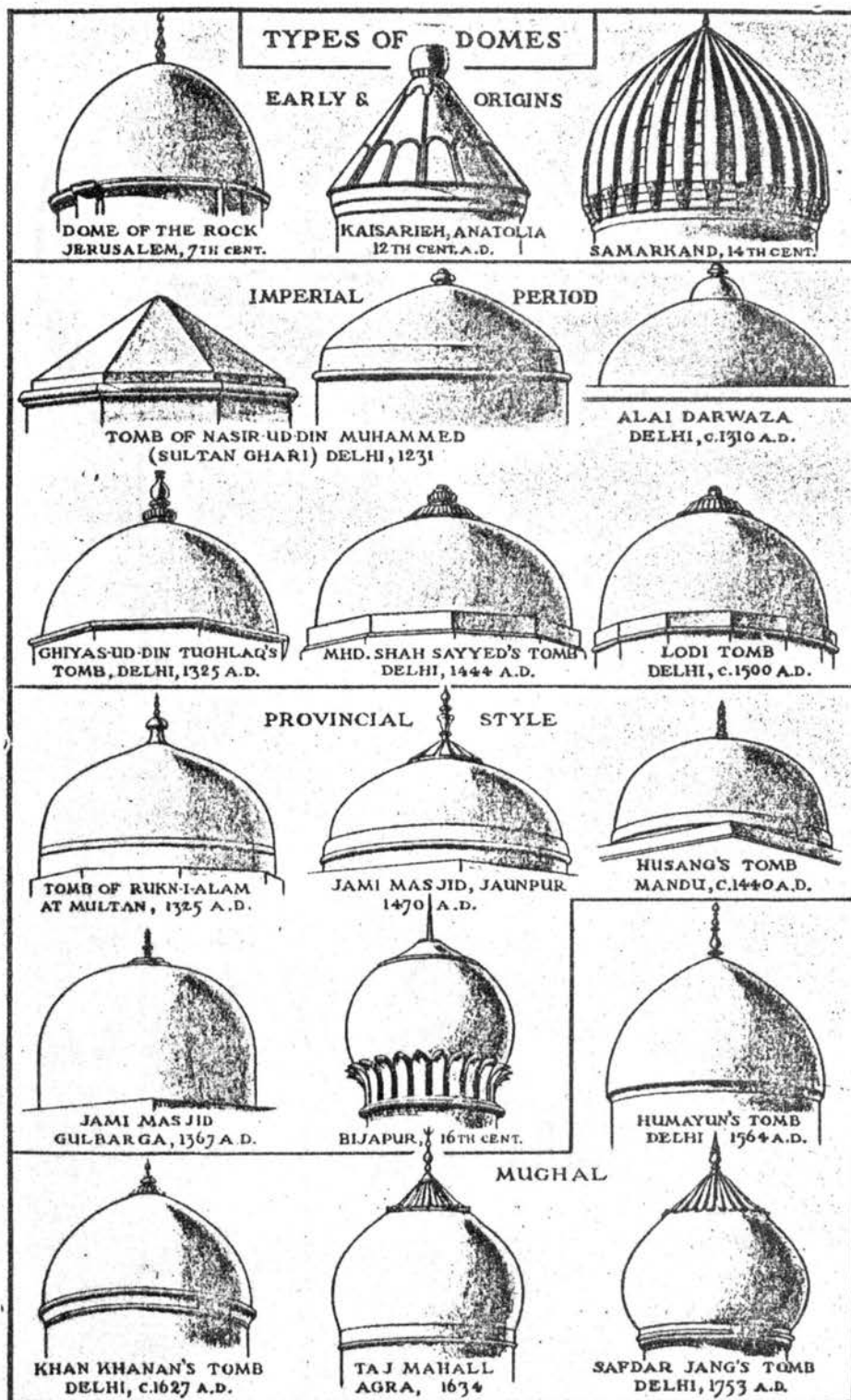


Figure 11. Types of Domes

Thus, in the course of time, was evolved a ground common to both the Mohammedan architect and the indigenous Hindu mason (34).

Consequently, the Indo-Islamic architecture, as Havell writes was only "a continuous development of Indian building traditions proceeding from altered social and political life, changes in religious ritual and symbolism and in the structural requirements evolved therefrom" (19).

The secular architecture of the Moslems took the form of houses, pavilions, town-gates, wells, garden, etc. besides large imperial palaces and total cities. Moslem architecture in India can be broken down into three major styles, the Delhi, or Imperial style, the Provincial style, and the Mughal style. The Delhi style began at the close of the twelfth century with established Moslem rule at Delhi and continued for nearly four centuries until it was succeeded by the Mughal style. The Provincial style refers to the building style practices in more self-contained portions of the country after these areas had thrown off allegiance to Delhi and the Moslems.

Delhi or Imperial Style (1200 A.D. - 1526 A.D.)

Due to the military and residential requirements of the times, the Delhi or Imperial style produced great complexes combining city, fort, and palace. Tughlaq's fortress-city at Delhi is representative of city layout of the time (1300's) (7). The city was surrounded by walls constructed of monolithic pieces of stone. At close intervals could be seen two storey circular bastions. Little remains of the secular architecture of this time which was primarily represented by fortresses and palaces. Figure 12.

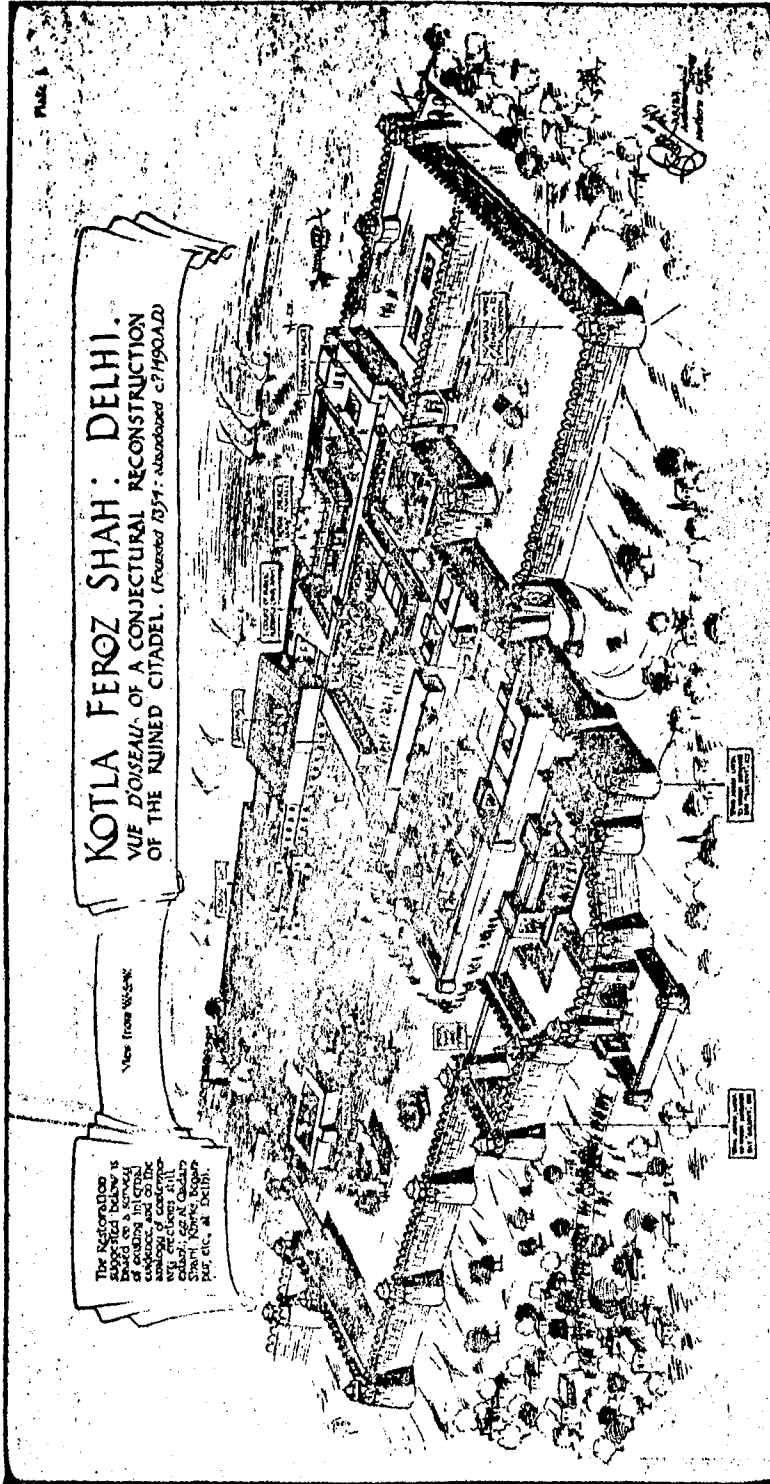


Figure 12. Delhi: Citadel of Kotla Feroz Shah

However, a private residence of a nobleman of a less exalted position does remain and was built in the 15th century. Figure 13. The residence consists of an enclosed courtyard with well and bathing facilities in the center. Around this are the stables and quarters for the servants. An inner staircase leads from the ground floor to the flat roof and was used as a terrace. Connected to the courtyard is a pillared area which was the domestic region of the house surrounded by the garden. The whole residence is protected by a high wall. The emphatic feature of this housing complex is a three storeyed square tower placed with easy access from all the ground floor quarters. This would seem to be a good place for the household members to pass their time and view the countryside. "The sloping wall of this tower, and the pyramidal roofs are all expressive of the existing architectural mode, while the entire conception enclosed as it is, both for defensive reasons and for privacy, is characteristic of the life of the time" (7) (1500 A.D.). Pointed horse shoe arches and low shallow domes are also indicative of this time and style, (1200 A.D. - 1526 A.D.).

It is clear that, in spite of the palaces and houses which appeared the vanity of the kings and nobles, life for the people, was squalid and non-human. "The houses remained the barest shelter for three hundred years (2).

Provincial Style (1200 A.D. - 1526 A.D.)

While Islamic architecture was developing at Delhi, the capitals of the various provinces were also developing a style of architecture. The styles of architecture in the provinces were basically offshoots

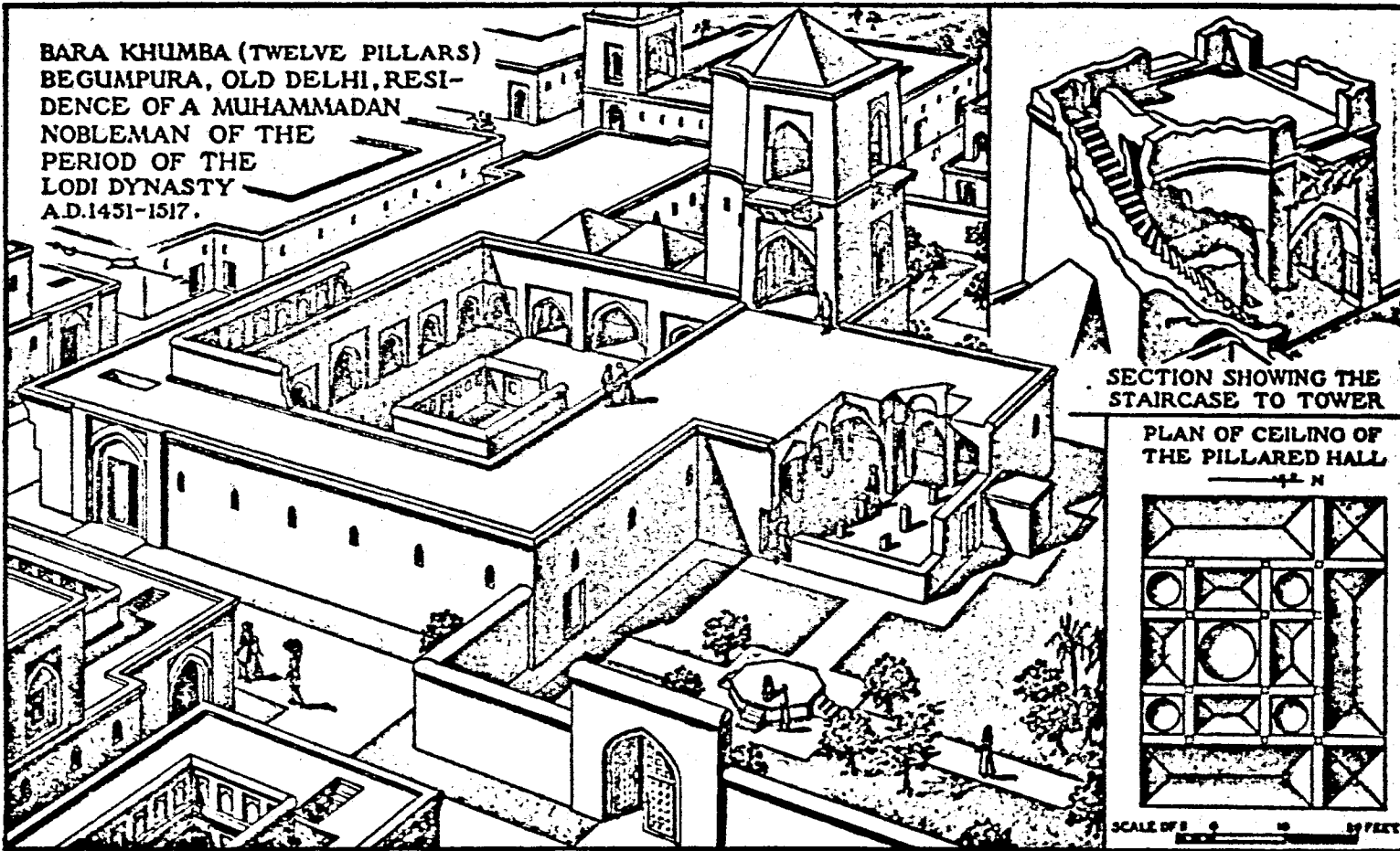


Figure 13. Private Residence of a Nobleman

of the Imperial Style. However, many individual characteristics began to be witnessed such as short square pillars, bracket capitals, horizontal archways, and roofs of flat slabs. Among some of the factors that determined the character of the provincial styles were the length of association a particular province had with Delhi, the existence and prevalence of already developed indigenous art forms, contact with foreign craftsmen, climatic conditions, and availability of building materials (34).

In the Punjab region while a basic Islamic architecture was evidenced in the 15th century, the indigenous wood carver came to the fore with much use of carved doorways and frames. The motifs of such examples were generally carved designs indicative of the appearance, shape, and fittings of a tent. A hypothesis by Percy Brown suggests that this was a carry over from a nomadic existence in some of the arid regions of the Punjab and the Great Indian Desert (7).

The building art in the Provincial style was witnessed also at Malwa. No observable effort at town-planning has been evidenced at its capitol, Mandu. Construction and design of the buildings as such went under a radical change and what became the important aspect was the decorative nature of the facade which included intricate carving of the doorways, windows, and cornices; use of inlaid stones and often friezes of blue and yellow glaze (7). This phase of the Provincial style was evidenced in the fifteenth century.

Among some of the architectural ideas employed in the Deccan were cupolas alternating with pyramidal roofs.

The type of building that eventually emerged under the Decanni rulers, although of an apparently original character, was by no means spontaneously developed.

In practice it consisted fundamentally of the fusion of two styles of Islamic architecture, both derived from other parts and both having arrived at a state of relative maturity. One of these was the architectural system that had been gradually forming under the Sultans at Delhi, which, owing to its forceful nature was influencing to a greater or lesser degree the provincial manifestations as they arose. The other style drawn from an entirely extraneous source, was the architecture of the neighboring country of Persia (7).

The architecture of the Deccan was the most foreign of any of the provincial styles since the existing architectural traditions of the region were completely ignored.

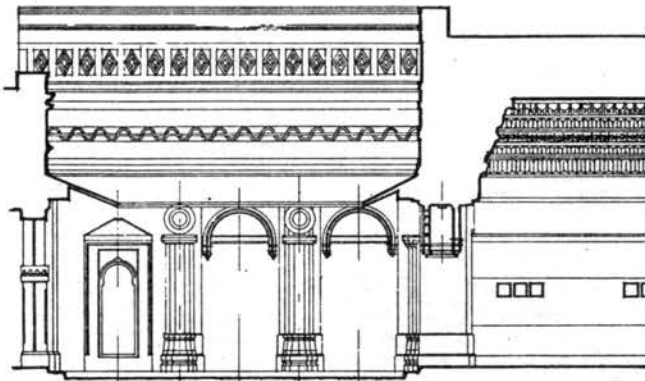
However, Indo-Islamic architecture in Gujarat was very indigenously Indian. Figure 14. This was caused by two main factors. The founder of the existing dynasty in Gujarat had been a Hindu but was forced to become a Moslem to save his life (15th century). However, he could never completely throw off all the ideals and traditions of the people which had been his heritage. Likewise, Gujarat was very rich in indigenous artisans who were very accomplished in the building arts. They had for generations been known for their outstanding ability in building Brahmanical and Jain temples. When they were required to direct their efforts to the creation of mosques and tombs, their background continued to direct the course of architecture (34).

Mughal Style (1526 - 1803 - 1857 A.D.)

When the Mughals conquered India, another period of colonial rule by Turkish conquerors seemed preeminent. But, the Indian Moslems rebelled and forced the Mughals into an alliance with the northern Indian Hindu aristocracy. The result was a synthesis of Islamic and

Figure 14.

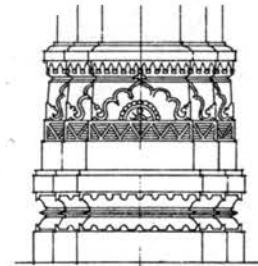
Raja Man Singh ruled in Gwalior from A.D. 1488 to 1516; he was a Gujarati by birth. He was a great patron both of architecture and of music. His work at Gwalior is worthy of great notice. His great fortress palace stands on the high cliff-like hill overlooking the present city. It is considered to be the finest of the earlier Hindu palaces. This figure shows details from one of the several rooms grouped around the two inner courts of his Man Mandir palace (4). Gwalior is in the central section of India.



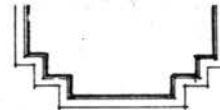
SECTIONAL ELEVATION

SCALE OF FEET 0 2 4 6 8 10 12 14

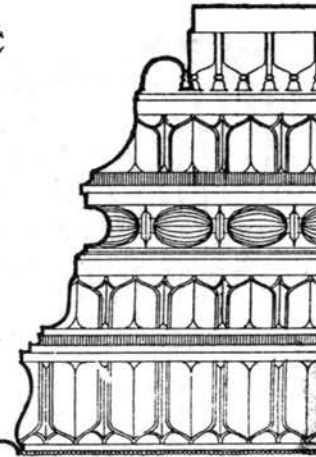
INDIAN PALACE
MAN-MANDIR PALACE
GWALIOR



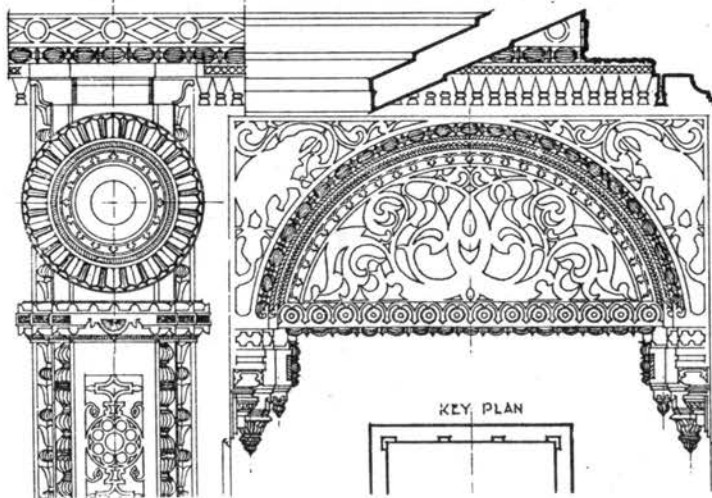
DETAIL OF BASE



PLAN OF BASE



1/8TH FULL SIZE DETAILS OF BASE —
CEILING, CORNICE, WALL CARVINGS.



KEY PLAN

SCALE OF FEET 0 1 2 3
FOR DETAILS OF BASE, CEILING, CORNICE ETC.

Hindu culture in most ways of life.

During the early years of Mughal domination, the country was too unsettled to do a great deal of building. But when the building art finally developed it did so in such a way as to be consistently of high quality for a period of approximately 200 years. Reasons for the high quality over such an extended period of time were due to the wealth of the ruling powers throughout this time and the high interest each of the five main rulers had in culture and its manifestations. Babur, Humayun, Akbar, Jahangir, and Shah Jahan were the five main Mughal rulers. Imperial generation of architecture developed to such a great extent that any indigenous architecture prevalent in the provincial or regional areas were soon subordinate. The Mughal style of architecture developed under these men and in looking at the existing examples it is evident that there were two phases under this basic style. The first developed during Akbar's reign and is characteristic for the building material that was used. A prevalence of red sandstone was used with ivory inlay. The other phase consisted of buildings built predominantly of white marble and developed under the rule of Shah Jahan. Percy Brown comments in his book Indian Architecture on the earlier phase:

In the sphere of building arts Akbar found the artisans of India still maintaining the living traditions of their craft, the guilds of workmen merely requiring organizing to provide the type of structure that he desired. The style of building that evolved under this ruler's patronage was chiefly executed in red sandstone readily available in these parts, with insertions of white marble not infrequently introduced for the purposes of emphasis. In principle the construction was of the trabeate order, although the 'Tudor' arch was often used but mainly in its capacity as decorative arcading as a matter of fact in its appearance but not in structure the style was arcuate and trabeate

in almost equal proportions. It is also possible to see by its character that it was not far removed from a wooden archetype, a method of construction that was still practiced in the more northern parts of Hindustan as may be observed in the secular architecture of the Punjab at such places as Lahore, Chiniot, and also in Kashmir. During this earlier Mughal period the dome was sometimes built hollow but never technically of the true double order. The pillar shafts were usually many-sided and the capitals were almost invariably in the form of bracket supports. Figure 15. As to the ornamentation, carved or boldly inlaid patterns were common while painted designs were often introduced on the interior walls and ceilings (7).

Brown describes the second phase of Mughal architecture under Shah Jahan in the following way:

The introduction of marble structures into the sandstone fortresses originally devised by Akbar was, however, mainly a preliminary procedure, a preparation for the magnificent architectural schemes undertaken by Shah Jahan which have given such distinction to the Mughal regime. At Delhi, therefore, there arose at this monarch's decree the last and finest of these great citadels, representative of the Moslem power in India, the culmination of the experience in building such imperial retreats which had been developing for several centuries (7).
Figure 16.

The building of this citadel by Shah Jahan was begun in 1639 and 1658 marks the end of his rule. The Mughal style of architecture continued to influence the building arts until about the beginning of the eighteenth century when essentially the empire collapsed due to an empty treasury and more and more of the provinces asserting their independence. The provinces produced weak examples of the Mughal style until the end of the eighteenth century when the Mughal style of architecture was finally exhausted and a striving for new means of creation was witnessed. In the eighteenth century, the Mughal Empire disintegrated into a loose federation of Hindu and Moslem states and thus what can be called the "classical Mughal civilization

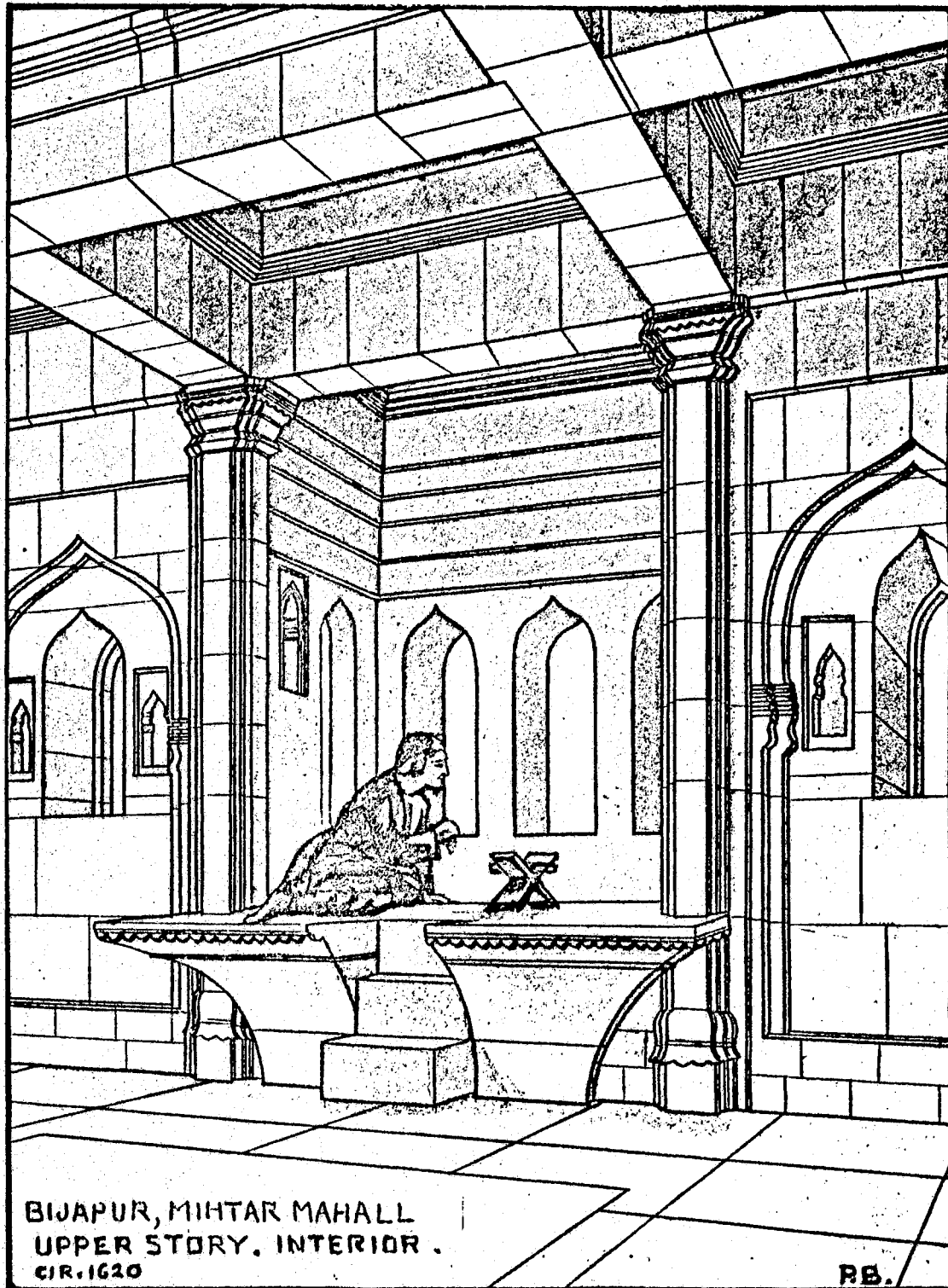


Figure 15. Bijapur, Mihtar Mahall, Upper Story, Interior

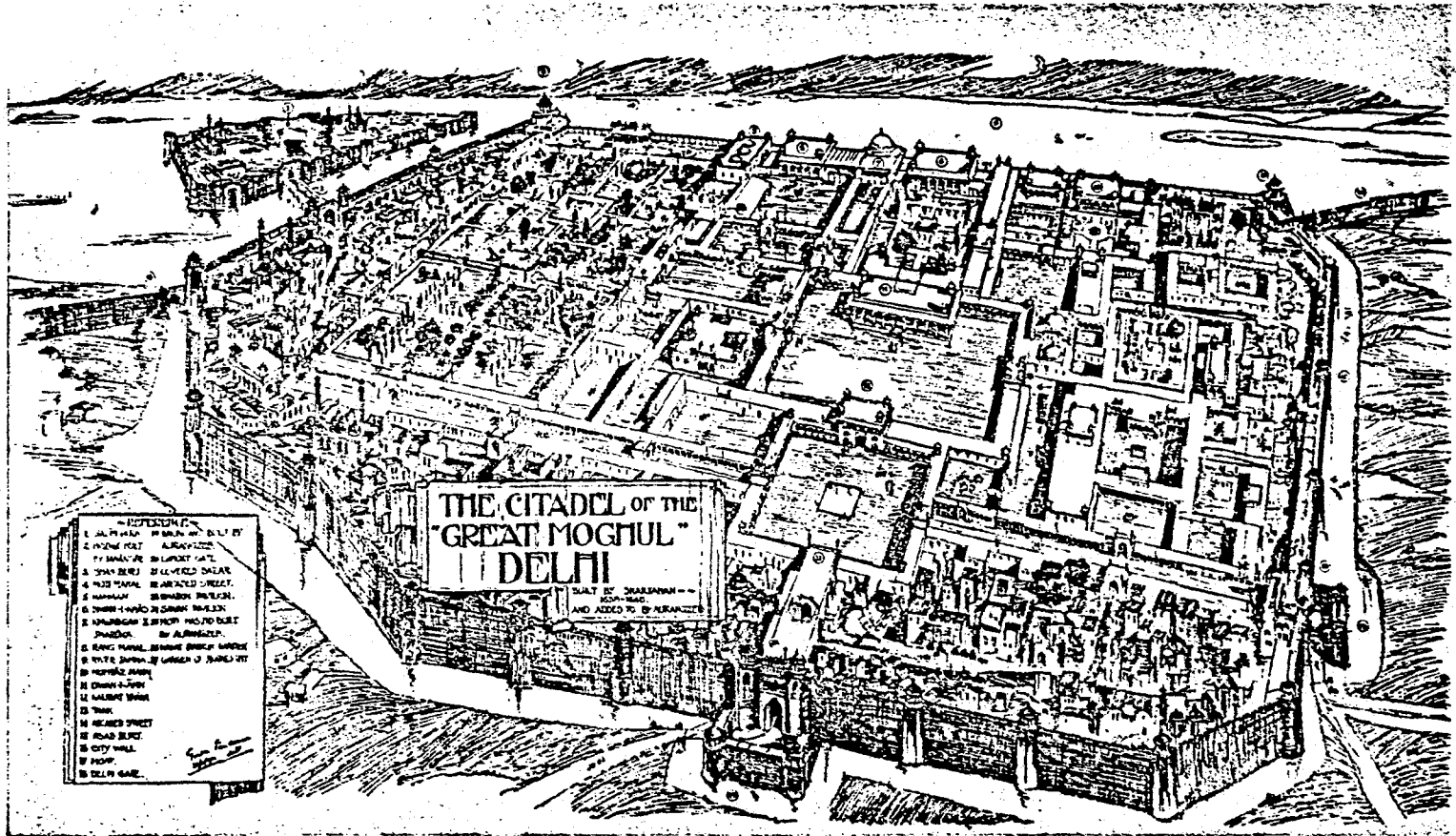


Figure 16. Delhi Fort, "The Citadel of the Great Moghul" (1639-48)

became, with slight modifications, the heritage of the whole of India" (18).

The Development of Southern Indian Architecture (A.D. 600 - 1800)

Indian architecture featured in most sources dwells primarily on architecture as it developed in central and northern India. Southern India developed architecture in a form to a great extent separate in character from the rest of India. This was due to its isolation. Dravidian types of people lived in Southern India and the architecture evolved from five main kingdoms that ruled in the South: Pallava (A.D. 600-900); Chola (A.D. 900-1150); Pandya (A.D. 1100-1350); Vijayanagar (A.D. 1350-1565); and Madura (from 1600) (13).

Domestic architecture as indicated by Percy Brown (7) was basically a wooden framework on masonry basements which was filled in with brick and plaster. Decorative murals on the exterior and interior walls of the houses were executed much as the ones in other areas of the country differing only in motifs.

In the Pallava period, the basic structure of buildings took the form of a wooden beam and bracket system with two foot square pillars. The decorative nature of architecture remained relatively simple with the chaitya-arch in a much reduced form used as a type of ornamentation (7). Figure 17 and Figure 18.

After much vying for power, the Chola dynasty arose victorious (900-1150 A.D.). The characteristic development of architecture under the Cholas was an extremely decorative style in which gryphon heads and gargoyle-like heads are seen in profusion. Sculpture de-

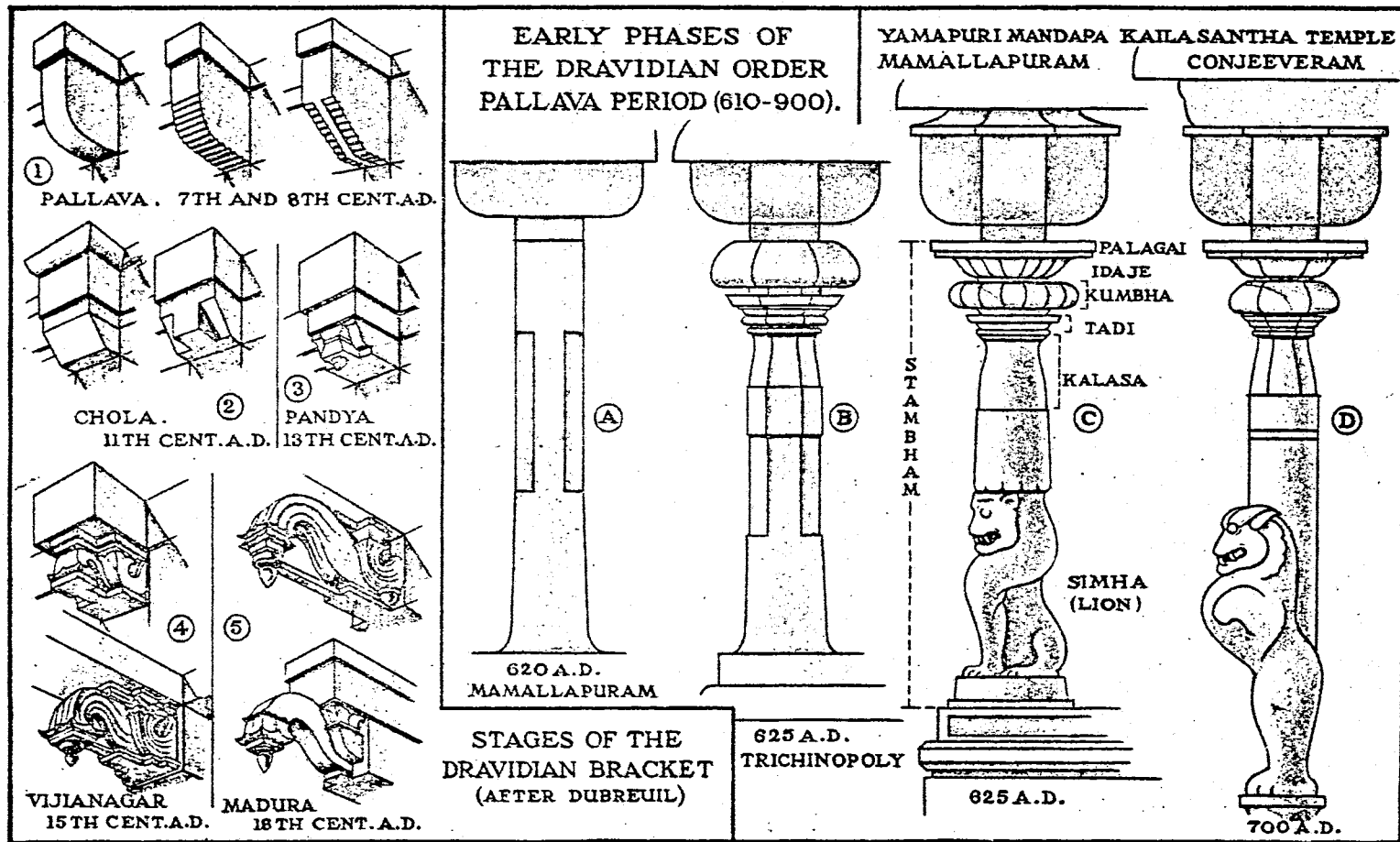


Figure 17. Phases of the Dravidian Order

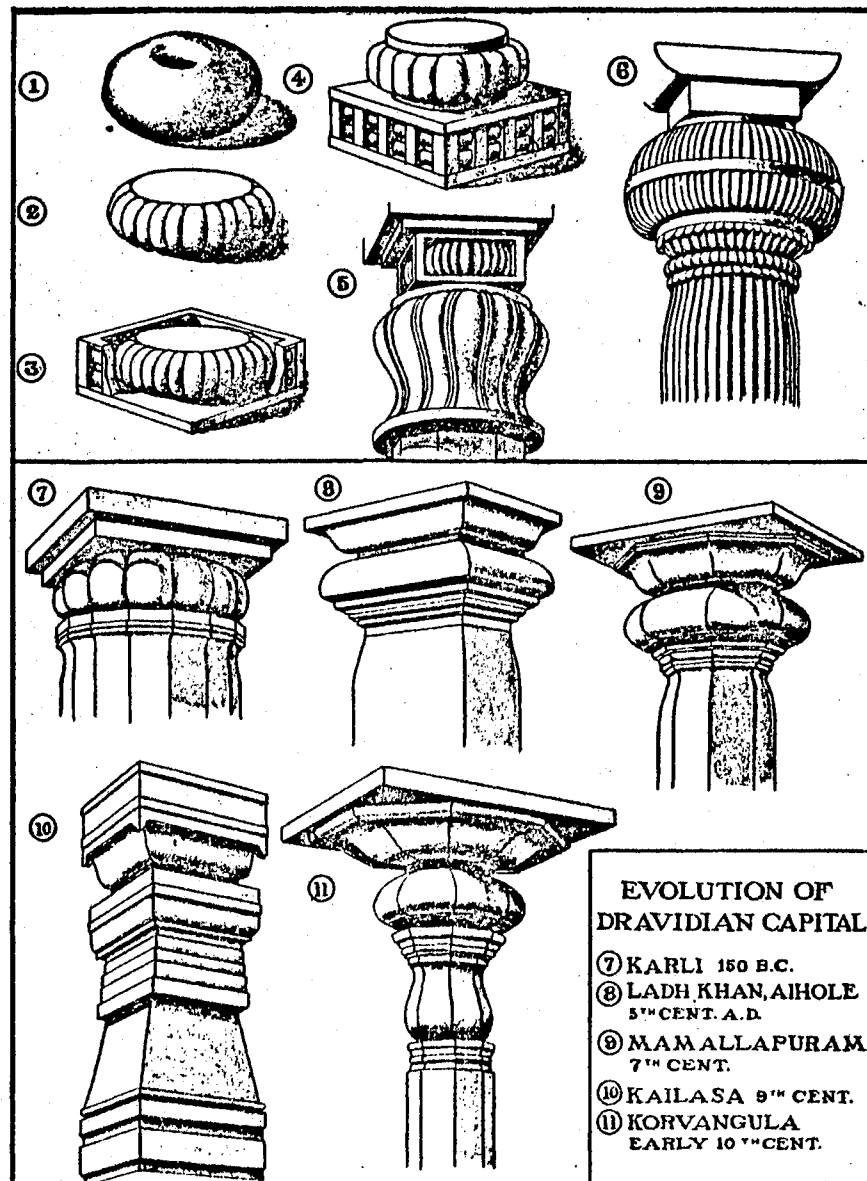


Figure 18. Evolution of the Dravidian Capital

velops at this time not so much as an art in itself, as an art in conjunction with architectural detailing. Figure 19.

The Pandyas' (1100 A.D. - 1350 A.D.) continue much the same framework the Cholas had originated and when the Vijayanager dynasty (1350-1565) took over it was with an extreme patriotic nature that architecture developed. The Moslems had already taken over much of India and it was of primary importance to this dynasty that they should not cross the Kistna River into the south of India. Of importance to architecture was not the massive single building that could be built but the coordination and unity of many buildings. Profuseness of ornamentation did continue. The pillar became primarily just a shaft to provide the backdrop for the attachment of intricately involved sculpture that was generally animal and supernatural in nature (7).

The Madura dynasty saw a further infiltration of Moslems forcing the Dravidian people further south to Madura. A refinement of sculptural detailing is seen. Figure 20.

Modern Indian Civilization (A.D. 1800 - Present)

Portuguese and French Period (1800 - 1850)

The 18th century saw India in a state of flux with many invaders moving into the country. New cultural ideas came in with both the Portuguese and the French who were not interested in ruling India but were interested in exploiting the raw materials and cheap labor that could be provided. The Portuguese began to build churches, monasteries, residences, factories, forts, and many other types of buildings. However, the influence of the Portuguese and other western countries was dependent upon how much political influence was present

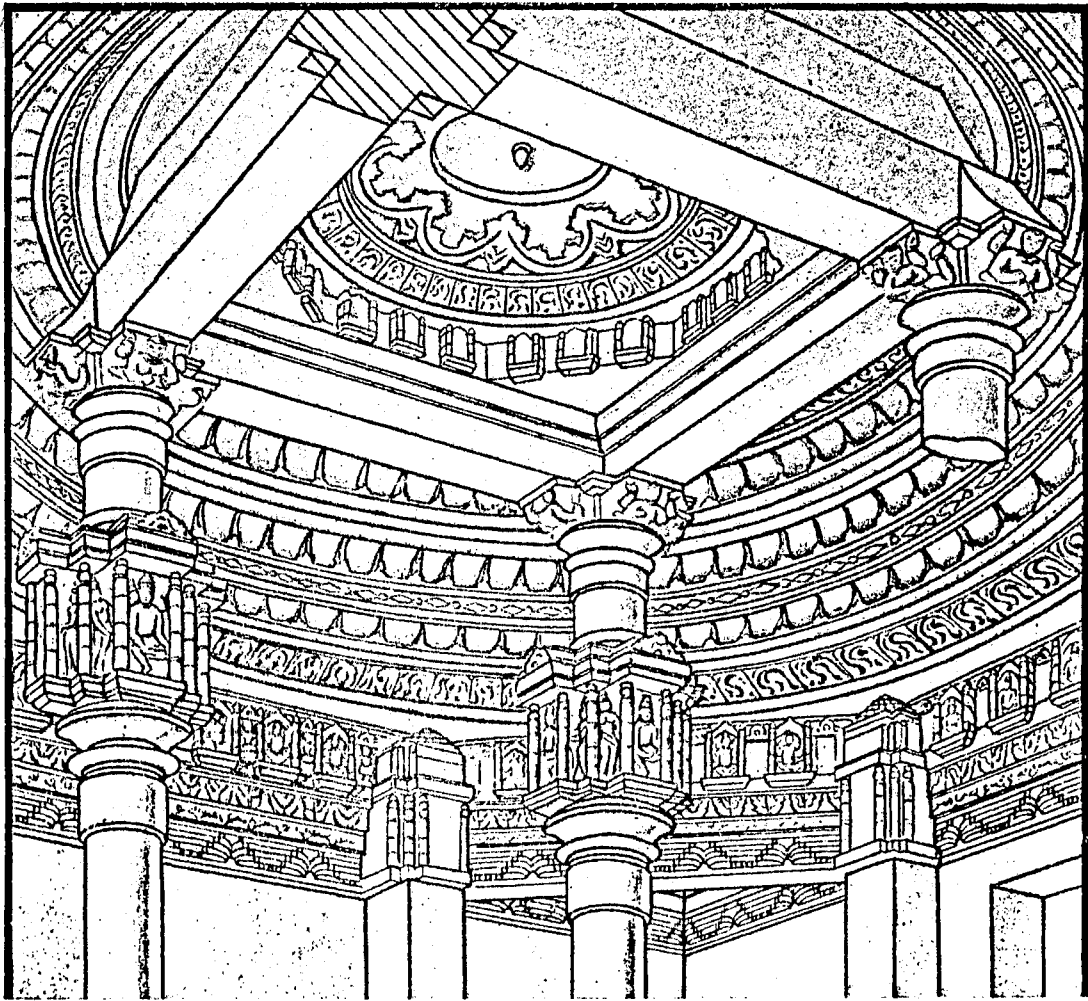


Figure 19. Ceiling Construction of Kandariya Mahadeo Temple
c. 1050 A.D.

Figure 20.

This is a very typical Southern Indian House at Madura. A street verandah leads through a passage into the main covered peristyle, or reception hall; a further lobby communicates with the more intimate part of the house, with its own court; beyond this again is a further open court, with the well in the centre, and cooking recesses around, each with clerestory ventilation above them.

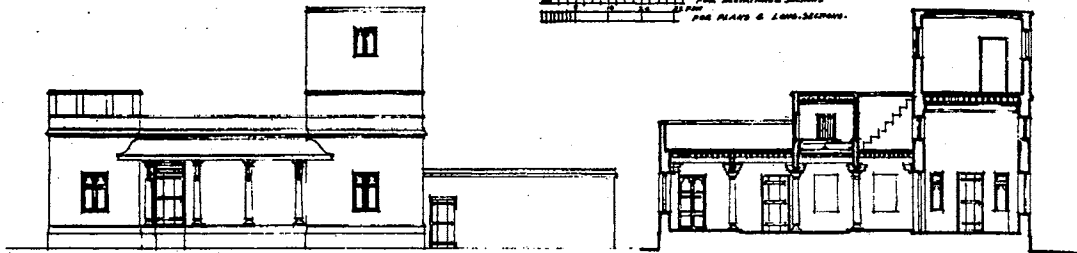
On the first floor the ladies bedrooms are provided; the staircases are so arranged that access may be gained to them either from the street vestibule or from the second court, without crossing the public reception room which was for the use of the male members of the family and their friends. This may appear to be a large house but this is essential where, under the joint-family system of the Hindus, there may often be three generations of a family occupying the same house together.

The whole site is surrounded by a high and strong wall, with a large gateway to the rear courtyard, fitted with massive timber doors, sufficiently high to allow an elephant to pass, since ceremonial occasions sometimes demand their use (4).

HINDU HOUSE

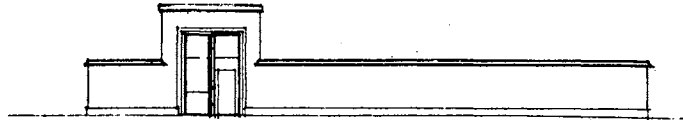
RAJARAM RAO'S HOUSE. MADURA.

scales:
1" = 10' FOR ARCHITECTURAL DETAILS
1" = 20' FOR PLANS & LONG-SECTIONS

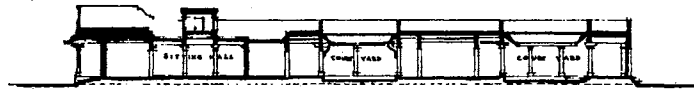


FRONT ELEVATION

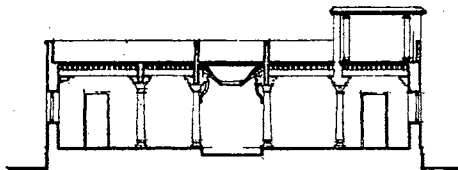
SECTION A-B



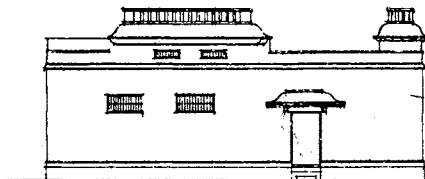
ELEVATION OF COMPOUND WALL WITH GATE



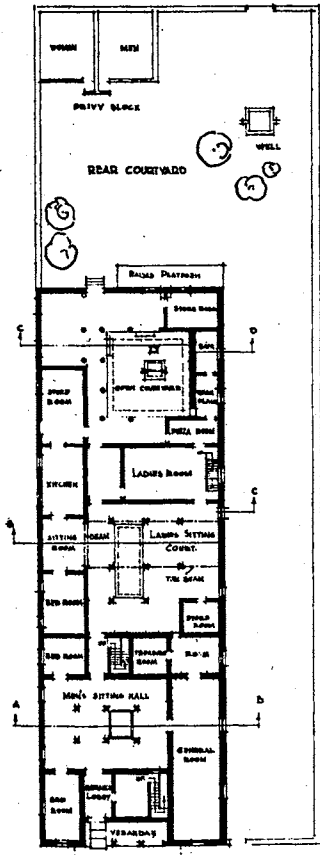
LONGITUDINAL SECTION



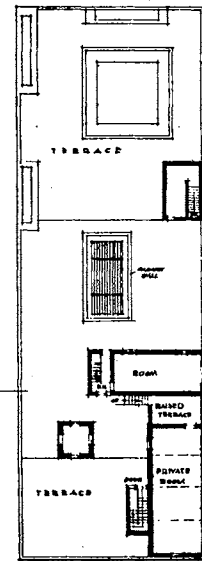
SECTION B-C



REAR ELEVATION



GROUND FLOOR PLAN



FIRST FLOOR PLAN

DESIGN. M.K. JADHAV
EXEUT. M.K. JADHAV.

and how it was wielded. Since France and Portugal were not interested in power, the lasting effect of the two countries on India was minimal.

English Period (1832-1947)

England's presence in India began with the East India Company which was a commercial enterprise that grew into a military complex sanctioned by the Crown. The East India Company came into India in the 1600's and had a first hand view of all that occurred in the country. As time went on, the English were able to witness the deterioration of the Mughal Empire but pretended to continue to acknowledge its existence. However, after 1832-37, a changed English policy went into effect. Indian opposition exploded in 1857-58 in the Great Mutiny. It was brought under control by the British armies who had just left the scene of the Crimean War.

The British government took over the administration of India. Modern railways, industries, schools and universities were built and Indians were admitted to higher and higher government posts. Indian upper-class life became increasingly European. Figure 21 and Figure 22.

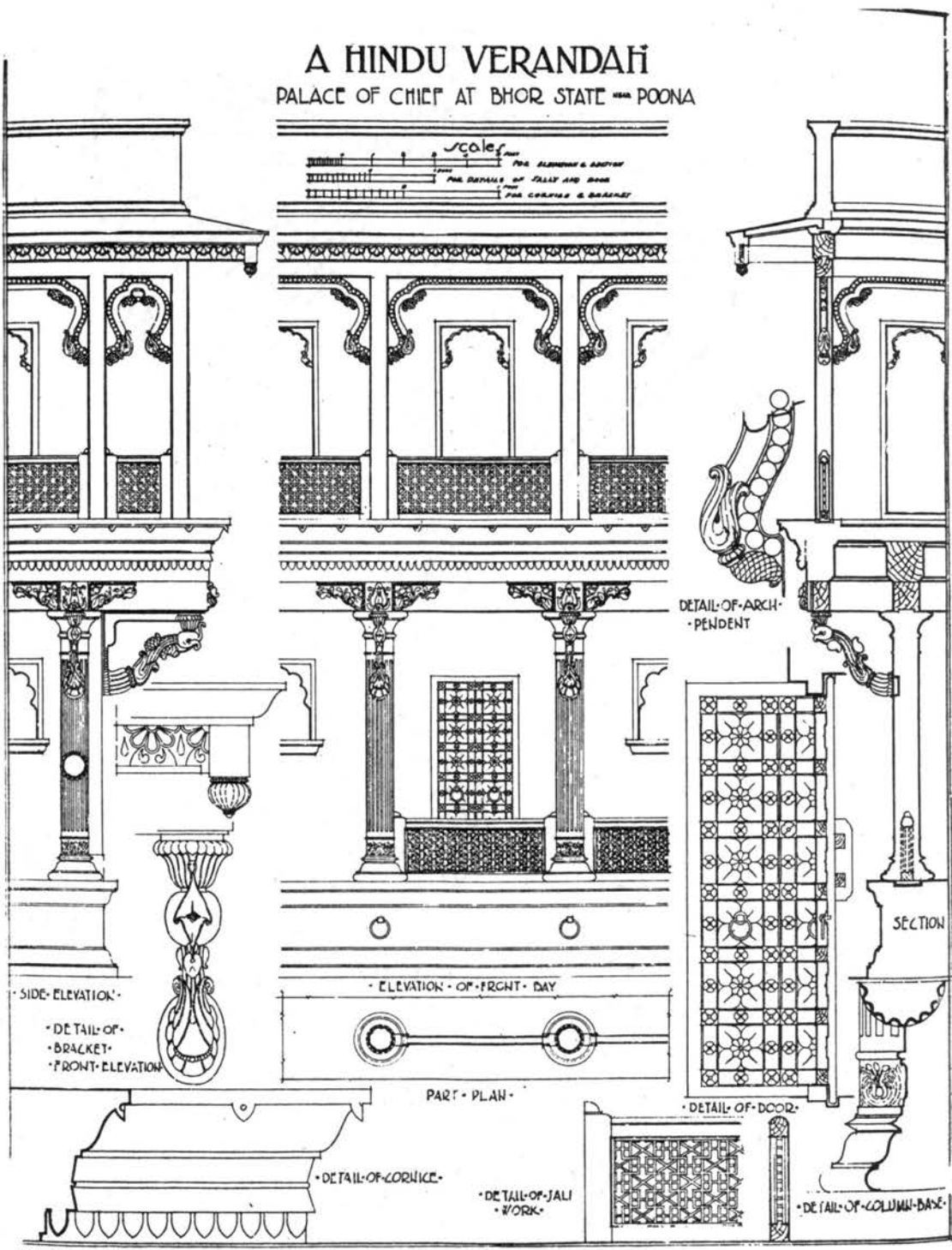
Towards the end of the nineteenth century a wave to return to the indigenous architecture occurred and was led by a group of Englishmen who had surveyed the surviving buildings and monuments and began to point out many of the good architectural features. An example of this revival movement was evidenced in the vast planning and building of New Delhi (1911-30) designed by Sir Edward Lutyens and Sir Edward Baker in a mixed Indo-European style (7).

For quite some time in the early twentieth century, unrest and

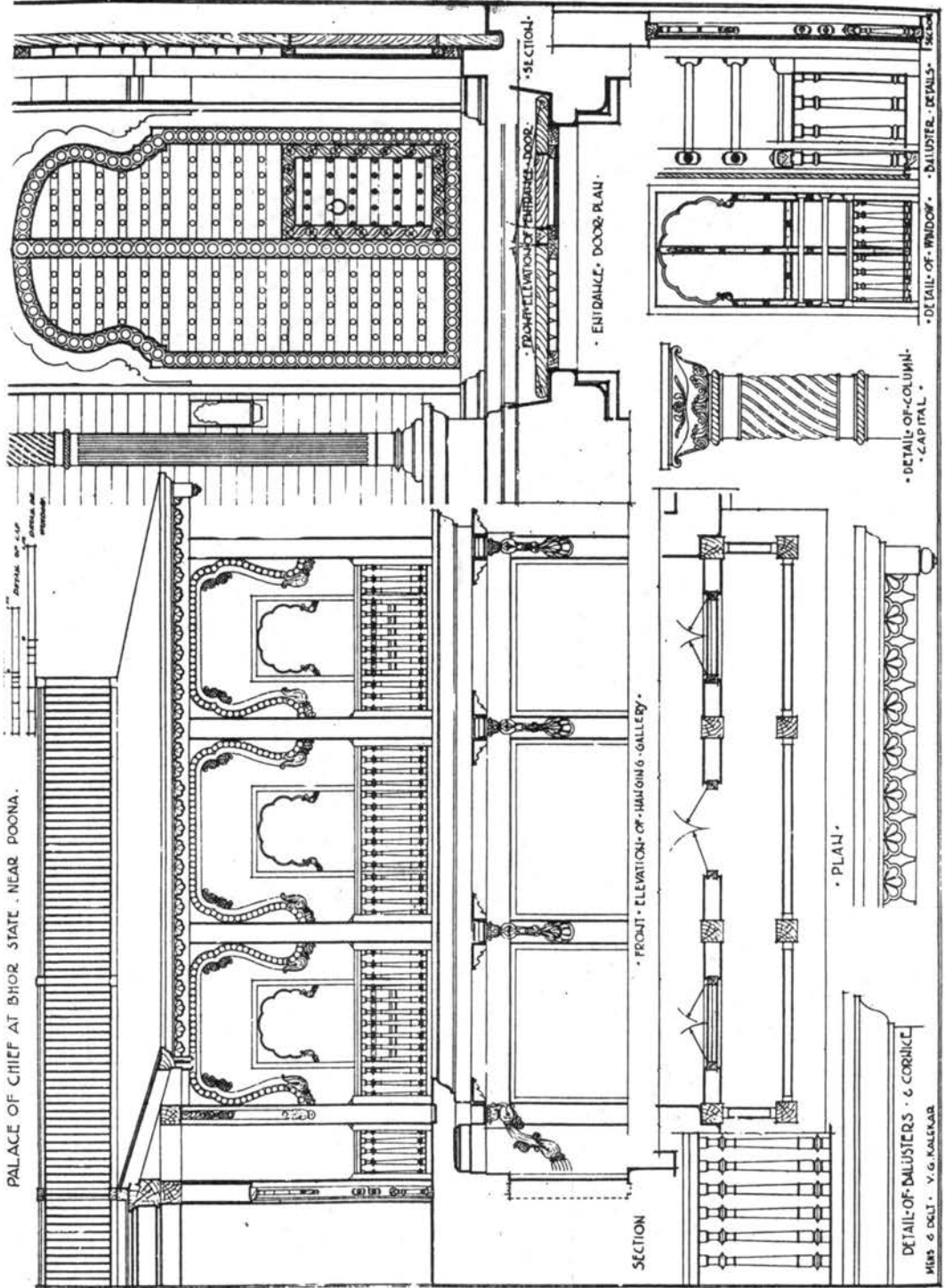
Figures 21 and 22.

These details are from another large house, the palace of the chief of Bhor State in the Poona district. This house is later in date, and here the details show the influence of the British occupation and how the European Renaissance forms were interpreted and blended by the Indian craftsmen with their own traditional work. It may be said with some truth to correspond with the English transitional work, especially the half-timbered work in the country districts, designed and carried out by village carpenter-craftsmen rather than architects. Signs of the foreign influence are to be seen most plainly in the columns, their capitals and bases, and also in the design of the balustrades, and in the raising of the height of the handrail design of the balustrades, and in the raising of the height of the handrail of the windows; in the latter case, the device of adding the two horizontal rails above the normal Indian height of the balustrade is clearly the reflection of a tendency to adopt the European chair, in place of the more comfortable mattress and cushions placed on the floor itself (4).

A HINDU VERANDAH PALACE OF CHIEF AT BHOR STATE POONA



MENS & DELT. V.G. KALEKAR.



PALACE OF CHIEF AT BHOR STATE . NEAR POONA.

SCALE OF 1" = 10'

SECTION

FRONT ELEVATION OF HANGING GALLERY.

PLAN.

DETAIL OF DALUSTERS & CORNICE

MRS. & DELT. V.G. KALEKAR

DETAIL OF WINDOW.

DALUSTER DETAILS.

DETAIL OF COLUMN. CAPITAL.

ENTRANCE DOOR PLAN.

PROJECTIONS OF HANGING DOOR.

SECTION.

organized thought moved toward the idea of an independent country to be ruled by the people. After long resistance, the British bureaucracy, dependent on Indian officials and troops had to give in to Mahatma Gandhi's non-cooperation movement. In 1947, India became independent. Since that time, modernization has occurred rapidly.

Independent India (1947 - Present)

After independence in 1947, a trend in favor of a national style of architecture was witnessed. But no one was able to define or draw up a national style. Introduction of chaitya arches, Hindu columns, and domes along with international modern trends of utility and functionalism have been witnessed (2).

The primary importance in architecture in the twentieth century has not been so much this quest for a national style as it has been to provide good and adequate housing for all the people of India. Emphasis since 300 B.C. had been placed on city life and the development of architecture there. However, it must be remembered that at least 85% of the population of India lived in villages and still does today. Village life has remained much the same as it has for many centuries. An investigation in 1953-1954 in 943 sample villages showed that, for the villages included,

about eighty-five per cent of the houses had mud plinths (foundations), eighty-three per cent had walls of mud, bamboo and reed, and about seventy per cent had roofs of straw, grass, reed, mud, etc. About seven per cent of the houses have plinths and walls of brick, cement, or stone and roofs of corrugated sheets, tiles, etc. More than ninety-five per cent of the houses had no attached latrines. About seventy per cent depended on wells, (for drinking water) thirteen per cent on tanks and ponds, twelve per cent on natural sources as lakes, springs, and rivers, three per cent on (deep drilled)

tubewells, less than one and one-half per cent on tap water supply and one and one-half per cent on other sources. About eighty-one per cent of the houses had three rooms or less; one-room houses accounted for thirty-four per cent and two-room houses for thirty-two per cent of the houses in the survey. About thirty-eight and one-half per cent of the households had less than 100 square feet of floor space per head and about thirty-two and one-half per cent had between 100 and 200 square feet (26).

In urban areas the congestion was found to be even more acute. This is a study that was conducted only seven years after India's independence and since that time as well as at that time city governments and the national government have been working on projects to help create and fund low cost housing both in urban and rural areas.

The August, 1946 issue of the A.I.A. Journal contains an article on "Low Cost Housing in Hyderabad." A quote from this article gives some insight to the redevelopment of this city.

The work of slum clearance goes forward steadily. Hyderabad slums are deplorable . . . To date, fourteen areas have been cleared and redeveloped, at a cost of seven million rupees - roughly \$2,100,000 (16).

Major General P. B. Fleming in this article explains that there are four levels or types of houses being built in the housing program labeled Class A, B, C, D. Figures 23, 24, 25. Table I.

Class A housing was designed to accommodate those able to pay the most. A feature of each of the housing classes is that each has its own walled court or compound. All of the houses have flat roofs to which there is easy access by way of ladders. Concrete was the construction material. The colors selected by each individual renter for his unit varied with many renting Class A apartments having the same color of unit as those renting Class D apartments. The colors

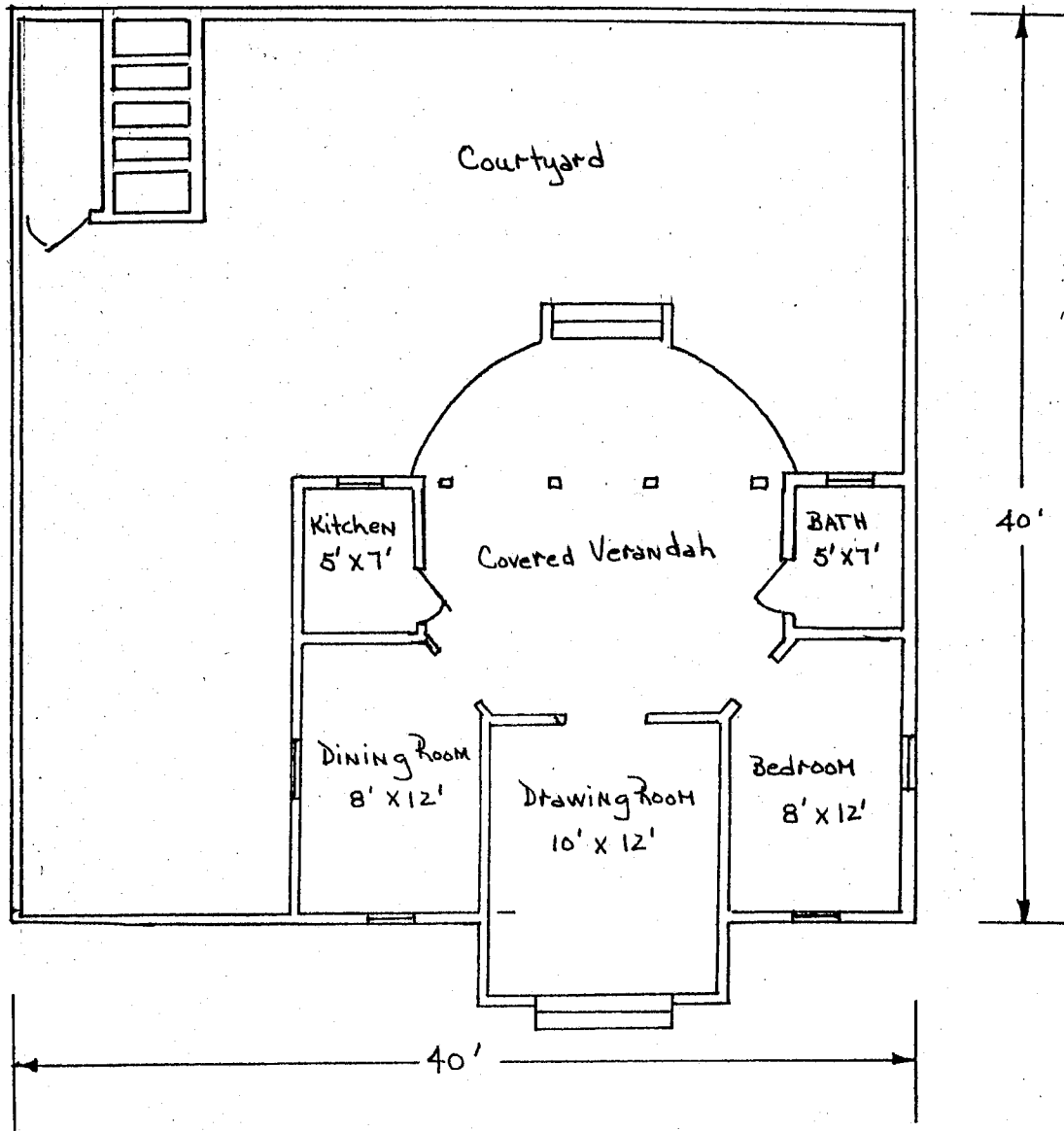


Figure 23. Low Cost Housing in Hyderabad-1941-Class A Public Housing

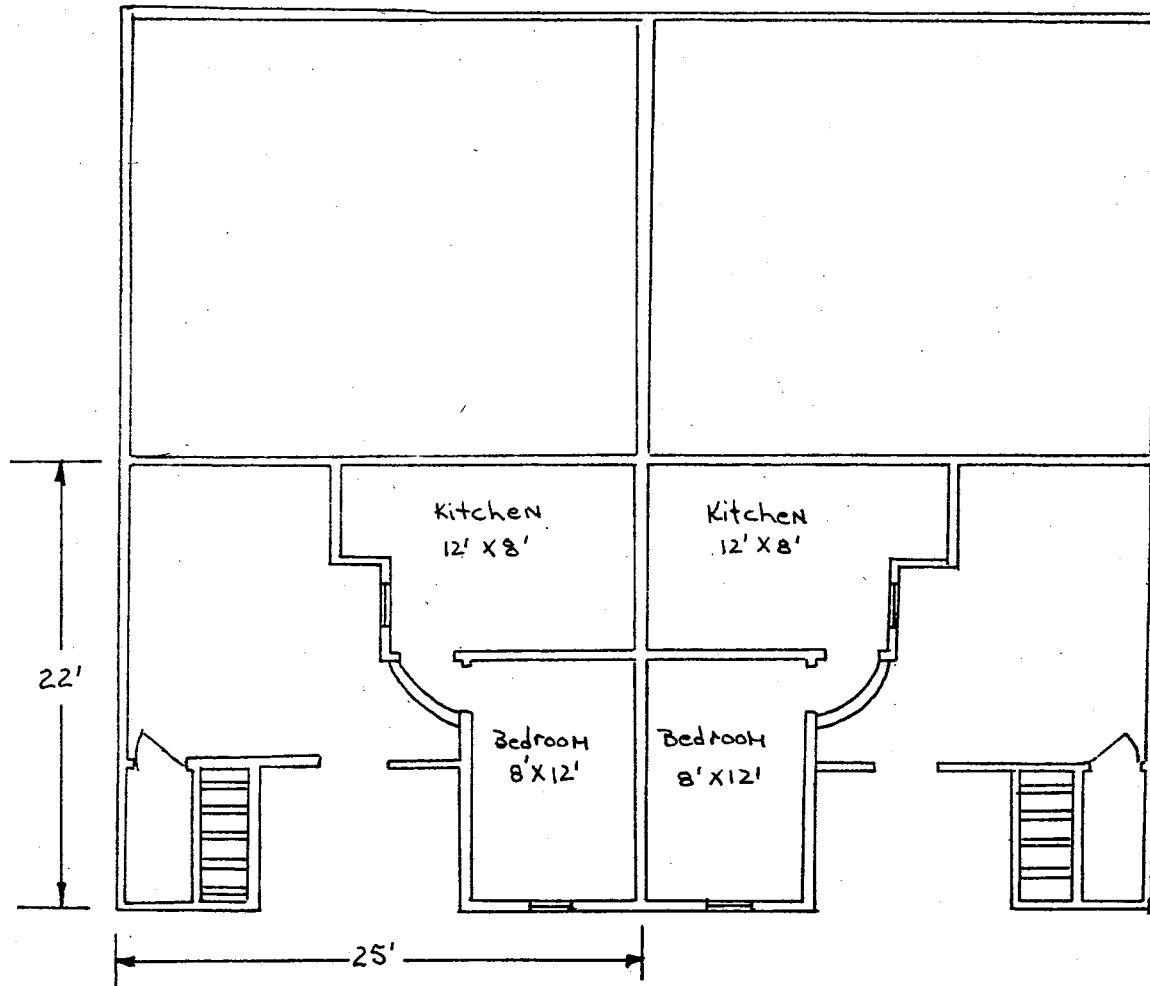


Figure 24. Class C Public Housing - Hyderabad - 1941

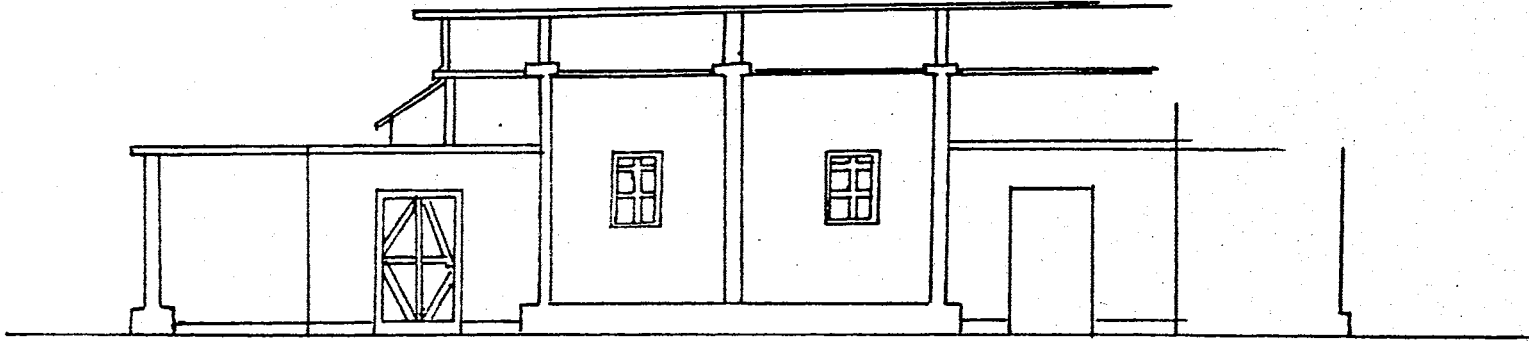


Figure 25. Elevation of Front-Class C Public Housing

varied from blue, pink, brown, green, buff, and gray.

TABLE I
TYPES OF LOW COST HOUSING IN HYDERABAD, 1941

	Built in Groups of	Dimensions	Rooms	Construc- tion Cost	Rent/ Month	Court- yard
Class A	1	40' x 40'	5	\$650	\$3.16	Private
Class B	2	30' x 30'	3	\$405	\$2.00	Private
Class C	4	22' x 25'	2	\$270	\$0.90	Private
Class D	2	18'6" x 12'3"	2	\$150	\$0.30	Private

A report of the national government's progress in housing projects was made in the Times of India Directory and Yearbook, 1967.

Working on the basis of the data collected in the 1961 census and further population projections and taking into account possible new construction and depreciation of existing houses, it has been estimated that the total shortage of urban housing in the country by the beginning of the Fourth Plan (April, 1966) was of the order of 1.14 crore dwelling units. In addition, nearly 6.27 crore houses in the rural areas are either Kacha or substandard and require to be rebuilt (24).

Four major housing schemes were cited, the Subsidized Industrial Housing Scheme, Plantation Labour Housing Scheme, Low Income Group Housing Scheme, and the Slum Clearance Improvement Scheme. The subsidized Industrial Housing Scheme provided from 1952-1966 a total of 154,933 houses. The Plantation Labour Housing Scheme provided from

1956-1966, 1000 houses. The Low Income Group Housing Scheme has provided long term loans and has completed 100,340 houses. The Slum Clearance Improvement Scheme from 1956-1966 provided for 94,900 dwelling units. Clearly India needs to pick up in the growth of housing. A crore is equal to 10,000,000 which means that over 70,000,000 housing units were estimated to be needed while the government in a little over a ten-year period built only 351,173 housing units in its combined housing projects which is only one-half of one per cent of the estimated need. The outlook, therefore, seems to be that of low standard housing in India for quite some time. Good design must go hand in hand with increased building in India and Percy Brown suggests hope that such design will come from the drawing boards of native Indians.

It is hoped that some genius will arise who will combine the beauty and the spirit of the old national art with the methods and ideals of the new age (7).

Chandigarh is an example of a modern attempt to portray the way of life of the people it serves (15). Among the characteristic elements that indicate this are the incorporation of traditional sunbreaks in front of the buildings and much use of 'jali' patterning in facades and interiors. Figure 26. Not all of Chandigarh has been a success in meeting the needs of the people. Numerous studies were made but were not entirely successful because India's heritage was not accurately reflected in the plans.

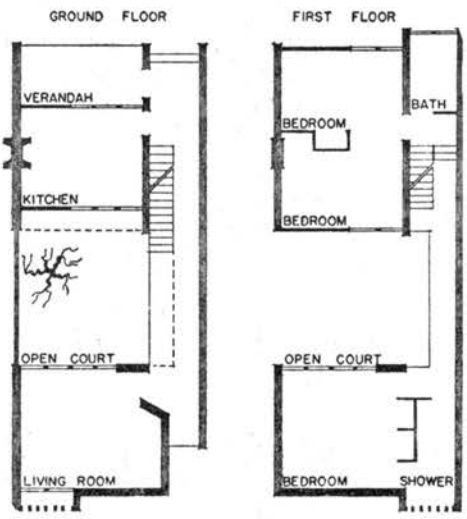


Figure 26. House with Interior Courtyard

CHAPTER III

SUMMARY

From a review of literature, three successive stages have been noted in the historical development of India. These three stages influenced and are witnessed in the development of domestic architecture. These three stages were the Ancient Hindu Period, originating with earliest known habitation from 3000 B.C. to 1200 A.D. The second stage was the Indo-Islamic Civilization which lasted until 1800 A.D. The third stage or Modern Indian Civilization is still in process. Southern Indian domestic architecture was different in nature due to isolation from the rest of India and must, therefore, be dealt with separately.

Ancient Hindu Period 3000 B.C. - 1200 A.D.

In the first stage of history, a well developed city civilization was seen at both Mohenjo-daro and Harappa. The houses of the Indus Valley Civilization were often two or more stories high and very plain. They were varied in size but were all based on much the same plan, a square courtyard around which were the rooms. Cooking was done in the courtyard with some houses having separate kitchens and a refined drainage system for waste water. All houses had bathrooms and latrines.

Brick and wood were the primary construction materials. The post

and lintel system of construction was used with corbelled arches evidenced. The roofs of the houses were flat.

The Indus Valley Civilization was destroyed by the Aryans about 1500 B.C. The Aryans were nomadic tribes moving in from the north. The building art as it began under the Aryans in the Vedic Civilization (1500 B.C. - 300 A.D.) was much more rudimentary than that of the Indus Valley Civilization. The huts were constructed of bamboos and leaves and were in villages. There was no city life at this time.

The huts were built close together for protection from beasts and other invaders. Fences were built around the villages. The Vedic huts built within these enclosures were based on circular beehive pattern with domed roofs. This pattern then evolved to an oval plan with a barrel roof. Designs in color were used on the exterior walls.

The Rig Veda was the first written literature in India and was written during the Vedic period (1500 B.C. - 300 A.D.). The Rig Veda showed the life of the people and the later Vedas depicted rituals and sacrifices that were to be observed. Hinduism had its foundation in the Vedas as did the caste system. The four castes witnessed were the Brahmin, the priestly caste; Kshatriyas, the warrior caste; the Vaisyas, the agricultural or worker caste; and the Sudra, the servile caste made up of 'non-Aryan' peoples.

A definite hierarchy was seen in the caste system and this social stratification affected the building of the villages (500 B.C. on). The Brahmins and Kshatriyas occupied the better houses while the workers or traders were either in small settlements in the same village or in separate villages.

Towns developed during the Mauryan Empire (322-185 B.C.). Of

primary importance to the towns were their fortifications which were of brick and consisted of battlements, towers, and covered ways. The towns were rectangular and divided into four parts, one each for the four castes. Building codes dictated the height of dwellings. The height varied according to caste identification of a person. The imperial palaces could be as high as eleven storeys. The buildings of the Brahmins could be up to nine storeys high. Ordinary kings could build to seven storeys while the Vaisyas and the Kshatriyas could build up to four storeys. The Sudras were limited to three storeys.

The houses of the towns and cities were generally built of wood with the interior and exterior covered with chunam plaster and then painted with frescoes. Most houses down to Gupta times (300 A.D.) were built with barrel vaulted roofs with gable-ends and often ornate finials. Roofs were both thatched and tiled. Later the barrel roofs gave way to a flatter type with overhanging eaves. The larger houses generally had raised terraces or flat roofs on which the household could sleep in hot weather.

The zenith of this Ancient Hindu Period was seen during the Gupta Empire (300 A.D. - 500 A.D.) which saw the beginning of the Medieval Hindu Civilization (300 A.D. - 1200 A.D.). Buddhism with its dismissal of the caste system had its effect at this time. The caste system in the city dissolved into a society of many classes led by the rich merchants of the city.

The house in the Gupta Empire saw a transition from a structure of necessity to one in which the highest magic and religious trends of the time were related. This trend was directly related to the

several writings of the time on art and architecture. The structures of the Gupta Empire did not undergo a revolutionary change, but what occurred was an understanding and adaptation of old forms.

In the struggle against Huns and other invaders, the Gupta towns were destroyed and the military class of India took over. Caste hierarchy was again seen but this time as an inflexible system. India became thoroughly divided and the civilization degenerated to a point of easy takeover by the Moslem invaders.

Indo-Islamic Civilization (1200 A.D. - 1800 A.D.)

Twelve hundred A.D. marks the time of Islamic takeover in India. Life remained much the same with the Hindu aristocracy continuing their rituals while paying tribute to the conquered. Village life remained untouched by the Moslems because they controlled the country only in a few strategic positions.

The indigenous architecture of India to this time was trabeate but with the spread of the Islamic influence the arch began to be seen. Prior to the Moslem takeover, rooftops were flat or low pointed with spires. With the Moslems came the dome. A synthesis of Moslem and Indian architecture occurred. The Indo-Islamic architecture as Havell writes was only "a continuous development of Indian building traditions proceeding from altered social and political life, changes in religious ritual and symbolism and in the structural requirements evolved therefrom" (19).

Three styles of Indo-Islamic architecture occurred, the Delhi or Imperial style, the Provincial style and the Mughal style. The Delhi style began at the close of the 12th century with established Moslem

rule at Delhi and continued nearly four centuries until it was succeeded by the Mughal style. Due to military and residential requirements, the Delhi style produced great complexes combining city, fort, and palace. The cities were surrounded by walls constructed of monolithic pieces of stone and had circular bastions at intervals.

Little is known of the domestic architecture of the time, however, a residence of a nobleman of the fifteenth century has been found. The residence consisted of an enclosed courtyard with wells and bathing facilities in the center. Around this were the stables and servant quarters. A staircase led from the ground to the flat roof and was used as a terrace. Connected to the courtyard was a pillared area which was the residence. The whole residence was protected by a high wall. The emphatic feature of this complex was a three-storyed square tower with easy access from all ground floor quarters. The total enclosure of the complex was for both defensive reasons and privacy.

Pointed arches and shallow domes were also indicative of the Delhi style. Life for the ordinary people other than kings and nobles was squalid.

The Provincial style of architecture refers to the building style practiced in more self-contained portions of the country after these areas threw off allegiance to Delhi and the Moslems. It was contemporary with the development of the Delhi style and was basically an offshoot from the Delhi style. However, many individual characteristics began to be witnessed such as short square pillars, bracket capital, horizontal archways, and roofs of flat slabs.

When the Mughals (A.D. 1526 - 1803 - 1857) conquered India,

another period of colonial rule seemed preeminent. But the Indian Moslems rebelled and forced the Mughals into an alliance with the northern Indian Hindu aristocracy which resulted in a synthesis of Islamic and Hindu culture in most ways of life.

Wealth and interest in architecture of the Mughal rulers resulted in nearly 200 years of consistently high quality building. Two phases of Mughal architecture were seen, one under the reign of Akbar and the other under Shah Jahan. Both phases were characteristic for the building materials used. Akbar used red sandstone with ivory inlays and Shah Jahan used white marble.

Akbar used the Indian artisans, finding them knowledgeable. In principle the construction of the buildings was trabeate with the arch used only as a decorative feature. The dome at this time was shallow and hollow, the pillar shafts were many sided and the capitals were in the form of bracket supports.

Shah Jahan's building in marble continued the sandstone tradition of Akbar. The Mughal style of architecture continued until the 18th century, at which time the empire collapsed. The treasury ran out of money and the country became a loose federation of Hindu and Moslem states.

Southern Indian Domestic Architecture (A.D. 600-1800)

The development of domestic architecture in Southern India was different in character from the rest of India. The architecture evolved from five main kingdoms that ruled in the South: Pallava (A.D. 600-900), Chola (A.D. 900-1150), Pandya (A.D. 1100-1350), Vijayanagar (A.D. 1350-1565), and Madura (from 1600).

Houses were basically built with wooden frameworks on masonry basements filled in with brick and plaster. Decorative murals were also used on both exterior and interior surfaces differing only in motif from the rest of the country.

Modern Indian Civilization (1800 - present)

The 18th century saw India in a state of flux with the French and Portuguese immigrating into the country. The French and Portuguese were not interested in ruling India but were interested in the exploitation of the raw materials India had to offer. The lasting effect of these two countries was minimal.

The English were present in India as early as the 1600's with the creation of the East India Company. However, by the 19th century this commercial enterprise grew into a military complex sanctioned by the crown. Resistance to the English came in the form of the Great Mutiny of 1857-58 which was quelled by the British armies.

The British took over the administration of India and built modern railways, schools and universities, and industries. Indians were allowed to rise within this British bureaucracy so that as time went on the Indian upper-class became increasingly European.

By the end of the 19th century, a group of Englishmen started a movement to return to the indigenous architecture of the country. The result was the building of New Delhi in an Anglo-Indian style.

The twentieth century witnessed great unrest and as the people became organized under Mahatma Gandhi's non-cooperation movement, the British bureaucracy dissolved. India became independent. Since 1947, the year of independence, modernization has occurred rapidly.

A trend toward a national architecture was seen with no one being able to define or draw up a national style. Introduction of traditional motifs and buildings were seen as well as trends toward the international style of utility and functionalism. However, the major problem became not so much the finding of a national architectural style to follow as to provide adequate housing for the people of the country. An investigation in 1953-54 taken in over 900 rural villages showed that much of the existing housing was substandard. This was shown also in urban areas. City government and national government have been working on projects to eradicate the problems of housing in both rural and urban areas.

A low cost housing project in Hyderabad was developed in the mid-forties with four different levels of housing being built relating directly to the amount each family could pay for housing. These housing units were all built with walled courtyards. Each unit has a flat roof which is accessible by way of ladders. Concrete was the building material and each unit could be painted a variety of colors.

Using data compiled in the 1961 census, the estimated need for housing by 1966 was projected at something over 70,000,000 units for the whole of India, while from 1950 to 1960 only 351,173 housing units had actually been built. The outlook for housing seems to be that of low standard housing in India for quite some time.

Good design is going hand in hand with increased building as the Indian architect's goal today moves toward synthesizing Indian tradition and modern technology along with providing adequate housing for the masses.

A SELECTED BIBLIOGRAPHY

- (1) Adams, Thomas. Outline of Town and City Planning. New York: Russell Sage Foundation, 1936.
- (2) Anand, Mulk Raj. "Reflections on the House, Stupa, the Temple, the Mosque, the Mausoleum and the Town Plan From the Earliest Times Till Today." Marg (December, 1963), 8-10.
- (3) Basham, A. L. The Wonder That Was India. New York: Taplinger Publishing Co., 1968.
- (4) Batley, Claude. The Design Development of Indian Architecture. London: John Tiranti, Ltd., 1940.
- (5) Bemis, Albert and John Burchard. The Evolving House. Cambridge: Massachusetts Institute of Technology, 1933.
- (6) Brown, Joe David. India. New York: Time, Inc., 1961.
- (7) Brown, Percy. Indian Architecture (two volumes). Bombay: D. B. Taraporevala Sons and Company, Private Ltd., 1956.
- (8) Burn, Sir Richard (ed.). The Cambridge History of Art, Vol. IV. New York: Macmillan Company, 1922.
- (9) Cameron, Roderick. Shadows From India. London: William Heineman, Ltd., 1958.
- (10) Childe, V. Gordon. New Light on the Most Ancient East. London: Kegan Paul, Trench, Trubner and Company, 1935.
- (11) Childress, Vance Ray. "A Field Investigation of Housing in Europe, India, Thailand, and Japan Indicating Some Cultural Effects Upon Their Design." (Unpublished Master's thesis, Oklahoma State University, Stillwater, 1970).
- (12) Coomaraswamy, A. K. Arts and Crafts of India and Ceylon. London: T. N. Foulis, 1913.
- (13) Dutt, Romesh C. Civilization of India. London: Aldine House, J. M. Dent, 1900.
- (14) Edwards, Michael. Everyday Life in Early India. London: B. T. Batsford, Ltd., 1969.

- (15) Evenson, Norma. Chandigarh. Berkeley: University of California Press, 1966.
- (16) Fleming, P. B. "Low Cost Housing in Hyderabad." A.I.A. Journal (August, 1946), 72-80.
- (17) Frederic, Louis. The Art of India. New York: Harry N. Abrams, Inc. (no date shown).
- (18) Goetz, Hermann. India, Five Thousand Years of Indian Art. New York: Crown Publishers, 1964.
- (19) Havell, Ernest Binfield. A Handbook of Indian Art. London: J. Murray, 1920.
- (20) Hunter, Sir W. W. Brief History of the Indian People. Oxford: The Clarendon Press, 1967.
- (21) Jackson, A. V. Williams. History of India. London: The Grolier Society Publishers, 1907.
- (22) Mehta, Rustam J. Handicrafts and Industrial Arts of India. Bombay: Taraporevala and Sons and Company, Private Ltd., 1960.
- (23) Mookerjee, Ajit. The Arts of India From Prehistoric to Modern Times. Calcutta: Institute of Art and Industry, Artistry House, 1958.
- (24) Nanporia, N. Y. (ed.). The Times of India Directory and Yearbook, 1967, including Who's Who, 1967. Bombay: The Times of India Press, 1967.
- (25) Pandey, B. N. A Book of India. London: William Collins and Sons and Company, Ltd., 1965.
- (26) Platt, Raye R. (ed.). India - A Compendium. New York: American Geographical Society, 1962.
- (27) Rapson, E. J. (ed.). The Cambridge History of Art, Vol. I. New York: Macmillan Company, 1937.
- (28) Rhys-Davids, T. W. Buddhist India. New York: G. P. Putnam and Sons, 1903.
- (29) Rowland, Benjamine. Art and Architecture of India. Great Britain: Penguin Books, Ltd., 1953.
- (30) Ruthnasswamy, Mariadas. India From the Dawn: New Aspects of An Old Story. Milwaukee: Bruce Publishing Company, 1949.
- (31) Sengupta, Padmini. Everyday Life in Ancient India. London: Oxford University Press, 1950.

- (32) Speiser, Werner. Oriental Architecture in Color. New York: Dover Publications, Inc., 1959.
- (33) Speltz, Alexander. The Styles of Ornament. New York: Dover Publications, Inc., 1959.
- (34) Swarup, Shanti. 5000 Years of Arts and Crafts of India and Pakistan. Bombay: Taraporevala and Sons and Company, Private Ltd., 1957.
- (35) Terry, John. The Charm of Indo-Islamic Architecture. London: Alec Tiranti, Ltd., 1955.
- (36) Webster's Seventh New Collegiate Dictionary. Springfield, Mass.: G. and C. Merriam Company, 1965.
- (37) Wiser, William and Charlotte Wiser. Behind Mud Walls. Berkeley: University of California Press, 1963.
- (38) Zimmer, Heinrich. The Art of Indian Asia. New York: Pantheon Books, Inc., 1955.

APPENDIX A

INDIAN CULTURAL ACHIEVEMENTS AND DYNASTIES

Following is a brief chronological survey of Indian cultural achievements and dynasties as presented by Ajit Mookerjee in her book, The Arts of India From Prehistoric to Modern Times.

Prehistoric Periods: Hand-axes, scrapers, flints, knives, etc., from Kashmir and several parts of Madhya Pradesh. Neolithic: ring stones, hammer-stones from Orissa, Bengal, and Assam. Cave paintings found at Madhya Pradesh and Uttar Pradesh. Megalithic: burial jars and mounds in Sind, South and Western India. Dravidian civilization.

Indus Valley Civilization c. 3000 - 1500 B.C.: Steatite seals and bronze figures, jewelry, painted pottery, terracotta figurines from Harappa, Mohenjo-daro, etc.

Aryan Settlement (Vedic Period) c. 1500-800 B.C.: Rig Veda c. 800 B.C. Earth Goddess and Vedic burial mounds, etc. 800 B.C. Upanisads.

Saisunga Dynasty c. 642 - 322 B.C.: Mahavira 599-527 B.C. (Founder of Jainism). Buddha 563-483 B.C. Jataka stories 500-200 B.C.

Maurya Dynasty 322-185 B.C.: black pottery, terracotta figurines. Asoka: Monolithic pillars, rock-edicts, early cave architecture.

Sunga and Kanva Dynasties 185-28 B.C.: Sculptured gateways and railings of Bharhut, Sanchi, and Bodhgaya.

Parthian and Saka Dynasties c. 60 B.C. - 48 A.D.: Early Gandhara sculptures.

Kushan Dynasties c. 30-250 A.D.: Continuing traditions of sculpture in Gandhara and Mathura. Origin of Buddha image. About 67 A.D. Buddhism reaches China.

Andhra Dynasties 230 B.C. - 225 A.D.: Sculptured stupas at Amaravati. Clay figures from Kundapur.

Gupta Dynasty 320-600 A.D.: Golden Age of Indian art and literature. Main centers of sculpture Mathura and Sarnath. Stone and brick temples. Murals at Ajanta and Bagh.

Early Medieval Dynasties 7th - 10th c. A.D.: Pallava Dynasty, c. 325-700 A.D. Rock-cut shrines. Chalukya Dynasty, 550-642 A.D. The Descent of the Ganges Temples at Badami and Aihole. Rashtrakuta Dynasty, 757-973 A.D. Kailasa temple and murals at Elura; cave temples at Elephanta. Pala Dynasty c. 750-1100 A.D. Stone and metal sculptures and illustrated manuscripts.

Indian Art Abroad 8th-10th c. A.D.: Borobudur and Prambanam in Java. Angkor Wat and Angkor Thom in Cambodia. Hindu rule in East Java 10th to 16th century A.D. Temples at Pagan in Burma. Thousand Buddhas in Lung-men caves in China. Horyuji temple at Nara in Japan.

Late Medieval Dynasties 11th -15th c. A.D.: Temples at Khajuraho. Solankis of Gujarat, 765-1197 A.D. Jain temples at Mount Abu, Girnar, etc. Eastern Gangas of Orissa, 1076-1148 A.D. Temples at Bhuvaneshvar, Konarak, and Puri. Chola Dynasty, 907-1053. Temples at Tanjore, South Indian bronzes, images of Nataraja. Hoysala and Yadava Dynasties, 1111-1318 A.D.

Sultanate of Delhi 1206-1586 A.D.: Early Indo-Islamic architec-

ture.

Mughal Empire 1526-1802 A.D.: Mughal architecture at Delhi, Agra, Fathepur, Sikri, Allahabad, etc. Mughal gardens at Lahore and Srinagar. Mughal paintings 17th to 19th century A.D. Rajput and Pahari paintings.

Colonial and Modern Periods 18th-20th c. A.D.: Archaeological Survey of India. Folk arts and crafts and primitive survivals. Abanindranath Tagore, Nandalal Bose, Jamini Roy (41).

GLOSSARY

- Arcuate.** Referring in architecture to curved construction.
- Arthasastra of Kautilya.** A political handbook on the techniques of Hindu government, statecraft, warfare, and public life around the fourth century, B.C.
- Brackets.** A projecting support to hold up the lintel, roof, balcony, etc.
- Chunam.** Lime, also plaster or stucco.
- Corbelled Arch.** Opening in wall held together by projecting stones, each farther than the one below, until the top block of stone completes an arch-like opening.
- Jali.** Wooden or stone lattice work; if floral, then of indigenous Indian origin; if geometrical, then of Moslem influence.
- Jatakas.** Buddhist prose writings, primarily legends.
- Kacha.** Temporary housing.
- Mahall.** Moslem word for palace.
- Post and Lintel.** A form of construction that entails the use of vertical posts spanned horizontally by other posts or lintels.
- Rajputs.** Synonym: Kshatriyas; the warrior and ruling caste second to the Brahmins.
- Rig Veda.** The oldest of the Vedas; a hymnbook telling of the life of the Aryans.
- Sastras.** Rule books, treatises, any books of divine or recognized authority.

Shastras. Synonym - Sastras.

Stupa. Hemispherical burial mound of religious significance to
Buddhists.

Sutra Apastaba. A book of rules.

True Arch. A curved structural member spanning an opening and
serving as a support.

Tudor Arch. A type of arch meeting at an angle at its apex.

Vedas. Holy books of the Indo-Aryans which were the foundation of the
Hindu religion.

Vinaya. The recorded 'Canon Law' of Buddhism.

Visvakarma. Patron deity of the craftsmen and an architect himself.

Visvakarmaprakasa. A rulebook related to architectural construction
supposedly written by Visvakarma.

VITA^y

Lydia Etta Sondhi

Candidate for the Degree of

Master of Science

Thesis: THE HISTORICAL DEVELOPMENT OF DOMESTIC ARCHITECTURE IN INDIA

Major Field: Housing and Interior Design

Biographical:

Personal Data: Born in Alva, Oklahoma, October 28, 1948, the daughter of Fred G. and Margaret M. Klug.

Education: Graduated from David H. Hickman High School, Columbia, Missouri, in June, 1966; attended the University of Missouri, Columbia, from 1966 to 1970; received the Bachelor of Science degree in 1970 with a major in Housing and Interior Design; completed the requirements for the Master of Science degree at Oklahoma State University in May, 1972.

Professional Experience: Graduate teaching assistant at Oklahoma State University from August 1970 to May, 1972.

Professional Organizations: Omicron Nu, Phi Upsilon Omicron, student affiliate membership A.I.D.