CHAPTER I

INTRODUCTION

(1) OBJECTIVES OF THE STUDY:

Almost all of the studies of Indian architecture made so far, by a great number of eminent scholars, are distinguished by one particular bias: namely that they deal exclusively with the architecture of religion and of royalty. The temple, the mosque, tomb and palace: these are the subject matter of study. The houses of the common people, that is to say, the architecture of the vast mass of the inhabitants of a civilization, are largely ignored. The one significant exception to this generalization is the study of the Indus Valley civilization. Here, by a strange set of circumstances, it is precisely the unpretentious domestic dwelling which is found in overwhelming numbers and the temple and palace are conspicuous by their peculiarity. The Indus Valley civilization could not, therefore, be studied in any context other than that of the residential dwelling.

The reason for this avoidance of the ordinary domestic house as an object of study is not merely because such houses are few and rare in recorded existence. For example, the relief carvings in Buddhist monuments show a great amount of details of domestic dwellings, but these have not been studied in depth. A.F.Coomaraswamy made a beginning with such a study in his "Early Indian Architecture: Palaces", but did not go much beyond the royal palace. Another important source is the miniature painting, yet these have not been studied for their architectural content.

Coming down to the period when the Archaeological Survey of India had begun to function, in the latter part of the 19th century, it is certain that in all of our towns and cities there must have then existed large numbers of medieval houses but these were not
recorded extensively. Instead, attention was concentrated on the more majestic examples of temple and palace.

The lack of a study of domestic architecture is not due to any lack of materials or due to any scarcity of resources; rather it is due to a fundamental attitude as to what constitutes architecture. The traditional definition of architecture had always been of a building which exhibited a quantity of decoration, and as such decoration was predominantly found in the palace and temple, it was only such classes of buildings which were included in the definition of architecture. The plain, unadorned building, regardless of its prevalence or its function, was not considered architecture. (We may define such an attitude as 'monumental'. In other words, what was sought for and admired and studied was not just a building but a monument. It was the concentration on monumental architecture which distracted attention from the domestic.)

This definition of architecture underwent a major transformation about the year 1900 with the appearance of what has been called 'modern architecture'. Modern architecture grew out of an attitude fostered by the Industrial Revolution which turned away from decoration and emphasized that aspect of architecture known as 'function'. Functional architecture now saw its goal in imaginative use of structure, material, space, rather than in the application of decoration. Apart from this change in attitude, there occurred a change in architectural investment itself. Where there had been construction of monuments, there arose now the construction of utilitarian structures such as factories, railway stations, apartments, etc. The whole emphasis in architecture moved away from aestheticism and decoration and 'style' to utility and function. The domestic house, neglected hitherto as a work of 'architecture', now became the most important part of the architect's task.

This revolution in architectural attitude was mirrored by a corresponding change in architectural studies. The study of monumental architecture began to give way to the study of, among
others, the domestic house. Unfortunately, this change in attitude, did not have any significant influence on studies of Indian architecture. Here the traditional definition of architecture as the study of the monumental continued to prevail, and till almost recent times we find newer and newer monographs appearing on temple architecture and palace architecture. The very expression 'architectural studies' means, in the Indian context, the study of classical monuments. In other words, we are continuing to neglect the study of that large component of our culture and civilization, namely the domestic house.

The above bias has wider implications. The study of Indian culture and civilization was, in the past, subject to a similar bias in that the Great Tradition or the Sanskrit tradition was the exclusive field of study and the Little Tradition represented by folk-culture was neglected. It has now been generally recognized that much of the Great Tradition has been in fact evolved out of the Little Tradition, and that no real understanding of the former can be possible without a study of the latter. (The roots of Indian culture go down into the Little Tradition and we have to incorporate this into Indian studies. In a similar way it is my contention that a study of domestic architecture will contribute to a greater understanding of Indian architecture as a whole.)

This point of view has been very ably put by Amita Hay in her book "Villages, Towns and Secular Buildings in Ancient India"(1) where she writes, " ... it proceeds (the study) on the premise that ancient Indian social and economic pattern evolved integrally from the basic aboriginal (tribal and rural) pattern of life, and as a corollary, the architectural types and forms that we find on early Indian bas-reliefs, also evolved from the rural and tribal house-types and forms ...". Professor Ray has restricted the study to the ancient period but has taken examples from contemporary times to illustrate the ancient prototypes. The reasoning behind this is that contemporary examples, even though late in time, represent traditions which go back almost unchanged to ancient times, so that the past can be reconstructed by using current specimens. This reasoning is perfectly sound in the Indian context, and in my own study I have posited the same argument.
Apart from the conceptual reason discussed above, there is one other important reason why domestic architecture has been neglected for study. While temples and palaces are relatively few and well-recorded in references, domestic architecture, by its very definition, is widely distributed, amorphous, ill-recorded and difficult to select. By what criteria does one select individual houses for closer examination? Which towns are to be selected? Where does one look for typical specimens? Which communities does one look for to study their houses? And even assuming that these problems are overcome, it still requires a team to measure and draw out the houses. Work of this nature is not suited to the norms of individual scholarship, and precisely because much scholarship was individual, such field-work was perforce not undertaken.

It should be added here that those scholars who have written about classical Indian town planning, and in this context have entered into some discussion of house-plans, have actually made no more than textual studies. They have not done field-work in existing historical towns in order to relate actual plans to textual prescriptions. Thus their work remains purely theoretical and hypothetical for no evidence is produced to prove that any real town or house was actually planned according to the rules of the texts. It will be shown later in this study that there are serious discrepancies between textual rules and actual plans, at least so far as Gujarat is concerned.

The above discussion will now reveal how the objectives of the present study were gradually evolved and how they fit into the overall situation of Indian architectural history. It now remains to explain in more precise terms the exact nature of the subject we have called the "Wooden Architecture of Gujarat".

This study is a study of the domestic architecture of Gujarat as it developed in historical times. In other words, it is not a study of the modern house in Gujarat, but of the traditional Gujarati house, and within this category it is only the wooden structure that is selected for examination. The justification for this will
be given in the following section, but it can be stated here as an advance conclusion that the wooden structure represents a truly indigenous Gujarati phenomenon within the Indian context, and it has a number of unique and original characteristics which betray an archaic origin. As such, this tradition is worthy of an extensive study as a valuable contribution to the general study of Indian architecture.

One other aspect in this connection needs to be mentioned. The domestic architecture included in this study has, on the one hand, a historical background, but, on the other hand, it continues to be the architecture in which the vast mass of the people are still living. These wooden houses are still very much in existence, though much dilapidated, and in some of the traditional towns they constitute about 70% of all contemporary housing. The wooden house is thus both old and current, i.e. it is a living tradition. The people who inhabit them still retain many of the traditional attitudes towards the concept 'house', so that what the study discloses is in fact the attitude towards 'architecture'. The way in which a house is conceived, the way in which it is used, forms a psychological construct which still operates in the minds of these people and it influences the way in which they look upon even modern architecture. Much of the new housing which is being constructed reflects, consciously or unconsciously, this very attitude and it is obvious that if the modern designer wants to design successfully, then he must seek to meet the needs generated by this attitude. A study of traditional architecture thus produces data for a better design of modern housing. This has been intensely realized in Europe where designers have come to the conclusion that modern cities, including modern houses, have in the past largely ignored the emotional needs of the users and imposed solutions based upon a supposed 'rationalism'. It was partly the study of medieval cities which led to this realization.)
DEFINING THE BOUNDARIES:

(Since the domestic architecture which this study seeks to examine represents a 'tradition', we have to first define what exactly the boundaries of this tradition are. The term 'Gujarat' has to be analyzed in order to ascertain whether it does indeed form a specific cultural context.) This analysis would be a very formidable task if by 'Gujarat' we meant ancient Gujarat. The name has denoted different geographical areas in different periods, depending upon the fluctuating fortunes of various ruling houses. (But the period we are concerned with is much later, namely the late medieval period from approximately 1600 to 1900 A.D. because it is in this period that the architecture of this study falls. By this time the term Gujarat had acquired a clear connotation and demarcated a clear geographical area.) Thus, there is no controversy in this regard. However, the historical and cultural foundations of this entity Gujarat go back earlier, and in order to define this I quote from an authoritative work, namely "The Archaeology of Gujarat" by Dr. H. D. Sankalia.

He writes, "Gujarat as the name of the region under discussion is of comparatively recent origin. Traditionally the region was said to consist of three divisions: Anartta, Lēṭa and Surāśṭra. The areas covered by the first two divisions is not clearly defined. Anartta is said to correspond to modern Northern Gujarat, with its capital at Anandapur or Anarttapur ..."

"Lēṭa roughly covered the present Southern Gujarat from the Mahī to the Tēpti and perhaps a little further south ..."

"Sūrāśṭra denoted the modern Kathiawār." (2)

He writes further on, "Northern Gujarat, really the Saraswati Valley, comes into prominence under the Caulukyas in the 10th century A.D. It is its culture that spreads over the whole of Anartta, Lēta and Sūrāśṭra and gives shape to an entity which begins to call itself Gurjarāstra, Gurjaraṇḍala, Gurjaradesa, and later Gujarat." (3)
The above description tallies with that by A.S. Altekar and K.M. Munshi (3) and shows that the area known as Gujarat is formed of three sub-divisions, anciently known as Anartta, Lata and Surastra (or Saurestra), and correspondingly to what today may be conveniently called North Gujarat, South Gujarat and Saurashtra. These three sub-regions have their own geographical and cultural characteristics which persist up to contemporary times and serve to differentiate them from each other. In this study these three sub-divisions have been maintained because they correspond very well with the evidence found on the ground during field-work.

Elsewhere Dr. Sankalia writes that the name Gujarat was derived from the spread of the group known as Gurjars who are thought to have entered the present regions sometime in the 10th century. The origin and ethnic composition of the Gurjars has remained a matter of controversy and hence no reliable conclusions can be drawn from the available theories. But most scholars appear to be agreed upon the fact that the Gurjars did form a community of migrants to the region, and that they entered Gujarat via Rajasthan. Traces of Gurjars are found in areas of Punjab and Kashmir, and seem to indicate the routes of such migration. What is more important for our purpose is to establish the fact that it was North Gujarat, centred around the ancient Anhilapura on the Sarasvati (modern Patan in Mehsana District), which formed the cultural nucleus from which spread influences to Saurashtra and South Gujarat and thus gave an over-all pattern of culture to the region during the formative period. There is no controversy on this aspect of the matter.

The above cultural divisions of the region are re-inforced by the geographical situation. The political unit known as Gujarat has all around it natural barriers which tend to isolate it from its neighbours. To the north appears the desert of Marwar in Rajasthan and this inhospitable area prevents easy movement and contact with the more fertile areas to its north. To the west the Great Rann of Kutch and the Arabian Sea form geographical boundaries which act as barriers. To the east appear hilly areas
bordering Malwa and stretching down to the Satpura Range bordering Maharashtra. This whole border area is inhabited by tribal peoples and was in the past known for its turbulent and insecure character. All the way from Danta in the north-east down through Ider, Dohad, Chota Udaipur, Rajpipla, the Narmada Valley, to the Dangs in the south-east, we find mainly Bhils, or groups related to them, in occupation even today and this is a clear indication of a boundary situation with reference to the Gujarat heart-lands. To the south the position is complex. South Gujarat is known to have an unusually large percentage of tribal people, and the figure, for example, for Surat District given in "Tribal Life in Gujarat" by P.G. Shah is 46.74% (4). But these tribals are not Bhils; they are agricultural tribes, mainly Kolis, and they are a continuation of the Kolis found in Maharashtra. South Gujarat has one other peculiar feature, namely that a large number of perennial rivers with a heavy discharge all the year round traverse the area from east to west. Due to the heavy rainfall (much greater than in North Gujarat) these numerous rivers, such as the Purna, Ambica and Auranga, appearing at short intervals, act as barriers to communication and movement. The combination of tribal population in strength and riverine barriers is again a clear indication of a boundary situation.

What the above geographical situation reveals is that the natural boundaries correspond fairly closely with the historical boundary and this serves to explain why 'Gujarat' has the physical distribution prevalent even today. The region forms a very clearly defined cultural unit, and this is in turn reinforced by the spread of the language. The language known as Gujarati is clearly established as the dominant language within the confines of the region described above, even though it has intrusions of other dialects in, for example, Kutch and Dangs. Language, history, geography, all combine to show that Gujarat is indeed a homogenous cultural entity and we are therefore justified in taking it as the unit for our study.
This cultural unit has been well defined by Dr. Sankalia in his "Studies in the Historical and Cultural Geography and Ethnography of Gujarat" as:

"What we know as Gujarat today is the country extending roughly from Mount Abu in the north to Daman in the south, from Dwaraka on the Arabian Sea in the west to Godhra or Dhad in the east, that is, the country bounded on the north by the desert of Marwar, on the north-west by the Great Runn of Cutch, on the west (if Kathiawar is included) by the Arabian Sea, on the south by the Deccan plateau which almost abuts on the coastal plain between Daman and Dahanu, on the east by the gorges of the Nerbada and the Tapti, with Satpura in between, on the north-east by the Mewar and Malwa plateus.

Having defined the external boundaries of the cultural unit, we must now indicate the internal boundaries between the various sub-divisions. The area comprising Saurashtra (ancient Kathiawar) and Kutch forms by and large one homogenous cultural sub-division by reason of its geography, soil conditions, and relative isolation from the rest of Gujarat. This area has in the past been the poorest part of the state, a large proportion of its inhabitants living from nomadic herding, and it has thus retained many archaic features in customs and habits which have tended to disappear in the rest of Gujarat. It is at the same time the area with a predominantly feudal background and this has added to its conservatism. We shall hereafter refer to this sub-division as 'Saurashtra'. The districts included in it are: Kutch, Jamnagar, Rajkot, Junagadh, Bhavnagar, Surendranagar.

(North Gujarat is the area which was anciently under the more immediate influence of Anhilpura and later under that of Ahmedabad.) Some of its parts, such as Banaskantha and the western parts of Mehsana and Ahmedabad district, have strong links with Saurashtra and even the landscape resembles it. It would seem to be that the occupational groups in both of these adjoining areas were once similar, namely herdsmen. (The rest of North Gujarat is
more agricultural and has its own internal homogeneity. The real issue is where to draw the line between North Gujarat and South. The area between Broach and Surat seems to be one of transition in which traditions of both the North and the South are found (for example the tribal element begins to significantly increase towards the South), and while this problem will be discussed in greater depth later, here suffice it to say that for practical purposes we may take the Narmada as the boundary between North Gujarat and South. It should, however, be understood that many groups from North Gujarat are settled in the South, imparting to the letter e culture of the former, while there is no evidence to show that people originally from the South settled in large numbers in the North. Thus, we have Patidar farmers from the North settled around Bardoli, but no Kolis from the South possessing land in the North. In other words, here again we find traces of a migratory trend from north to south.

According to the divisions described above, North Gujarat would then comprise the following districts: Banaskantha, Mehsana, Ahmedabad, Sabarkantha, Panch Mahal, Kheda, Baroda, and that portion of Broach north of the Narmada. South Gujarat would comprise: the southern portion of Broach, Surat, Valsad and Dangs. It must here be emphasized that these sub-divisions are not meant to indicate political sub-divisions, but cultural, and in particular, architectural. It will be shown in the course of this study how the architecture is differentiated according to the cultural differentiations of these sub-divisions.

Having demarcated the units of our study, it now remains to explain the choice of the subject in its specific architectural terms. In other words, why is it that out of the whole range of an architecture in mud, brick, stone and wood, it is precisely that in wood which has been selected for study? This particular choice needs a broader discussion.

When we speak of 'material' in architecture, what it really means is the material used in making the essential supporting structure of the building. This portion is technically called the
'load-bearing' part. Those materials which are used in roof coverings, for example thatch or tiles, or in partitions, for example woven bamboo, are not considered as essential load-bearing materials and are not used as indicators of the architectural character. It is only that material which is used in walls, columns, piers, which is considered load-bearing and which provides the qualitative term to describe the architecture.

Now, in Gujarat there exists a wide-spread use of mud, brick and in some parts stone in the domestic architecture, but when it comes to the dominant urban house it is clearly noticeable that in the majority of cases wood was the material of preference. The sheer quantum of woodwork, the opulent and even wasteful application of the material, the profusion of carvings, all of these were so unique in Gujarat that it was obvious that here was a distinctive kind of architecture which did not fit in with the usual Indian categories. Of course, ancient India was well known to have had a wooden architecture which was then universal in the sub-continent, but all of this had perished long ago and its only evidence was archaeological and literary. Considering the general disappearance in India of the wooden tradition, how was it possible for so much woodwork to still exist in contemporary Gujarat? Again, there were other peripheral regions which still had a wooden architecture, such as Nepal or Kashmir or certain parts of South India, but they were all situated in easy reach of forests which provided the raw material. But Gujarat was not so favoured, and yet it had a wooden architecture on this prolific scale. This alone was strange and called for an explanation. Was it that Gujarat, by some unusual set of circumstances, was still continuing the ancient wooden tradition of classical times? It was not merely the presence of woodwork which was unusual but its extraordinary quality. Here in Gujarat was to be found a domestic architecture which was so superior in workmanship, so excellent in its artistic achievement, and so clearly an original creation, that it fully merited study. The woodwork found in the urban centres had become the ideal which stimulated imitation even in the villages, so that one could see traces of wooden architecture
throughout the whole of Gujarat and if any one material represented the true architecture of the region it was wood. All of these factors made it logical to choose wood as the material of study rather than any of the others.

It should, however, be added that in Saurashtra, where wood was scarce, stone was in many ways a rival to wood. But the study of stone architecture was deliberately excluded for a number of reasons. An architecture in stone follows different structural principles from one in wood and to take both these subjects under one head would have been a contradiction. In addition, it was found by survey that the stone architecture in many cases showed influence of the northern stone-using regions of India, for example Rajasthan, and thus the whole subject belonged to quite a different context. It would not have been useful to combine such disparate traditions into one study. However, many individual buildings in stone were studied precisely in order to determine the differences and the eventual similarities, and these have been used in making comparisons. For this purpose even buildings in mud were examined, and in this sense what has been covered is not simply the wooden portion of the architecture, but the greater part of what may be called the domestic architecture of Gujarat.

Having thus narrowed down the material terms of reference to wood-work, we may now clarify in greater detail what the term 'wooden architecture' exactly implies. To begin with, it must be stated that the architecture in wood was primarily an urban phenomenon, so that it is an urban architecture which formed the core of the study. It was later discovered, during field-work, that whereas the urban buildings were in wood and the rural ones generally in mud, yet in so far as their planning was concerned, there was no fundamental difference. Thus, there was no urban/rural dichotomy with regard to the form of the house or its manner of use; what had changed was the material. Urbanization had modified many usages but the basic sociology of the house remained intact. Because of this, we may say that although the study has an urban bias with regard to the materials, in the sociology it is broad based and includes the typical domestic life of Gujarat irrespective of whether it was urban or rural. In order to make
The specific character of Gujarati woodwork can be best judged by comparing it to other well known techniques in different parts of the world. From the structural point of view, we may distinguish the following basic techniques of constructing the multi-storeyed structure in wood:

(a) The fully wooden house (or log cabin): In this system the logs of wood are placed horizontally over each other and the junction is effected by a continuous tongue-and-groove. At the corners where the ends of each log meet, a dove-tail joint is formed which prevents the ends from coming apart. By this means a solid wall of wood is made which supports the superstructure. This kind of wooden house is found in Northern Europe, Russia and Japan, but not anywhere in India or its neighbouring countries. (Fig.1.a)

(b) The partially wooden house: In this system the wooden members are placed upright at intervals and they are joined together by additional horizontal timbers at their upper and lower ends thus forming a frame. A number of such frames are then combined together to form a structural 'cage' or two-way frame, and the intervening spaces between the uprights are filled in with brickwork of the same thickness as the timbers. One distinctive aspect of this framing is that at certain critical points of the frame a diagonal strut is added and this system is technically called 'triangulation', while the whole technique of woodwork is called half-timbering. This kind of half timbering appears in much of Central Europe and Britain - but not in India. (Fig.1.b)

(c) The partially wooden house (second variant): In this system there is a wooden frame which may be joined together to form the cage, or it may remain incomplete and be supplemented with, not diagonal struts, but bonding-timbers, and the
whole body of woodwork is enclosed in thick brickwork leaving only one face exposed. Technically speaking, this too is half-timbering but its structural behaviour is quite different from that of (b) above. It is this second variety of half-timbering which is found specifically in Gujarat and which forms the subject of this study. It is this which has been designated as 'wooden architecture'.

The above definition of what constitutes 'wooden' in our context will now explain why no discussion of brick architecture was made earlier. Brickwork is an essential part of Gujarati wooden architecture but it does not constitute an exclusive load-bearing material. In many cases, as will be seen later, it has only a secondary role to play. The relationship between brickwork and wood in this case is a complex one and cannot be categorized in a simple manner. Summing up the above arguments, we can now state that the precise nature of the subject under study is in fact the half-timbered architecture of Gujarat, and this architecture is, for the sake of emphasis, termed wooden.

(3) METHOD OF WORK:

As already mentioned, domestic architecture presents one great difficulty in its study, namely that the objects themselves are spread out over a large and amorphous area which makes identification and selection hazardous. To select any one group of buildings in a specific area, or any one building within that group, for examination is liable to the charge of being discriminatory or subjective. And yet, there is no other way to study domestic architecture than by making such a choice. The solution to this apparent dilemma is the following. What we are indeed studying is not the individual house per se but only in so far as it is a good representative of a particular class. In other words, the total quantum of domestic architecture in a given locale can be sub-divided into classes within each of which there is a dominant house type. The search is then for a good representative of this dominant house-type, and once that is found the problem is solved. This procedure was followed in this study throughout.
In order to make such an initial classification, the method adopted was to first make a general survey on the ground of a major part of the locale in question. By doing so it soon became apparent that there were sub-areas having houses of a generally higher quality and by a comparison with adjoining sub-areas it could be observed that this was one of the dominant models which all the inhabitants were seeking to imitate. This model was almost always that of a rich, urban residence and one could observe even village houses attempting to emulate it. On the other hand, the surrounding houses, even though poorer, still showed a great similarity in the layout and planning with the upper-class model, so that one could readily here identify a general model of which the rich house was in fact a manifestation. In other words, it is not the rich house which is the generator of the type but merely its best specimen. The difference between the rich house and the poor was one of degree and not of kind.

Apart from this urban house-type, there were always on the periphery of towns other houses of a distinctively different character which can best be described as 'huts'. These were inhabited by the poorest inhabitants most of whom had no fixed occupations but were general labourers. Yet, within their sub-areas, the type of huts had a typical system which was repeated in all of the examples of the group, so that here was another 'model' of a particular type of house. In this way we could, for each area, discover the dominant house-types and select our particular examples from the classes so identified. Fortunately, there are very few actual house-types in the whole of Gujarat, and this fact made this study more feasible.

With regard to the villages, it could be ascertained by test-cases taken at random from a number of separate locations that wood as a load-bearing material was rare. The dominant material used was mud. But, given economic prosperity, the mud house would be replaced by a half-timbered brick house in imitation of the urban model. Thus, village housing could by and large be ignored for purposes of this study because it is not representative of
wooden architecture. While village housing is interesting on its own account and worthy of further study, it does not form part of the wooden tradition. The relationship between the urban house and the rural nevertheless has had to be examined in general terms in order to discover the origins of prevalent house-types. Thus, what has been ignored in villages is the general survey. What has always been included is the spot-survey to establish possible links between rural and urban house-types. In general the architecture described in this study is an urban architecture because it is there that wood has been extensively used.

At this point one additional problem related to field-work must be mentioned. The domestic house is always in private ownership. The study of an individual building, or even of a group, is dependent on the good-will of either the owners or their tenants. There is no way to compel an owner into permitting his dwelling to be examined even if it were at all desirable to do so, which is not the case. The only justifiable way in which domestic architecture can be studied is by the willing co-operation of all concerned. This means cultivating a relationship with individual families, and it must be remembered that during daylight hours a large number of those remaining in the houses are women. The setting up of a relationship bordering on the intimate, for the space of a few hours or days, and which involves moving about in the most private parts of house-interiors, is a delicate operation and one liable to be easily upset. We were fortunate that in the vast majority of cases we were successful to an unusual degree, and there are many reasons for this.

The average Gujarati family is very receptive to strangers, possibly because of the age-old traditions of trade and commerce. The Gujarati has himself migrated to all parts of the world and this has made him accustomed to dealing with all kinds of people. But nevertheless, there are areas of the house where strangers or clients are not welcome. In order to overcome such a situation I always took with me two, sometimes three, students of architecture from Gujarat to form the team for work. These young students
always knew the norms to be followed within the house and the family and were able to establish a rapport with the inmates. The use of Gujarati as the language of communication was an additional asset. But it must be emphasized that Hindi, the language with which I am more conversant, often succeeded where Gujarati had failed. There were families which were initially suspicious and assumed that we were some kind of government organization surreptitiously collecting data on income or property. The use of Hindi then convinced them that we were not local officials but 'outsiders', and the fact of being an 'outsider' put us into a neutral category which disarmed suspicion.

A third reason for success was the fact that all of the team were members of the M.S. University of Baroda. This University enjoys such confidence among the people of Gujarat that a reference to its name at once softened attitudes. In almost every town and city that we visited we came across ex-students of this University, and once such an individual had been found, he then proceeded to become our guide and friend and took us to all the houses of his acquaintances.

A fourth and very interesting reason was that many families were very proud of their beautifully carved wooden houses, and when we were found inquiring in the vicinity, they would insist on our visiting their houses also so as to not miss so much grandeur. Once rapport had been established, we found that the womenfolk were frequently more enthusiastic than the men in giving details about their home and family life. A great part of the sociology of the Gujarati house has thus been collected from information given by the older women of these families.

Finally, in as many cases as possible, we took with us either letters of introduction to local individuals or the addresses of acquaintances residing in the locale, and used these as our hosts to secure further contacts. All of these individuals have been mentioned in the acknowledgement.
Having said the above, a personal remark may be appropriate here. It has always been a moving experience for me to enter a town often as a complete stranger, to wander through its narrow streets and lanes, to look at houses without arousing suspicion, then to look for individuals who may prove receptive. And always we have been able to find these individuals. Once this initial relationship had been established, it took little time and effort to then widen the contact. By the time we had completed our work we had made a number of friends and what had initially been a strange town had become now something well-known. We had enjoyed the confidence and hospitality of so many families, probed into so many of their personal details, that a kind of intimacy had grown. Many of the photographs in this study will bear testimony to this intimacy.

In the following is given an account of the more formal method of work :-

(a) The Census of India 1961, Vol. V, Part VII-A(2) entitled "Wood Carving of Gujarat" by R.K. Trivedi, Supdt. of Census operations, Gujarat (6), gives a detailed list of buildings in Gujarat carrying wood-carvings. It is, of course, evident that there are innumerable buildings in wood which do not carry carvings, so that wood-carving and wooden architecture are not synonymous terms. In addition, it was found during field surveys that many important areas of wood-carving had been inadequately covered and that the list is thus not comprehensive. To have gone exclusively by the census list would have meant missing a great amount of important woodwork. Fortunately we did not rely wholly on the list and pursued our own independent surveys.

But nevertheless, the census list gave us a very good base from which to fan out, and in all larger towns we used the list of streets and wards to make our preliminary surveys. In this way much time and effort was saved. The manner in which the data was used was as follows. Out of the list we would select those wards in which the houses were either particularly numerous or particularly old, and which also had a greater amount of carvings mentioned.
These sub-areas of the town would then be surveyed on foot, the individual buildings shown were identified where possible, and using this sub-area as a starting point we would then fan out into adjoining sub-areas until we found the presence of woodwork petering out. A series of such smaller surveys soon gave us a comprehensive picture of the over-all situation. Here one favourable aspect must be mentioned.

The quantum of woodwork was invariably the greatest in the historical centres of towns, and particularly so in the walled or fortified areas. Now, the physical area covered by such 'citadels' is generally fairly small, at least by contemporary standards, so that the distances to be actually covered were not impracticable. To give a few examples: Ahmadabad has a citadel which can be crossed on foot in about 45 minutes (because of the winding lanes), while Baroda has one which can be crossed in about 30. Thus, the problem was found to be manageable. Areas outside the citadel which also contained significant woodwork were visited by vehicle.

From these census lists buildings which had a distinctive attribute, such as being of a well-known historical family or of a Nagarseth, or being an old Haveli-temple, were specially marked out for scrutiny. In the vicinity of such buildings were almost always other significant structures. Sometimes a particular community was sought out from the list, as for example the Muslims of Ahmadabad, in order to ascertain their main locations. The photographic plates of the volume were, of course, very good guides to the character of the architecture.

(b) The corpus of literature represented by Gazetteers, travellers' accounts, histories, poetical works, etc., was consulted and each significant reference was noted and followed up on site. In many cases the families mentioned, as for example that of Shantidas Jawahari of Ahmadabad, or Virji Vora of Surat, were sought for and their old residences inquired into. Some notable
old families could thus be found, others had vanished leaving no trace. In this connection one important point has to be mentioned.

The wooden structure has a very limited durability. Various destructive agencies combine to accelerate the process of decay, and the average age of a wooden building is some 200 years. If very well protected, the wooden parts may survive for some 400 years, and this is the age given in the census report for the oldest surviving woodwork in Gujarat. Now, this means that the records which have to be consulted in order to find references to families, houses or settlements need not go much beyond the 16th century and this therefore serves to restrict the corpus of reference material. In this study we have no doubt looked for references for wood as a structural material in all possible references irrespective of period or age, but where it was a question of discovering individual specimens which have survived, the search was restricted to approximately the 16th century as the lower terminus.

It should be added that in the course of this study every single important town of Gujarat was visited (see index), and in addition those villages were also visited which had received some significant mention in historical records. In general, however, a more intensive survey was made of those sub-divisions which had a great preponderance of wood. Other sub-divisions, such as Saurashtra (including Kutch), could be more cursorily covered because sample-probes showed that this whole sub-division is definitely not the locale of major wooden architecture. Woodwork in Saurashtra appears sporadically and in limited quantum. But again, this situation is not because of any aversion to the material. As will be shown hereafter, wood remains the material of distinction, and it is precisely its scarcity which renders it costly and hence the choice of those who want to express status through their architecture.

(c) Once the survey had indicated that a particular building was worthy of more detailed examination, then the following process was initiated:—
(1) A measured drawing was prepared of the plans, sometimes of the section and details, of the house. This work was carried out always by a minimum of three persons: two to take the measurements and call out the dimensions, the third to note down the figures against rough sketches of the house. The persons who assisted in measuring were always students of architecture who had volunteered for the work. The task of noting down the data was always done by me.

(2) The next stage was to take photographs and make individual sketches of particular details, as also to write down notes on the architecture. This work was always done by me.

(3) Then the members of the family were personally interviewed to discover their background, their relationship to the house, its use, changes made, their opinions on planning, etc. In short, what may be called the sociology of the house was ascertained. This work was always carried out by me personally, using two languages mainly: Gujarati and Hindi. In the case of some very educated families we were able to use English. The information was always noted down on the spot and re-checked and written out fair later in the evenings. Missing items were then collected subsequently.

(4) Every evening the rough drawings and sketches done during the day were f air ed out, a note made of missing items or discrepancies, and these subsequently re-checked. All these drawings were made by me.

(5) In addition to the above merely recording of data, each evening was devoted to an analysis of what had been observed and a comparison made with what had been observed elsewhere. All this was written up in the form of a running diary of events and observations.

The drawings described above were, upon return to Baroda at the end of the tour, once again re-drawn on white paper to scale and with complete precision. As a matter of interest it may be mentioned that the above process entailed drawing each house four
times: firstly in the form of a rough sketch on graph paper done at site; then a fairing out of this rough sketch into a more finished drawing, also on graph paper, later in the day; then a precise drawing in pencil on white paper upon return to Baroda; and final inking in of the pencil work. In a few rare cases it was observed that despite all these precautions some dimensions taken on site did not tally. Subsequent visits were then made on site for re-checking.

Regarding the measurements, all work was done in centimetres for the sake of greater accuracy. Each measurement was taken to the nearest round figure, i.e. 15.5 was rounded off to 16 cm. except in the case of some important details where exact information was required. In case this rounding off of dimensions is questioned, the following aspect may be considered. In the course of taking measurements, it could be observed that the artisans had themselves been unable to maintain complete accuracy. Spacing of wooden columns, for example, was often inaccurate by 2 to 3 centimetres (in the case of symmetrical layouts). Column widths differed by 1 cm within the same room. Wall distances varied similarly, particularly so when succeeding layers of plaster or white-wash had obliterated the original dimensions. All such discrepancies are perfectly natural in architectural work where minute accuracy is just not possible on site. Architectural construction is not individual work but team work, and the various members of a team cannot all exhibit the same degree of accuracy, so that differences are inevitable. In addition, the structural members involved in construction are heavy and cumbersome, and the accuracy which a wood-carver can implement in his small-scale object is not feasible in large-scale carpentry or masons work. To this must be added the fact that age-old houses have decayed during the centuries of their existence, walls have inclined, columns lost their original alignment, many parts have been repaired or partitioned, so that an accuracy of say 5 cm in the over-all dimensions of a house is a good achievement. In accordance with this factual situation, we have rounded off our own dimensions to the nearest centimetre, and even the multiple effect of this on a single house is not likely to exceed 10 cm.
Since the subject is woodwork, the majority of dimensions were taken on the wooden structural members. Wall thicknesses were separately measured. Special care was taken to ascertain the dimensions of bays, grids, door-frames and clear openings, sizes of structural members, brick sizes, roof slopes, floor-heights, etc. All such information will enable comparisons to be made, both within Gujarat as well with other wood-working centres in India and elsewhere. To facilitate such a comparative study, important information relating to dimensions has been incorporated in the form of charts at the end.

In preparation of the final inked drawings illustrating this study, the following system was adopted:

(1) Barring a few exceptions, all house-plans were drawn in the metric scale of 1:100. This common scale was deliberately used so as to make it feasible to compare individual houses with regard to their proportions, sizes, bays, etc. Since the drawings have been xeroxed, some slight distortion in the scale may arise, but this can be checked against the scale marked on each plan.

The individual dimensions marked on the plans at the sides always refer to the wooden members wherever they are present, the individual figures are in centimetres. The measurement is from column face or edge to the next, and not from centre-to-centre. The width of each column is given if it is free-standing or attached to a wall but with one face clear. When a column is embedded within a wall and only an edge is visible, then the measurement shows the projection of this edge beyond the wall face. This is particularly the case with corner columns.

Wall thicknesses can be read either at the dimension line on the side, or it is written inside the plan and parallel to the wall concerned. The dimensions of openings are not given within plans so as not to complicate the drawings too much. These are given in the charts or described in the text.
Certain abbreviations have been used in the plans to help explain important details, as for example 'N' for wall niche, 'C' for wall cupboard, 'D' for door, 'W' for window. The full list of such symbols is given in Fig. 2.

The position of beams is generally shown with dotted lines; beams embedded within walls are not shown. The spanning direction of floor joists is shown by arrows. Floor finishes are indicated wherever they are in the original condition. Stairs are drawn in the usual manner except that the arrows shown always indicate a movement upwards, i.e. either from the floor given to the floor above, or from the floor below coming up to the given floor. Where two stairs lie over each other, and a part of each is visible in the plan, then two arrows are shown, one for the stair coming from below, one for the stair going up.

As regards the shading applied to the plans, two conventions have been employed. All woodwork has been shown in black, including door and window frames. The intention is to make this the most prominent part of the plan. Brick walls have been shown with diagonal hatching. Stone walls have been left unhatched because they are rare in our plans, and mud walls have been stippled.

All the above symbols are given in a comprehensive list in Fig. 2.

(2) In general, relatively few cross-sections have been given in the illustrations. The reason for this is that the Gujarati house has a very uniform cross-section which repeats with little change throughout the major sub-divisions. Thus, no new information would be supplied by giving a repetitive cross-section for each house whose plan has been drawn. Instead, a few cross-sections have been given as typical sections, and these are to be thought of as applying, with small changes in proportions, to the whole range of houses within a particular sub-division.

One other reason for omitting cross-sections is that in a very large number of cases the houses have had upper floors added.
to them (third and fourth floors) due to scarcity of urban space. Furthermore, in a majority of the cases the original roof of tiles has been replaced with corrugated sheet, and it is not certain whether at the time when this was done the roof slope was also amended or not. Because of these alternations it was thought better to leave out too many uncertain cross-sections.

(3) Regarding the individual details, again the same principle as under (2) was followed. The details of construction remain very constant within each sub-division, in fact this is one of the major findings of this study, so that there was no need to give the details of each dwelling separately. Instead, a series of typical details is given at the beginning of the set of illustrations and these form then a constant accompaniment to each dwelling. When individual details are unusual or when they should be particularly emphasized, then they are given separately with each plan. Some of these individual details then form constants for other series of buildings. This will become clear during a reading of the descriptive text.

(4) The individual site plans of houses are not shown, except in a few interesting cases, because it was found that the site has no major influence on individual house design. While there are general categories of houses, such as row-houses, in which the site has been used to produce such rows or internal streets, but basically it is not the site which has influenced the design, but rather it is the house-design and social pattern of life which has influenced the way in which the site has been used. Thus, a typical site-use will suffice to explain all the others.

(5) As regards elevations, very few have been drawn because all the necessary information can be gained from the photographs.

(d) Once the general pattern of the wooden architecture of Gujarat had been identified through field-work and analysis, it became necessary to compare this with classical texts on Śilpa Śāstra in order to discover affinities. The subject and relevance of such Śāstras is somewhat complex and therefore some digression is necessary.
The first point to be clarified is whether any domestic architecture was ever constructed according to sastric rules. The artisans who made domestic houses in Gujarat were masons and carpenters. Now, it is an observable fact that virtually none of these artisans is today conversant with Sanskrit. Nor do many of them have in their family possession old manuscripts on architecture which might have once formed part of their tradition. It is worth quoting some of the observations of various scholars on the subject of these artisans, and even though the opinions deal with the builders of temples, it can nevertheless serve as a pointer to their qualifications.

J. Burgess and H. Cousens, writing in 1902 in "The Architectural Antiquities of Northern Gujarat", said, "Becoming the greatest temple builders in Western India, they (the Jains) had also, in their keeping at least, the old works on civil and religious architecture, such as the Prasada-mandala (sic), Raja-vallabha, etc., which they have preserved in their temple libraries, where they are jealously locked up in huge chests. The modern Salats owe their knowledge indirectly to these, of which they possess rough Gujarati abstracts, for their guidance... They are said to be, as a rule, however, somewhat jealous of the secrets of their guild." (7) The authors state in a footnote that they personally found the masons quite communicative. This description indicates that these artisans knew neither Sanskrit nor the works in the original, but used fragments of information whose source may have been an oral tradition.

In "The Architectural Antiquities of Western India", H. Cousens wrote again on the same theme, "The descendants of the old Salats still exist in this part of the country (Gujarat) and follow their calling... They still possess some of their old Sanskrit books, which they profess to follow, but it is doubtful whether many of them can understand them intelligently, since they are written in slokas, or verse, which are often obscure in their meaning." (8)
D. Subba Rao was of the same opinion when he wrote in the "Journal of the Oriental Institute", Baroda, Vol. VIII.4, "These treatises (on architecture) contain very valuable information. They convey no meaning whatever to Sanskrit scholars on account of two reasons. One is that many of the expressions, used therein, are technical terms, which convey no idea whatever in their context, by translation in the usual manner, as Sanskrit scholars are prone to do. The second is that these texts have been handed down from generation to generation through those artisans who, though knowing Sanskrit, were not scholars. These texts have become so full of philological and grammatical errors that the Sanskrit scholars today would find it very difficult to make any consistent meaning out of them." (9)

In the book "Kshirārṇava" by P. O. Sompura, Dr. Motichendra gave an introduction in which he said, "The study of ancient Śilpasastras is not as easy as some imagine, because not only is the language of books dealing with śilpa obscure, but since the tradition itself has died out the meanings cannot be ascertained. There are also no commentaries on them available ..." (the Hindi text is here translated by me). (10).

In his other great work, "Dipārṇava", Prabhakshanker Sompura gave a brief account about his own community which is an ancient one of stonemasons, and speaking about their life wrote, "Sompura craftsmen had acquired the knowledge of their craft as a profession. ... But later, as the practical side of their occupation increased, their theoretical (or educational) side decreased. And so, their understanding of Sanskrit texts became meagre ... Sons would learn the profession (verbally) from their fathers and not from the texts, thus reducing the need for such texts. The surviving texts were honoured and preserved as family property (but not read). As they became old they were copied out by those not educated (in Sanskrit), leading to many errors. ... The surviving texts are very corrupt (ashudha)". (11).
And a few pages on, "And in the copies of these handwritten manuscripts endless errors can be found because these artisans had a lack of the knowledge of Sanskrit." (12). (Both these translations are by me, assisted by some students of Gujarati, and give the gist of what the author wished to say. They are not literal translations. In a conversation with me in 1975 Shri Sompura specifically confirmed this opinion.)

The family of P.O. Sompura is an old one, being salāts or stone masons by caste, and he himself, up to his death, may be considered one of the leading authorities on temple architecture in general and on the Gujarati tradition in particular. Dr. Pramod Chandra wrote of him, "A more significant advance in the understanding of the śilpa texts was achieved, however, in 1960 with the publication of the Dipārnava with a Gujarati translation and commentary ... Work of this type had been previously attempted ... but none possessed the degree of accuracy and thoroughness of Sompura's work ... " (13).

The sum total of the above opinions clearly confirms that by the end of the 19th century the leading architectural craftsmen in Gujarat had lost their understanding of śilpa texts and were working on the basis of fragmentary rules written down either in Gujarati or handed down verbally, or by the simple process of imitating existing structures. The fact that so few old manuscripts have been found among these salāts further indicates that architectural work was certainly not being executed with a manual in one hand and a measuring rod in the other.

In the sphere of domestic architecture the situation must have been worse. The bulk of the wooden buildings surveyed both by us and the 1961 Census were constructed about 150 to 200 years ago, i.e. between 1800 and 1850, and if manuals had been extensively used then, many specimens would have survived today. But with a single exception no manuals on domestic architecture have been found so far. The classical silpa texts, such as the Samarāṅgana
Sutradhāra, Aparājitapṛcchā, Rājaśalabha, etc., all deal overwhelmingly with temples, palaces and forts and barely touch upon the domestic house. Even when they do, it is rarely wood that they speak of. This is indeed a very serious contradiction: the architecture actually existing in bulk on the ground was one in wood, and yet the bulk of the manuals pointedly ignore the use of wood. This fact leads inevitably to the conclusion that domestic architecture was not sought to be covered by the āilpa texts. Our own field observations also confirm this, namely that the design and construction of houses show very few points of reference with āilpa rules. This aspect will be elaborated later with some examples.

The one significant exception to the above is the Pramāṇanāmanjarī which, pointedly, describes an architecture almost wholly in wood! It is this work which has, therefore, been extensively used in this study to serve as a reference manual. The other texts will be quoted only when relevant. Here again it is important to distinguish those texts which are relevant to Gujarat or Western India. M.A. Dhaky, who has worked extensively on the subject of texts, besides being very conversant with Gujarat, has in an unpublished manuscript (shown to me by P.O. Sompura) stated that the main relevant texts are: Samarāṅgana Sutradhāra, Pramāṇaṃanjarī, Aparājitapṛcchā, Vāthusaṅga, Kṣirāṃgaṇa, Diparnava, and the works of Mandana. The last-named he considers a mere copyist, "What purpose could these fresh compilations have served at this stage is a moot point." (14).

Regarding the relevant texts, there is one other important aspect. The contents of these texts are mainly on: rituals, astrology, prescriptions for layouts, measurements, proportions, and avoidance of inauspicious elements. Nowhere does one find structural data on vital subjects such as: strength of materials, sizes of beams and columns in terms of the span or load, methods of water-proofing, wood-joints, brick bonding, making of mortars (as opposed to plasters), manufacture of bricks, etc. etc. No building can be constructed without these essentials, and the fact that they do not figure in these texts is a significant indication as to their real purpose. It is my contention that
these śilpa texts were written, not to enable the building to be constructed, but to ensure that it followed rules which brought prosperity and avoided the insauspicious. In other words, the main objective was ritualistic. This is not the place to go into this at length, and much of the argument will become clear in the course of the descriptions, but the point here is that large-scale textual studies were thought unnecessary in this study because so little of the texts deals with matters which to us are essential. This is a study of architecture on the ground, not of architectural rituals. While some rituals do play a part even in the domestic house, they are nowhere as important as perhaps in temple architecture or the royal palace. This point has been clearly recognized and commented upon by Amita Ray, "While there is in almost every Purāṇa and Silpēśāstra text a chapter on nagara-vinyāsa and nagara-lakshanās, there is no chapter on grāme-vinyāsa or grāme-lakshanās ... While prāśādas and devalayās and durgās occupy much of the attention of the writers of such texts there is hardly any reference to the humbler dwelling houses of ordinary individuals." (15).

The above observations will show that domestic architecture most certainly did not figure as an important subject in the repertoire of the Indian śilpi, and must instead have formed the domain of the much humbler carpenter and mason who had pretensions to neither Sanskrit nor Brahmanhood. These artisans must have picked up fragments of textual prescriptions which they used to enhance their status, and the only way in which this can be adjudged is by a detailed study of the buildings they actually constructed - and not by an a priori study of texts.

(e) It has been put forward by many scholars that in order to study a subject one should first formulate concepts so as to have a context within which the subject can be studied. In the present case such an objective, even though desirable, is not feasible. Domestic architecture was produced, not in response to a theoretical or philosophical need, but in response to the practical problems of existence. It is basically a pragmatic architecture devoid of sophistication, and executed at a level which has been elsewhere
called the Little Tradition (see page 3). In such a case, to formulate any pre-conceived concepts would be to pre-judge the issue. It must be here emphasized that domestic architecture has so far not been systematically studied at all in this region, so that until there is a corpus of material to examine, or comparative studies thereof, no theoretical concepts can be framed. In my opinion, it is preferable to first collect the basic material for the study and to then proceed to see whether any concepts can be derived from it. In other words, it is better to proceed from the known to the unknown. If that which is known is collected impartially and examined without bias, then there can be no danger of the conceptual conclusions being distorted.

The rule followed in collecting data was based upon practical considerations, namely that one should commence with the simple and then move onto the more complex; and that one should first look for the general situation before proceeding to the particulars. In architectural terms, this meant that it was the settlement pattern and general social conditions which had first to be identified and the individual house was then taken as an illustration of it. In analyzing methods of construction and detailing of structural parts, the objective was to discover the development of techniques from primitive beginnings to sophisticated norms, and to always relate them to the material conditions. It is the study of architecture as a comprehensive subject, and even though the title selected is "Wooden Architecture", yet it was felt that no technique or planning system develops in isolation, and that one has to look at woodwork with reference to the total architectural situation first before concentrating on the specific material chosen. By making the terms of reference wide, what has been studied is not just woodwork, but the basic domestic architecture of Gujarat as a whole of which woodwork then forms a part. Of course, woodwork represented its most outstanding and typical manifestation.
The last point to be made in this section concerns those wooden buildings which were deliberately excluded from the study. With a few exceptions, all the buildings which showed major colonial influence in their architecture were excluded. The reason for this is that our objective was to study only that domestic architecture which can be considered typical and representative of the culture of Gujarat. While this culture has many facets, such as for example the Muslim or the Maratha, and these were included, the colonial element was never really integrated into the social fabric of Gujarat up to the end of the period under review, namely the year 1900, and has therefore been excluded. Colonial influence had, of course, begun to make itself felt much earlier, but it was mainly restricted to superficial, decorative elements. The basic structure and layout of the typical house remained undisturbed by such influence.