CRAFT & FOLK ART MUSEUM

STUDIES OF VILLAGE LIFE BY
KATHERINE D. BLAIR

4 VILLAGES:

ARCHITECTURE

IN

NEPAL
Preface

4 Villages: Architecture in Nepal shows us that by studying architecture, one can learn a great deal about the life of a people. A truism for architects, this avenue of analysis is not generally known or appreciated by the layman. Now Katherine Blair, an architect herself, has spelled it out for us. Through her drawings and photographs, she clearly illustrates the inter-relation of life style and environment to building form and structure.

The manner in which the subject matter was gathered and how it has been treated make both the exhibit and the catalogue unique. Ms. Blair, who learned to speak Nepali, lived with families in the villages shown and studied the architecture from the inhabitants' point of view. After her initial visit in 1972-73, she returned in 1980 to chart the changes which had occurred over the seven to eight year interval. In her carefully researched analysis of the architecture, she describes the ways in which culture, climate, site, available construction materials, economic development, and transportation affected the house form. In addition, she also discusses the extent to which local methods of food raising affected the house form and in turn the life style of the villagers.

Although the villages of Nepal are unique, they are similar in many ways to villages in other Third World countries. Thus Ms. Blair’s work not only gives us insight into Nepalese life, it also gives us some understanding of life for the rest of the two-thirds of the world’s population who live in developing countries. In addition, by demonstrating that through architectural study we can learn about the people of Nepal, she shows us that we can learn a lot about ourselves by studying our own architecture.

Thank you Katherine for a splendid experience, and for your wonderful drawings and photographs!

Edith Wyle, Program Director
Craft and Folk Art Museum

About the Author

Katherine D. Blair is an architect who has studied, worked, and traveled extensively throughout Asia. In addition to her research in Nepal, which was funded by a Fulbright-Hays Research Grant and a National Endowment for the Arts Professional fellowship, she has surveyed village architecture in many other Asian countries and has extensive knowledge of the subject. She has a B.A. degree from Wellesley College, a Master of Architecture degree from Harvard University, and she also studied at the School of Architecture in Ahmedabad, India. After working for several years in Washington, D.C., she and her husband now live in Pacific Palisades, California.
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Katherine D. Blair
Los Angeles, California. 1983
In some Nepalese villages furniture has been introduced because the men began wearing western-style pants and found sitting on the floor uncomfortable.

Looking down a village lane in Kodingaon.

The limitations of local transport modes have inhibited change and architectural innovation throughout Nepal.
TABLE OF CONTENTS

AN OVERVIEW OF NEPAL

AN INTRODUCTION

7 Geographic Zones
    map of Nepal

8 Climate

11 Natural Vegetation

13 Areas of Settlement

14 Settlement Patterns

15 Architectural and Ethnic Diversity

15 Geography and Politics

15 Transportation

16 Energy Demand and Environmental Diversity

BUDBUDI
A THARU VILLAGE

18 The Village

22 The House

KODGAON
A GURUNG VILLAGE

30 The Village

36 The House

MARPHA
A PANCHGAON VILLAGE

42 The Village

48 The House

SATUNGAL
A NEWAR VILLAGE

54 The Village

60 The House

BIBLIOGRAPHY

68 Notes
AN OVERVIEW OF NEPAL

AN INTRODUCTION

To many, Nepal is known as the site of Mt. Everest, the world's highest mountain, and as the home of the Sherpas, world-famous mountain climbers. Far less well known is the remarkable diversity of landscape, wildlife, culture, and architecture found in a country approximately the size of Tennessee.

The following chapters provide a glimpse of life in four Nepalese villages which widely differ in size, housetype, and population. Budhudi has 11 houses and 111 people, Kodgaon has 63 houses and 345 people, Marpha has 162 houses and 720 people, and Satungal has 242 houses and 1371 people. So that the reader can place each village in a larger context, this introduction provides an overview of the country.

More or less rectangular in shape, Nepal is about 500 miles long, 90 to 150 miles wide, and 54,717 square miles in area. The altitude ranges from 650' above sea level to peaks over 26,000'. It is located on the same latitude as central Florida but is completely landlocked. Nepal is bordered on the north by the Tibetan Autonomous Region of the Peoples Republic of China and on the south, east, and west by India. In 1981 the population was approximately 14,490,000.

GEOGRAPHIC ZONES
The world's highest mountain chain, the Himalayas, forms a substantial portion of the land area in Nepal, but three other mountain chains and flat plains not far above sea level are found there as well. The country can be divided into seven geographical zones from south to north which run more or less parallel to each other over the entire length of the country.
The world's highest mountain chain, the Himalayas, forms a substantial portion of the land area in Nepal, but three other mountain chains and flat plains not far above sea level are found there as well.

1) The TERAI is a narrow band of flat land 10 to 30 miles wide averaging 650' above sea level. It runs along almost the entire length of the southern border with India.

2) The SIWALIK MOUNTAIN CHAIN is 5 to 25 miles wide. It is the lowest and southernmost chain of the Himalayan system. This chain reaches a height of 6000' in a few places but most peaks are less than 4500'. In some places the Siwaliks merge directly into the Mahabharat, the chain directly north of it. In other places the two ranges are separated by wide flat valleys, the biggest of which are called the Inner Terai Valleys. Budhni is in this zone.

3) The MAHABHARAT MOUNTAIN CHAIN is about 10 miles wide with a steep and jagged relief and peaks 6000' to 9000' high.

4) The MIDLANDS are 30 to 65 miles wide and are the largest of the seven geographic zones. With the exception of a few flat valleys, the entire zone is mountainous but the contours are soft and gentle. Elevations range from 1950' to 6500'. Kodgaon and Satungal are in this zone.

5) The HIMALAYAN MOUNTAIN CHAIN rises abruptly to the north of the Midlands. Within Nepal it includes more than 250 peaks above 20,000' and eight of the world's ten highest mountains.

6) The INNER HIMALAYAN VALLEYS lie just north of the Himalayan chain and range in elevation from 8000' to 20,000'. Marpha is in this zone.

7) The TIBETAN MARGINAL CHAIN is north of the Inner Himalayan Valleys and lower than the Himalayas. Although some peaks are as high as 22,750', the average height is 19,000' and the contours are in general gentle. In the western part of the country, it forms the political border with Tibet.

CLIMATE

The climate extremes of Nepal are as great as those of topography. Nearly every type of weather on earth is represented, ranging from humid tropical jungle to arctic desert. Most of the country, however, has a monsoon climate in which 80% of the annual precipitation falls between June and September and the rest of the year is relatively dry.

The monsoon hits east Nepal first and then gradually moves westward, losing moisture and depositing less rainfall as it passes across the country. Thus east Nepal has more rain and a longer monsoon than west Nepal, but it is difficult to generalize because local topographical conditions cause large differences in the rainfall. The highest rainfall in the country — more than 236" annually—is on the south face of the Annapurna Himal in west Nepal.

The particular alignment of the mountain chains in Nepal affects the rainfall. The larger portion of rainfall is dumped on that side
TOPOGRAPHICAL MAP

GEOGRAPHIC ZONES

- Tibetan Marginal Chain: 10 - 20 miles
- Inner Himalayan Valleys: 20 - 30 miles
- Himalayan Chain: 10 - 20 miles
CLIMATE

of the mountain which the clouds hit first, in this case the south face of these east-west running chains. The difference in rainfall on the north and south faces of the lower chains is not so great, but the difference between the north and south faces of the Himalayas is extreme. This higher chain blocks almost all the rainfall from the southeast and forms a meteorological limit between the monsoon climate of the Indian subcontinent and the cold, arid climate of the Tibetan plateau. The Inner Himalayan Valleys, shielded by the Himalayas, receive little of the monsoon and much of the generally low precipitation there is in the form of snow during the winter. The Tibetan Marginal Chain receives almost no precipitation of any sort; in many places it is less than 5" annually.

Since most of the crops in Nepal are rain-fed rather than irrigated, areas with higher rainfall attracted the most settlement. East Nepal, which has more rain and a longer monsoon than west Nepal, has a higher population. The area with the highest rainfall has only transient herders, however, because the cloud cover in monsoon is too great to grow crops. Temperature does not seem to have affected settlement much—largely because most of Nepal has a fairly mild climate. Both rainfall and temperature have greatly influenced the architecture. The villagers had no sophisticated materials and lacked mechanical means of heating and cooling. Nonetheless they managed to control the climate inside their houses by a judicious choice of materials, houseform, site, and building orientation.

NATURAL VEGETATION

The natural vegetation cover, which is as varied as the climate and the topography, includes forest, grassland, shrubs, and tundra. Although greatly altered by local populations and continuously decreasing in extent, the forests still constitute the...
The majority of the natural vegetation cover. The forests run in two belts—a southern one, which includes the Terai, the Siwaliks, and the Mahabharat, and a northern one which includes the Himalayas and the Inner Himalayan Valleys.

The southern zone consists of deciduous and semi-deciduous trees, and the forests are less dense than in the northern zone. There is little undergrowth except in the Mahabharat region above 6500'.

The treeless area between the two zones—almost the entire Midlands region—is entirely man-made, the result of centuries of habitation. Here most of the trees which grow around the villages and fields have been planted for some particular purpose—either they have edible fruit or can provide animal fodder, or in the case of bamboo, can be used for making houses, bridges, baskets, and many other necessities of village life. Often the only remnants of forests are shrubs and thickets among which cattle graze.

The northern zone of forest cover appears on the southern slopes of the Himalayas above 8000'. This man-made line, which actually varies between 6000' and 10,500' marks the point at which local conditions (slope too great, soil too thin, temperature too cold, or cloud cover too dense) make cultivation impossible. Above this limit of cultivation the forest extends to about 13,000'. Although many of the species of the northern and southern forests are similar, the northern and higher forest differs markedly from the lower southern one because at the higher elevation the temperatures are much cooler and there is less rainfall. As the elevation progresses, the trees become smaller, shorter, and then disappear altogether at the "treeline," the upper limit of forest growth. Beyond this point and extending for another 4500' is the alpine zone composed of shrubs, bushes and grasses. The vegetation is "capped off" at the snowline—about 17,500'. Above this point the snow never melts. The progression of vegetation cover on the north slopes of the Himalayas (the Inner Himalayan Valleys) is similar to that on the
INNER HIMALAYAN VALLEYS
compact or clustered settlements

MIDLANDS
clumped, dispersed, or compact settlements

SIWALIK CHAIN
compact settlements
TERAI
compact settlements

SETTLEMENT

south slope except that the treeline is about 1500’ higher. Since the rainfall in the Inner Himalayan Valleys differs markedly as one goes from east to west Nepal, the amount and composition of the forest there varies. The climate of the Tibetan Marginal chain north of the Inner Himalayan Valleys is so cold and arid that there is very little vegetation cover of any sort.

AREAS OF SETTLEMENT

Of the seven topographical zones, only four attracted settlers: the Terai, the Inner Terai Valleys of the Siwaliks, the Midlands and the Inner Himalayan Valleys. Accommodation to the climate and topographical peculiarities of each zone produced a variety of life styles but they all had the same focus, raising food, and the same format, small rural village. This is still true today. More than 96% of Nepal’s population lives in rural villages of less than 600 people, and they are primarily engaged in food raising, usually at a subsistence level.

Although it has nearly flat landscape, fertile soil, and abundant rainfall, the Terai was the last area to be settled. Because an especially virulent form of malaria was endemic to the area until the 1960’s when the government began a country-wide eradication program, the densely forested and swampy Terai region was almost totally uninhabited until the mid-nineteenth century. Then landless peasants from India, long used to the scourge of malaria, began to come in and clear the land. Today nearly all the forest is gone and the area is heavily populated. Although the Terai comprises only 17.4% of the total land area in Nepal, it contains 62.2% of the arable land. Called the “grainery of Nepal” by some, it is the only region which produces a food surplus.

The Inner Terai Valleys of the Siwaliks are very similar to the Terai with abundant rainfall, basically flat, fertile and easily cultivatable soils, and a high incidence of malaria. With one or two exceptions these valleys remained covered with dense forest until the malaria eradication program began in the 1960’s. Since
then, thousands of hill Nepalese have migrated to this area, clearing the land and farming it.

The Midlands attracted the earliest and the most settlement, because 1) they are sandwiched between the Mahabharat and Himalayas and somewhat protected from invasion and warfare, 2) they are situated above the malaria zone, and 3) they are blessed with a mild climate and abundant rainfall. Unlike the Terai and the Inner Terai Valleys, the climate and the soils here vary greatly, so that the “survival strategies” of the various groups who settled this area differed, depending on their location. Those at the lower elevations (usually below 6000’) were generally farmers and rice was their main crop. Those who lived at the higher elevations with easy access to abundant alpine pastures were more likely to be herders who practiced some farming. Today about 60% of the total population still live in the Midlands but life there has become increasingly untenable. Less than 37% of the arable land in the entire country is here, and the population density per square mile of arable land is now about 3900 people. In earlier eras this region was self-sufficient except in times of great drought. Now food shortages are a chronic problem.

The Inner Himalayan Valleys are the least inhabited of the four areas with less than 10% of the population. The cold, harsh climate never attracted many settlers and the area could never have sustained a large population. The growing season is very short and the crop yields are generally low. Of necessity, farming was always complemented with large-scale herding and trading activities.

SETTLEMENT PATTERNS
Since the villagers lived off the land—either raising crops or animals—the amount of productive land largely determined both the size and the type of settlement: compact, clustered, or dispersed.

Compact settlements, where the houses are very close together, in some cases even sharing party walls, are found in areas where the farm land is flat and very fertile or in very short supply. In the Terai and Kathmandu Valley, the villagers farm every possible square inch of the rich soil. Generally the houses are in the center of the fields. In the arid, western Inner Himalayan Valleys, the land is not so fertile, but water is scarce and only irrigation farming is possible. Settlement is limited to those areas which have water and here the arable land is utilized to its fullest extent. The houses are sandwiched into the “left-over” areas, generally on the valley walls overlooking the fields.

Dispersed and clustered settlements are found in the mountainous regions where the abundant rainfall does not limit cultivation to small areas. In the dispersed settlements, the houses are scattered over the hillside near the owner’s land. The
boundaries of these villages are not at all evident and one seems to merge into another. In the clustered settlements which are more common in narrow valleys, the houses are close together but the steep terrain prevents the densities possible on flat ground. In both dispersed and clustered settlements the more productive land, which is generally on the low and less steep slopes, is reserved for agriculture.

ARCHITECTURAL AND ETHNIC DIVERSITY
Nepal's ethnic diversity is as great as that of landscape, topography, and climate. As many as thirty-five ethnic groups have been identified and these can be divided into three major groups: The Ancient Nepalese groups or Tribals, the Tibetans or Bhotias, the Indo-Nepalese. All 4 VILLAGES belong to the tribal groups. Budbudi is a Tharu village, Kodgaon is Gurung, Marpha or elliptical.

The differences in lifestyle, settlement pattern, climate, and the idiosyncracies of the various ethnic groups produced an astounding variety of housetypes. These can be categorized by ethnic groups since each group lived in its own area and mixed little with the others. The houses differ in size, materials, number of stories, layout and location of space, number and placement of openings, and shape—most are rectangular but some are round or elliptical.

GEOGRAPHY AND POLITICS
While various factors produced a variety of housetypes, geographic circumstances affected architecture throughout the country. Over the centuries malarial jungles and nearly impassable mountains discouraged invading armies. Nepal was never conquered or ruled by a foreign power. These natural barriers also minimized peaceful contacts with the outside world, made economic development extremely difficult, and kept the population at a subsistence level for most people. None of the ideas, technological discoveries and advances, or man-made materials, which were widely disseminated throughout the rest of the world during the last 500 or 600 years, ever reached Nepal.

Political circumstances also isolated the country and affected the architecture. Until the present Shah dynasty unified the country in the latter part of the eighteenth century, the area we now call Nepal was divided into about fifty petty kingdoms. The rulers were constantly engaged in warfare and skirmishes with each other and did nothing to improve village life. The early Shah rulers likewise cared little for the welfare of their subjects. They were concerned with territorial expansion rather than progress and development. Regarding Europeans as a threat to the established order, the Shahs forbade them to enter the country. The Rana prime ministers, who ruled from 1846 to 1951, continued the policy of excluding foreigners while maintaining a very privileged, wealthy elite and the status quo in terms of village development.

When the Shahs resumed power in 1951, they opened the doors to the outside world. Since then, the change throughout the country has been rapid and dramatic. For example, in 1951 the literacy rate was less than 2%, life expectancy was 26 years, and there were 10 doctors in the entire country. Today, life expectancy has increased to 45, the number of doctors approaches 400, and adult literacy is 19%. Over one-half of the primary-age children now attend school. The change is apparent in village architecture. New materials and new ideas have been incorporated into village housing. A "civic" architecture is beginning to develop in the form of schools, health posts, post offices, and other buildings which house various activities that are becoming an important part of village life.

TRANSPORTATION
While geographical barriers and deliberate government policy prevented contact with the outside world until 1951, within the country there might have been more contact between groups and regions had the transportation system been more sophisticated. Roads and even carts were infeasible in the extremely mountainous terrain. The villages were connected by a network of trails; most people and goods moved by foot. Pack animals were not used very extensively because in many places the trails were too steep and rocky and because the villagers were unable to build bridges which could support pack animals.

The "suspension type" bridges which spanned the deep and narrow river gorges in the northern part of the country were very primitive. The "cables" were made of plaited bark and bast and the cat walks were merely thin strips of trees loosely tied together. Downstream where the rivers were too wide to be spanned with this type of bridge, dug-out canoes were used. In monsoon the rivers swelled from the rains and melting snows. The mid-spans of the suspension bridges were often carried away while downstream the rivers became too swollen to be crossed in dugout canoes. In winter, snow made the trails impassable in the northern parts of the country. Between the snow and the monsoon, large areas of the country were cut off for months at a time. In addition to the weather problems, there was no organized upkeep of the trails and bridges so they were generally in a terrible state of repair.

The transport system was not only primitive—it was also expensive. High transport costs inhibited intervillage trade and this in itself imposed a certain lifestyle on the population. The villagers were in most things self-sufficient. The over-riding concern of all but the wealthiest was to raise or grow enough food to survive. Self-sufficiency, the sine qua non of village life, was evident even in the architecture. In building form, only local materials.
methods, and labor were used. In building use, food self sufficiency was especially apparent—generally over 50% of the space is allocated to food storage and preparation and farm tools.

The inadequacy of the transport system did not eliminate all intervillage contact, however. The one thing that the villagers needed and could not produce themselves was salt. During the fair weather period a group of people from each village would carry some of their agricultural produce to a market several days away and exchange it for salt. In addition to their salt buying trips, many Nepalese worked in India and large numbers of men served as Gurkha mercenaries in the British Army. They were exposed to many new building forms and materials, but importing outside laborers was difficult and bringing back new materials was too expensive and too cumbersome. Village builders used only those materials which could be easily carried from a source within a radius of about 5 miles from the building site (close enough to walk and return in one day).

Transportation has vastly improved since 1951, but the bulk of the transport network is still the 9,400 to 12,500 miles of trails.

Most villagers are still isolated and live several days walk from the nearest road. In most areas the only new materials to have been introduced into local construction are ones which are lightweight, nonbreakable, and easily carried.

The likelihood of an extensive road network ever being constructed in Nepal is remote. The rugged terrain, large numbers of rivers and streams, and the heavy monsoon, make road construction and maintenance expensive. Nevertheless, travel in the hills has been immensely improved and facilitated by trail maintenance, the construction of all weather foot suspension bridges which can support pack animals, and the construction of 25 short take off and landing (STOL) air strips. The 2900 mile road network which has been built brings all the villages closer to the nearest road.

ENERGY DEMAND AND ENVIRONMENTAL DAMAGE

While advances in education, health, agriculture, and transportation have greatly improved the quality of village life, Nepal’s energy crisis threatens to destroy it altogether. Fuel needs of a rapidly expanding population have caused gross deforestation and soil erosion that now threaten a centuries old way of life.

Traditionally the villagers depended on local forests to supply wood for cooking and heating, and foliage for animal fodder. When the human and animal populations were relatively small, this practice did not cause much environmental damage, especially since in many areas the villagers agreed among themselves to cut or gather only dead wood. In the last thirty years, however, the number of people depending on the forests for their fuel needs has increased by about 65%, while the size of the forests has steadily decreased. In addition, the expanding population has cleared forest to create more farmland, and the number of animals fed on tree fodder has significantly increased. According to the World Bank, at the present rate of deforestation, all accessible forests in the Midlands and the Terai will be gone in 25 years.

The environmental problems caused by the deforestation are exacerbated by the high rate of natural soil erosion, and the lack of fuel alternatives. At present, in rural Nepal the only fuel alternatives to wood are animal dung, which is the only source of crop fertilizer, and kerosene, which is too expensive by village standards. The per capita income in Nepal in 1981 was US $140, but average income in the rural areas is much less.

The deforestation causes both large and small scale problems. At the regional level the problems revolve largely around rainfall. The trees provide vital ground cover which channels much of the rain water directly into the ground and reduces the speed and potential destructive force of the water which does wash down the hillsides. Water absorbed at the higher levels is eventually released at lower levels in the form of springs, often
the only water source for villages on ridges and upper slopes. Without the trees, the springs dry up after monsoon. The rain water runs off very rapidly, carrying tremendous amounts of topsoil with it (now considered by many to be Nepal's largest and most valuable export item). The vastly increased volume and speed of the run-off provoke landslides on the lower slopes, destroying houses and terraced fields, swelling the streams and rivers of Nepal, and producing floods on the Indian plains.

At the village level, the problem centers around farm land and crop yields. As more and more trees are cut, the villagers are losing their fields in rain-induced landslides. At the same time they have to go farther and farther for wood. In many places, gathering a load of wood now takes an entire day, whereas before this chore required only a few hours. As fuel gathering becomes more time consuming, people are beginning to use their animal manure for cooking fuel instead of for fertilizer. On their reduced land area they are applying less fertilizer which in turn reduces crop yields. Meanwhile the village population continues to grow. The result is that more people have less food and a more marginal existence.

The Nepalese government, well aware of the consequences of deforestation, is devoting a substantial portion of scarce resources to the problem, so far with some encouraging results. The forests, which used to belong to the king, are now under local management and control. This has greatly increased the villagers' incentive to restrict and restructure their tree-cutting practices. Many local tree nurseries have been started and experiments have been done to develop trees which will grow rapidly in the high, cold regions where trees do not regenerate easily. Much experimenting has also been done to develop both fuel-efficient stoves and bio-gas cookers which turn animal wastes into both cooking gas and a more potent fertilizer. Whether these efforts will suffice to rescue this wonderful Shangri-La, with its unique landscape, culture, and architecture, from environmental destruction remains to be determined.
The Tharus, unlike the other ethnic groups discussed in this study, are found within the borders of Nepal, and in the Indian states of Uttar Pradesh, Orissa, Bengal, and Bihar. In Nepal they are found throughout the Terai and the Inner Terai Valleys, but they are less concentrated in the eastern part of these regions. Budbudi is located in Surkhet Valley, an Inner Terai Valley in far west Nepal. The Tharus constitute about 5% of the total Nepalese population. Despite their large numbers, however, they are one of the least known groups in Nepal, largely because they settled in malaria-infested jungles called "marland" or "land of death" by the people in adjoining areas. Within this secure asylum to which the Tharus either escaped or naturally migrated, they practiced a primitive type of slash-and-burn agriculture, herded cattle, hunted, fished, and gathered.

Since the Tharus settled in such inhospitable areas, they had few contacts with outsiders. Consequently, many misconceptions arose about them. The most widespread one is that they are immune to malaria. Though they do seem to have a strong resistance, they are not immune. Another misconception was that Tharu women practice sorcery and witchcraft. Presumably this was based on the belief that only someone with supernatural powers could survive in such a hostile environment.

The origins of the Tharus are unknown. They have no written language, and a very primitive material culture. From the little that is known, it is felt that they are the northernmost extension of the Middle Indian aborigines, the earliest inhabitants of the Indian subcontinent, and probably Nepal as well.

According to the Tharus themselves, they are descendants of high-caste royal Rajput women who escaped from Muslim
invaders by running into the jungle with their servants. In the jungle they began to drink intoxicating liquors, eat the meat of pigs and boars, and raise fowls, for which they "lost caste."

There is no historic evidence to support either claim. Both seem to stem entirely from the Tharus' desire to be accepted as social equals by the caste-oriented groups with which they have had increasing contact as their jungle habitat has been cleared and settled.

Slightly more is known about the history of the area the Tharus traditionally inhabited. The region, which includes large areas in India as well as Nepal, was an important area of settlement.

Then, sometime between the seventh and the eleventh centuries A.D., for unknown causes, the towns there were destroyed and the land was overtaken by the malarial jungle. For the next eight centuries the area seemed to function as a protective barrier to the politics on either side of it. Finally, in about 1860, the Shah rulers of Nepal, who by then had political control of part of the Tharus' territory, determined that the revenue potential from settlement was more important than defense. After many fruitless attempts to induce Nepalese to migrate there—they preferred the climate and healthier environment of the higher elevations—the government finally employed Indian landlords, or zamindars, and tenant cultivators to clear the land and settle the Terai.

Between 1890 and 1940 the middle and western Terai was settled in this manner. The Tharus did not fare well under the zamindars who ruthlessly exploited them and cheated land-owning Tharus out of their property.

The Tharus migrated to Surkhet Valley, where Budhudi is located, to escape the rapacious zamindars. They came from Dang, another Inner Terai Valley in the Siwaliks and one of the oldest and largest concentrations of Tharu settlements in Nepal. Although the villagers have no idea when their ancestors settled Budhudi, land records show that the village was founded about 1900. The name Budhudi is thought to originate from a bubbling spring, located next to the village, which has now dried up.

Surkhet Valley was attractive to Tharus from Dang because the elevation and climates are very similar. Today there are about thirty Tharu villages in the southeastern part of the valley.

Tharu villages have been called "ephemeral features on the landscape" because the villagers frequently shifted settlements in the jungle. The principal reason for these migrations was economic—they practiced a primitive kind of slash-and-burn agriculture which quickly exhausted the soil. In addition, the Tharus were known to move because of cholera epidemics, marauding wild elephants, or the belief that evil spirits were killing or molesting their children.

The Tharus of Surkhet Valley no longer move about and have practiced sedentary agriculture for at least eighty years. Nonetheless, they still build their villages and houses as if they were
temporary residents who planned to move on in a few years' time.

The traditional migrating pattern of the Tharus is reflected in their housetype, village size, and settlement pattern. The houses are very crude buildings which could be quickly and easily made from available materials. Their construction required little investment of time and energy and the houses could be abandoned without loss. To facilitate resettlement and to increase mobility, the villages were small, containing only about twenty to thirty houses.

The village plan is identical in all Tharu villages. It is extremely simple and looks as if the village had only recently been established. A single lane runs the length of each village and the houses line up on either side. There are no non-residential structures. In the Terai jungles the villages were surrounded by high wooden fences to protect them from marauding animals, but these fences are not needed in Surkhet Valley.

From the layout, one would expect the focal point of village life in Budbudi to be the wide village lane onto which all houses open. Surprisingly little communal activity occurs there. Occasionally a large dance is held in front of the village headman's house, but most dancing and festivals occur inside the house. Threshing, an important village activity, is staged in two areas south of the village and the communal oil press is located on the north edge of the village. This central area is primarily used for feeding animals in monsoon and winter, and for children's play. Most outdoor life occurs in a private enclosed area behind each house. The present village water source is a spring about one-quarter mile away which is shared with several other villages.

A few changes have occurred in Budbudi since it was first settled about eighty years ago. The size of the village expanded and contracted. By 1925 there were 24 houses but now there are only 11, and the number of people in the village in 1980 had dwindled to 111 people. Over the years villagers left to clear and settle new land elsewhere in Nepal. Greatly increased land and construction costs make it unlikely that the village will ever expand to its former size.

Surkhet Valley has also changed in recent years. In 1972, the Nepalese government designated one of the villages there, Birendranagar, as one of four regional administrative headquarters in the country. The small village of 52 houses and 300 people has become a small town of several thousand, covering several square miles. Some of the Budbudi villagers cashed in on this building boom by buying wooden carts and water buffaloes and becoming contractors for hauling construction materials. These wooden carts and a few Nepalese army jeeps were the first wheeled vehicles to appear in Surkhet Valley. Before development began, no wheeled vehicles of any kind were used even though the terrain is basically flat.

Indeed, before 1972 few outsiders ventured through the malarial jungles south of Surkhet and the inhabitants were isolated. For some residents of the valley, the isolation was reduced in 1963 when a wireless station and an airstrip were built. For the Tharus, however, contact with the outside world was still limited to their annual trek to Chisapani, a village three days' walk to the south. There they would barter their agricultural produce for salt and kerosene. Even within Surkhet Valley the Tharus were isolated. They rarely went into the small bazaar at nearby Birendranagar, because prices for the few items they sought were much lower in Chisapani.

Thus far the radical changes in Surkhet Valley have only marginally affected the villagers of Budbudi. They now go to the bazaar in Birendranagar for small items like matches, cigarettes and soap, but for major purchases they still walk once a year to Chisapani where salt is 75% cheaper. In the near future, however, the lifestyle of the villagers is likely to change radically. A road to the Indian border will soon be completed and they will be able to traverse in a few hours a distance that used to take as long as four days.

The Tharus formerly were slash-and-burn cultivators. They would burn off a portion of the forest, rake up the ashes, and plant seeds. Since no fertilizer was used, the soil was soon exhausted and the villagers had to move on to more fertile territory. As the Tharus were essentially the only inhabitants, they
could afford to be wasteful in their land use. Eventually, however, Tharus became sedentary farmers. They intensively worked the same land over and over with oxen-driven ploughs and fertilized the soil with animal manure.

This same type of sedentary agriculture is still practiced in Budbudi. The main crops are rice, corn, wheat, and mustard. Small amounts of barley are raised as animal feed, and lentils and mustard are raised primarily as barter for salt. The other crops, as well as vegetables and tobacco, are raised for home consumption.

When the Tharus inhabited the jungles, they were known for their cattle herding. Though vastly reduced in numbers, cattle and animals are still an important part of the village economy. Nearly every household has one pair of oxen for ploughing and a few have cows which are kept primarily for rearing oxen. Several families also have water buffaloes—felt to be especially strong animals—for pulling carts. In addition to their farm work, the cattle are valued for their dung which is used for both manure and cooking fuel. Every household also raises pigs, chickens, pigeons, and goats to sell in Birendranagar.

The effects of deforestation are beginning to be felt in Budbudi. However they have not reached crisis proportions yet, in part because the village and fields are in the middle of a wide, flat valley where the possibility of landslides is remote. The forest where villagers cut their wood has become noticeably thinner and farther away. Twenty years ago it took two hours to reach the forest and now it takes nearly three.

In 1975 the Nepalese government imposed regulations intended to remedy the deforestation problem in Surkhet Valley. Each household must purchase a permit which entitles it to cut a predetermined number of loads of dead wood during a set period of thirty-five days within the months of March and April. If this regulation can be enforced, the deforestation problem in Surkhet may not deteriorate further.

In the Tharu villages fertile soil was so abundant that the only limitation on the amount cultivated was their ability to clear and settle it. As a consequence, their long, one-story houses occupy much more land area than the houses in the hills. There a scarcity of arable land affected both the house form and the settlement pattern.

Within a given Tharu village the houses are identical in construction, site alignment, and space allocation. Their length varies, according to the number of people and animals in the household. As these fluctuate over time, the same house will be expanded or contracted. If the household needs more space because of births, marriages, or animal purchases, the size is increased. If the household needs less space because of deaths, migrations, or animal losses, the size is decreased to reduce maintenance. Adjacent to every house is a large "kitchen garden" where vegetables and fruits are raised. Directly behind the house is a private fenced area where grains are dried, the family socializes, and various household tasks are performed. Since there is no electricity, this private outdoor space is heavily utilized. In some Tharu villages, the facade of the house is decorated with religious pictures of animals and hunting scenes in low mud relief, but in Budbudi the houses are devoid of any ornamentation.

Every house in the village has only two huge rooms, but they seem to have more because of the way in which the rooms are subdivided. The room at the south end has three doorways, two for the family and one for the animals. This room is divided by a fence and the animals are kept in one half at night. The other half is the most intensely used space in the house. It is the only area which has a high light level during the day, and the female members of the household spend many hours there grinding flour and dehusking rice. It is also the only area in the house large enough to accommodate the entire family at one time (the average household size in Budbudi is 11 but one household has 23 members and one has 24). The family eats here, they gather around a small hearth in one corner to keep warm on cold winter nights and mornings, and important family occasions such as weddings, funerals, and religious festivals are celebrated here.

A floor-to-ceiling partition separates the two rooms. The one at the north end of the house is about two thirds as big and
I.

1. Animals
2. Eating / Food Preparation
3. Food Preparation
4. Cooking
5. Sleeping
6. Backyard
7. Pigsty

scale: 1/8" = 1'0" (1:100)

A BUDBUDI HOUSE
completely different in use and ambiance. It is extremely dark because the only light sources are six or seven small circular openings about 5" in diameter and 12" above the floor level. This second room is subdivided into smaller spaces by huge earthen grain storage pots, or debris, which are 4' to 6' high and 1' to 1½' wide. At the far end of the room, in the most inaccessible part of the house, are the "shrine room" and the "kitchen." Here food is prepared on the floor and cooked on a small clay stove. There is no chimney and the smoke from the cooking fire permeates the entire house, preventing insect infestation by coating the structural timbers with tars and repelling malarial mosquitoes. The "shrine room" contains the largest debrī, which is the shrine to the family deity. The eldest male member of the household, who is in charge of the family's religious activities, conducts various rituals here and sleeps here with his wife. The rest of the sleeping arrangements vary from house to household. In the house shown here, the children of both families of the household sleep in the space next to the "shrine room," and the younger brother and his wife sleep in the entry area. Water is stored and some food is prepared in the area opposite to where the children sleep. Dishes are always washed outside to avoid messing up the mud floors.

By Nepalese village standards, the amount of floor space devoted to storage is very modest—only that taken up by the debrī. Additional storage is obtained by using overhead platforms, suspending items from the roof frame, and by sticking things, such as small farm tools, into the thatch. Fuel wood, large farm tools, and ploughs are kept outside behind the house.

In order to maintain a high degree of mobility, the migratory Tharus had only a few household goods which they carried with them. The villagers of Budbudi have more or less maintained this tradition. They still make most of the things they need in daily life, working in clay to make the debrī and water pots, using...
bamboo, reeds, and fiber to make baskets, snares, fish nets, fans, mats, and ropes. They also make string beds, the only furniture in the house. The bed frame is made of wood and then strung with rope which the Tharus make from a vine found in the forest. The bed is ideal for hot, humid climates. It elevates the sleeper off the ground while the strings allow the air to circulate around the body. Metal cooking and eating utensils are purchased outside the village.

When the Tharus were a constantly migrating tribe, they needed "throw-away houses" which could be constructed with a minimal investment of time and energy. Structurally, the Tharu house is very simple. Wall posts, columns, and roof beams—which are simply tree trunks with the branches and bark removed—are lashed together to make a rigid frame. This supports the thatch roof and a non-load-bearing "curtain wall" made of small reeds and mud. The reeds, which are lashed to the wall posts, act as reinforcing, both holding the clay in place until it hardens and keeping it from spalling out once it is hard. This type of reed and mud wall is commonly referred to as "wattle and daub." No specialized skills are required to build the house and everyone in the village participates in its construction.

Despite its crude construction and simple technology, the Tharu house represents a surprisingly sophisticated response to the extremes of the local climate—hot, dry summers, hot, humid monsoons, cold winter nights, and an annual rainfall of 61". The climate is accommodated by using a 12" thatch roof to shed the rain and by utilizing the simple principle of heat storage and re-radiation. The wattle and daub walls and the clay debris absorb the sun's heat during the day and re-radiate it at night. There is a six to ten hour time lag between the time the heat is absorbed and when it is given off. The net effect is that the dark room with the debris is comfortable during the day and re-radiate it at night. If the family needs more room for animals or people, they simply break down the wall at one end of the house and extend it. The addition can be at either end, and it may go right up to the property line. When the property line has been reached in both directions, the family cannot add on at the ends. They then increase the area of the house by making it wider.

The Tharus' sedentary lifestyle in Budbudi no longer necessitates "throw-away" houses. Nevertheless, they still build their houses in the traditional manner with the traditional materials, even though these are no longer readily available and much time is spent in their accumulation. To accumulate materials for a house...
the size of the one shown here would take about 30–34 days and to construct it would take about 18–22 days. Both men and women participate in the accumulation of the materials and in the construction of the house itself, but each sex has strictly defined chores. In some Tharu villages the priest examines the plot for evil spirits and “serpents” before construction begins, but this is not done in Budbudi.

The owner does not have to pay the workers a wage, but he is expected to supply them with food during construction and when it is finished, to put on a large feast for all those who participated in its construction. The only cash cost incurred is the cost of the permit to cut the wood. In 1980, for a house the size of the one shown here, the owner would provide about $84 worth of food to the workers and spend about $21 for the permit to cut the wood.

Since the villagers collectively participate in the construction of a house, they collectively own it. If the family moves away, the other villagers dismantle the house and divide up the materials among themselves. The only condition under which the owner can sell the house is if he incurred cash expenses in its construction, as for example in paying for the permit to cut the wood, a relatively recent requirement.

The impermanent nature of the materials used in the Tharu house requires a great deal of maintenance. As in construction, the men are in charge of the roof, the wood framework, and the wall reeds, and the women take care of the mud and dung wall finishes and the mud floors. One half of the roof is replaced every year. The wall reeds require periodic replacement and repair, especially where rats eat through and make holes. The strings used to lash all the joints together become loose and need to be retied. Twice a year, before and after monsoon, both the interior and exterior wall surfaces are replastered with two coats of mud and the floors are remudded.
opposite, top:
The women make the mud wall plaster by mixing mud, cow dung, and straw.

opposite, below:
The walls are made of reeds plastered over with mud. This type of wall is called "wattle and daub."

right:
All the village men participate in annual house maintenance and repairs.
KODGAON

A GURUNG VILLAGE

As with the Tharus, the history of the Gurungs is unclear. They are thought to have migrated from Tibet during a period of Tibetan expansion between the seventh and tenth centuries A.D. Initially they settled at high elevations on the southern slopes of the Himalayas in the areas of Lamjung Himalaya and Himal Chuli in central Nepal. Over the centuries they gradually moved west to the southern slopes of the Annapurnas where Kodgaon is located. Of the total Nepalese population, the Gurungs constitute only about 1.5%.

Compared to other areas in Nepal their initial habitat was rather inhospitable, but compared to the cold, arid Tibetan plateau from where they came, it must have seemed like paradise—cold, but covered with game-infested forests, lush alpine pastures ideal for grazing large herds, and huge expanses of unpopulated areas suitable for slash-and-burn cultivation. They moved from site to site every few generations.

The Gurungs began to settle in permanent villages about three to four hundred years ago. Ruins of what are believed to be their earliest villages have been found as high as 11,480'. Gradually they moved to lower elevations. Their herding and primitive cultivation required such vast amounts of land that even a small increase in population forced some of them to migrate to other areas. In addition, the lower elevations had agricultural advantages. The warmer and longer growing seasons permitted the cultivation of higher yielding crops such as maize and millet. Today most Gurung villages are found between 3280' and 8528' in their traditional settlement areas.

At 6400', Kodgaon is located at about the mid-point of Gurung settlement areas in the Modi River Valley on the southern slopes...
Kodgaon is a clustered settlement. In layout and appearance, it is typical of the Gurung villages in the Modi River Valley. The slopes of this valley are very steep and the houses step down the hillside, with several houses next to each other on each "step." Since the site is so steep, there are no large open communal areas for village-wide functions. Instead the villagers congregate on the paved terraces in front of their houses. A paved walkway winds through the village.

In Kodgaon the mornings are cold throughout the year and during monsoon the cloud cover becomes too dense to grow any crops above 6000'. These conditions influenced the choice of site in two ways. First, the village is situated on the northern slope of the NE-SW oriented river valley so that all the houses catch the morning sun, which begins to heat up the environment as soon as its rays hit the surfaces of the houses and terraces. This is especially important to the villagers because their only other source of heat is wood, which must be carried long distances. Second, in order to maximize the arable land the village was located above it in the area where the dense monsoon cloud cover grossly inhibits crop growth. Over time the village has grown upward and sideways rather than downward into the cultivable areas. Despite the cold mornings and monsoon cloud cover, the generally mild climate with cool summers, cool monsoons, and mild winters is very suited for settlement.

Cultural morés determined the location of specific houses within the village. The 9 houses owned by the low-caste Hindus are all built in an area distinctly separate from the rest.

On the basis of genealogical and legendary evidence, Ghandrung is anywhere from 250 to 750 years old. According to the local villagers, Kodgaon is the oldest of the seven villages. In some areas of Nepal, there are much older villages, but most of these have remained more or less unchanged over the centuries. Kodgaon and the other six villages of Ghandrung, on the other hand, have been completely transformed in both appearance and "survival strategies" since the Gurungs initially settled there.

When Kodgaon was first settled, the villagers were principally herders who also hunted and practiced slash-and-burn farming. Today they are sedentary farmers who have some animals, but who no longer hunt at all.

Had agriculture been the primary focus of the Gurungs when
they first came to the Modi Valley, they would likely have chosen another site for their village. Even below the agricultural limit of 6000' there is heavy cloud cover which retards the maturation of the monsoon crops (rice, maize and millet) and reduces yields. In addition, the area is plagued with hail storms which cause tremendous damage to growing crops.

Although Kodgaon's location is not ideal for agriculture, its location at the midpoint between summer and winter grazing areas was ideal for a community which maintained herds of sheep and goats numbering in the tens of thousands. This was true of the villages of Ghandrung until the early part of the twentieth century. Sheep and goats were the mainstay of the economy then. At least 1000 animals were sold every year to other groups at the time of important religious festivals and feasts. The wool was woven into blankets, capes, and rugs and bartered for manufactured items in Pokhara, the nearest bazaar town, roughly 1 to 1½ days' walk.

As the villagers began to switch to sedentary agriculture the large herds began to disappear. Today in the entire village of Kodgaon there are only about 1000 goats and sheep. The animals are still sold at the time of the big religious festivals, but now only a few families weave woolen items and most of the wool is sold to merchants from distant Gurung villages.

The demise of herding occurred within the last 100 years and was the result of three factors: 1) increased competition from cheaper and more prestigious textiles from India and China; 2) plagues which killed huge numbers of animals and made raising new ones risky; and 3) a loss of herdsmen as the British Army expanded their recruitment of Gurungs into the Gurkha
mercenary regiments. At the same time, increases in the population prompted villagers to convert grazing areas into fields.

The change from slash-and-burn to sedentary agriculture began more than 130 years ago when the Gurungs began to grow rice, a higher yielding crop than maize or millet. It completely transformed the village environment from largely forested slopes, in which areas were periodically burned off and planted, to neatly terraced hillsides. The conversion to flat terraces with low retaining walls was necessary because rice had to be immersed in water while growing. Since rice required a warmer climate than was present at the altitude of the village, the terraces were constructed by the river, 1500'-1900' below the village, where the temperature is higher. The actual amount of land where rice could be successfully grown was quite limited. This forced the villagers to work the same land over and over again, so fertilizer was needed. In addition, rice, unlike maize or millet, required the soil to be worked intensively before planting. Ploughs were introduced along with oxen to pull the ploughs and provide manure. When rice was first introduced, the other crops were still grown by the slash-and-burn method. Eventually, however, the population became too large to leave areas of land fallow for long periods. All the land was cleared, terraced, fertilized and worked continuously. When the villagers began to grow rice, they began to divide up the lands and assign individual property rights. Before that all the land was communally owned.

Today in Kodgaon the principal cereal crops are rice, barley, wheat, millet, and maize. The most recent major crop to be introduced was the potato, first planted about 1930. It became an important cash crop within the decade and potato sales have contributed substantially to the growth of the seven villages of Ghandrung since that time. In addition to potatoes, millet, maize, and garlic are also sold as cash crops.

Although the large herds are gone, every household has animals suited to the needs of sedentary farmers. The initial demand for crop fertilizer was solved by bringing in oxen and cows. As more and more areas were terraced and continuously worked, the demand for manure increased. Water buffaloes, which produce a richer milk than cows, more dung than oxen, and can survive on a diet largely composed of tree fodder, were introduced. Now almost every household has at least one buffalo and many have several. Before planting of each crop, the buffaloes are brought down to the fields to feed on crop stubbles while they fertilize the area. They are kept exclusively for milk products and for dung. Ploughing is still done with oxen, but they are now owned by only a few families and rented to the others at planting time.

Since a large number of animals require fodder and the villagers rely exclusively on wood for heating and cooking, a severe burden is placed on the local forests. For the short term, a crisis situation has been avoided by the local village council. It deter-
mined that the traditional fuel and fodder source, a forest directly above Ghandrung and used by all seven villages, was over cut and ordered all the villagers to collect fodder and cut wood further away in a newly demarcated area. The old fuel wood and fodder source was an hour's walk. Including travel time, a day's fodder ration took three hours to collect and three or four loads of previously cut wood could be brought in a day. The new area is two hours away so that the daily fodder collection takes five hours and only two loads of previously cut wood can be brought in a day.

In addition to the radical change in the village environment, the village itself has been completely transformed. When the Gurungs first settled in the Ghandrung area, they lived in small, one-story houses which were round or elliptical in shape with wattle and daub walls and thatch roofs. Today everyone lives in rectangular stone houses with slate roofs. In Kodgaon, the change began about 1860 when the first Gurkha soldiers returned from service in the British Army with their pension monies. They tore down their old round houses and built large stone ones on the same site. Subsequent generations of returning soldiers followed suit, while rich landowning families who did not have pensioners in the household also built stone houses. The last round house in Kodgaon was replaced by a stone one in 1970. The total number of houses has increased, however, as some of the soldiers built houses on new sites. Similar transformation and growth have occurred in the other Gurung villages in the Modi Valley, all of which had many Gurkha pensioners. The old-style houses have almost disappeared from this area. The "building boom" for the stone houses occurred between 1930 and 1960. Only 10 houses have been built since then, and it is unlikely that many will be built in the future as the houses are becoming extremely expensive to construct.

The Gurkha pensioners have acted as "agents of change" in other ways as well. The village school buildings, constructed between 1972 and 1980, were financed largely by donations from retired pensioners, who were also the prime movers behind the water tank construction in each of Ghandrung's villages in 1972. Long before the school was constructed, however, the villagers had great respect for education, especially in Kodgaon, which has the highest literacy rate in Ghandrung. Four households in Kodgaon have members with university degrees.

The most recent change in Kodgaon is the appearance of foreign backpacking tourists. The number was quite small until the opening of a trail in 1977 which connected Ghandrung with another extremely popular backpacking trail. By 1980 about 4550 tourists a year were passing through. Some have their own tents, but most stay in one of eight newly constructed "hotels" which are located on the trail below Kodgaon in an area now called the "bazaar." With one or two exceptions, houses have not been converted into hotels because the Gurungs of Ghandrung do not have a tradition of entertaining strangers. The settlement is located on a trail which was not a major trade route. The only people who passed through were Gurungs from other villages in the Modi Valley.
To a Western eye, the houses of Kodgaon appear to be as ancient as the Gurungs themselves. Actually, as mentioned above, they are a recent innovation.

In the small, elliptically shaped houses which the Gurungs formerly occupied, the family lived in the central part, which was more or less square in shape. The "nubs" on either end were partitioned off and used for storage. A subceiling less than 7' above the floor created a small "attic" space where baskets and tools were kept. The interior light level was very low as the only source of light besides the doorway was a very small wooden lattice. A covered verandah, which ran the length of the house in front, was used by the family during the day in the rainy season. The rest of the year they spent the daylight hours in the paved terrace in front of the house.

When the Gurungs began to build much bigger and more elaborate stone houses, they maintained the same layout with only three living spaces, but they are much larger. The ground floor has one large room where the family lives; the remaining area on this level is used for storage. The entire second story is also used for storage. A verandah runs along the front of the house and there is still the paved terrace in front. Although the size of the stone house varies, the use of space is the same throughout the village.

The sunken fireplace at one end of the family's living quarters is the center of life within the house. Here food is cooked, and the family members eat and gather in the evenings. Beside the fireplace is a bed which belongs to the head of the house.

As in the Tharu house, the smoke from the fire is considered beneficial, hence there is no chimney. The smoke "cures" food placed on a rack above the fire. There are holes in the floor above so that the smoke can filter throughout the house, coating the structural timbers to prevent insects from eating them. The area around the fireplace is separated from the rest of the room by a low partition and wooden shelves (in some Gurung villages this area is actually two separate rooms). The other area is used mostly for sleeping and has two beds. Water is always kept in three large jugs by the front door and the dishes are always washed outside to minimize water damage to the mud floor. The water is carried to the house from the water storage tank at the upper end of the village. Some families who live below the tank have run private water lines from the tank down to their houses and they now have only to go outside for water.

Although the light level within the new-style house is much higher than it was in the elliptical ones, it is still quite dark inside. Consequently the family members still spend most of their time outside during the daylight hours. During the dry season, they live on the terrace threshing and drying grain; weaving cloth, bamboo baskets and mats; washing clothes, dishes, babies, sitting, sunning and talking. During the rainy season family members take refuge under the covered verandah where they continue to perform the endless stream of household chores.

The amount of space allocated to storage in the Kodgaon house is high, even by Nepalese standards. The entire second floor is used for storage. In addition, a small room behind the fireplace...
A KODGAON HOUSE

1. Front Terrace
2. Front Verandah
3. Cooking / Eating / Sleeping
4. Farm Tool Storage
5. Food Storage
6. Wood Storage
7. Grain & Household Storage

scale: 1/8" = 1'0" (1:100)
and two covered, semi-enclosed areas on the ground floor level are used for storage. Wood and farm tools are stored in the semi-enclosed areas. Within the living area itself, there are numerous shelves for storing eating and cooking utensils. During monsoon, newly harvested corn is suspended from the ceiling.

Animals are usually kept in a stable, or donsar, which is a separate structure by the house. Over some donsars is a room which is often occupied by family members who desire more privacy. Several families have outdoor latrines, another innovation introduced by Gurkha soldiers. Otherwise the family members relieve themselves "in the fields."

From a climatic standpoint, the old-style houses were especially suited to the environmental needs of the earliest Gurungs. They settled in areas which had cold, snowy, and very windy winters. Their rounded buildings exposed less surface area to the cold than a rectangular building with the same floor area, and were therefore warmer and more fuel efficient. Bending the bamboo in the walls to make a rounded "pre-stressed" shape helped the light-weight building resist heavy wind loads. As in the Tharu house, the wattle and daub wall absorbed solar radiation and reradiated it into the house, further reducing fuel requirements. The thatch roof insulated the space below from cold while shedding rain and snow.

As with the Tharu house, the old-style house required no skill to construct. The materials were used as they were found. All the pieces of the frame were simply lashed together. The "reinforcing" for the wattle and daub walls were identical to the woven bamboo mats still used in Kodgaon for temporary huts erected in the fields during harvest.
If the old-style elliptical house was the equivalent of the small, fuel-efficient car, the new style stone houses were "gas guzzlers" which required much more winter fuel. Even though the family still lived in only one room, it was much bigger and, being rectangular in shape, more surface area was exposed to cold and wind. At the time the change was made, however, the increased fuel wood consumption was of no consequence because the forests were very close to the villages and the wood was easy to gather.

The new stone houses are much easier to maintain. Exposed to more than 200" of rainfall annually, the thatch roof on the old houses had to be replaced every year. In addition, the wall and roof timbers would rot out periodically and require replacing, the bamboo reinforcing in the wall would have to be repaired or replaced, and the entire wall surface both inside and out would have to be remudded once a year. With the stone houses, the only maintenance necessary is the periodic replastering of the interior walls and monthly refinishing of the mud floors.

At the time the Gurungs were converting to the new stone houses, the most prestigious houses in Nepal were the Newar houses of Kathmandu Valley. These seem to be the model upon which the Gurung houses were based. Many of the construction details in the Gurung houses are similar to the Newar, although much more crudely executed.

Constructing houses in the "Newar style" required new tools, skills, and technical knowledge. Some of the Gurungs acquired the skills during their military service, and others paid for the services of carpenters and masons with their pensions. When a market for these construction skills developed in Kodgaon, some of the villagers who did not join the army went off to Newar bazaars and learned them.

The stone houses are variations on simple masonry bearing-wall structures. On the ground floor the building loads are carried by both the massive 18"-24" walls and an internal system of columns and beams. The slate roof and the second floor are carried on a wooden substructure of beams and joists which are tied into the stone wall. Architecturally the most distinctive feature, and structurally the most complex, are the angled struts which support the roof overhang.

Accumulating the stone, slate, and timber for the Gurung house takes a long time. The stone and slate must be quarried and carried to the site. The stone quarry is only 15-30 minutes away but the slate quarry is 1½ hours away. In a day a worker can bring as many as 50 stones but only 3 to 4 of the 36"x18"x1½" slates. The trees are cut and brought from the forest. The joists, beams and columns are all shaped with an adze. Since this tool is very inefficient, a large number of trees are required.
Accumulating the materials for a house the size of the one shown here would take about 76 days. The construction process would only take about 41 days. During the course of construction, 3 carpenters, 5-6 masons, and as many as 15 unskilled workers would be required. Masons are also required during the accumulation period to quarry the stones and the slates. Female members of the family building the house generally help in construction but otherwise, women do not work as construction laborers.

By village tradition, each household provides one day of labor during construction. The house-builder still has to provide food in exchange. For all the other workers, the builder pays a wage and provides food or pays a cash equivalent. The cost of accumulating and constructing a house the size of the one shown here was about $3840 in 1980. Of this, about $1000 would be for construction and the rest would go to accumulate materials. Since the accumulation cost has become so expensive, it is now quite common to buy an existing structure such as a small house or donsar, dismantle it and move the materials to a new site.

Before construction begins in Kodgaon, the prospective house-builder consults one of two local lamas or a local Brahmin. This “structural advisor” tells him the auspicious dates for completion of various phases of construction and determines the presence or absence of a demon serpent in the plot. If a “serpent” is present, the advisor prescribes the proper procedure to follow. In addition to giving the dates by which the foundation, front door, main column, walls, roof, and fireplace must be completed, the advisor also determines the most auspicious position for the front door, fireplace, and beds. The placement of these in Kodgaon is almost identical in every house, but in the other villages of Ghandrung, their placement varies.
MARPHA

A PANCHGAON VILLAGE

Marpha is one of five villages known as Panchgaon. Located about 30 miles south of the Tibetan border, the villages line the Kali Gandaki River in a portion of an Inner Himalayan Valley known as Thak Khola. The villages are directly north of the area inhabited by the Thakalis, an ethnic group renowned for the wealth it amassed in the Tibetan salt trade. The villagers of Marpha call each other Marphalis or Panchgaonlis, but to the outside world they refer to themselves as Thakalis. The population of Panchgaon is very small and represents less than .01% of the total Nepalese population.

As with the Tharus and the Gurungs, the Thakalis-Marphalis never developed their own written language. Hence their history must be pieced together from an analysis of their language and legends. The language of the two groups is related to that of the Gurungs and the Tamangs. Together or separately the three groups entered Nepal from the north during a period of Tibetan expansion, sometime around 1000 A.D. According to their legends both the Thakalis and the Marphalis originally settled in far west Nepal and then subsequently migrated to the Thak Khola area. Since it contains an important India-Tibet trade route which was established as early as the eighth century A.D., Thak Khola was almost certainly settled by earlier populations. Whether or not they had already abandoned the area or were displaced or absorbed by the Thakalis-Marphalis is not yet known.

The area of Thak Khola where the Marphalis settled is extremely arid. The valley floor, except where irrigated, is almost a desert. Strong daily winds blow whatever moisture there is in the air from the middle of the valley toward the forest cover on the rim. Daily winds make the summers quite pleasant—the
maximum temperature is 82°F. The winds make winters so cold, however, that approximately half of Marpha’s population moves south to the warmer parts of Nepal. Before malaria was eradicated in the early 1970’s, families generally migrated south for only three months. Now they stay for as long as six months, and some have permanently settled there.

The physical setting of Marpha is quite dramatic. At an elevation of 8650’, it is situated between Mt. Dhauligiri – 26,810’ and Mt. Annapurna – 26,541’, respectively the world’s sixth and tenth highest mountains. In the enormous cleft between the two mountains is the world’s deepest river gorge. At the point where Marpha is located, the depth of the gorge is more than twice that of the Grand Canyon.

The present location of Marpha is not its original site. Like most of the villages in the area, Marpha was once fortified and situated on a hilltop high above its present location. When considerations of defense ceased to be important, many of these hilltop villages relocated near the banks of the Kali Gandaki River. The villagers of Marpha say that their village was moved to its present location about 150 years ago after a severe water shortage and a smallpox epidemic.

The main lane of the present village is a small piece of the old and important trade route which ran through the Thak Khola region. But Marpha’s villagers were principally farmers and were not heavily involved in this trade. In their inhospitable surroundings, however, they could never grow enough food to last an entire year. Thus, for centuries Marpha’s villagers have been forced to supplement their farm output with other work. At various times in their history they have run animal caravans, marginally participated in the Tibetan salt trade, raised goats and sheep, worked as servants for wealthy Thakali merchants in neighboring villages, and worked in southern Nepal for part of the year. When the Chinese closed the Tibetan border in 1959, the salt trade, on which the Marphalis were somewhat dependent, soon ended. The Marphalis’ response to the loss was to become heavily involved in the tourist business which began a few years after the border was closed.

The old trade route which runs through Marpha is now a principal trekking route. During the spring and fall tourist seasons, backpacking tourists stay with many of the local families. Unlike Kudgaon, providing food and hospitality to strangers is not new in Marpha. Traditionally the villagers offered food and lodging to passing traders and caravan drivers. What is new is the size of the annual tourist influx – now as many as 6,000 a year.

By Nepal standards, Marpha is quite large. In the 1977 village census there were 720 people and 162 houses. Most of the houses sit on either side of the main lane and have direct access to the main irrigation canal that runs beside it. Houses away from the main lane are still not far from this water source. Until re
cently the water was used for bathing and washing clothes and utensils, as well as for irrigation. In 1977 a system of six communal water taps was installed along the canal. The villagers now have safe drinking water but by mutual agreement they still wash clothes and dishes in the canal so as to avoid endless queues at the taps.

The main lane is the social as well as the physical center of the village. During the warm summer months when Marpha’s population is at its height, it is often congested with large numbers of kibbitzing men who gather at various tea stalls to drink whiskey or tea, just as American men of a small town might congregate at the local bar. The “tea stall” (actually just a person’s house) is a traditional Marpha institution. There are now twenty-four such establishments since the tourists began coming in large numbers. The tea stalls also sell small items such as candles, matches, and cigarettes which the villagers need for daily use.

In addition to the 162 houses in Marpha, there are more than 75 naws, which are located on the periphery of the village. The naws, which from a distance look like the houses, are enclosed areas used almost exclusively for threshing grains. These large enclosed areas are necessary to prevent large amounts of grain from being blown away by the strong daily winds.

The villagers’ religious fervor is evident everywhere. At each end of the village stands a large gatehouse, built to protect the village from ghosts and spirits and to bless the travelers who pass beneath. Since the arrival of the tourists, billboards advertising local “hotels” adorn them. There is a Tibetan Buddhist temple or gompa which used to be the focal point for much village activity. Because the second son of every Marpha family traditionally became a lama, Marpha had a huge religious community. That tradition is changing. Now only a few men take vows, and today there are only three lamas and one incarnate lama. Except during religious festivals the gompa is empty.

Religion is nonetheless an important part of people’s lives and the lamas often visit villagers’ houses to perform special rituals. Long walls piled high with commemorative prayer stones are strung out from each end of the village, and several walls of prayer wheels are located within the village.

There are also a number of “public” structures in Marpha. Two communally owned, water-driven flour mills—as old as the village itself—are located just beyond the northern gatehouse. The other public buildings, indicative of the changes in Marpha since Nepal opened her doors in 1951, include a school (built in 1959), a village council house (built in 1965) and public latrines (built in 1978).

The principal determinant of the village location was agriculture. The annual rainfall in this arid region is only 19". Hence all crops must be irrigated. But the amount of irrigable land near the water source is limited. Thus every square inch of arable land is
farmed, and the village is nestled above the farmland in the “left-over” area at the base of the valley wall. Over the years, the growth of the village has been up the hillside rather than out into the tillable area. Further land economies were realized by placing the houses immediately adjacent to each other, in most cases sharing walls, and eliminating a large communal exterior space common in many Nepalese villages.

Climate equally affected the formation of the village plan. Wind exposure to each unit was minimized by placing the units adjacent to each other. Additional wind protection was achieved by locating the village at the base of the western wall of the valley rather than out in the middle. This location also catches the morning sun which begins to heat up the environment as soon as its rays hit the surfaces of the buildings. As in Kodgaon, this is especially important to the villagers because the mornings are always cold and it is a wood-scarce area.

Marpha culture also affected the development of the village plan. The people of Marpha are divided into four clans of equal social status. By tradition, all villagers marry within the village, so all are related. Thus, all houses can be adjacent, even sharing walls, without suffering any loss in social standing. However, in Marpha, as in Kodgaon, the low caste kamis (blacksmiths) and damais (tailors), who came to Marpha long after the Marphalis had settled the area, live in a distinctly separate area on the periphery of the village.

Despite many changes in Marpha, life for most villagers still centers on agriculture. During the planting and harvesting periods, all other work in the village ceases as every able-bodied person is engaged in the field work. The rest of the year many hours are spent in the fields. The main crops are cereal grains—wheat, barley, buckwheat, and corn. Recently there have been some important changes in crops and diet. Fruits and vegetables have been introduced by a Nepalese Government Agricultural Extension Farm located near Marpha. The fruit-growing program was initiated because distilled spirits can be made from fruit. The government wanted to induce the villagers not to use large amounts of the local grain crops—still the principal part of the diet—for making whiskey. The fruits were introduced in 1966, and now nearly every family has a few apple, peach or apricot trees. The vegetables—cauliflower, cabbage, carrots, and spinach—were introduced at the same time to add much-needed vitamins to the diet. The government induced the farmers to grow vegetables by setting up a program to market the seeds. Barbed wire fences, installed to prevent marauding animals from eating the vegetables, now dot the Marpha fields.

Animals have always been an important part of life in Marpha. When the Tibetan salt trade was at its height, goats and sheep were often used to carry small pouches of salt or grains. Yaks, also used as pack animals, were then a common sight in Marpha.

Today cows are kept for milk, zum (half yak and half cow) for ploughing, donkeys for running caravans between villages on the Tibetan border and the nearest road to the south, sheep for wool and meat, and goats for skin, milk, and meat.

For most of the year the goats and sheep are kept above Marpha in pastures ranging in altitude from 9,700' to 16,400'. The grasses in these upper pastures are not of sufficient quantity to allow the villagers to accumulate large amounts of fodder for use during the winter. Thus, unlike some Thakali villages to the south, the herds of Marpha were never very large and, though important, were never central to the economy. Wool is still used by local households to make carpets which are used locally or sold to tourists.

Rapid deforestation, consequent soil erosion, and landslides have not yet become serious in Marpha. The normally low rainfall greatly reduces the possibility of a mudslide. In addition, the Panchgaonlis have organized themselves to maintain their forests and their land.

The forests above the villages of Panchgaon are communally owned. In order to prevent the villagers from all going to cut in the same place, each village has the exclusive right to cut trees within a certain area determined by the local village councils. Only dead trees can be cut. Certain villages, including Marpha, have “summer forests” and “winter forests.” If either was used exclusively, the forest would be over-cut and the denuded slopes could prove landslides below. The summer forest is used from May 1st to November 1st, when the river, swollen with rain and melting snow, is too high to cross. The winter forest, which is on the rim of the other side of the valley, is used from November 1st to May 1st when the river is low.

Because of the severity of the climate, large amounts of fuel are required, and fuel gathering has always been a major time-consuming activity. This is in marked contrast to other areas of Nepal where devoting many hours to fuel gathering is due to the fact that the forests are becoming progressively more distant. For Marpha villagers both summer and winter forests are approximately one and one-half hour’s walk away. For a family which spends the entire year in Marpha someone in the household must be sent to get wood 120 days a year. A family which spends only six months in Marpha must send someone 45 days a year.
THE HOUSE

The present dwellings of the Panchgaonlis have clearly been influenced by the local climate, their culture and their agriculture. A scarcity of arable land necessitated a house form that minimized area at grade, extended vertically rather than horizontally, and shared walls. Most houses were built into the hillside (although the one shown here was not) which facilitated the terraced section so typical of all Marpha houses. Land scarcity also eliminated the option of having an area next to the house for outdoor grain drying, so the roof—flat because of low rainfall—is used for this. The roof area is protected from the strong daily winds by stacking wood around the edges. This wood is put on the roof when a family member dies and used only in emergencies when the occupants are snowbound or sick. After several generations have lived in a house, the stacked wood can be as high as four feet.

Building traditions in Marpha have dictated what rooms should be in the house, but not their arrangement. Unlike most villages in Nepal, where there is little variation in the floor plan, no two Marpha houses are alike. For example, in some houses, the winter cooking area is on the ground floor, in others, on the second floor, in some, on the back of the house, on others, on the front. Grain storage rooms, however, are always in the most inaccessible part of the second level. One of the grain storage rooms, the thin dhan, is also a shrine room used for weddings, funerals, and ancestor worship, one of the few remaining vestiges of the remote tribal origins of the villagers. The size of the room, the placement of the storage bins, and the degree of cleanliness indicate the ceremonial functions of the room. Its placement in the inner recesses of the house, where it gets no sunlight, also indicates that it is not for daily use and that it is only for family use. Traditionally Marpha women make rugs, some of which are now sold to tourists, but there is no special place in the house for this activity.

Because of its severity, climate has influenced the Marpha house form more than it has in most other parts of the country. As is true everywhere in rural Nepal, the villagers depend on sunlight to perform the endless stream of household chores. In Marpha, however, the area in which they perform these tasks must be protected from the strong daily winds, especially in winter. The need for such a protected area led to the development of the most distinctive feature of the Marpha house, the central light well. This allows sunlight to enter the living quarters on the upper floors through the windows and doors that open onto it, while the exterior walls, which have small openings, act as a buffer against the wind. The light well penetrates through to the ground floor courtyard and also provides light to the areas that open off it as well. Using a light well means that a portion of the house on the ground floor is permanently open to the sky. This area is occupied by those in the household who would suffer least, namely the animals. The hay and manure mixture that accumulates here is used as crop fertilizer. The house has two cooking areas, one outside for use in summer and one inside for winter. Here the family members spend most of their time on the coldest winter days and the floor is wood which is warmer than mud for sitting. The other rooms in the house, which are not used much in winter, have mud floors.

The climate is in large measure responsible for the introduction of chimneys in Marpha. Because of the extremely dry air and the absence of wood eating insects, villagers do not have to rely on smoke to preserve food grains and structural timbers. Some houses in Marpha still have a traditional 'smoke hole' above the cooking fire for venting smoke, but now many houses—including the one shown here—have a chimney. The material used for the chimneys is an example of recycling Nepalese-style. They are made from flattened tins that are used for transporting food goods in the mountains.

Marpha houses have a stone foundation, stone walls and a flat earthen roof. They are simple masonry bearing-wall structures, with a slight modification. The floors and roof loads are carried on a separate system of interior columns which are tied into the walls at each floor. This system eliminates total dependence on the stone walls. There is good reason for this. The local earth used for mortar has a high clay content which tends to shrink when dry causing the walls to buckle. In addition to the mortar problems, the local masons never used any sort of tape measure or plumbline, common elsewhere in Nepal, so they could never build straight walls of uniform thickness which could support the roof and floor loads unaided. The interior walls are made of wood or wattle and daub. Except in the winter cooking areas, the interior floors are mud. In construction the roof is identical to the floors, but the mud is thicker and graded to drain. Many of the construction details appear to be Tibetan in origin. It is not known whether these originated with the Panchgaonlis or were adapted from other groups in the area who came from Tibet at a much later date. In a house the size of the one shown, accumulation of materials and construction would require about four months. Five carpenters, 4 masons and 4 unskilled laborers would be needed. The total cost in 1980 was about $4075.00.

New houses in Marpha are considerably different from the older
ones because of vastly increased labor and materials costs and because of shifting migration patterns of both house-owners and house-builders. Marpha residents now spend a longer period in the south and no longer need a house that resists the winter wind and cold. By the same token the majority of Marpha house-builders are now seasonal migrants from other parts of Nepal. They use construction methods they learned in their own villages, so the construction details have changed. Because of the costly and primitive transport (Marpha is 5 days from the nearest road), the materials are the same. The only new building material that has been introduced in any quantity is the tin used for stoves, gutters, and chimneys. Since the tin is obtained from recycling cans used for transporting food goods to Marpha, the transport costs of the material itself are nil. In some houses, easily carried non-breakable vinyl sheeting has been put under the mud on the roof to prevent leaks.

The new houses are much smaller, and in some instances cheaper materials have been substituted. The floor plans have also changed. In one case, the plan was changed simply to reduce cost. The house is one story with only three rooms and a very small central courtyard. In another case the plan was changed because the family only spends the warm summer months in Marpha. The house has large openings on all four sides and the central courtyard was eliminated.

In recent years, the interior of many Marpha houses has changed. For example, furniture is becoming increasingly common. Traditionally, people sat on the floor or on slightly raised platforms. The only furniture was a very low "table" used for eating. Since the men started wearing western-style pants instead of the baggy traditional ones, however, they found sitting on the floor uncomfortable and have begun to shift to chairs and tables. The same phenomena has been occurring in other villages in the area. There is now such a demand for furniture that a factory has been started in a village across the river from Marpha. One
practical change has been the introduction of stairs to replace ladders as a means of access from the first floor to the second. When the ladders were used, the animals would occasionally knock them over and leave the occupants stranded on the upper floors. Another practical change has been the introduction of chimneys, mentioned earlier, and new types of stoves. Both were introduced by Tibetan refugees who settled in a village across the river from Marpha. The Tibetans' tin stove radiates heat and cooks the food faster. It is now used by many of the Marpha families who stay for the winter. In the summer the villagers remove the heat-radiating tin stove, build a traditional clay stove and hook it up to the chimney. Some houses have a "stand-up" stove, a modification of another type also used by the Tibetan refugees. Since Marpha women traditionally cook while squatting on the floor, the stand-up stove is a real innovation.

The stone walls and wooden substructure requires no maintenance at all but the wall, floor, and roof finishes require a great deal. Nearly all of it is done by the women of the household. The interior mud wall plaster makes the house more airtight and warmer in winter, but the "plaster" requires periodic reapplication of moisture to keep it from cracking and spalling. This is done throughout the house twice a year, after which the upper portion of the wall is finished with lime wash. The base of the wall, portions of the wood floors and all the woodwork are finished with a very thin coat of red mud. Other than its distinctive appearance, there is no apparent reason why the villagers
use red mud instead of any other for these interior surfaces. Most woodwork is remuddled twice annually, but the base of the walls and the floors are done every two to three days. The area around the cooking fire is remuddled after every meal, partly for religious reasons and partly because the heat of the fire dries out the mud. The roof has to be regraded two or three times a year, and this is usually done by men.
In contrast to the foregoing groups which, on the whole, maintained their cultural integrity over the centuries as they roamed Nepal, the Newars are an amalgam of various ethnic groups which immigrated to the Kathmandu Valley over the last two and a half millenium. In fact, the word "Newar" is a phonetic variation of "Nepal." Historically, the term did not refer to a specific group but rather to an inhabitant of the Kathmandu Valley which was called "Nepal" until the eighteenth century when the present Shah dynasty unified the country.

Of all the ethnic groups in Nepal, the Newars are by far the most advanced. They were the only group to develop their own script and literature, and they also had the most highly developed arts. Over the centuries they excelled in terra-cotta, stone sculpture, brass work, bronze-casting, wood-carving, and painting. In light of their extensive cultural achievements, the region in which Newar culture flourished is surprisingly small. It did not extend far beyond the 250 square miles of Kathmandu Valley, even though a much larger territory was controlled by Newar kings at various times.

Despite their enormous impact on Nepal, the Newars comprise only about 4% of the total population. Although a substantial number of them have moved to other parts of Nepal, the majority still live in Kathmandu Valley.

It is easy to see why the Kathmandu Valley attracted settlers. At 4400' the Valley was above the areas on the Indian plains which were subject to malaria. The surrounding mountains protected it from invasions and warfare. The soil, climate, high rainfall, and the flat terrain made farming easy, while the fertility of the soil made it possible to grow more than a subsistence amount of...
I food. From a very early time farmers began to offer part of their surplus food in exchange for non-agricultural goods and services. In response to their demand, an artisan and a merchant class arose in Kathmandu Valley and a limited amount of trade was carried on with India and Tibet.

Even though the Newars developed a written language, they did not start writing their own history until the sixteenth century. Our knowledge of events before this time is based entirely on legends, inscriptions, coins, monuments, and archeological remains. It seems that the earliest settlers of the Kathmandu Valley were Austro-Asiatics who came from the plains of northern India. Nothing is known of them except a few traces of their language in modern Newari. About the sixth century B.C. they were conquered by the Kiratas, a Mongoloid group from the southeast. Their Tibeto-Burman language eventually dominated the older language and is the basis of modern Newari. Almost nothing is known of the Kiratas themselves, but under their rule the foundations of what we know today as Newari culture were laid. It appears that Kathmandu Valley had a highly developed civilization by the time the Licchavis from north India conquered the Kiratas in the third century A.D. In the seventh century A.D., the limited trade between India and Tibet became extensive. Two of the most accessible passes were north of Kathmandu Valley and it became the most important entrepot trade center between the two countries. The trade brought prosperity to the valley and spurred further development of the arts. The Tibetan trade continued to be very important to the Kathmandu economy until the end of the nineteenth century.

Both the Licchavis and their successors, the Mallas, supported the arts and carried the sophisticated cultures they conquered to new heights, but after the Shahs conquered the Mallas in the eighteenth century, Newari art and culture went into an extended period of decline. The traditional Newar building crafts did not again receive substantial patronage until 1972 when UNESCO and the Federal Republic of Germany sponsored restoration of some of the major palaces and temples in Kathmandu.

Throughout the rise and decline of Newar culture most of the Newars were farmers, and most of the Newar villages which dot Kathmandu Valley have always been farming villages. In this respect, as well as in its appearance and layout, Satungal is a typical Newar village. However, with only 1,371 people (1978 census), it is about one-half the average size. Three and four-story brick row houses line narrow lanes that wind from the edge of the village toward a large open area at the center. This central square, or chowk, is the social center of village life. Here women get water and wash clothes and babies at one of the several water taps, children play, men play cards, grains are threshed and dried, and villagers purchase small dry goods such as sugar or cigarettes at one of the two shops which adjoin it. At the edge of
Satungal, and typical of Newar villages, are two small ponds fed by a diverted stream. The ponds were the source of all bathing, drinking, and washing water until 1953 when the Nepalese Government installed a water system and water taps in the central *cbowk*.

The *cbowk* is dotted with numerous small religious shrines. The principal religious buildings are the *patis* and the village temple, which is built in the pagoda or multi-roofed style. Nepalese historians claim that this style originated in Kathmandu Valley, but other scholars trace its origins to India. The *patis* are raised covered platforms open on three sides and closed at the back. They are one of several types of religious structures known as *dharamsalas*—free rest places for travelers which were built to gain religious merit. When the *patis* are located in a village such as Satungal, they are used for socializing and for temporary storage of grain and brick. During the busy agricultural season, migrant farm workers live in some *patis*.

As in the other villages described here, culture, agriculture and climate have affected the village plan. The most basic determinant was agriculture and the desire to maximize all arable land, even in this incredibly fertile valley. Satungal and most Newar villages are located on high, flat and less easily farmed areas called *tars*. The villages are surrounded by farmland which is terraced down to a water source such as stream or river. However, even the land on which the villages are built is arable. Thus, further land economies were achieved by developing a houseform which shared walls and which expanded vertically rather than horizontally. Hence, the three or four-story row house which gives the Newar village its urban character. The high buildings cast a long shadow at grade, particularly along the narrow lanes. This led to the development of the *cbowk*, which was protected from daily afternoon winds and provided a large, sunny open area where grains could be threshed and dried. (The only way to preserve them in the absence of electricity.) The *cbowk* is paved with stones which heat up during the day making it a warm place to sit in winter when the houses, which get little direct sunlight, are quite chilly inside. During the monsoon, the paving prevents the *cbowk* and the lanes, also paved, from becoming a sea of mud.

Each part of a Newar village is designated by a place name or *tol*. In Satungal, there are thirteen *tols*, each of which covers a very small area. Originally, each of the village’s eight castes seems to have lived in its own *tol* with the highest caste in the center around the *cbowk* and the lower ones on the periphery of the village. Today the caste distinction of each *tol* has all but disappeared as subsequent generations of house-builders construct their houses on the available plots between existing houses. Only the low-caste butchers are still confined to one area.

The area where Satungal is located has been inhabited since the
third century A.D. It is unlikely that the present village is that old because it is located on the route that invaders took from India and west Nepal, and the villages were periodically destroyed by invasions and warfare. Village records indicate that the present site has been occupied for at least five hundred years.

In addition to the damage incurred through warfare, no buildings from the earliest settlements could have survived the earthquakes, insects, fire, heavy monsoon rainfall, and other destructive factors in the Kathmandu Valley environment. Even though the buildings standing today are relatively new, however, there is no reason to believe that they differ markedly from those built a millennium earlier because as far as we know the conditions which make these buildings appropriate today existed then.

The focus of village life has always been agriculture. This is not surprising as the soil of Kathmandu Valley is exceptionally fertile with huge deposits of peat and phosphatic blue clays, called kô. Until recently, kô was the principal source of crop fertilizer.

Since the farmers could rely on the kô to fertilize their crops, they did not need dung or large numbers of dung-producing animals which required food and grazing areas. Without animals they couldn't use a plough. Instead they used a long spade, called a kodale, which the Newars claim penetrates the soil more deeply for cultivation than a plough and hence makes the soil more productive. The kodale method of soil preparation is very time consuming but with plenty of labor in the household the Newars didn't need labor-saving methods. Since the Newars did not keep oxen for ploughing, they did not keep them for pulling carts—even though in their flat valley transport by wheeled vehicle would have been easy. Instead the Newars developed the khambu, two baskets suspended from a long pole which is carried on the shoulder.

Agriculture has continued to be the principal focus of village life, but it has changed dramatically since improved rice and wheat seeds were introduced in 1965. Rice yields increased by 75% and wheat yields by 100% to 160%. Families who before could barely raise enough to eat now had a surplus to sell. The improved seed required chemical fertilizers and mechanical threshers. To purchase these, some villagers sold part of the surplus and some took jobs in Kathmandu. Meanwhile, the population increased by 22.3% between 1970 and 1978. There was nowhere to expand village landholdings and, despite the phenomenal increases in crop yields, there were more people to feed than the village could sustain. Many families were forced to seek nonagricultural jobs and buy food. Even more households began to work in Kathmandu. Today, of the 217 households in the village, 189 are engaged in agriculture but of these, only 77 depend exclusively on farming. Only the men work outside the village, mostly in construction, commerce and trade. Kathmandu employment provoked further change in village agriculture. With less time and labor available in the household but more money, some villagers have "contracted" out the soil preparation to ploughmen or to owners of gasoline-powered hand tractors. At harvest time, many villagers hire migrant labor while they continue at their jobs.

Many other changes have occurred in the village in the last thirty years. In 1953, the Nepalese Government installed the water system and taps in the chowk. In 1959 the villagers built a school, and in 1968 they built a village council house. In 1970, the Nepalese Government set up a health post. The biggest change in lifestyle however, occurred when electricity was installed in 1971. This extended the day from sunset to as late as 11:00 p.m. With access to electricity, the villagers began to enter the industrial age: machines replaced hand labor. They now have flour and pounded-rice mills and electric looms. A few of the village carpenters have electric saws.

The village itself has experienced remarkable growth. Unlike the other villages described here, which grew little in the last twenty years, Satungal's housing stock has increased 52% since 1960. Today there are 242 houses. The housing boom here is due to increased demand from population growth and to increased income from agriculture and employment in Kathmandu. Most of the new houses have been built within the main village area, but about 20 have been built nearby on the Rajpath, the highway completed in 1956 which connects Kathmandu and India.

Today slightly more than three-quarters of the village households raise some sort of animals. Animal fodder is not a problem, however, because the number of big animals is small and they are fed crop straws. Cows and water buffalo are kept for milk, goats for meat, sheep—a recent introduction—for wool and meat, chickens for eggs, and ducks for ritual sacrifice. Because the Newars have frequent festivals in which animals are killed and eaten, there are large annual fluctuations in the village animal population.

Satungal does not have a fuelwood crisis because most people burn crop straws and some of the families who have animals burn dung. Wood is used only when cooking long hours for a feast or making whiskey. As recently as 1965, the villagers went to the forest to collect dead wood when it was needed, but now there is no dead wood left, and the government forbids felling live trees. Meanwhile the demand for fuelwood in Kathmandu has grown enormously. Now when wood is needed, villagers buy bundles from wood-cutters who live near distant forests and pass through Satungal on their way to sell it in Kathmandu markets.
THE HOUSE

The Newar house, like the Newar village, reflects the influence of climate, culture, agriculture, and site. As previously mentioned, the desire to maximize arable land led to the evolution of extremely dense settlements with houseforms that expanded vertically and shared walls. The row house was possible because the site was basically flat. Despite the strong caste divisions of the Newars, the party wall was possible because within each block of houses, the inhabitants belonged to the same caste and were often related.

Unlike some Newar villages where the three-storied houses are more common, nearly all the houses in Satungal have four stories. The width of the houses is uniform but the length varies according to the wealth of the owner. The space is allocated by story and used almost identically in every house, regardless of house or family size. Stairs run up one side of the house. Each stair opening can be closed and barred with solid plank doors—probably remnants of earlier defense needs.

The first floor is divided into two rooms by an interior bearing wall. During the rainy season the water table rises dramatically. The water percolates up through the foundation, saturates the construction above and makes the rooms on the ground floor damp and moldy. In addition to the water problem, the rooms on this floor are dark and unpleasant because the buildings cast long shadows and little sunlight penetrates inside. The Newars have a practical response to this situation. The family lives on the floors above and this space is used for storage or animals. In the Newar towns and sometimes in the villages, this area on the ground level is used as a shop. In this case the floor is raised and vented, and the entire front is opened up. (In the house shown here, a portion of the ground floor has been rented out from time to time as a teashop. It has no raised floor but the house opens into the large, sunny chowk, and gets plenty of light and air even during monsoon.)

The second floor is the main living area of the house. Like the first floor, it also has an interior bearing wall which divides the floor area into two large rooms. The room on the back of the house is usually further subdivided into smaller rooms which are used for sleeping and storage. At night the entire family gathers in the room on the front of the house. Before electricity was introduced, they kept warm on cold winter evenings with a small charcoal pot, but now families often gather around an electric hot plate which is used as a space heater.

The third floor is usually one large room with columns replacing the interior bearing wall. The houses which have only three stories do not have this floor which is traditionally used for feasting. The fact that an entire floor is given over to feasting indicates the significance of this activity for Newars, who have more feasts and festivals than any other group in Nepal. A house shrine is often located on this floor, but in Satungal the house shrine has no special place and is located on the second, third or fourth floors.

The third-floor feasting area has the largest number of windows and the highest light level in the house. On a daily basis it is often used for weaving. Since the introduction of electricity, a few families have purchased electric looms. These are operated almost exclusively by women, whereas the old hand looms were operated almost exclusively by men.

Like the third floor, the fourth floor is also one large room with columns running down the middle. Used only for eating and cooking, it reflects both practical and cultural rationales for space allocation. Locating the cooking in the most inaccessible part of the house insures that the cooking area will not be entered by low-castes or untouchables, important for the caste-conscious Newars. Usually only family members are allowed on this floor. Locating the cooking on the top level is also practical, because it prevents the entire house from filling up with smoke from the cooking fire. This floor has only one dormer window and the light level is quite low.

The use of space in the fourth floor has undergone a radical change in recent years. In some houses the family has made the top floor into a chicken coop, and moved the eating down to the third floor. The chicken eggs are sold to merchants in Kathmandu, and the waste which accumulates is used as crop fertilizer. Many families have made one half of the top floor into a roof terrace, which reduces the cooking and eating area by half but has several advantages. In the elevated private sunny area, grains can be dried without constant supervision to prevent their being eaten by chickens or animals, and the women can sun while preparing a meal.

Compared to other village housetypes, the amount of space allocated to storage in the typical Newar house is small. Other than the ground floor which is too damp and dark to be used for living space (and so is used for storage of crop straws or for
SECOND FLOOR

FIRST FLOOR

THIRD FLOOR

FOURTH FLOOR

A SATUNGAL HOUSE

scale: 1/8" = 1'0" (1:100)
animals), little floor space is devoted exclusively to storage, and things are stored here and there in every room.

The interior furnishings of the Newar house are extremely modest. Until recently there was no furniture. The house shown here has furniture in the second-floor living area but in no other rooms. In some Newar houses the floors are covered with tiles; in some the floors are clay and covered with straw mats which are made from woven crop straws. During the day, villagers sit on the mats. At night, the bedding is brought out and in the morning, rolled up and put away. Traditionally, clothing was kept in wall recesses but wardrobes are now a prestigious dowry item.

The Newar house has a stone foundation, brick walls, and a wood substructure that supports clay floors and a tile roof. The house is a simple masonry bearing-wall structure. The internal loads are carried by an internal spine wall on the first and second floors and by columns on the third and fourth floors.

The heavy monsoon rains (most of the 90" annual rain falls within the four-month monsoon period) were the single most important determinant of the form and materials used in the Newar house. Rains affect the structure from the top down and the bottom up. The roof is covered with waterproof clay tiles and is sloped to shed water. A roof overhang protects the walls below from direct water penetration during the monsoon and direct sun the rest of the year. Excessive water would make the mud mortar too wet and ooze out, while excessive sun could make the mortar too dry and spall out. The monsoon rains also cause foundation and lower wall problems. During the rainy season, the water table rises dramatically. The Newars used the most waterproof materials available to them—stone for the foundation and brick for the walls above. Even so, the water still seeps up through the mud mortar, saturates the bricks and causes extensive water damage.

A secondary consideration in the choice of materials was fire.
above:
In large Newar villages and towns the first-floor area of the house is often converted into a shop.

opposite, left:
Whiskey brews in the apparatus at left while a meal cooks on the traditional mud stove at right.

opposite, right:
A large dormer window lights the cooking and eating area on the fourth floor.

always a problem in the dense settlements of the Newars. In addition to its water-resistant properties, masonry appealed as a wall material because it was fireproof and would prevent fires from spreading through the party walls. The use of roof tiles instead of thatch greatly reduced the chance of fire spreading along a row of adjacent roofs, especially a problem since the Newars cook on the fourth floor right under the roof.

The foundations must support as many as four stories. Consequently they were huge—three to four feet deep, and 30" to 36" wide. The masonry walls are also massive—generally 24" wide at the ground level, but tapering off a few inches at each level. Both sundried and fired brick are used in the walls. The most expensive fired brick is used as a face brick because it looks better and resists water damage. The water-resistant fired bricks are also used for the entire wall thickness of all walls to a height of about 3' above the foundation. Above this, all walls which are not visible (internal walls, party walls, and that portion of the front and back walls which is not visible to the outside) are made of cheaper sun-dried brick. The interior wall surfaces are finished with a mud and dung plaster, largely for cosmetic reasons. Stone, which is completely waterproof, would be the preferred wall material but it is so scarce in Kathmandu Valley that it is used only for the foundations.

Structurally, the most elaborate part of the house is the roof frame. The weight of the tile bed—4"-5" of mud—and the need for a large overhang to protect the walls below from direct water penetration produced a frame of quite astounding complexity held together with wooden pegs, wooden nails, and complex interlocking scarf joints. As in the Gurung houses, the most distinctive features architecturally are the angled struts which support the roof overhang. The mud tile bed makes the fourth floor below more airtight and warmer in winter, but causes other problems. Weeds and grasses often sprout in the roof, adding to its weight and producing fungal growth in the roof timbers below the mud.

The same materials and structural principles were used in temples and palaces though the quality of construction differs markedly. In contrast, in most civilizations comparable to the Newars, the buildings used by rulers and priests substantially differed from the houses of the common people.

Constructing a Newar house requires the skills of carpenters and masons. Because of the tremendous demand for construction labor in Kathmandu in recent years, carpenters, masons, and unskilled laborers are all available in Satungal. Over a hundred people are employed in construction in one capacity or another, though as recently as twenty-five years ago, building tradesmen who worked in Satungal came from a neighboring village. Another reason for the huge increase in construction laborers is that
even though within Newar culture most occupations are caste-specific, the construction trades seem to be open to any male. Without exception, however, women are employed only as unskilled common laborers. To build a house the size of the one shown here would require two carpenters, four masons, and six to eight unskilled laborers. The construction would take about sixty days, and in 1980 it would have cost about $2,400.

As in Kodgaon, before construction begins, the prospective Satungal house-builder takes a soil sample and his astrological chart to the village astrologer. The astrologer takes a reading and determines what gods and serpents inhabit the plot. Depending on the outcome of the reading, the builder may have to perform various rituals to cleanse the site. The astrologer also gives dates by which various phases of construction must be completed. Since the astrologer sometimes advises postponing the entire project two or three years, his consultation before construction is often avoided by the house-builder who needs a house right away.

Since Satungal is barely a five-minute walk from the Rajpath, the transportation cost of bringing in new construction materials is very low. In recent years a number of new materials have been used in village construction. Cement is probably the most significant. With it, villagers can build flat, waterproof roof terraces and walls with vapor barriers that can stop the destructive movement of water through the walls in monsoon. Cement wall-plaster, a cosmetic wall treatment felt to improve the appearance of the house, has been used on the facades of a few houses. Galvanized zinc sheeting has been used as a roofing material on some houses because it is cheaper than the traditional roof which requires extensive wood framing. Other changes have been made in traditional construction to reduce cost. The mud tile bed for the roof has been eliminated so that bamboo, which is much cheaper than wood, can be used for the framing. Bamboo is also being used for floor joists. The windows which used to be large vertical openings are becoming more square because longer pieces of wood cost more than shorter pieces. The windows are now devoid of any ornamentation. Fewer bricks and thinner walls are more common.
NOTES

Unless otherwise noted, all diagrams, maps, and drawings are the work of the author and are based on her fieldwork and research.


10. All housing costs were calculated in 1980 Nepalese Rupees and converted to U.S. Dollars at the Exchange rate of 11.9 Nepalese Rupees = $ U.S. 1, the exchange rate which prevailed in 1980 when the cost information was gathered.


Rapport, Amos. House Form and Culture.


