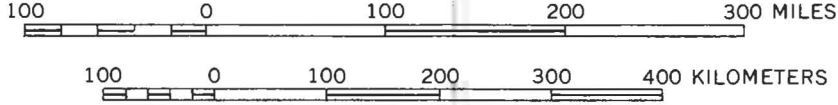


# HIMALAYAS

## LANDFORMS



## GEOGRAPHIC REGIONS OF THE HIMALAYAS

—PRADYUMNA P. KARAN

From the Indus in the northwest to the Brahmaputra in the east the Himalayas form a broad continuous arc for nearly 1600 miles along the northern border of the India subcontinent. The mountain system, averaging 200 to 250 miles in width, rises sharply from the Indo-Gangetic plain. North of this mountain belt lies the plateau of Tibet, which extends northwards to the Kun Lun range (Map 1).

The Himalayas had their origin in a series of earthmovements or powerful lateral thrusts acting from the direction of Tibet towards the old stable crystalline block of the Indian Peninsula in the south. The earth movements raised the deposits laid down in the shallow Tethys Sea to form the mountain mass from Kashmir to Assam. The northwest-southeast trend of the Himalayas, the sharp bend in its axis on the west at Nanga Parbat, where the Indus has cut a deep gorge across the mountain, and the deep knee-bend at its eastern extremity, where the Brahmaputra has cut through the range, are due to resistance offered by the old stable block of the Indian Peninsula to the thrusting movements from the north.

Physically the Himalayas form three parallel zones: (1) the Great Himalaya, (2) the Inner Himalaya, also known as Middle or Lesser Himalaya, and (3) the Sub-Himalayan foothills and the adjacent Terai and Duar plain. Each of these lateral divisions exhibit certain homogeneous characteristics (Map 2).

The Great Himalaya, the highest zone, consists of a great line of snowy peaks with an average height exceeding 20,000 feet. The width of this zone, composed largely but not entirely of gneiss and granite, is about 15 miles. Spurs from the Great Himalaya project southwards into the Inner Himalaya in an irregular fashion. The Nepal and Sikkim portion of the Great Himalaya contain the greatest number of highest peaks. Next in general elevation is the Kumaon section, followed by the Punjab and Bhutan sections. Great Himalaya is least highest in Assam. The snow line on the southern slopes of the Great Himalaya varies from 14,700 feet in Nepal and Sikkim to 17,000 in Punjab. To the north of the Great Himalaya are several

ranges such as the Zaskar, Ladakh, and the Kailas. The Karakoram range also lies on the Tibetan side of the Great Himalaya.

The Great Himalayan region is one of the few remaining isolated and inaccessible areas in the world today. Some high valleys in the Great Himalaya are occupied by small clustered settlements. Extremely cold winters and a short growing season limit the farmers to one crop per year, potatoes and barley being the most common. More important than farming is yak and sheep herding. The formidable mountains have limited the development of large-scale trade and commerce. Only limited trade flowed through the high passes until the recent India-China border dispute, which led to a complete cessation of trade across most of the Great Himalayan range in India.

The Inner Himalayas, about 50 miles wide, border the Great Himalayan range on the south. It consists principally of high ranges issuing obliquely from the Great Himalayan range at points where the latter changes its direction, and several outer disconnected ranges. These comprise Nag Tibba given off from Dhaulagiri, the Dhauladhar range from the neighborhood of Badrinath, the Pir Panjal range (the largest of the Inner Himalayan ranges), and the North Kashmir range from the Zoji La, separating the Jhelum and Kishanganga Rivers. The three outer parallel ranges are the Mahabharat stretching through Nepal, the Mussoorie range between the Ganges and the Sutlej, and the Ratanpir in southern Kashmir separated from Pir Panjal by the Punch River. In the eastern Himalayas of Sikkim, Bhutan and Assam the Inner Himalayas have been deeply dissected into blocks of north-south ranges by rivers rising in the Great Himalayan area. The Inner Himalayas possess a remarkable uniformity of height, between 6,000 and 10,000 feet.

The Inner Himalayan area is a complex mosaic of forest-covered ranges and intervening fertile valleys. While it is not as forbidding as the Great Himalaya to the north, it has nonetheless served to isolate the fertile valleys of the Himalayas from the Gangetic plains. Except for major valley centers such as Srinagar, Kangra and Katmandu, and hill stations such as Simla, Mussoorie and Darjeeling, the region in general is moderately populated. Within the Inner Himalaya the intervening mountain ranges tend to compartmentalize the populated valleys. Although natural drainage lines are largely north-south, the numerous gorges and rugged mountains make travel difficult in any

direction. Lateral roadways and transport routes are generally lacking, and monumental engineering feats are required to establish east-west transportation links to the principal population centers. Lacking adequate means of easy communication it is not uncommon for dwellers in neighbouring Himalayan valleys to remain complete strangers. Only major population centers are linked with India by road.

The outermost and lowest zone, the Sub-Himalaya, including the Siwalik range of Tertiary rocks contiguous with the plains of India, is a result of the latest phase of elevatory movement responsible for the mountain system. Its width gradually narrows from about 30 miles in the west until it nearly disappears in Bhutan and Assam. With a gap of about 50 miles opposite the Tista and Raidak basins, the outcrop of the Siwalik zone is continuous from the Indus to Brahmaputra. A characteristic feature of the Sub-Himalaya is the large number of longitudinal, flat-bottomed valleys known as "duns," usually spindle-shaped and filled with gravelly alluvium.

South of the forested foothills lies the Sub-Himalayan piedmont plain known as Terai and Duars. The southern part of the Terai and Duar forms a densely cultivated belt along much of its length. The northern part contains jungles and malarial swamps, inhabited by wild animals, and constitutes negative areas which add to the isolation of the Inner Himalayan valleys, particularly in the central and eastern sections.

## THE CULTURAL PATTERN

The population, settlement, and economic patterns within the Himalayas have been greatly influenced by the variations in relief and climate, which impose harsh living conditions and tend to restrict population movement and communications. People living in adjacent valleys have often preserved their cultural individualities, which could have dwindled or disappeared with easier access to the outside world. People belong to four major cultures, each distinguished by characteristic socio-economic features (Map 3).

First, the Indian and Afghan-Iranian cultures have penetrated the Himalayas from the south and west respectively. The principal features of the Indian culture such as Indo-Aryan languages, Hinduism, and settled agriculture have come from the Indo-Gangetic plains. The

major features of the Afghan-Iranian culture, non-Indic Aryan languages, Islam, and both settled agriculture and pastoralism, have penetrated the Himalayas from west. Both Indian and Afghan-Iranian cultures have common links and may be termed Indo-Iranian or Aryan.

Secondly, the Tibetan and Burman (sometime called South-east Asian) cultures have encroached upon the Himalayas from the north and east respectively. The distinctive features of Tibetan culture, the Tibetan language, lamaistic Buddhism, and a combination of pastoralism and settled agriculture, come from the north. Burman cultural features-Tibeto-Burman languages, indigenous religious systems (distinct from the major religions of Hinduism, Islam and Buddhism), and shifting agriculture-have made inroads into the Himalayas from the east.

Culturally, therefore, the Himalayas present a complex pattern with four major cultures encroaching upon the area from different directions. In general outline, people of Indian cultural extraction are dominant in the Sub-Himalaya and Inner Himalayan valleys from Kashmir to Nepal. To the north people of Tibetan culture inhabit the High Himalayas from Ladakh to North-eastern India. In central Nepal, in an area between 6,000-8,000 feet (in some areas up to 10,000), the Indian and Tibetan cultures have intermingled, producing a combination of Hindu and Tibetan traits. This intermediate area between Indian and Tibetan cultures in Nepal forms a distinct cultural region. Elsewhere in the Himalayas the Indian and Tibetan cultures meet each other directly without any intermediate zone. Eastern Bhutan and Assam Himalayas are inhabited by people whose culture is similar to those living in northern Burma and Yunan. People of western Kashmir have a culture similar to the inhabitants of Afghanistan and Iran.

### **A SUGGESTED SYSTEM OF HIMALAYAN GEOGRAPHIC REGIONS**

A comprehensive regional georgaphic analysis of the Himalaya presents several problems. Aside from serious methodological difficulties in dividing the Himalayas into geographical regions, the lack of detailed geographical materials relating to variations in landform, climate, land use and occupance pattern for vast areas presents problems in the investigation and presentation of a system of geographic regions

based on areal differentiation of the entire content of human occupance which shows an association of inter-related natural and societal features. The physical and human geography of a large part of the Himalayas is known only in broad general outline. There are vast areas which have not yet been studied by geographers, anthropologists or other social scientists.

In many ways the entire Himalayan area provides a fascinating field for pioneering research by geographers. The book written by Burrard and Hayden, more than three decades ago, still remains the only published study of the geography and geology of the entire Himalayan range.<sup>1</sup> Although Burrard and Hayden deserve credit for a pioneer attempt to describe the geology and geography of the world's highest mountains, nevertheless they overlooked modern concepts of regional geography and geological overthrust structure in their interpretation of Himalayan geography and geology. In recent times the geological research of Wadia, West, Auden, Gansser, Heim, Pilgrim and Hagen have yielded much geographical literature on the Himalayan landforms.<sup>2</sup> Likewise, the anthropological and sociological work of Verrier Elwin, Pant, Furer-Haimendorf and Kawakita have provided us with knowledge of the Himalayan people and cultures in certain areas of the vast mountain system.<sup>3</sup>

Since the Himalayas have played such an important role in India's history and geography, it is surprising that Indian geographers have neglected serious research and study of the Himalayas. The relatively small number of published research papers on the various aspects of Himalayan geography attests to their lack of interest.<sup>4</sup>

In addition to the imperfect knowledge of the physical and human geography of vast areas, the attempt to divide the mountain system into geographic regions faces methodological difficulties. For instance, the Himalayan area exhibits a fine geographic variation in the pattern of human occupance from one section to another. In effect, the Himalayas contain a series of small geographic regions based on the distinctive cohesive association of features and the pattern and intensity of human occupance. If adequate geographic material were available, a comprehensive regional analysis of the minute geographic regions of the Himalayas could be made, filling an important gap in Indian geography. However, the detailed regional division and analysis on a small scale, undoubtedly a worthwhile and challenging task for the regional geographer, lies outside the scope of this short paper. Therefore a broad

regional classification is adopted here.

On the basis of general spatial differentiation of associated geographic elements and broad pattern of human occupation, the Himalayas are divided into three major realms: (1) Western Himalayas, (2) Central Himalayas, (3) Eastern Himalayas. Each of these three realms possess some unifying physical and cultural traits and have certain measure of geographic homogeneity. They possess enough similarity or mutual ties to be treated as a unit. However, the degree of similarity is not great because of the large portion of the area involved in each realm which causes many important spatial details to be disregarded (Map 4).

The three realms can be further divided into a hierarchy of smaller regions of lower rank and size depending on the scale or degree of generalization. In Western Himalayas, where the mountains are wide, principal geographic regions are large enough to be easily identified on the scale of generalization used in this paper. In the Central and Eastern Himalayas, where the mountain mass is much narrower, it is difficult to distinguish small geographic regions within the limitations of this paper. These realms and their regional divisions are briefly described below. No attempt is made to present a comprehensive geographic analysis of each region.

#### A. WESTERN HIMALAYAN REALM

The Western Himalayan realm may be divided into the Sub-Himalayan Kashmir (Poonch and Jammu), Pir Panjal, Vale of Kashmir, Ladakh and Baltistan, and the Kohistan and Gilgit regions. The impact of Afghan-Iranian culture is dominant in the western part of this realm, and Hindustani and Lamaistic Tibetan cultures impinge from the south and north respectively. These cultural differences together with the physical variations and settlement pattern form the basis for delimiting geographic regions.

*Sub-Himalayan Kashmir:*—The Sub-Himalayan Kashmir comprises the outermost ranges, formed entirely of tertiary rocks, which rise from the Punjab plains, commencing with a gentle slope from Jammu, ending abruptly inwards in steep perpendicular escarpments. Within the parallel outer ridges are a series of wide longitudinal or strike valleys known as "duns." The extensive picturesque duns of Udhampur and Kotli in the Jammu hills are typical examples of the longitudinal valleys.

Between 30 and 35 inches of precipitation falls in the region. Agriculture is concentrated chiefly in the valleys. Wheat and barley are principal *rabi* crops (spring harvest) sown after the October and November rains and harvested in April or May. Maize and bajra, sown in late spring or early summer (April to June) and harvested in October or November, form the *kharif* crops (autumn harvest). Since irrigation is limited both the *rabi* and *kharif* crops are dependent on rainfall. The area is densely settled in the southeast with a density of 350 persons per square mile in Jammu. The population density in the northwest (Riasi and Poonch) decreases to 150 per square mile. Jammu, the principal regional focus of the Sub-Himalayan area, has been the home of Dogra rulers of Kashmir. It has excellent transportation links with India.

*Pir Panjal*: North of the Sub-Himalayan region the Pir Panjal mountains (12,500-15,000 feet) of the Inner Himalaya rise steeply.<sup>5</sup> The steep southern slopes of the Pir Panjal are often barren, being too steep to maintain a soil-cap for the growth of forests. The long, gentle north and northeastern slopes toward the Kashmir Valley are covered with forests, succeeded higher up by snow-capped peaks. Southeast of Ravi, the Pir Panjal is continued as the Dhauladhar range, passing through Dalhousie, Dharmasala and Simla. The mountainous Pir Panjal region is very sparsely populated. The highway linking Srinagar with Jammu crosses the Pir Panjal at Bannihal Pass (9,300 feet).

*Vale of Kashmir*: Between the Inner Himalayan ranges (Pir Panjal and the North Kashmir range) lies the Vale of Kashmir with a southeast-northeast trend, some 84 miles long and 25 miles broad in its central portion. The total area of the Vale is about 1900 square miles, and its mean elevation is nearly 5200 feet. The ranges which surround the valley attain a high altitude with peaks rising above 18,000 feet, except in the northwest at Baramula where the Jhelum has cut a narrow gorge across the mountains. Girdled by high mountains the Vale has continental climate with seasonal extremes of temperature. Average January temperatures (30°F) are a little below freezing, while the July average is above 70°. The Vale gets about 35 inches of precipitation, part of which come during the winter months in the form of snow.

The Vale is intensively cultivated.<sup>6</sup> Rice, maize and wheat are the principal crops. Rice is grown in the warmer and more humid lower parts, maize on the higher areas. On the higher Karewa terraces with its poor soils, dry crops are important. A large proportion of the cultivated



area in the Vale is irrigated by *kuls* (irrigation channels) led off from the streams. Pastoral occupation, particularly sheep raising, is important, and there is considerable transhumance. In summer the shepherds take their animals to high alpine pastures above the tree line, commonly known as *margs*, for grazing, returning to the Vale during the winter months when they subsist on feed. Pastoral activity supplies the raw wool which provides the basis for the important woolen industry.

Culturally the Vale is a region where the Afghan-Iranian and Indian cultures have blended. The influence of Islam became strong in the 14th century on an indigenous Hindu population. Most of the Kashmiri Muslims are descendants of Hindus converted to Islam. Society is organized on a hierarchial basis in the Hindu manner, and the practice of Islamic religion varies a great deal. Muslims with the highest traditional status are the Syyids and Shaikhs, who are supposed to be descendants of the early conquering Muslim nobility. The Rajput and Jat Muslims are descendants of high-caste converted Hindus. Other Muslim castes are occupational groups, derived mostly from the indigenous population. Among them are the Gujars, traditionally semi-nomadic herdsman, and the Hanjis, boatmen and fishermen, who provide house-boat transportation in the lakes and rivers around Srinagar. The Hindu Brahman (Kashmiri Pandits) are the best educated group in the Vale, reasonably prosperous and very closely knit.

Srinagar, the core of the Vale, is the principal focus of routes leading to other parts of Kashmir. As a geographic region the Vale is a distinctive area which stands out from the rest of Kashmir.

*Ladakh and Baltistan* : To the north and east of the Vale lies the Great Himalayan range. Beyond it lies the trans-Himalayan Zaskar range. Northeast of the Zaskar range the country is high-level arid plateau with the exception of the deep gorge of the Indus. The altitude steadily rises till the peak K2 (Godwin Austin) on the Karakoram range, attains a height of 28,265 feet-the second highest in the world.

Physically the desolate, dreary waste of Ladakh and Baltistan presents a very different landscape from the soft green of cultivated fields and forested mountains in the Vale and southern Kashmir. Ladakh is one of the loftiest (12,000-15,000 feet) inhabited regions of the world.<sup>7</sup> Its short but warm summers enable a few grain (barley and buckwheat) and fruit (apricots) crops to ripen. At places there are extensive flat

lands of which the most conspicuous are the Deosai Plain (13,000 feet), Lingzhi Tang (16,000 feet), and Depsang, about the same altitude. Between the Ladakh and Zaskar ranges are the rugged districts of Rupshu and Lahaul.

Population is sparse in this barren, dry region. Settlements are chiefly located in the narrow ribbon-like alluvial plain bordering the Indus River, east of Leh. Both Ladakhis and Baltis are Mongolid in physical traits. In Ladakh Mahayana Buddhism is the dominant religion; Baltistan forms a transitional area between Islamic Gilgit and Buddhist Ladakh.<sup>8</sup> Buddhist monasteries, prayer flags and chortens form significant elements of the cultural landscape in Ladakh and adjoining Baltistan. Leh, in the narrow valley of the Indus, is the chief transportation and trading center. It is connected with Srinagar via the Zoji-La Pass (11,580 feet) across the Great Himalaya. Skardu, also on the Indus, is the nodal point of Baltistan.

*Kohistan and Gilgit* : To the north of the Kishanganga lies the Nanga Parbat<sup>9</sup> massif, marking the western extremity of the Himalayan chain. The rugged Kohistan<sup>10</sup> lies to the west of Nanga Parbat massif. Isolated settlements are located in the valleys where wheat, barley, pulses and buckwheat are grown. Sparsely populated Gilgit and Hunza<sup>11</sup> lie beyond the Indus in the valley of the Gilgit River, which joins the Indus north of Bunji. Settlements are located on the irrigated terraces in the valleys. Rice, wheat, barley and fruit crops are grown. In addition to farming the raising of livestock is important.

Culturally, the region is a part of the Islamic world. The languages spoken in the area have close affinity with languages of Iran and Afghanistan to the West. Pashto, an Iranian language, is spoken in parts of Kohistan and Gilgit. Dardic, another language common in the area, has close affinity with Iranian languages but partakes heavily from the Aryan languages of India.

## B. CENTRAL HIMALAYAN REALM

The Central Himalayan realm between Kashmir and Sikkim may be divided into three major geographic regions: Himachal and Punjab Himalayas, Garhwal and Kumaon Himalayas, and Nepal Himalayas. Although there are basic similarities in physical and cultural patterns throughout the major regions, each geographic region may be subdivided

into regions of lower hierarchy on the basis of local differences in physical and cultural factors.

*Himachal and Punjab Himalayas*: The characteristic northwest-southeast trend of the Himalayas consisting of the Siwalik, the Inner Himalayan ranges (Dhauladhar), and the Great Himalayas is continued in Himachal and Punjab.<sup>12</sup> A large portion of the region has remained economically backward for centuries. In recent times it has come under the impact of plans for economic development. Under the three Five-Year Plans over 1400 miles of motorable roads have been constructed. The new roads have considerably helped in linking secluded areas and bringing them in closer contact with the people on the plains.

The region contains two small but distinctive geographic areas of significance. These are the Kangra and Kulu Valleys, drained by the Beas River. Both are easily accessible from Pathankot and Amritsar. Kangra Valley lies between the Dhauladhar range and the irregular mass of outer Himalayan ranges. The Valley begins from Shahpur, 40 miles from Pathankot, and ends approximately 50 miles further to the east. It is a fertile area, interspersed with homesteads set in the midst of groves and fruit trees. The population of Kangra is remarkably dense, about 100 per square mile as against an average of 4 to 5 per square mile in dry Spiti and Lahaul.

Kulu Valley begins beyond the town of Jogindranagar and Mandi in Himchal Pradesh. The Valley forms a basin, about 50 miles long and 2 miles broad, drained by the River Beas, which rises at the crest of the Rohtang Pass, 15 miles north of Manali. Kulu, the principal commercial centre, lies at a height of 4,000 feet and is 176 miles from Pathankot. Manali is an important trade center for the people of Lahaul and Spiti.

With the exception of a few Buddhists, the region is peopled almost entirely by the Hindus. Because of their long isolation from the plains of India, the people have developed and preserved a distinct way of life and tradition.<sup>13</sup> The tranquility of life in the mountains and the variegated beauty of the surrounding country have helped them evolve many valuable art forms in music, painting, dance and handicrafts. The Kangra School of Painting, noted for its harmony and delicacy of portraiture, was nurtured in this region.

Simla, Chamba, Narkanda and Solan are the chief urbancommercial centres. Jogindranagar is the site of the important hydroelectric works on the Beas. Bhakra-Nangal dam on the Sutlej is located near the Siwalik front.

Beyond Rohtang Pass in the middle of the Great Himalayan area lie Spiti and Lahaul. This region is surrounded by mountains with elevations ranging from 15,000 feet, to 20,000 feet. Lahaul, with an average altitude of 12,000 feet, lies in the watershed of the Chandra and Bhaga Rivers which join to form the Chenab. As compared to Spiti, the land is relatively fertile with facilities for irrigation in Lahaul.

Spiti is bordered by Ladakh, Tibet and Rampur. Arable land is scarce in dry Spiti. The only significant crops grown are barley and buckwheat. Pastoral activity is important. Both Lahaul and Spiti are culturally Tibetan, and distinct from the dominant Hindu culture in the Inner Himalayan area.

*Garhwal and Kumaon Himalayas:* The three-fold division of the Punjab Himalayas-Siwalik, Inner Himalaya and Great Himalaya-is continued eastwards in Kumaon, The terai region, bordering the Siwalik foothills, is quite extensive in this section.<sup>14</sup> Malaria, once rampant in the terai, has been largely eradicated and the land is being brought under cultivation by the Uttar Pradesh Government Terai Development Board. The narrow belt of the gravelly Bhabar, to the north of the terai, is largely covered with tropical forests. Certain sections of the Bhabar area are being reclaimed for agriculture.

The Himalayan foothills rise steeply from the Bhabar. The Doon Valley, in Dehra Dun district, lies behind the foothills between the Ganges on the east and the Jamuna on the west.<sup>15</sup> Dehra Dun, situated at an altitude of 2,282 feet, is a cosmopolitan town with a number of all-Indian institutions such as the National Defence Academy, Survey of India, and the Forest Research Institute.

The Inner Himalayan region<sup>16</sup> contains several hill stations such as the famous Mussoorie and Nainital located at heights of about 6,580 feet and 6,350 feet respectively. In Almora and Nainital districts, potatoes, introduced in the mid-19th century, are now an important agricultural product.

Beyond the Inner Himalayas lies the Great Himalayan range with snow-capped peaks along the Tibetan border. Among the well-known peaks are the Kedarnath, Badrinath,<sup>17</sup> and Nanda Devi. The Gomukh glacier in Tehri (now Uttar Kashi) and Milam and Pinpari in Almora are among the principal Glaciers in Kumaon Himalaya.<sup>18</sup> Milam, which extends right up to Tibet, is 25 miles wide, the largest glacier in Kumaon Himalaya.

Pahari (meaning "of the mountains") culture, and adjunct to the Hindu culture of the northern plains of India, is found in the foothills and Inner Himalayan areas.<sup>19</sup> The Pahari have numerous contacts with the people of the plains with whom they share origins and who have been coming to the Hindu shrines and hill retreats in the Pahari area. They are isolated from the Tibetan Bhotiyas by high mountains, but have trading contacts when the Bhotiyas come lower regions. As compared to the Hindus of the plains, the culture of the Pahari is less orthodox. There is more permissiveness or flexibility in the rules of interaction; they follow a number of rules pertaining to marriage which would be unacceptable to plains Hindus, especially those of high caste. For example, the bride price is prevalent instead of dowry; divorce is relatively easy; widow marriage is permitted; brothers can share a wife; and in Jaunsur-Bewar district polyandry is practiced. The Pahari have distinctive folklore, songs, dances and festivals. Animal sacrifice is important in religious ceremonies and there is great reliance on mediums and diviners.

Most of the pahari live below 7,000 feet in the valleys and on the slopes where water is available and terraced cultivation is possible. Millet, wheat and barley are the staples, but where irrigation is possible rice is grown. The villages are small and isolated with two-story houses of stone and timber.

The semi-nomadic Bhotiyas live in the northern regions.<sup>20</sup> The Bhotia villages are situated in the High Himalayan valleys. At the head of these valleys lie the passes through which the Bhotiyas used to enter Tibet for trade until 1959, when the India-China border dispute led to the closing of trade across the border. The Bhotiyas live in their villages only for short periods in the year. They go either to high altitudes with their herds during the summer months, or to the Bhabar near the plains for trade during the winter when the high valleys are severely cold.

Bhotiyas migrate with their families, herds of cattle, and their scanty belongings. Very often whole villages are on the move during seasonal migrations.

*Nepal Himalaya*: Nepal Himalaya comprises three distinct areas: Himalayas, Inner Terai and Terai.<sup>21</sup> Each of these major divisions can be divided into three geographic regions on the basis of homogeneity of human activity which manifests the relationship between the cultural and physical landscape. Above 10,000 feet, Tibetan culture prevails. In the lower Terai and Inner Terai, mostly below 2,500 feet, Indian culture is dominant (except among the Tharus). Between these two cultural areas, from 2,500 to 10,000 feet, lies the intermediate mountains and valleys of Central Nepal, inhabited by people who exhibit a mixture of Tibetan and Indian cultures including some elements of early aboriginal culture.

The first physical division-Himalaya-may be divided into 3 distinct geographic regions: the eastern mountains, Katmandu Valley, and western mountains. A relatively humid climate, greater population density, and a more cultivated area distinguishes the eastern mountains from the drier, more sparsely populated western mountains. In both the eastern and western mountains the southern section of the river valleys-Kali, Karnali and Kosi-have a sub-tropical climate with considerable rice farming. In the higher northern sections potatoes and barley are dominant field crops. Yak and sheep raising are an important part of the economy at higher altitudes, with a good deal of seasonal herd migration.

Between the eastern and western mountains is the Katmandu Valley, the most distinctive geographic region of Nepal Himalaya. It is the heart of modern Nepal-the largest city and the chief cultural center. It has also the greatest contact with the outside world. Enclosed by the Mahabharat range, the inhabitants of the valley have developed a distinctive way of life. Few places on earth are more productive than the Katmandu Valley, and few support so many people on so little good land.

The complex forest-covered Churia Hills and their enclosed valleys form the second physical division of Nepal, the Inner Terai. These hills are not so forbidding as the mountains of the north. However, from time immemorial they have served as barriers between the fertile

Inner Himalayan valleys and the Ganges plain of India. The Inner Terai can be sub-divided into three geographic regions: east, central, and west Inner Terai on the basis of climate, land use, and human occupancy pattern. Generally speaking, the entire Inner Terai is relatively sparsely populated with no large settlements. The U.S.-aided Rapti Valley Development Scheme is designed to increase colonization in the central Inner Terai through resettlement of peasants from more crowded areas.

The third primary division-Terai-is economically the most valuable region of Nepal. Here rainfall varies between 80 inches in the east to 40 inches in the west. The average density of population per square mile increases from about 90 in far-western Terai to over 350 in eastern Terai. Humid eastern Terai, with its greater rainfall, has a larger arable area and grows a variety of crops including rice, jute, tobacco and sugar cane. The far-western Terai, with less rain, has a limited extent of arable land. Its dry, dusty landscape stands in contrast to the green of eastern Terai. These differences in rainfall, land use and population form the basis for the division of Terai into three geographic regions: the eastern Terai, midwestern Terai, and far-western Terai.

### C. EASTERN HIMALAYAN REALM

The Eastern Himalayan realm may be divided into three geographic regions: Darjeeling and Sikkim Himalaya, Bhutan, and Assam Himalaya. This division is based partly on physical factors, and to a greater degree on differences in history and cultural features which are manifested in the landscape.

*Darjeeling and Sikkim Himalaya:* Facing the alluvial gap between the Rajmahal Hills (Bihar) and Shillong Plateau (Assam), Darjeeling and Sikkim Himalaya<sup>22</sup> exhibit certain geographical characteristics resulting from the uninterrupted sweep of the moisture-laden southwest monsoon through the gap and its direct impingement upon the Himalayan slopes. The mountains get full blast of the monsoon and rainfall is heavy; even in central Sikkim further to the north it is in the neighbourhood of 200 inches during the year. The River Tista and its feeders have cut deeply into the gneissic rocks of central Sikkim, laying bare an underlying series of slates, phyllites and mica schists, which, being more easily denuded than the more resistant gneiss, have enabled the

rivers to cut still deeper. In this way, instead of a narrow gorge, a large basin over 40 miles wide has cut back through the central section of Sikkim between two north-south transverse ridges (Singalila and Donkhya), each of them 80 to 90 miles long. The western of these ridges, the remarkable Singalila range, includes the peak of Kanchenjunga (28,150 feet). East of Kanchenjunga the line of highest peaks curves in a broad arc convex towards the north.

Contained within the Tista basin, and isolated from India by forest-clad mountains and from Tibet by the Great Himalayan range, Sikkim has a distinct geographical personality which forms the basis for recognizing it as a separate region.<sup>23</sup> The Darjeeling hills, which was Sikkimese territory until 1835, is treated there together with Sikkim Himalaya for the sake of convenience. However, Darjeeling district has its own distinctive geographic features, and it can be recognized as a sub-region within this larger geographic region.

Culturally, Darjeeling and southern Sikkim is dominated by the large number of Nepali settlers of Hindu faith. The native Lepchas inhabit central Sikkim, and people of Tibetan culture are dominant in the northern part of the region. Rice farming is widespread in central and southern Sikkim. Barley, millet and maize cultivation extend to higher altitudes in the region of Tibetan culture. Gangtok is the nodal centre of Sikkim Himalaya. Darjeeling is the major commercial center serving the entire region. It is also one of the principal hill stations in the Himalayas.

*Bhutan Himalaya:* Both physically, and culturally, Bhutan Himalaya merits recognition as a separate geographic region within the Eastern Himalayan realm.<sup>24</sup> The northern part of Bhutan lies within the Great Himalaya; the snow-capped ranges attain a height of more than 24,000 feet in some places. High valleys at elevations of 12,000 feet are used for grazing in summer months. Spurs from the Great Himalayas radiate southward, forming the watershed between principal rivers of Bhutan. Of these, the Black Mountain range, forming the watershed between the Sankhso and Manas Rivers, divides Bhutan into two geographic subdivisions both administratively and ethnographically. To the east, in Tongsa, the people originally came from the hills of Assam, while to the west in Paro the population is predominantly Tibetan in origin. The several broad, fertile valleys of central Bhutan, formed by the erosive work of rivers and located at elevations varying from 5,000 to 9,000 feet, form the cultural and economic core of the kingdom. Among



them the Paro, Thimbu and Punakha Valleys are best known.

The southern section of Bhutan comprises the sloping Duars plain. The mountains rise sharply from the narrow Duars. The rainfall is excessive, and hillsides are clothed with vegetation. The entire Duars tract is unhealthy. The narrow strip of Duars plain contains access to the 18 strategic passes through the Himalayan foothills leading into mountainous central Bhutan.

Most of the inhabitants of central and northern Bhutan adhere to Tibetan culture. Unlike Nepal, the people of southern Bhutan are less Hinduized. An exception is the large number of Nepali settlers in southwestern Bhutan. In eastern Bhutan Tibetan culture has been considerably modified by the intrusion of elements from the Indo-Mongoloid culture of Assam Himalaya.

*Assam Himalaya*: Assam Himalaya comprises the least known and largely unexplored part of the mountain system. Along the Tibetan border the Great Himalayan range rises to more than 23,000 feet. Inhabited by animist hill tribes of Indo-Mongoloid stock who practice shifting agriculture, this rugged area possesses a distinctive geographic personality which sets it apart from the rest of the Himalayas.<sup>25</sup> As a result of the dispute between India and China this hitherto isolated area is being opened up.

In the lower hills adjacent to the plains are Indo-Aryan Hindu farmers. Towards the north, at higher altitude, are Tibetan people such as Monpas, Membas and Khambas. Near Bomdi La are Sherdukpens<sup>26</sup>—a group similar to the Tibetans.

The tribes of the Inner Himalayas in Assam have cultural affinities with the people of Burma and southern Yunnan to the east. Among the numerous tribal groups the most well known are the Akas, Daflas,<sup>27</sup> Apa Tanis, Miris, Galongs, Abors and Mishmis. In addition to their common Tibeto-Burman language, the people have a number of similar traits. They practice shifting agriculture, or jhuming, in which the land is cleared for farming by cutting large trees and burning over the area. The cleared land is then sown. No animals or plows are used in farming; hoes and digging sticks are the principal farming tools. After 3 or 4 years, when soil fertility declines, the land is abandoned. Principal crops are rice, millet and maize. Pigs, chickens and cattle

are the chief livestock.

Rural settlements consist of several long-houses inhabited by a number of patrilineally related families. Houses are located on raised piles and the chief building material is bamboo. People practice an indigenous variety of religion in which the followers propitiate a variety of deities.

The more developed western section of Assam Himalaya (Kamang Frontier district) stands out as a distinctive sub-region within this region. Its cultural pattern is similar to the eastern section, but shows more Buddhist influence. The houses are more substantial, made of stone and wood. The villages have monasteries, buildings strictly for religious purposes, prayer flags and prayer wheels. The staple crops are millet and maize rather than rice.

### CONCLUSION

The distinctive geographical regions of the Himalayas have been identified and described in broad outline. The system of regional division presented in this paper recognizes three major realms; each realm in turn is divided into several geographic regions depending upon general physical and cultural similarities. This paper attempts to provide a framework for further detailed regional analysis, which would undoubtedly result in refinements in the regional division of the Himalayas.

### REFERENCES

1. S. G. Burrard, H. H. Hayden and A. M. Heron, *A Sketch of the Geography and Geology of the Himalaya Mountains and Tibet*, Government of India, Second Edition, 1933. A new volume on the *Geology of the Himalayas* by A. Gansser is scheduled for publication in early 1966 by John Wiley & Sons, New York.
2. See the bibliographical note on the Himalayan orogeny, glaciation and rivers in O. H. K. Spate, *India and Pakistan*, New York: E. P. Dutton, 1954, pp. 37-39, and in Toni Hagen, Dyhrenfurth, Burer-Haimendorf and Schneider, *Mount Everest: Formation, Population and Exploration*, London: Oxford University Press, 1963, p. 96.

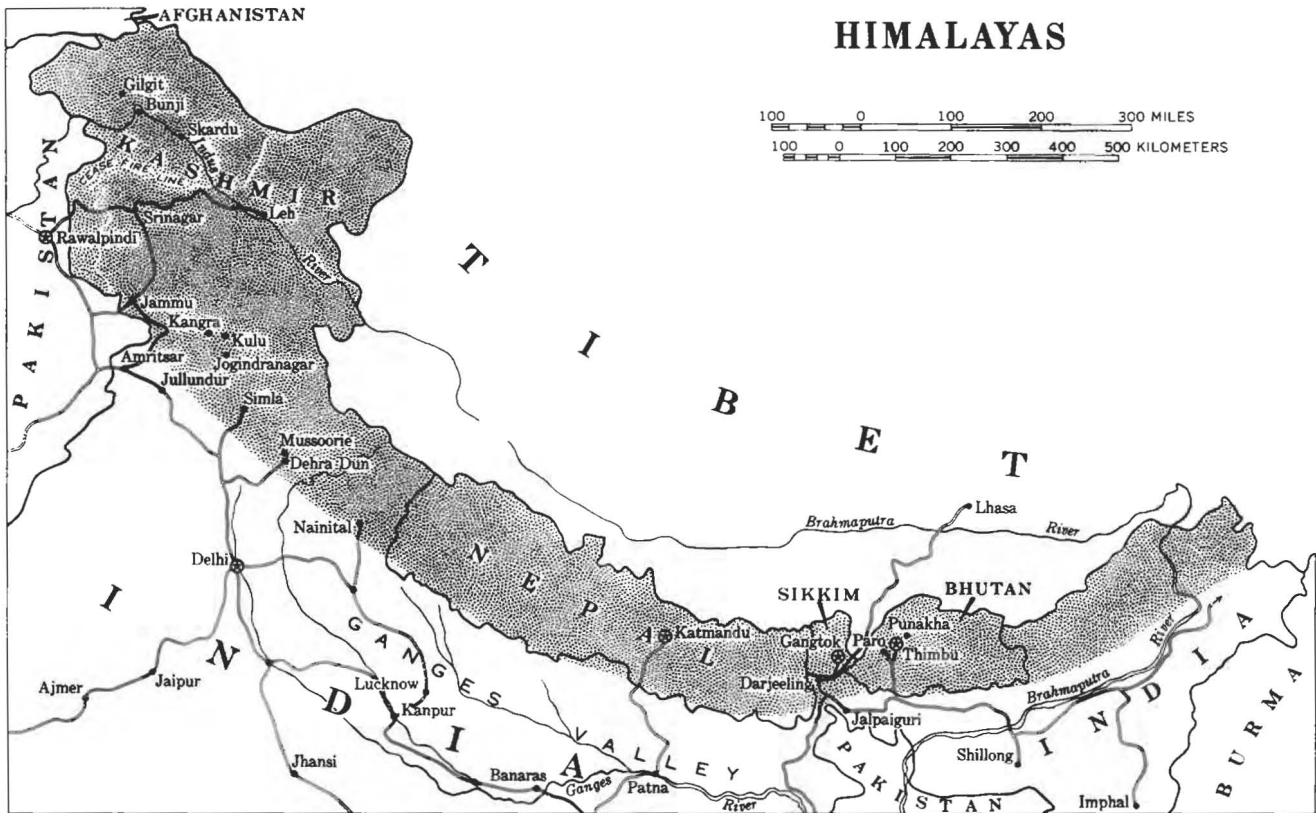
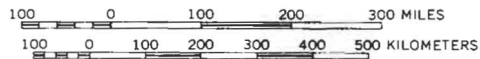
3. Only a few selected publications are listed here. Verrier Elwin, *A Philosophy for NEFA*, Shillong: North-East Frontier Agency, 1959, and his *India's North-East Frontier in the Nineteenth Century*, Oxford: Oxford University Press, 1959; S.D. Pant, *The Social Economy of the Himalayans*, London: George Allen & Unwin, 1935; Christoph von Furer-Haimendorf, *Himalayan Barbary*, New York: Abelard Schuman, 1956, and his *The Sherpas of Nepal: Buddhist Highlanders*, Berkeley: University of California Press, 1964; Jiro Kawakita, "Ethno-Geographical Observations on the Nepal Himalaya," *Scientific Results of the Japanese Expedition to Nepal Himalaya*, 1952-53, Vol. 3, Peoples of Nepal Himalaya, Kyoto: Fauna & Flora Research Society 1957.
4. S. P. Chatterjee, *Fifty Years of Science in India: Progress of Geography*, Calcutta: Indian Science Congress Association, 1963. Papers on Himalayan geography published by Indian geographers are listed at various places in the bibliography.
5. S.C. Bose, "Morpho-ecology In and Around Pir Panjal," *Geographical Review of India*, Vol.23, No.4, December 1961, pp. 55-67.
6. For further details see A. N. Raina, "Observations on Soils and Land Utilization in Kashmir Valley," *The Geographical Review of India*, Vol.25, No.3, September, 1963, pp.183-191; and S. C. Bose, "Occupance in Relation to Geomorphology in the Vales of Kashmir," *Geographical Review of India*, Vol.23, No.2, June, 1961, pp.40-48.
7. W. E. Garrett, "Mountaintop War in Remote Ladakh," *National Geographic Magazine*, Vol.123. No.5, May, 1963, pp.664-687.
8. James Hurley, "The People of Baltistan; A Transitional Culture of Central Asia," *Natural History*, Vol.70, No.8, October, 1961, pp.19-27; No.9, November, 1961, pp.56-68.
9. E. Loewe, "Glaciers of Nanga Parbat," *Pakistan Geographical Review*, Vol.16, No.1, January, 1961, pp.19-24; B.A. Qureshi, "Nanga Parbat," *Pakistan Quarterly*, Vol.11, No.4, Summer 1963, pp.29-35.

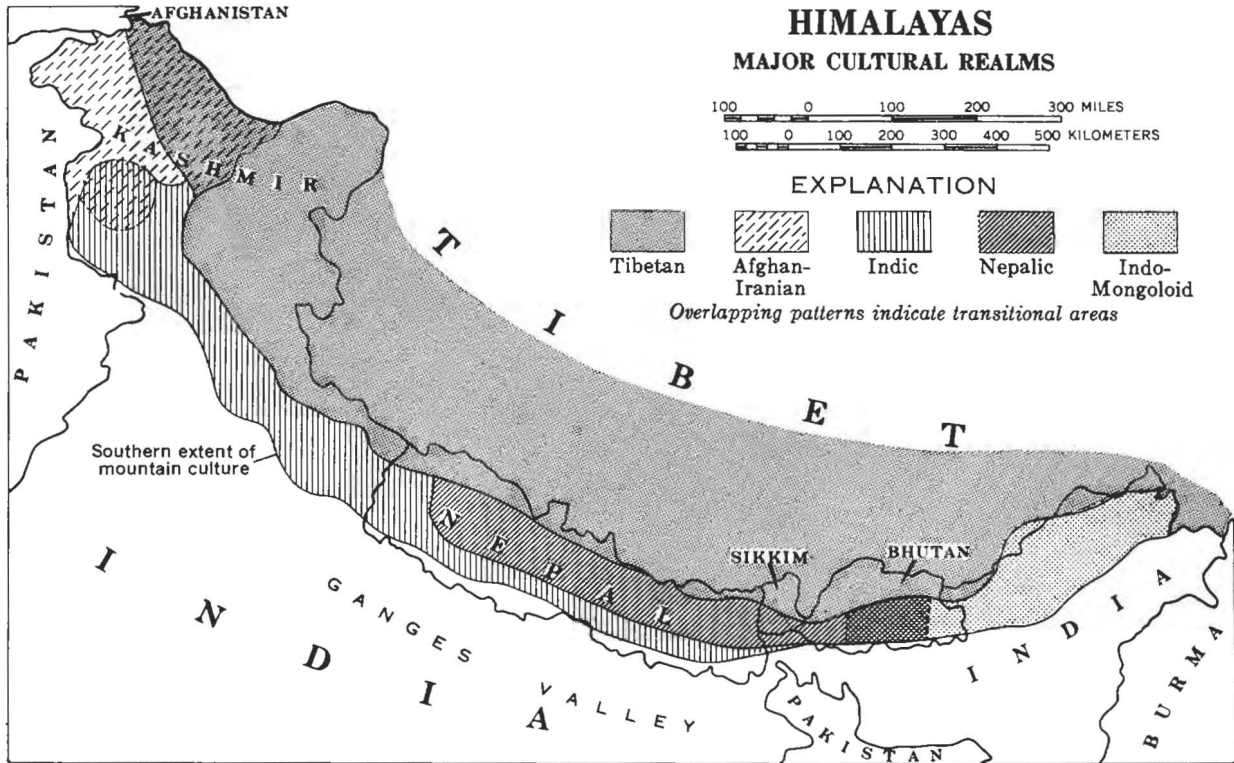
10. Trevor Braham, "Swat and Indus Kohistan," *The Alpine Journal*, Vol.68, No.307, November, 1963, pp.251-261.
11. L. E. Rushbrook Williams, "Hunza and Nagar Yesterday and Today," *Royal Central Asian Journal*, Vol.51, parts 3 and, 4 July-October, 1964, pp.228-235; John Clark, "Hunza in the Himalayas: Storied Shangri-La Undergoes Scrutiny," *Natural History*, Vol.72, No.8, October, 1963, pp.39-41; John Staley, "Hunza-Nagar and the Minapin Glacier," *Explorer's Journal*, Vol.41, No.2, June, 1963, pp.12-18; Renee Taylor and Mulford J. Nobbs, *Hunza, the Himalayan Shangri-La*, El Monte, California; Whitehorn Publishing Co., 1962, 56 pages.
12. For details see S. L. Kayastha, *The Himalayan Beas Basin*, Varanasi: Banaras Hindu University Press, 1964, 346 pages.
13. S. D. Misra, "Social Groups in Himachal Pradesh," *Bulletin dela Societe de Geographie d'Egypte*, Tome 35, 1962, pp.217-272. Maps. See also other geographic papers by Misra on this area: "Agricultural Geography of Himachal Pradesh," *The Oriental Geographer*, Vol.7, No.1, January, 1963, pp.46-58; "Population and Settlements in Himachal Pradesh," *The Deccan Geographer*, Vol.3, No.1, January, 1965, pp.31-42; "A Short Note on the Socio-Historical Geography of Himachal Pradesh," *The National Geographical journal of India*, Vol.8, Part 2, June, 1962, pp.164-170; "Geographical Regions of Himachal Pradesh," *The Deccan Geographer*, Vol.1, No.2, January, 1963, pp.125-140.
14. Y. D. Pande, "Agriculture in the Nainital Tarai and Bhabar," *Geographical Rivew of India*, Vol.23 No.2, June, 1961, pp.19-39.
15. Ramesh Dutta Dikshit, "Evolution of the Duns," *The India Geographer*, Vol.4, No.1, August, 1959, pp.77-84. See also his *Rural House Types in Dehra Dun Valley*, *The Deccan Geographer*, Vol.3, No.1, January, 1965, pp.43-50.
16. Several recent papers discuss various geographic aspects of the region: S.D. Kaushic, "Human Settlement and Occupational Economy in Garhwal-Ghot Himalayas," *Journal of the Asiatic Society*, 4th Series, Vol.1, No.1, 1959 (published 1961), pp.23-34; Kaushic, "Climatic Zones and Their Related Socio-economy in the Garhwal Himalaya," *Geographical Review of India*, Vol.24, No.3-4, September-December, 1962, pp.22-41; Kaushic, "Agriculture in the Himalayan Ganga Bashin," *The National Geographical Journal of India*, Vol.8, Part 3-4, September-December,

- 1962, pp.270-283; S. Bose, "Land and People of the Dhauliganga Valley," *Man in India*, Vol.42, No.4, October-December, 1962, pp.292-304; Y.D. Pande, "Forest Resources of Kumaon" *Indian Geographical Journal*, Vol.36, No.2, April-June, 1961 pp.64-78; Balbir Singh Negi, "Mineral Resources of Kumaon and Garhwal," *Geographical Review of India*, Vol.22, No.3, September, 1960, pp.40-48.
17. S. C. Bose, "Some Geomorphological Features Near Kedarnath and Badrinath," *Geographical Review of India*, Vol.22, No.4, December, 1960, pp.33-36.
  18. Vijay K. Raina, "A Note on Some Glaciological Observation in the Garhwal Himalayas," *Indian Minerals*, Vo.17, No.2, April-June, 1963, pp.159-163; N. Ahmad and H.B. Saxena, "Glaciations of the Pindar River Valley, Southern Himalayas," *Journal of Glaciology*, Vol.4, No.34, February, 1963, pp.471-476.
  19. For a discussion of the social inter-relations in a Garhwali village near Dehra Dun see Gerald D. Berreman, *Hindus of the Himalayas*, Berkeley: University of California Press, 1963, 430 pages.
  20. S. C. Bose, "Nomadism in High Valleys of Uttara Khand and Kumaon," *Geographical Review of India*, Vol.22, No.3, September, 1960, pp.34-39.
  21. For details see P.P. Karan, *Nepali: a Cultural and Physical Geography* Lexington: University of Kentucky Press, 1960, pp.91-95.
  22. P. P. Karan and W.M. Jenkins, *The Himalayan Kingdoms; Bhutan, Sikkim and Nepal*, Princeton, New Jersey: D. Van Nostrand Co., 1963, pp.56-78.
  23. Hope Namgyal, "Sikkim," *Asia Magazine*, Vol.5, No.9, February 28, 1965, pp.4-8.
  24. Karan and Jenkins, *The Himalayan Kingdoms, op. cit.*, pp.27-55. See also P. P. Karan, "The Kingdom of Bhutan," Map Supplement No.5, *Annals, Association of American Geographers*, Vol.55, No.4, December, 1965, and by the same author, "Geopolitical Structure of Bhutan." *India Quarterly*, Vol.19, No.3, July-September, 1963, pp.203-213.

25. Savitri G. Burman, "NEFA (North-East Frontier Agency)-The Land and Its Peoples," *India Quarterly*, Vol.19, No.4, October-December, 1963, pp.344-369.
26. R. R. P. Sharma, *The Sherdukpens*, Shillong: North-East Frontier Agency, 1961.
27. R. K. Shukla, *The Dajlas*, Shillong: North-East-Frontier Agency, 1959.

# HIMALAYAS

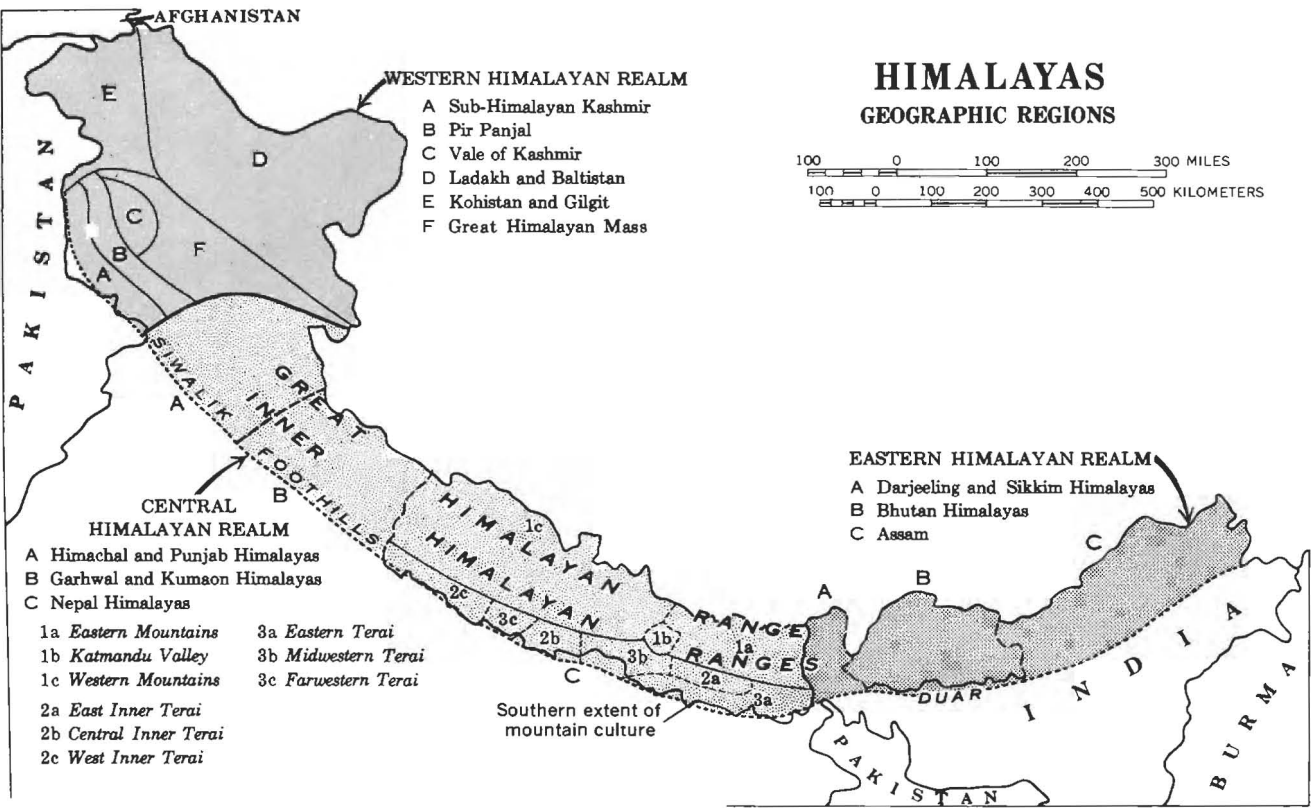
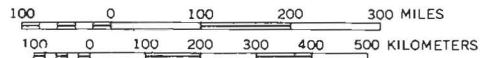






# HIMALAYAS

## GEOGRAPHIC REGIONS



### WESTERN HIMALAYAN REALM

- A Sub-Himalayan Kashmir
- B Pir Panjal
- C Vale of Kashmir
- D Ladakh and Baltistan
- E Kohistan and Gilgit
- F Great Himalayan Mass

### CENTRAL HIMALAYAN REALM

- A Himachal and Punjab Himalayas
- B Garhwal and Kumaon Himalayas
- C Nepal Himalayas

- 1a Eastern Mountains
- 1b Katmandu Valley
- 1c Western Mountains
- 2a East Inner Terai
- 2b Central Inner Terai
- 2c West Inner Terai
- 3a Eastern Terai
- 3b Midwestern Terai
- 3c Farwestern Terai

### EASTERN HIMALAYAN REALM

- A Darjeeling and Sikkim Himalayas
- B Bhutan Himalayas
- C Assam

Southern extent of mountain culture