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CONTENTS

1	INDIA
176	The INDIAN OCEAN
191	INDIAN PHILOSOPHY
213	INDONESIA
246	INDUSTRIAL ENGINEERING AND PRODUCTION MANAGEMENT
275	INDUSTRIAL GLASS AND CERAMICS
299	Chemical Process INDUSTRIES
385	Extraction and Processing INDUSTRIES
529	Manufacturing INDUSTRIES
570	Textile INDUSTRIES
589	INFECTIOUS DISEASES
615	INFORMATION PROCESSING AND INFORMATION SYSTEMS
631	INFORMATION THEORY
638	INHERITANCE AND SUCCESSION
648	INSECTS
741	INSURANCE
755	INTEGUMENTARY SYSTEMS
775	Human INTELLIGENCE
782	INTELLIGENCE AND COUNTERINTELLIGENCE
789	INTERNATIONAL LAW
797	20th-Century INTERNATIONAL RELATIONS
900	INTERNATIONAL TRADE
930	IRAN
972	IRAQ
997	IRELAND

India

India (officially in full, the Republic of India; Bhārat in Hindi) is a federal republic that occupies the greater part of South Asia. Constitutionally, India is a "sovereign socialist secular democratic republic," consisting of 25 states, each with a substantial degree of control over its own affairs, and 7 less fully empowered union territories. The capital is New Delhi. With more than one-sixth of the world's total population, India is the second most populous country, after China.

The land of India—together with Bangladesh and most of Pakistan—forms a well-defined subcontinent, set off from the rest of Asia by the imposing northern mountain rampart of the Himalayas and by lesser adjoining mountain ranges to the west and east. In area, India ranks as the seventh largest country in the world, covering 1,222,559 square miles (3,166,414 square kilometres), just slightly more than 2 percent of the Earth's total land surface.

India's frontier, bordered by six countries, is 9,425 miles (15,168 kilometres) long, of which 3,533 miles (5,686 kilometres) is coastline. Neighbouring countries of particular concern to India are Pakistan to the northwest and China to the north, both of which have intractable border disputes with India, and Bangladesh, which is surrounded on three sides by Indian territory. The other nations on India's frontier are Nepal and Bhutan to the north, situated between India and China, and Myanmar (Burma) to the northeast.

Much of India's territory lies within a large peninsula, surrounded by the Arabian Sea on the west and the Bay of Bengal on the east; Cape Comorin, the southernmost point of the Indian mainland, marks the dividing line between these two bodies of water. Off the extreme south-eastern coast, the Gulf of Mannar and the Palk Strait separate India from the island nation of Sri Lanka. India has two union territories composed entirely of islands: Lakshadweep, in the Arabian Sea, and the Andaman and Nicobar Islands, which lie between the Bay of Bengal and the Andaman Sea.

It is known from archaeological evidence that a highly sophisticated, urbanized culture—the Indus Civilization—dominated the northwestern part of the subcontinent from about 2600 to 2000 bc. From that period on, India functioned as a virtually self-contained political and cultural arena, which gave rise to a distinctive tradition that was associated primarily with Hinduism, the roots of which can largely be traced to the Indus Civilization. Other religions, notably Buddhism and Jainism, also originated in ancient India, but their presence in India is now quite small.

Throughout its history India was intermittently disturbed by incursions from beyond its northern mountain wall. Especially important was the coming of Islām, brought from the northwest by Arab, Turkish, Persian, and other invaders beginning early in the 8th century ad. By the 13th century much of the subcontinent had fallen under Muslim domination, and it largely remained so until the mid-18th century. In the intervening period the number of Muslims steadily increased, and by the early 20th cen-

tury they formed almost one-fourth of India's population. Only after the arrival of the Portuguese navigator Vasco da Gama in 1498 and the subsequent establishment of European maritime supremacy did India become exposed to major external influences arriving by sea, a process that culminated in the absorption of the subcontinent within the British Empire.

Direct administration by the British, which began in 1858, effected a political and economic unification of the subcontinent, the legacy of which is found in many aspects of the current Indian state, including its parliamentary system of government. When British rule came to an end in 1947, the subcontinent was partitioned along religious lines into two separate countries—India, with a majority of Hindus, and Pakistan, with a majority of Muslims. (The eastern portion of Pakistan gained independence as Bangladesh in 1971.) Although Hindi was declared India's official language, English continued to be a widely used *lingua franca*, especially by educated Indians in business and government.

India remains one of the most ethnically diverse countries in the world. Apart from its many religions and sects, India is home to innumerable castes and tribes, as well as to more than a dozen major and hundreds of minor linguistic groups from several totally different language families. Religious minorities still account for one-sixth of the population, and Muslims alone for more than one-ninth. Earnest attempts have been made to instill a spirit of nationhood in so varied a population, but tensions among neighbouring groups abound and not infrequently result in violence.

Economically and socially, India has made great strides since independence: it has a well-developed infrastructure and a highly diversified industrial base, its pool of scientific and engineering personnel is reputedly the third largest in the world, and the pace of its agricultural expansion has more than kept up with the growth in its population. Social legislation in India has done much to alleviate the disabilities previously suffered by formerly "untouchable" castes, tribal populations, women, and other disadvantaged segments of society. At independence, India was blessed with several leaders of world stature, most notably Mohandas (Mahatma) Gandhi and Jawaharlal Nehru. Not only were these leaders able to galvanize the masses in their own country but, because of their prestige and enduring legacy, they also helped enable India to play an important role in global affairs, often as a champion of the causes of the world's colonially exploited and less developed nations. (J.E.Sc.)

This article is organized into three broad subject areas—the physical and human geography of India, the history of the Indian subcontinent, and the geography and history of each Indian state and union territory. The *Macropædia* articles PAKISTAN and BANGLADESH discuss those countries since their creation. For detailed coverage of India's three largest cities, see BOMBAY, CALCUTTA, and DELHI.

The article is divided into the following sections:

Physical and human geography 2

The land 2

- Relief
- Drainage
- Soils
- Climate
- Plant and animal life

The people 13

- Ethnic composition
- Linguistic composition
- Religions
- Caste
- Settlement patterns and demographic trends

The economy 17

- Resources
- Agriculture, forestry, and fishing
- Industry
- Finance and trade
- Transportation

Administration and social conditions 21

- Government
- Education
- Health and welfare
- Cultural life 24
- Daily life
- The arts

- Recreation
- Press and broadcasting
- History 26
 - India from the Paleolithic Period to the decline of the Indus Civilization 26
 - The early prehistoric period
 - The earliest agriculturalists and pastoralists
 - The rise of urbanism in the Indus Valley
 - The Indus Civilization
 - Post-Harappan developments
 - The development of Indian civilization from
 - c. 1500 BC to c. AD 1200 36
 - c. 1500–c. 500 BC
 - The beginning of the historical period, c. 500–150 BC
 - 150 BC–AD 300
 - AD 300–750
 - 750–c. 1200
 - The early Muslim period 54
 - North India under Muslim hegemony, c. 1200–1526
 - The Muslim states of South India, c. 1350–1680
 - The Vijayanagar empire, 1336–1646
 - The Mughal Empire, 1526–1761 68
 - The significance of Mughal rule
 - The establishment of the Mughal Empire
 - The reign of Akbar the Great
 - The empire in the 17th century
 - Mughal decline in the 18th century
 - Regional states, c. 1700–1850 76
 - The Marāṭhas
 - The Afghan factor in North India, 1747–72
 - The Sikhs in the Punjab
 - Rājasthān in the 18th century
 - The south: Travancore and Mysore
 - Politics and the economy
 - Cultural aspects of the late precolonial order
 - India and European expansion, c. 1500–1858 82
 - European activity in India, 1498–c. 1760
 - The extension of British power, 1760–1856
 - The mutiny and great revolt of 1857–59
 - British imperial power, 1858–1947 98
 - Climax of the raj, 1858–85
 - Foreign policy
 - Indian nationalism and the British response, 1885–1920
 - World War I and its aftermath
 - Prelude to independence, 1920–47
 - The transfer of power and the birth of two nations
 - The Republic of India 110
 - The Nehru era, 1947–64
 - Post-Nehru politics and foreign policy
 - India since the mid-1980s
- Northwest India 117
 - Chandīgarh 117
 - Haryana 117
 - Himāchal Pradesh 119
 - Jammu and Kashmir 120
 - Punjab 123
 - Rājasthān 125
- North-central India 128
 - Delhi 128
 - Madhya Pradesh 128
 - Uttar Pradesh 131
- Northeast India 134
 - Arunāchal Pradesh 134
 - Assam 136
 - Bihār 138
 - Manipur 141
 - Meghalaya 142
 - Mizoram 143
 - Nagaland 144
 - Orissa 145
 - Sikkim 148
 - Tripura 149
 - West Bengal 150
- West and west-central India 152
 - Dadra and Nagar Haveli 152
 - Daman and Diu 153
 - Goa 154
 - Gujarat 155
 - Mahārāshtra 157
- South India 160
 - Andaman and Nicobar Islands 160
 - Andhra Pradesh 161
 - Karnāṭaka 163
 - Kerala 165
 - Lakshadweep 167
 - Pondicherry 168
 - Tamil Nadu 168
- Bibliography 170

PHYSICAL AND HUMAN GEOGRAPHY

The land

RELIEF

It is now generally accepted that India's geographic position, continental outline, and basic geologic structure resulted from the shifting of enormous, rigid, crustal slabs called tectonic plates. These plates, which form the entire surface layer of the Earth, collide or slip by one another as they move across the underlying layer of molten material. India forms the northwestern portion of the Indian-Australian Plate.

Hundreds of millions of years ago, much of India's landmass was a fragment of an ancient southern-hemispheric supercontinent known as Gondwana, or Gondwanaland (which also included what are now South America, Africa, Australia, and Antarctica). With the shifting of tectonic plates, Gondwanaland began to break up, and the Indian fragment, carried by the Indian-Australian Plate, began to drift slowly northward toward the much larger Eurasian Plate. When they finally collided (approximately 50 million years ago), the northern edge of the Indian-Australian Plate was thrust under the Eurasian Plate at a low angle. The collision reduced the speed of the oncoming plate, but even today the underthrusting, or subduction, of the plate continues.

The effects of the collision and continued subduction are numerous and extremely complicated. An important consequence, however, was the slicing off of crustal rock from the top of the underthrusting plate. These slices were thrown back onto the northern edge of the Indian landmass and came to form much of the Himalayan mountain system. The new mountains—together with vast amounts of sediment eroded from them—were so heavy

that the Indian-Australian Plate just south of the range was forced downward, creating a zone of crustal subsidence, or geosyncline. Continued rapid erosion of the Himalayas added to the sediment accumulation, which was subsequently carried by mountain streams to fill the geosyncline and cause it to sink more.

India's present-day relief features have been superimposed on three basic structural units: the Himalayas in the north, the Deccan Plateau (or Deccan) in the south, and the Indo-Gangetic Plain (lying over the geosyncline) between the two. For a detailed discussion of the plate tectonic process and its role in the formation of the Indian subcontinent, see the article **PLATE TECTONICS**. Further information on the geology of India is found in **ASIA**.

The Himalayas. The Himalayas (Sanskrit: *hima*, "snow," and *alāya*, "abode"), the loftiest mountain system in the world, form the northern limit of India. This great, geologically young mountain arc is about 1,550 miles (2,500 kilometres) long, stretching from the peak of Nānga Parbat in Pakistan-held Jammu and Kashmir to the Namcha Barwa peak in the Tibet Autonomous Region of China. Between these extremes the mountains fall across India, southern Tibet, Nepal, and Bhutan. The width of the system varies between 125 and 250 miles.

Within India the Himalayas are divided into three longitudinal belts, called the Outer, Lesser, and Great Himalayas. At each extremity there is a great bend in the system's alignment, from which a number of lower mountain ranges and hills spread out. Those in the west lie wholly within Pakistan and Afghanistan, while those to the east straddle India's border with Myanmar (Burma). North of the Himalayas are the Plateau of Tibet and various Trans-Himalayan ranges, only a small part of which,

in the Ladākh region of Jammu and Kashmir, are within the territorial limits of India.

Because of the continued underthrusting of the Indian peninsula against the Eurasian Plate, the Himalayas and the associated eastern ranges remain tectonically active. As a result, the mountains are still rising, and earthquakes—often accompanied by landslides—are common. The relatively high frequency and wide distribution of earthquakes have generated controversies around several hydroelectric and irrigation projects. Despite the tectonic instability, the Himalayas, with their sacred peaks, occupy a major place in the life and culture of India.

The Outer Himalayas (the Shiwalik Hills). The southernmost of the three mountain belts are the Outer Himalayas, also called the Shiwalik Hills. Crests in the Shiwaliks, averaging from 3,000 to 5,000 feet (900 to 1,500 metres) in elevation, seldom exceed 6,500 feet. The range narrows as it moves east and is hardly discernible beyond the Duārs, a plains region in West Bengal. Interspersed in the Shiwaliks are heavily cultivated, flat valleys (*dūns*) with a high population density. To the south of the range is the Indo-Gangetic Plain. Weakly indurated, largely deforested, and subjected to heavy rain and intense erosion, the Shiwaliks provide much of the sediment transported onto the plain.

The Lesser Himalayas. To the north of the Shiwaliks and separated from them by a fault, the Lesser Himalayas (also called the Lower or Middle Himalayas) rise to heights ranging from 11,900 to 15,100 feet. Their ancient name is Himāchal (Sanskrit: *hima*, “snow,” and *acal*, “mountain”). These mountains are composed of both ancient crystalline and geologically young rocks, sometimes in a reversed stratigraphic sequence because of thrust faulting. The Lesser Himalayas are traversed by numerous deep gorges formed by swift-flowing streams (some of them older than the mountains themselves), which are fed by glaciers and snowfields to the north.

The Great Himalayas. The northernmost Great, or Higher, Himalayas (in ancient times, the Himādri), with crests generally exceeding 16,000 feet in elevation, are composed of ancient crystalline rocks and old marine sedimentary formations. Between the Great and Lesser Himalayas are several fertile longitudinal vales; in India the largest is the Vale of Kashmir, an ancient lake basin with an area of about 1,700 square miles (4,400 square kilometres). The Great Himalayas, ranging from 30 to 45

miles wide, includes some of the world's highest peaks. The highest, Mount Everest (29,028 feet [8,848 metres]), is on the northern border of Nepal, but India also has many impressive peaks, such as Kānchenjunga (28,208 feet) on the border of Nepal and the state of Sikkim and Nanda Devi (25,646 feet), Kāmet (25,446 feet), and Trisūl (23,359 feet) in Uttar Pradesh. The Great Himalayas lie mostly above the line of perpetual snow and thus contain most of the Himalayan glaciers.

Associated ranges and hills. In general, the various regional ranges and hills run parallel to the Himalayas' main axis. These are especially prominent in the northwest, where the Zaskār Mountains and the Ladākh and Karakoram ranges, all in Jammu and Kashmir, run to the northeast of the Great Himalayas. Also in Jammu and Kashmir is the Pīr Panjāl Range, which, extending along the southwest of the Great Himalayas, forms the western and southern flanks of the Vale of Kashmir.

At its eastern extremity, the Himalayas give way to a number of smaller ranges running northeast-southwest, including the heavily forested Pātkai, Nāga, and Mizo hills, which extend along India's borders with Myanmar and the southeastern panhandle of Bangladesh. Within the Nāga Hills, the reedy Logtāk Lake in the Manipur River valley, is an important feature. Branching off from these hills to the northwest are the Mikir Hills, and to the west are the Jaintia, Khāsi, and Gāro hills, which run just north of India's border with Bangladesh. Collectively, the latter group is also designated as the Shillong (Meghālaya) Plateau.

The Indo-Gangetic Plain. The second great structural component of India, the Indo-Gangetic Plain (also called the North Indian Plain), lies between the Himalayas and the Deccan. The plain occupies the Himalayan foredeep, formerly a seabed but now filled with river-borne alluvium to depths of up to 6,000 feet. The plain stretches from the Pakistani provinces of Sind and Punjab in the west, where it is watered by the Indus and its tributaries, eastward to the Brahmaputra valley in Assam.

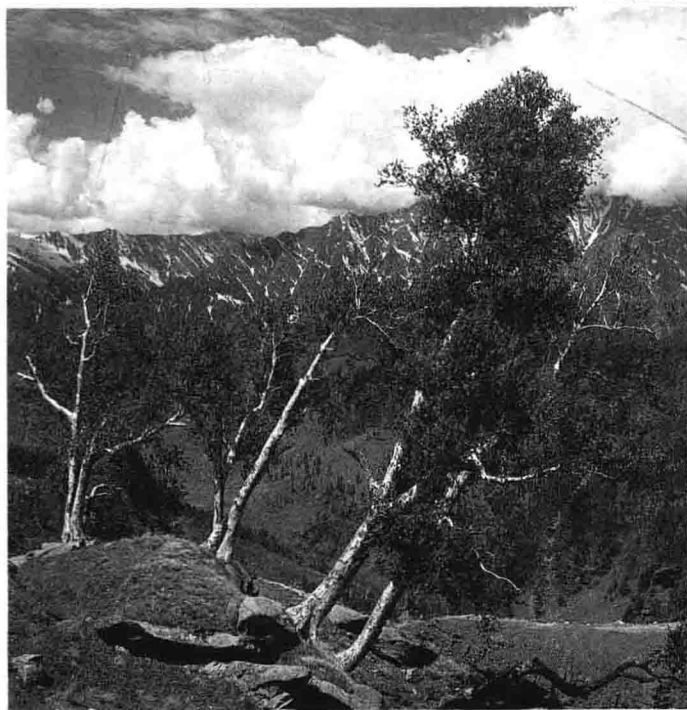
The Ganges basin (mainly in Uttar Pradesh and Bihār) forms the central and principal part of this plain. The eastern part is made up of the combined delta of the Ganges and Brahmaputra rivers, which, though mainly in Bangladesh, also occupies a part of the adjacent Indian state of West Bengal. This deltaic area is characterized by annual flooding attributed to intense monsoon rainfall, an exceedingly gentle gradient, and an enormous discharge that the alluvium-choked rivers cannot contain within their channels. The Indus River basin, extending west from Delhi, forms the western part of the plain; the Indian portion is mainly in the states of Haryāna and Punjab.

The overall gradient of the plain is virtually imperceptible, averaging only about 6 inches per mile (95 millimetres per kilometre) in the Ganges basin and slightly more along the Indus and Brahmaputra. Even so, to those who till its soils, there is an important distinction between *bhāngar*—the slightly elevated, terraced land of older alluvium—and *khādar*, the more fertile fresh alluvium on the low-lying floodplain. In general, the ratio of *bhāngar* areas to those of *khādar* increases upstream along all major rivers. An exception to the largely monotonous relief is encountered in the southwestern portion of the plain, where there are gullied badlands centring on the Chambal River. This area has long been famous for harbouring violent gangs of criminals called dacoits, who find shelter in its many hidden ravines.

The Great Indian, or Thar, Desert, forms an important southern extension of the Indo-Gangetic Plain. It is mostly in India but also extends into Pakistan and is mainly an area of gently undulating terrain, and within it are several areas dominated by shifting sand dunes and numerous isolated hills. The latter provide visible evidence of the fact that the thin surface deposits of the region, partially alluvial and partially wind-borne, are underlain by the much older Indian-Australian Plate, of which the hills are structurally a part.

The Deccan Plateau. The remainder of India is designated, not altogether accurately, as either the Deccan Plateau or peninsular India. It is actually a topographically variegated region that extends well beyond the peninsula—

The three
major
parts of
the Indo-
Gangetic
Plain



Birch trees in the western Himalayas in eastern Jammu and Kashmir.

Ardea London

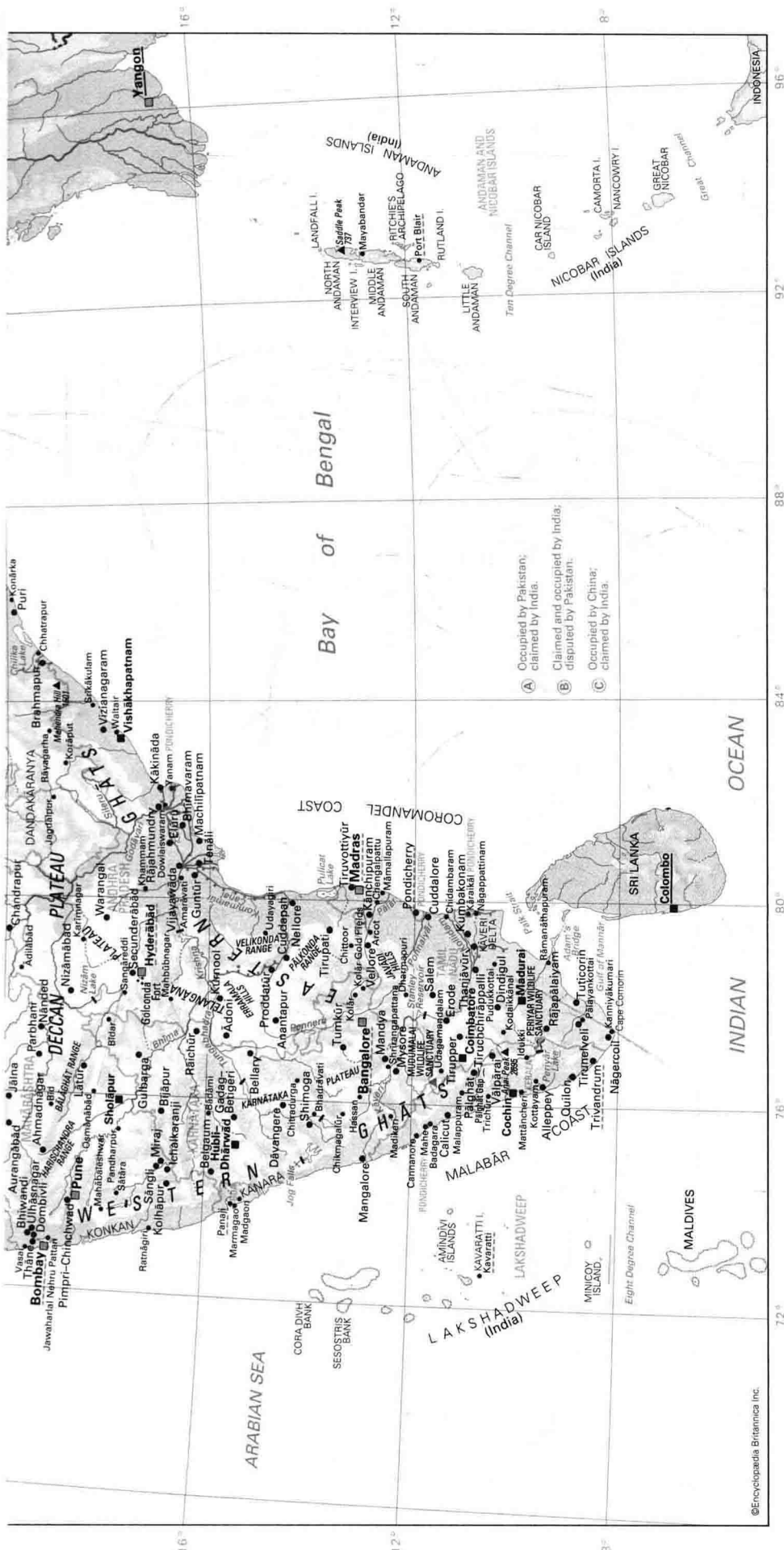
MAP INDEX

Political subdivisions

Andaman and	
Nicobar Islands	10 00 N 94 00 E
Andhra Pradesh	16 00 N 80 00 E
Arunāchal	
Pradesh	28 00 N 94 30 E
Assam	26 00 N 93 00 E
Bihar	25 00 N 86 00 E
Chandigarh	30 45 N 76 50 E
Dadra and Nagar	
Haveli	20 05 N 73 00 E
Daman and Diu	20 10 N 73 00 E
Delhi	28 37 N 77 10 E
Goa	15 20 N 74 00 E
Gujarat	22 00 N 72 00 E
Haryana	29 00 N 76 00 E
Himāchal	
Pradesh	32 00 N 77 00 E
Jammu and	
Kashmir	34 00 N 76 00 E
Karnāṭaka	14 00 N 76 00 E
Kerala	10 00 N 76 30 E
Lakshadweep	10 00 N 73 00 E
Madhya Pradesh	23 00 N 79 00 E
Mahārāshtra	19 00 N 76 00 E
Manipur	25 00 N 94 00 E
Meghālaya	25 30 N 91 20 E
Mizoram	23 30 N 93 00 E
Nagaland	26 00 N 94 15 E
Orissa	21 00 N 84 00 E
Pondicherry	11 56 N 79 50 E
Punjab	31 00 N 75 30 E
Rājasthān	26 00 N 74 00 E
Sikkim	27 30 N 88 30 E
Tamil Nādu	11 00 N 78 00 E
Tripura	24 00 N 92 00 E
Uttar Pradesh	28 00 N 80 00 E
West Bengal	24 00 N 88 00 E

Cities and towns

Ābu	24 36 N 72 42 E
Ādilābād	19 40 N 78 32 E
Ādoni	15 38 N 77 17 E
Agartala	23 49 N 91 16 E
Āgra	27 11 N 78 01 E
Ahmadābād	
(Ahmedabad)	23 02 N 72 37 E
Ahmednagar	
(Ahmednagar)	19 05 N 74 44 E
Āizawl	23 44 N 92 43 E
Ajmer	26 27 N 74 38 E
Akola	20 44 N 77 00 E
Aligarh	27 53 N 78 05 E
Ālipur Duār	26 29 N 89 34 E
Allahābād	25 27 N 81 51 E
Alleppey	09 29 N 76 19 E
Almora	29 37 N 79 40 E
Alwar	27 34 N 76 36 E
Amarāvati	
(Amaravathi)	16 35 N 80 22 E
Amarpur	23 31 N 91 39 E
Ambāla	30 21 N 76 50 E
Āmbāsa	23 56 N 91 51 E
Ambikāpur	23 07 N 83 12 E
Āmer (Amber)	26 59 N 75 52 E
Amrāvati	
(Amraoti)	20 56 N 77 45 E
Amreli	21 37 N 71 14 E
Amritsar	31 35 N 74 53 E
Anantapur	14 41 N 77 36 E
Anantnāg	
(Islāmābād)	33 44 N 75 09 E
Āra (Arrah)	25 34 N 84 40 E
Arcoṭ	12 54 N 79 20 E
Āsānsol	23 41 N 86 59 E
Aurangābād	19 53 N 75 20 E
Ayodhya	
(Oudh)	26 48 N 82 12 E
Āzamgarh	26 04 N 83 11 E
Badagara	11 36 N 75 35 E
Bādāmi	15 55 N 75 41 E
Bahāmpur	
(Berhampore)	24 06 N 88 15 E
Bahraich	27 35 N 81 36 E
Bālāghāt	21 48 N 80 11 E
Bālāngir	
(Bolāngir)	20 43 N 83 29 E
Bālēshwar	
(Balasore)	21 30 N 86 56 E
Ballia	25 45 N 84 10 E
Baitit (Hunza)	36 20 N 74 40 E
Bālurghāt	25 13 N 88 46 E



Banāras, see Vārānasi	Bündi 25 27 N 75 39 E	Dhūle (Dhūlia) 20 54 N 74 47 E	Hyderābād 17 23 N 78 28 E
Bānda 25 29 N 80 20 E	Burdwān, see Barddhamān	Diamond Harbour 22 12 N 88 12 E	Ichalkaranji 16 42 N 74 28 E
Bandar, see Machilipatnam	Burhānpur 21 18 N 76 14 E	Dibrugarh 27 29 N 94 54 E	Idukki 09 35 N 77 00 E
Bangalore 12 59 N 77 35 E	Buxar 25 35 N 83 59 E	Digboi 27 23 N 95 38 E	Imphāl 24 49 N 93 57 E
Bānkura 23 15 N 87 04 E	Calcutta 22 32 N 88 22 E	Dimāpur 25 54 N 93 44 E	Indore 22 43 N 75 50 E
Bānswāra 23 33 N 74 27 E	Calicut 11 15 N 75 46 E	Dindigul 10 21 N 77 57 E	Ingrāj (English)
Bāra Banki 26 55 N 81 12 E	(Kozhikode) 11 15 N 75 46 E	Dispur 26 08 N 91 47 E	Bāzār 25 00 N 88 09 E
Bāramūla 34 12 N 74 21 E	Cambay, see Khambhāt	Diu 20 42 N 70 59 E	Islāmābād, see Anantāg
Barddhamān (Burdwān) 23 15 N 87 51 E	Cannanore 11 51 N 75 22 E	Dombivli 19 13 N 73 05 E	Itānagar 27 09 N 93 33 E
Bareilly 28 21 N 79 25 E	Cawnpore, see Kānpur	Dowlaiswaram 16 57 N 81 48 E	Itārsi 22 37 N 77 45 E
Bāripāda 21 56 N 86 43 E	Chāibāsa 22 34 N 85 49 E	Dumka 24 16 N 87 15 E	Jabalpur (Jubbulpore) 23 10 N 79 57 E
Bārmer 25 45 N 71 23 E	Chamba 32 34 N 76 08 E	Dūngarpur 23 50 N 73 43 E	Jagdalpur 19 04 N 82 02 E
Baroda, see Vadodara	Chanda, see Chandrapur	Durg 21 11 N 81 17 E	Jaipur 26 55 N 75 49 E
Barwāni 22 02 N 74 54 E	Chanderi 24 43 N 78 08 E	Durgāpur 23 30 N 87 20 E	Jaisalmer 26 55 N 70 54 E
Bassein, see Vasai	Chandigarh 30 44 N 76 55 E	Dwārka 22 14 N 68 58 E	Jalandhar (Jullundur) 31 19 N 75 34 E
Basti 26 48 N 82 43 E	Chandrapur (Chanda) 19 57 N 79 18 E	Elīrūr (Ellore) 16 42 N 81 06 E	Jālaun 26 09 N 79 21 E
Batāla 31 48 N 75 12 E	Chatrapur, see Chhatrapur	English, see Ingrāj Bāzār	Jaigaon 21 01 N 75 34 E
Bathinda (Bhatinda) 30 12 N 74 57 E	Chengalpattu (Chingleput) 12 42 N 79 59 E	Erode 11 21 N 77 44 E	Jāina 19 50 N 75 53 E
Beāwar 26 06 N 74 19 E	Cherrapunji 25 18 N 91 42 E	Etah 27 38 N 78 40 E	Jālōr 25 21 N 72 37 E
Belgaum 15 52 N 74 30 E	Chhapra 25 46 N 84 45 E	Etāwah 26 46 N 79 02 E	Jalpāiguri 26 31 N 88 44 E
Bellary 15 09 N 76 56 E	Chhatrapur (Chatrapur) 19 21 N 84 59 E	Faizābād (Fyzabad) 26 47 N 82 08 E	Jamālpur 25 18 N 86 30 E
Belonia 23 15 N 91 27 E	Chhindwāra 22 04 N 78 56 E	Faridābād 28 26 N 77 19 E	Jammu 32 44 N 74 52 E
Benares, see Vārānasi	Chicacole, see Srikākulam	Faridkot 30 40 N 74 45 E	Jamnagar 22 28 N 70 04 E
Berhampore, see Baharampur	Chidambaram 11 24 N 79 42 E	Farrukhābād-cum- Fatehgarh 27 24 N 79 35 E	Jamshedpur 22 48 N 86 11 E
Berhampur, see Brahmapur	Chikmagalur 13 19 N 75 47 E	Fatehpur 25 56 N 80 48 E	Jaunpur 25 44 N 82 41 E
Bettiah 26 48 N 84 30 E	Chineni 33 02 N 75 17 E	Fatehpur Sikri 27 06 N 77 40 E	Jawaharlal Nehru Pattan (Nhava Sheva) 18 56 N 73 02 E
Betūl 21 55 N 77 54 E	Chingleput, see Chengalpattu	Ferozepore, see Firozpur	Jhābua 22 46 N 74 36 E
Bezawada, see Vijayawāda	Chinsura, see Hugli-Chunchura	Ferozpur, see Ferozpur Jhirka	Jhālāwār (Brijnagar) 24 36 N 76 09 E
Bhadraīvati 13 52 N 75 43 E	Chitrādurga (Chitaldrug) 14 14 N 76 24 E	Firozābād 27 09 N 78 25 E	Jhānsi 25 26 N 78 35 E
Bhāgalpur 25 15 N 87 00 E	Chittaurgarh (Chitor) 24 53 N 74 38 E	Firozpur 30 55 N 74 36 E	Jhūnjhūnūn 28 08 N 75 24 E
Bhandāra 21 10 N 79 39 E	Chittoor 13 12 N 79 07 E	(Ferozepore) 30 55 N 74 36 E	Jind 29 19 N 76 19 E
Bharatpur 27 13 N 77 29 E	Chunchura, see Hugli-Chunchura	Firozpur Jhirka (Ferozepur) 27 48 N 76 57 E	Jodhpur 26 17 N 73 02 E
Bharūch (Broach) 21 42 N 72 58 E	Chōru 28 18 N 74 57 E	Fyzabad, see Faizābād	Jogighopa 26 14 N 90 35 E
Bhatinda, see Bathinda	Cocanada, see Kākināda	Gadag-Betigeri 15 25 N 75 37 E	Jorhāt 26 45 N 94 13 E
Bhātpāra 22 52 N 88 24 E	Cochin 09 58 N 76 14 E	Gāndhinagar 23 12 N 72 40 E	Jowai 25 27 N 92 12 E
Bhāvnagar (Bhaunagar) 21 46 N 72 09 E	Coimbatore 11 00 N 76 58 E	Gangānagar (Sri Gangānagar) 29 55 N 73 53 E	Jubbulpore, see Jabalpur
Bhilainagar 21 13 N 81 26 E	Conjeeveram, see Kānchipuram	Gangotri 27 20 N 88 37 E	Jullundur, see Jalandhar
Bhilsa, see Vidisha	Cooch Behār, see Koch Bihār	Gauhāti, see Guwahāti	Jūnāgadh 21 31 N 70 28 E
Bhīlāwāra 25 21 N 74 38 E	Cuddalore 11 45 N 79 45 E	Gaya 24 47 N 85 00 E	Kāilāshahar 24 20 N 92 01 E
Bhimavaram 16 32 N 81 32 E	Cuddapah 14 28 N 78 49 E	Gezing, see Gyalshing	Kaira, see Kheda
Bhind 26 34 N 78 48 E	Cuttack 20 30 N 85 50 E	Gezing, see Gyalshing	Kaithal 29 48 N 76 23 E
Bhir, see Bid	Dabaka 26 07 N 92 52 E	Ghātālā 22 36 N 86 29 E	Kākināda (Cocanada) 16 56 N 82 13 E
Bhiwandi 19 18 N 73 04 E	Dalhousie 32 32 N 75 59 E	Ghāziābād 28 40 N 77 26 E	Kālimpang (Kālimpong) 27 04 N 88 29 E
Bhiwāni 28 47 N 76 08 E	Dāltenganj (Daltonganj) 24 02 N 84 04 E	Ghāzīpur 25 35 N 83 34 E	Kāmārhāti 22 42 N 88 22 E
Bhopāl 23 16 N 77 24 E	Dāmān (Dāmão) 20 25 N 72 51 E	Gilgit 35 55 N 74 18 E	Kānchipuram (Conjeeveram) 12 50 N 79 43 E
Bhubaneswar 20 14 N 85 50 E	Damoh 23 50 N 79 27 E	Girdih 24 11 N 86 18 E	Kandla 23 02 N 70 13 E
Bhuj 23 16 N 69 40 E	Darbhangā 26 10 N 85 54 E	Godhra (Godhr) 22 45 N 73 38 E	Kāngra 32 06 N 76 16 E
Bhusāwal 21 03 N 75 46 E	Darjiling (Darjeeling) 27 02 N 88 16 E	Gomoh 23 52 N 86 10 E	Kannauj 27 04 N 79 55 E
Bid 18 59 N 75 46 E	Datia 25 40 N 78 28 E	Gonda 27 08 N 81 56 E	Kanniyākumari 08 05 N 77 34 E
Bidar 17 54 N 77 33 E	Dāvangere 14 28 N 75 55 E	Gondia 21 27 N 80 12 E	Kānpur (Cawnpore) 26 28 N 80 21 E
Bihār Sharif 25 11 N 85 31 E	Dehra Dūn 30 19 N 78 02 E	Gorakhpur 26 45 N 83 22 E	Kapūrthala 31 23 N 75 23 E
Bijāpur 16 50 N 75 42 E	Dhārī 24 52 N 84 11 E	Gulbarga 17 20 N 76 50 E	Kāraikāl 10 55 N 79 50 E
Bijnor 29 22 N 78 08 E	Delhi 28 40 N 77 13 E	Gulmarg 34 03 N 74 23 E	Karīmānagar 18 26 N 79 09 E
Bikāner 28 01 N 73 18 E	Deogarh, see Devghar	Guna 24 39 N 77 19 E	Karnāl 29 41 N 76 59 E
Bilāspur 31 20 N 76 45 E	Deoria 26 31 N 83 47 E	Guntūr 16 18 N 80 27 E	Kasauli 30 55 N 76 57 E
Bilāspur 22 05 N 82 09 E	Devghar (Deoghar) 24 29 N 86 42 E	Gurdāspur 32 02 N 75 31 E	Katihār 25 32 N 87 35 E
Bishnupur (Vishnupur) 23 05 N 87 19 E	Dewās 22 58 N 76 04 E	Gurgaon 28 28 N 77 02 E	Kavaratti 10 33 N 72 38 E
Bithūr 26 38 N 80 17 E	Dhamtari 20 41 N 81 34 E	Guwahāti (Gauhāti) 26 11 N 91 44 E	Kendujhargharh (Keonjharhargharh) 21 38 N 85 35 E
Bodh Gaya, see Buddh Gaya	Dhānbād 23 48 N 86 27 E	Gwalior 26 13 N 78 10 E	Khairāgarh 21 25 N 80 58 E
Bokākhāt 26 38 N 93 36 E	Dhār 22 36 N 75 18 E	Gyalshing (Gezing) 27 17 N 88 16 E	Khambhāt (Cambay) 22 18 N 72 37 E
Bokāro 23 49 N 86 00 E	Dharmānagar 24 23 N 92 10 E	Hajipur 25 41 N 85 13 E	Khammam (Khammamett) 17 15 N 80 09 E
Bolāngir, see Balāngir	Dharmapuri 12 08 N 78 10 E	Haldia 22 03 N 88 07 E	Khandwa 21 50 N 76 20 E
Bombay (Mumbai) 18 58 N 72 50 E	Dharmshāla (Dharmśāla) 32 13 N 76 19 E	Hamirpur 25 57 N 80 09 E	Kharagpur 22 20 N 87 20 E
Brahmapur (Berhampur) 19 19 N 84 47 E	Dhārswād (Dhārswār), see Hubli-Dhārswād	Hamirpur 31 41 N 76 31 E	Khargon (Khargone) 21 49 N 75 36 E
Brijnagar, see Jhālāwār	Dhaulpur (Dholpur) 26 42 N 77 54 E	Hanumānagarh (Sadulgarh) 29 35 N 74 19 E	Kheda (Kaira) 22 45 N 72 41 E
Broach, see Bharūch	Dhenkānāl 20 40 N 85 36 E	Hāora, see Howrah	Khetri 27 59 N 75 48 E
Budaun 28 03 N 79 07 E	Dhuburi (Dhubri) 26 02 N 89 58 E	Haridwār (Hardwār) 29 58 N 78 10 E	Khowai 24 06 N 91 38 E
Buddh Gaya (Bodh Gaya) 24 42 N 84 59 E		Hassan 13 00 N 76 05 E	Kishangharh 26 34 N 74 52 E
Bulandshahr 28 24 N 77 51 E		Hāthras 27 36 N 78 03 E	Koch Bihār (Cooch Behār) 26 19 N 89 26 E
Buldāna 20 32 N 76 11 E		Hazāribāg (Hazāribāgh) 23 59 N 85 21 E	Kodāikkānāl 10 14 N 77 29 E
Bulsār, see Valsād		Hissār (Hissār) 29 10 N 75 43 E	Kodarma 24 28 N 85 36 E
		Hoshangābād 22 45 N 77 43 E	Kohima 25 40 N 94 07 E
		Hoshiārpur 31 32 N 75 54 E	Kolār 13 08 N 78 08 E
		Howrah (Hāora) 22 35 N 88 20 E	Kolār Gold Fields 12 55 N 78 17 E
		Hubli-Dhārswād 15 21 N 75 10 E	Kolhāpur 16 42 N 74 13 E
		Hugli-Chunchura 22 54 N 88 24 E	
		Hunza, see Baltit	

Konārka (Konārak)	19 54 N 86 07 E	Mumbai, see Bombay	Poona, see Pune	Sikar	27 37 N 75 09 E
Korāput	18 49 N 82 43 E	Munger (Monghyr)	Poonch, see Pūnch	Silchar	24 49 N 92 48 E
Kota (Kotah)	25 11 N 75 50 E	Murshidābād	Porbandar	Silghāt	26 37 N 92 56 E
Kottayam	09 35 N 76 31 E	Murwāra	Port Blair	Siliguri, see Shiliguri	
Kozhikode, see Calicut		Mussoorie	Pratāpgarh (Partāpgarh, Pratāpgarh)	Silvassa	20 15 N 73 00 E
Krishnanagar	23 24 N 88 30 E	Muttra, see Mathura	Proddatūr	Simla, see Shimla	
Kullu (Kulu)	31 58 N 77 06 E	Muzaffarābād	Puduchcheri, see Pondicherry	Sirohi	24 53 N 72 52 E
Kumbakonam	10 58 N 79 23 E	Muzaffarnagar	Pudukkottai	Sirsa	29 32 N 75 01 E
Kurnool	15 50 N 78 03 E	Muzaffarpur	Pūnch (Poonch)	Sitāmahi	26 36 N 85 29 E
Kurukshetra (Thānesar)	29 59 N 76 51 E	Mysore	Pune (Poona)	Sitāpur	27 34 N 80 41 E
Lachung	27 42 N 88 45 E	Nabadwip, see Navadwip	Puri	Siuri (Sūri)	23 55 N 87 32 E
Lakhimpur	27 57 N 80 46 E	Nadiād	Purnia (Purnea)	Siwān	26 13 N 84 22 E
Lalitpur	24 41 N 78 25 E	Nagaon (Nowgong)	Pusa	Skardu	35 18 N 75 37 E
Lāṭūr	18 24 N 76 35 E	Nāgappattinam (Negapatam)	Pushkar	Solan (Solon)	30 55 N 77 07 E
Leh	34 10 N 77 35 E	Nāgaūr	Quilon	see Sholāpur	
Longju	28 45 N 93 35 E	Nāgercoil	Rāe Bareilly	Somnāth	20 53 N 70 22 E
Lucknow	26 51 N 80 55 E	Nāgla	Rāichūr	Sonāmura	23 29 N 91 17 E
Ludhiāna	30 54 N 75 51 E	Nāginimāra	Rāiganj	Sonipat (Sonepat)	28 59 N 77 01 E
Lunglei (Lungleh)	22 53 N 92 44 E	Nāgpur	Raigarh	South Dum Dum	22 34 N 88 23 E
Machilipatnam (Bandar, Masulipatam)	16 10 N 81 08 E	Nāhan	Raipur	South Suburban (Mejherhāt)	23 32 N 88 18 E
Madgaon (Margao)	15 18 N 73 57 E	Naihati	Raisen	Sri Gangānagar, see Gangānagar	
Madhubani	26 22 N 86 05 E	Naini Tal	Rāj Gangpur	Srikākulam (Chicacole)	18 18 N 83 54 E
Madhupur	24 16 N 86 39 E	Nānded (Nānder)	Rāj Nāndgaon	Srinagar	34 05 N 74 49 E
Madikeri (Mercāra)	12 25 N 75 44 E	Narsimhapur (Narsinghpur)	Rājāhmundry	Sultānpur	26 16 N 82 04 E
Madras	13 05 N 80 17 E	Narsinghgarh	Rājapālāiyam	Sundarnagar	31 32 N 76 53 E
Madurai (Madura)	09 56 N 78 07 E	Narwar	Rājauri (Rājauri)	Sūrat	21 10 N 72 50 E
Mahābaleshwar	17 55 N 73 40 E	Nāshik (Nāsik)	Rājgarh	Surendranagar (Wadhwan)	22 42 N 71 41 E
Mahābalipūr, see Māmallapuram		Nāthdwāra	Rājkot	Sūri, see Siuri	
Mahbōbnagar	16 44 N 77 59 E	Navadwip (Nabadwip)	Rāmanāthapuram (Rāmnād)	Tamlūk	22 18 N 87 55 E
Mahe	11 42 N 75 32 E	Nāvsārī	Rāmpur	Tanjore, see Thanjāvūr	
Mahesāna (Mehsāna)	23 36 N 72 24 E	Nawāda	Rānchi	Tārāpur	19 51 N 72 42 E
Maheshwar	22 11 N 75 35 E	Negapatam, see Nāgappattinam	Ratlam	Tawang (Towang)	27 35 N 91 52 E
Mainpuri	27 14 N 79 01 E	Nellore	Ratnāgiri	Tenālī	16 15 N 80 35 E
Malappuram	11 04 N 76 04 E	New Delhi	Raurkela (Rourkela)	Tezpur	26 38 N 92 48 E
Māldah (Mālda)	25 02 N 88 09 E	Nhava Sheva, see Jawaharlal Nehru Pattan	Rāyagarha (Rāyagada)	Thāne (Thāna)	19 12 N 72 58 E
Mālegaon	20 33 N 74 32 E	Nimach	Rewa (Rewah)	Thānesar, see Kurukshetra	
Māmallapuram (Mahābalipur, Seven Pagodas)	12 37 N 80 12 E	Nizāmābād	Rishikesh	Thanjavūr (Tanjore)	10 48 N 79 09 E
Mandasor, see Mandasaur		Nongthymmai	Rohatak	Tikamgarh	24 44 N 78 50 E
Mandi	31 43 N 76 55 E	Nova Goa	Rourkela, see Raurkela	Tinnevely, see Tirunelveli	
Mandla	22 36 N 80 23 E	Pānaji	Rūpnagar	Tinsukia	27 30 N 95 22 E
Mandasaur (Mandasor)	24 04 N 75 04 E	Nowgong, see Nagaon	Sabritm	Tiruchchirāppalli (Tiruchirāppalli, Trichinopoly)	10 49 N 78 41 E
Māndu	22 22 N 75 23 E	Ootacamund, see Udagamandalam	Sādulgarh, see Hanumāngarh	Tirunelveli (Tinnevely)	08 44 N 77 42 E
Mandya	12 33 N 76 54 E	Orchha	Sāgar (Saugor)	Tirupati	13 39 N 79 25 E
Mangalore	12 52 N 74 53 E	Osmānābād	Sahāranpur	Tirupper (Tiruppūr)	11 06 N 77 21 E
Mangan (Mangang)	27 31 N 88 32 E	Oudh, see Ayodhya	Saharsa	Tiruvottiyūr	13 09 N 80 18 E
Margao, see Madgaon		Pālamcottah, see Pālayankottai	Sahdol, see Shahdol	Tonk	26 10 N 75 47 E
Marmagao (Mormugāo)	15 24 N 73 48 E	Pālanpur	Sāhibganj	Towang, see Tawang	
Masulipatam, see Machilipatnam		Pālāshi	Sālem	Trichinopoly, see Tiruchchirāppalli	
Mathura (Muttra)	27 30 N 77 41 E	Pālayankottai (Pālamcottah)	Sambalpur	Trichūr	10 31 N 76 13 E
Mattāncheri	09 58 N 76 16 E	Pālgāṭ	Sambhal	Trivandrum	08 29 N 76 55 E
Mayabandar	12 51 N 92 53 E	Pāli	Sangāreddi (Sangareddipet)	Tuensang	26 17 N 94 50 E
Meerut	28 59 N 77 42 E	Pānaji (Nova Goa, Panjim)	Sāngli	Tumkūr	13 21 N 77 05 E
Mehsāna, see Mahesāna		Pānīpat	Sārāikela	Tura	25 31 N 90 13 E
Mercāra, see Madikeri		Panna	Sārāngpur	Tuticorin	08 47 N 78 08 E
Merta	26 39 N 74 02 E	Pārādwip	Sasarām	Udagamandalam (Ootacamund)	11 24 N 76 42 E
Mhow	22 33 N 75 46 E	Parbhani	Sātāra	Udaipur	24 35 N 73 41 E
Miraj	16 50 N 74 38 E	Pātān	Satna	Udayagiri	14 52 N 79 19 E
Mirzāpur-cum- Vindhyāchal	25 09 N 82 35 E	Pathānkot	Saugor, see Sāgar	Udhampur	32 56 N 75 08 E
Mokokchūng	26 20 N 94 32 E	Patlāla	Sawāi Madhopur	Ujjain	23 11 N 75 46 E
Mon	26 45 N 95 06 E	Patna	Secunderābād	Ulhasnagar	19 12 N 72 58 E
Monghyr, see Munger		Pech Morena, see Morena	Sehore	Una	31 29 N 76 17 E
Morādābād	28 50 N 78 47 E	Phalodi	Seoni	Unnāo	26 32 N 80 30 E
Morānhāt (Moran)	27 11 N 94 56 E	Phēk	Seringapatam, see Shrirangapattana	Uttarkāshi	30 44 N 78 27 E
Morbi (Morvi)	22 49 N 70 50 E	Phulabāni (Phulbāni)	Shahdol (Sahdol)	Vadodara (Baroda)	22 18 N 73 12 E
Morena (Pech Morena)	26 29 N 78 01 E	Pilāni	Shāhjahānpur	Vālpārai	10 22 N 76 58 E
Mormugāo, see Marmagao		Pilbhit	Shāhpura	Valsād (Bulsār)	20 38 N 72 56 E
Motihārī	26 39 N 84 55 E	Pimpri- Chinchwad	Shājāpur	Vārānasi (Banāras, Benares)	25 20 N 83 00 E
		Pithorāgarh	Sheopor	Vasai (Bassein)	19 21 N 72 48 E
		Pondicherry (Pondichéry, Puduchcheri)	Shiliguri (Siliguri)	Vellore	12 56 N 79 08 E
			Shillong	Verāval	20 54 N 70 22 E
			Shirma (Simla)		
			Shirmoga		
			Shivpuri		
			Sholāpur (Solāpur)		
			Shrirangapattana (Seringapatam)		
			Sibsāgar		

Vidisha (Bhilsa) . . . 23 32 N 77 49 E
 Vijayavāda
 (Vijayavādā,
 Bezvāda) . . . 16 31 N 80 37 E
 Viśākhapatnam
 (Viśākhapatam) . . . 17 42 N 83 18 E
 Vishnupur,
 see Bishnupur
 Vizianagaram
 (Vizianagram) . . . 18 07 N 83 25 E
 Wadhvān, see
 Surendranagar
 Waltair . . . 17 43 N 83 20 E
 Warangal . . . 18 00 N 79 35 E
 Wardha . . . 20 45 N 78 37 E
 Wokha . . . 26 06 N 94 16 E
 Yamunanagar . . . 30 07 N 78 12 E
 Yanam (Yanaon) . . . 16 44 N 82 13 E
 Yavatmāl
 (Yeotmāl) . . . 20 24 N 78 08 E
 Zunheboto . . . 26 01 N 94 30 E

Physical features and points of interest

Ābu, Mount, see
 Guru Peak
 Adam's Bridge,
shoal . . . 09 05 N 79 34 E
 Ajanta Caves . . . 20 33 N 75 42 E
 Amindivi Islands . . . 11 23 N 72 23 E
 Anai Peak . . . 10 10 N 77 04 E
 Andaman
 Islands . . . 12 30 N 92 45 E
 Arabian Sea . . . 14 00 N 71 00 E
 Arāvali (Aravalli)
 Range . . . 25 00 N 73 30 E
 Badarināth
 Shrine . . . 30 44 N 79 29 E
 Baghelkhand,
historic region . . . 24 00 N 82 00 E
 Baitarani, *river* . . . 20 45 N 86 48 E
 Bālāghāt Range . . . 18 45 N 76 30 E
 Banās, *river* . . . 25 54 N 76 45 E
 Banihāl Pass . . . 33 31 N 75 13 E
 Barāk, *river* . . . 24 52 N 92 30 E
 Beās (Biās), *river* . . . 31 10 N 74 59 E
 Bengal, Bay of . . . 15 00 N 90 00 E
 Betwa, *river* . . . 25 55 N 80 12 E
 Bhima, *river* . . . 16 25 N 77 17 E
 Biās,
 see Beās
 Brāhmani, *river* . . . 20 39 N 86 46 E
 Brahmaputra,
river . . . 23 51 N 89 45 E
 Buckingham,
 see Kommamūr
 Cambay, see
 Gulf of Khambhāt
 Camorta Island . . . 08 08 N 93 30 E
 Car Nicobar
 Island . . . 09 10 N 92 47 E
 Cauvery,
 see Kāveri
 Cauvery,
 see Kāveri Delta
 Chambal, *river* . . . 26 29 N 79 15 E
 Chāng Chenmo
 Range . . . 34 10 N 79 10 E
 Chenāb, *river* . . . 33 00 N 74 30 E
 Chhattisgarh
 Plain . . . 21 00 N 82 15 E
 Chilika (Chilka)
 Lake . . . 19 46 N 85 20 E
 Colleroon,
 see Kollidam
 Comorin, Cape . . . 08 04 N 77 34 E
 Cora Divh Bank . . . 13 42 N 72 11 E
 Corbett National
 Park . . . 29 40 N 78 45 E
 Coromandel
 Coast . . . 13 30 N 80 30 E
 Dandakāranya,
region . . . 19 30 N 81 45 E
 Deccan Plateau . . . 19 00 N 79 00 E

Deo, *river* . . . 24 35 N 91 45 E
 Deosai
 Mountains . . . 35 20 N 75 12 E
 Dhebar Lake . . . 24 16 N 74 00 E
 Dibāng Valley,
region . . . 27 50 N 95 32 E
 Eastern Ghāts,
mountains . . . 14 00 N 78 50 E
 Eight Degree
 Channel . . . 08 00 N 73 00 E
 Ellora Caves . . . 20 01 N 75 10 E
 Erramala Hills . . . 15 30 N 78 10 E
 Gandak, *river* . . . 25 39 N 85 13 E
 Ganges (Ganga),
river . . . 23 22 N 90 32 E
 Ganges, Mouths
 of the . . . 22 00 N 89 00 E
 Gāro Hills . . . 25 30 N 90 30 E
 Gersoppa,
 see Jog Falls
 Gir National Park . . . 21 00 N 70 50 E
 Gir Range . . . 21 18 N 71 00 E
 Girnār Hills . . . 21 30 N 70 33 E
 Godarpura,
pilgrimage
centre . . . 22 15 N 76 09 E
 Godāvari, *river* . . . 17 00 N 81 45 E
 Godwin-Austen,
 Mount, see K?
 Golconda Fort . . . 17 24 N 78 20 E
 Gomati (Gumti),
river . . . 25 32 N 83 10 E
 Great Channel . . . 06 00 N 94 00 E
 Great Himalaya
 Range
 (The Great
 Himalayas) . . . 29 00 N 83 00 E
 Great Indian
 (Thar) Desert . . . 27 00 N 71 00 E
 Great Nicobar,
island . . . 07 00 N 93 50 E
 Gujarāt Plain . . . 22 51 N 71 30 E
 Gumti,
 see Gomati
 Guru Peak
 (Mount Ābu) . . . 24 36 N 72 42 E
 Harischandra
 Range . . . 19 15 N 74 05 E
 Hazārībāg
 Wildlife
 Sanctuary . . . 23 38 N 85 31 E
 Hirākūd Dam . . . 21 31 N 83 57 E
 Hirākūd
 Reservoir . . . 21 35 N 83 50 E
 Hugli (Hooghly),
river . . . 21 55 N 88 05 E
 Indian Ocean . . . 05 00 N 80 00 E
 Indira Gandhi
 Canal (Rājasthān
 Canal) . . . 31 12 N 75 00 E
 Indo-Gangetic
 Plain . . . 26 00 N 84 00 E
 Indus, *river* . . . 34 30 N 76 30 E
 Interview Island . . . 12 51 N 92 48 E
 Jaintia Hills . . . 25 18 N 92 15 E
 Jaldapāra Wildlife
 Sanctuary . . . 26 38 N 89 22 E
 Jashpur Pats,
uplands . . . 23 00 N 84 00 E
 Javādi Hills . . . 12 35 N 78 50 E
 Jawahar Tunnel . . . 33 31 N 75 13 E
 Jhelum, *river* . . . 31 12 N 72 08 E
 Jog (Gersoppa)
 Falls . . . 14 14 N 74 50 E
 Jumna,
 see Yamuna
 K?
 (Godwin-Austen,
 Mount) . . . 35 53 N 76 30 E
 Kachchh (Kutch),
 Gulf of . . . 22 36 N 69 30 E
 Kachchh (Kutch),
 Rann of,
marsh . . . 24 05 N 70 10 E

Kachchh Wild
 Ass Sanctuary . . . 23 30 N 71 18 E
 Kaimur Hills . . . 24 35 N 82 04 E
 Kāmet Peak . . . 30 55 N 79 35 E
 Kanara, *region* . . . 14 30 N 74 15 E
 Kanchenjunga
 Peak . . . 27 42 N 88 08 E
 Karakoram
 Range . . . 35 30 N 77 00 E
 Karnātaka
 Plateau . . . 14 00 N 76 00 E
 Kashmir, Vale of . . . 34 05 N 74 50 E
 Kāthiāwār
 Peninsula . . . 21 58 N 70 30 E
 Kavaratti Island . . . 10 33 N 72 38 E
 Kāveri (Cauvery),
river . . . 11 09 N 79 52 E
 Kāveri (Cauvery)
 Delta . . . 09 30 N 79 30 E
 Kāziranga
 National Park . . . 26 38 N 93 20 E
 Ken, *river* . . . 25 46 N 80 31 E
 Khambhāt
 (Cambay),
 Gulf of . . . 21 00 N 72 30 E
 Kistna,
 see Krishna
 Kollidam
 (Colleroon),
river . . . 11 23 N 79 46 E
 Kommamūr
 (Buckingham)
 Canal . . . 16 21 N 80 37 E
 Konkān, *region* . . . 18 05 N 73 25 E
 Krishna (Kistna),
river . . . 15 57 N 80 59 E
 Kutch, see
 Kachchh,
 Gulf of
 Kutch, see
 Kachchh,
 Rann of
 Ladakh Range . . . 34 00 N 78 00 E
 Lakshadweep,
archipelago . . . 11 00 N 72 30 E
 Landfall Island . . . 13 40 N 93 02 E
 Little Andaman,
island . . . 10 45 N 92 30 E
 Logtāk Lake . . . 24 33 N 93 50 E
 Lōni, *river* . . . 24 41 N 71 14 E
 Lushai,
 see Mizo Hills
 Machund,
 see Sileru
 Mahādeo Hills . . . 22 22 N 78 34 E
 Mahānadi, *river* . . . 20 19 N 86 45 E
 Mahānadi Delta . . . 20 30 N 86 30 E
 Mahendra Hill . . . 18 58 N 84 21 E
 Mahi, *river* . . . 22 16 N 72 58 E
 Maikala Range . . . 22 30 N 81 30 E
 Malabār Coast . . . 11 00 N 75 00 E
 Malaya Hill . . . 21 28 N 85 20 E
 Mālvā Plateau . . . 23 45 N 77 00 E
 Mānas Wildlife
 Sanctuary . . . 26 43 N 90 55 E
 Mannar, Gulf of . . . 08 30 N 79 00 E
 Maruthali
 Desert . . . 27 30 N 72 30 E
 Middle Andaman,
island . . . 12 30 N 92 50 E
 Mikir Hills . . . 26 10 N 93 30 E
 Minicoy (Minikoi)
 Island . . . 08 17 N 73 02 E
 Mizo (Lushai)
 Hills . . . 23 10 N 92 50 E
 Mount Ābu,
 see Guru Peak
 Mudumalai Wildlife
 Sanctuary . . . 11 37 N 76 30 E
 Nal Sarovar Bird
 Sanctuary . . . 22 48 N 72 08 E
 Nancowry Island . . . 07 59 N 93 32 E
 Nanda Devi
 Peak . . . 30 23 N 79 59 E

Nānga Parbat,
mountain . . . 35 15 N 74 36 E
 Narmada
 (Narbādā),
river . . . 21 38 N 72 36 E
 Nicobar Islands . . . 08 00 N 93 30 E
 Nizām Lake,
reservoir . . . 18 10 N 77 55 E
 North Andaman,
island . . . 13 15 N 92 55 E
 Palār, *river* . . . 12 28 N 80 10 E
 Pālghāt Gap . . . 10 46 N 76 39 E
 Palk Strait . . . 10 00 N 79 45 E
 Pālkonda
 Range . . . 14 05 N 79 05 E
 Patkai Range . . . 27 00 N 96 00 E
 Penneru
 (Penner), *river* . . . 14 35 N 80 10 E
 Periyār Lake . . . 09 32 N 77 12 E
 Periyār Wildlife
 Sanctuary . . . 09 30 N 77 15 E
 Pīr Panjāl Range . . . 33 37 N 74 32 E
 Ponnaiyār, *river* . . . 11 46 N 79 47 E
 Pulicat Lake,
lagoon . . . 13 40 N 80 10 E
 Purvachal,
highlands . . . 24 30 N 93 00 E
 Rājasthān Canal,
 see Indira Gandhi
 Canal
 Rāvi . . . 32 22 N 75 36 E
 Rihand, *river* . . . 24 33 N 82 59 E
 Ritchie's
 Archipelago . . . 12 14 N 93 10 E
 Rohilkhand
 Plains . . . 28 00 N 79 30 E
 Rutland Island . . . 11 25 N 92 40 E
 Saddle Peak . . . 13 09 N 93 01 E
 Sāmbhar Salt
 Lake . . . 26 58 N 75 05 E
 Saramati,
 Mount . . . 25 44 N 95 02 E
 Sariska Wildlife
 Sanctuary . . . 27 25 N 76 30 E
 Sātpura Range . . . 21 25 N 76 10 E
 Sesostri's Bank . . . 13 08 N 72 00 E
 Shivpuri National
 Park . . . 25 40 N 77 42 E
 Shyok, *river* . . . 35 13 N 75 53 E
 Siachen Glacier . . . 35 30 N 77 00 E
 Sileru (Machund),
river . . . 18 09 N 82 09 E
 Simlipal
 Sanctuary . . . 21 45 N 86 10 E
 Son, *river* . . . 25 42 N 84 52 E
 South Andaman,
island . . . 11 45 N 92 45 E
 Stanley
 Reservoir . . . 11 54 N 77 50 E
 Sundarbans,
region . . . 22 00 N 88 45 E
 Sutlej, *river* . . . 29 23 N 71 03 E
 Tadoba National
 Park . . . 20 18 N 79 45 E
 Tāpi (Tāpti),
river . . . 21 06 N 72 41 E
 Telangāna
 Plateau . . . 16 30 N 78 00 E
 Ten Degree
 Channel . . . 10 00 N 92 30 E
 Thar, see Great
 Indian Desert
 Tista, *river* . . . 25 23 N 89 43 E
 Tungabhadra,
river . . . 15 57 N 78 15 E
 Velikonda Range . . . 14 45 N 79 10 E
 Vindhya Range . . . 23 00 N 77 00 E
 Wainganga, *river* . . . 18 50 N 79 55 E
 Western Ghāts,
mountains . . . 14 00 N 75 00 E
 Wular Lake . . . 34 20 N 74 33 E
 Yamuna (Jumna),
river . . . 25 30 N 81 53 E
 Zoji Pass . . . 34 17 N 75 29 E

that portion of the country lying between the Arabian Sea and the Bay of Bengal—and includes a substantial area to the north of the Vindhya Range, which has popularly been regarded as the divide between Hindustan (northern India) and the Deccan (Sanskrit: *dakṣiṇa*, “south”).

Having once constituted a segment of the ancient continent of Gondwanaland, this land is the oldest and most stable in India. The plateau is mainly between 1,000 and

2,500 feet above sea level, and its general slope descends toward the east. A number of the hill ranges of the Deccan have been eroded and rejuvenated several times, and only their remaining summits testify to their geologic past. The main peninsular block is composed of gneiss, granite-gneiss, schists, and granites, as well as of more recent basaltic lava flows.

The Western Ghāts. The Western Ghāts, also called the

Principal
peaks

Sahyādrī, are a north-south chain of mountains or hills that mark the western edge of the Deccan Plateau. They rise abruptly from the coastal plain as an escarpment of variable height, but their eastern slopes are much more gentle. The Western Ghāts contain a series of residual plateaus and peaks separated by saddles and passes. One of the highest elevations in the northern half, Mahābaleshwar (4,718 feet), is a laterite plateau. The chain attains greater heights in the south, where the mountains terminate in several uplifted blocks bordered by steep slopes on all sides. These include the Nilgiri Hills, with the highest peak, Doda Betta (8,651 feet); and the Anaimalai, Palni, and Cardamom hills, all three of which radiate from the highest peak in the Western Ghāts, Anai Peak (Anai Mudi, 8,842 feet). The Western Ghāts receive heavy rainfall, and several major rivers—most notably the Godāvari, Krishna (Kistna), and Kāveri (Cauvery)—have their headwaters there.

The Eastern Ghāts. The Eastern Ghāts are a series of discontinuous low ranges running generally northeast-southwest parallel to the coast of the Bay of Bengal. The largest single sector—the remnant of an old mountain range that eroded and subsequently rejuvenated—is found in the Daṇḍakāranya region between the Mahānadi and Godāvari rivers. This narrow range has a central ridge, the highest peak of which is Arma Konda (5,512 feet) in Andhra Pradesh. The hills become subdued farther southwest, where they are traversed by the Godāvari River through a gorge 40 miles long. Still farther southwest, beyond the Krishna River, the Eastern Ghāts appear as a series of low ranges, including the Erramala, Nallamala, Velikonda, and Pālkonda. Southwest of the city of Madras, the Eastern Ghāts continue as the Javādi and Shevaroy hills, beyond which they merge with the Western Ghāts.

Inland regions. The northernmost portion of the Deccan Plateau may be termed the Peninsular Foreland. This large, ill-defined area lies between the peninsula proper to the south (roughly marked off by the Vindhya Range) and the Indo-Gangetic Plain and the Great Indian Desert (beyond the Arāvali Range) to the north.

The Arāvali Range runs southwest-northeast for more than 450 miles from a highland node near Ahmadābād, Gujarāt, northeast to Delhi. These mountains are composed of ancient rocks and are divided into several parts, in one of which lies Sāmbhar Salt Lake. Their highest summit is Guru Sikhar Peak (5,650 feet) on Mount Abu. The Arāvalis form a divide between the west-flowing streams, draining into the desert or the Rann of Kachchh (Kutch), and the Chambal and its tributaries within the Ganges catchment area.

The
Vindhya
Range

Between the Arāvalis and the Vindhya Range lies the fertile, basaltic Mālwa Plateau. This plateau gradually rises southward toward the so-called Vindhya Range, which is actually a south-facing escarpment deeply eroded by short streams flowing into the valley of the Narmada River below. The escarpment appears from the south as an imposing range of mountains. The Narmada valley forms the western and principal portion of the Narmada-Son trough, a continuous depression running southwest-northeast, mostly at the base of the Vindhya Range, for about 750 miles.

To the east of the Peninsular Foreland lies the mineral-rich Chota Nāgpur Plateau (mostly within eastern Madhya Pradesh, southern Bihār, and interior Orissa). This is a region of numerous scarps separating areas of rolling terrain. To the southwest of the Chota Nāgpur Plateau is the Chhattisgarh Plain, centred on the upper course of the Mahānadi River.

Most of the inland area south of the Peninsular Foreland and the Chota Nāgpur Plateau is characterized by rolling terrain and generally low relief, within which a number of hill ranges, some of them mesalike formations, run in various directions. Occupying much of the northwestern portion of the peninsula (most of Mahārāshtra and some bordering areas of Madhya Pradesh, Andhra Pradesh, and Karnāṭaka) is the Deccan Lava Plateau. The mesalike features are especially characteristic of this large, fertile area, which is cut across by the Sātpura, Ajanta, and Bā-lāghāt ranges.

Coastal areas. Most of the coast of India flanks the Eastern and Western Ghāts. In the northwest, however, much of coastal Gujarāt lies to the northwest of the Western Ghāts, extending around the Gulf of Khambhāt (Cambay) and into the salt marshes of the Kāthiāwār and Kachchh (Kutch) peninsulas. These tidal marshes include the Great Rann of Kachchh along the border with Pakistan and the Little Rann of Kachchh between the two peninsulas. Because the level of these marshes rises markedly during the rainy season, the Kachchh Peninsula normally becomes an island for several months each year.

The area farther south, especially the stretch from Damān to Goa (known as the Konkan Coast), is indented with rias (flooded valleys) extending inland into narrow riverine plains. These plains are dominated by low-level lateritic plateaus and are marked by alternating headlands and bays, the latter often sheltering crescent-shaped beaches. From Goa south to Cape Comorin (the southernmost tip of India) is the Malabār coastal plain, which was formed by the deposition of sediment along the shoreline. This plain, varying between 15 and 60 miles wide, is characterized by lagoons and brackish, navigable backwater channels.

The predominantly deltaic eastern coastal plain is an area of deep sedimentation. Over most of its length it is considerably wider than the plain on the western coast. The major deltas, from south to north, are of the Kāveri, the Krishna-Godāvari, the Mahānadi, and the Ganges-Brahmaputra rivers. The last of these is some 190 miles wide, but only about one-third of it lies within India. Traversed by innumerable distributaries, the Ganges delta is an ill-drained region, and the western part within Indian territory has become moribund because of shifts in the channels of the Ganges. Tidal incursions extend far inland, and a small rise in sea level would submerge Calcutta, located about 95 miles from the head of the Bay of Bengal. The eastern coastal plain includes several lagoons, the largest of which, Pulicat and Chilika (Chilka) lakes, have resulted from the deposition of sediment along the shoreline.

Islands. Several archipelagoes in the Indian Ocean are politically a part of India. The union territory of Lakshadweep is a group of small coral atolls in the Arabian Sea to the west of the Malabār Coast. Far off the eastern coast, separating the Bay of Bengal and the Andaman Sea, lie the considerably larger and hillier chains of the Andaman and Nicobar Islands. Also a union territory, the Andamans are closer to Myanmar and the Nicobars closer to Indonesia than to the Indian mainland.

DRAINAGE

More than 70 percent of India's territory drains into the Bay of Bengal via the Ganges-Brahmaputra river system and a number of large and small peninsular rivers. Areas draining into the Arabian Sea, accounting for about 20 percent of the total, lie partially within the Indus drainage basin (in northwestern India) and partially within a completely separate set of drainage basins well to the south (in Gujarāt, western Madhya Pradesh, northern Mahārāshtra, and areas west of the Western Ghāts). Most of the remaining area, less than 10 percent of the total, lies in regions of interior drainage, notably in the Great Indian Desert of Rājasthān (another is in the Aksai Chin, a barren plateau in Jammu and Kashmir controlled by China but claimed by India). Finally, less than 1 percent of India's area, along the border with Myanmar, drains into the Andaman Sea via tributaries of the Irrawaddy.

Drainage into the Bay of Bengal. *The Ganges-Brahmaputra river system.* The Ganges and Brahmaputra rivers, together with their tributaries, drain about one-third of India. The Ganges (Ganga), considered sacred by the country's Hindu population, is 1,560 miles long. Although its deltaic portion lies mostly in Bangladesh, the course of the Ganges within India is longer than that of any of the country's other rivers. Its source is at the foot of a Himalayan glacier at an elevation of some 22,100 feet.

The Ganges enters the Indo-Gangetic Plain at Haridwār (Hardwār). From Haridwār to Calcutta it is joined by numerous tributaries. Proceeding from west to east, the Ghāghara, Gandak, and Kosi rivers, all of which emerge

The
Konkan
and
Malabār
coasts

from the Himalayas, join the Ganges from the north, while the Yamuna and Son are the two most important tributaries from the south. The Yamuna, which also has a Himalayan source (the Yamunotri glacier) and flows roughly parallel to the Ganges throughout its length, receives the flow of several important rivers, including the Chambal, Betwa, and Ken, which originate in India's Peninsular Foreland. Of the northern tributaries of the Ganges, the Kosi, India's most destructive river (referred to as the "Sorrow of Bihār"), warrants special mention. Because of its large catchment in the Himalayas of Nepal and its gentle gradient once it reaches the plain, the Kosi is unable to discharge the large volume of water it carries at its peak flows, resulting in floods and frequent changes of course.

The seasonal flows of the Ganges and other rivers fed by meltwaters from the Himalayas vary considerably less than those of the exclusively rain-fed peninsular rivers. This consistency of flow enhances their suitability for irrigation and—where the diversion of water for irrigation is not excessive—for navigation as well.

Although the total length of the Brahmaputra (about 1,800 miles) exceeds that of the Ganges, only 450 miles of its course lies within India. The Brahmaputra, like the Indus, has its source in a trans-Himalayan area about 60 miles southeast of Mānasarowar (Ma-fa-mu; Mapam) Lake in the Tibet Autonomous Region of China. The river runs east across Tibet for more than half its total length before cutting into India at the northern border of Arunāchal Pradesh. It then flows south and west through the state of Assam and south into Bangladesh, where it empties into the vast Ganges-Brahmaputra delta. The narrow Brahmaputra basin in Assam is prone to flooding because of its large catchment areas, parts of which experience exceedingly heavy rainfall.

Peninsular rivers. The peninsular drainage into the Bay of Bengal includes a number of major rivers, most notably the Mahānadi, Godāvari, Krishna, and Kāveri. Except for the Mahānadi, the headwaters of these rivers are in the high-rainfall zones of the Western Ghāts, and they traverse the entire width of the plateau (generally from northwest to southeast) before reaching the Bay of Bengal. The Mahānadi has its source at the southern edge of the Chhattisgarh Plain.

India's peninsular rivers have relatively steep gradients and thus rarely give rise to floods of the type that occur in the plains of northern India, despite considerable variations in flow from the dry to wet seasons. The lower courses of a number of these rivers are marked by rapids and gorges, usually as they cross the Eastern Ghāts. Because of their steep gradients, rocky underlying terrain, and variable flow regimes, the peninsular rivers are not navigable.

Drainage into the Arabian Sea. A substantial part of northwestern India is included in the Indus drainage basin, which India shares with China, Afghanistan, and Pakistan. The Indus and its longest tributary, the Sutlej, both rise in the trans-Himalayan region of Tibet. The Indus initially flows to the northwest between towering mountain ranges into Jammu and Kashmir. It then travels generally to the southwest through Pakistan until it reaches the Arabian Sea. The Sutlej also flows northwest from its source but enters India farther south, at the border of Himāchal Pradesh. From there it travels west into the Indian state of Punjab and eventually enters Pakistan, where it flows into the Indus.

Between the Indus and the Sutlej lie several other major Indus tributaries. The Jhelum, the northernmost of these rivers, flows out of the Pir Panjāl Range into the Vale of Kashmir and thence via Bāramūla Gorge into Pakistani-held Jammu and Kashmir. The three others—the Chenāb, Rāvi, and Beās—originate in the Himalayas within the Indian state of Himāchal Pradesh. The Chenāb travels across Jammu and Kashmir before flowing into Pakistan; the Rāvi forms a part of the southern boundary of Jammu and Kashmir and thereafter the Indo-Pakistani border prior to entering Pakistan; and the Beās flows entirely within India, joining the Sutlej in the Indian state of Punjab. The area through which the five Indus tributaries

flow has traditionally been called the Punjab (Persian: *panj*, "five," and *āb*, "water"). This area currently falls in the Indian state of Punjab (containing the Sutlej and the Beās) and the Pakistani province of Punjab. Despite low rainfall in the Punjab plains, the moderately high runoff from the Himalayas ensures a year-round flow in the Indus and its tributaries, which are extensively utilized for canal irrigation.

Farther to the south, another notable river flowing into the Arabian Sea is the Lūni of southern Rājasthān, which in most years has carried enough water to reach the Great Rann of Kachchh in western Gujarāt. Also flowing through Gujarāt is the Mahi, as well as the two most important west-flowing rivers of peninsular India—the Narmada (catchment area 38,200 square miles) and Tāpi (Tāpti; 25,000 square miles). The Narmada and its basin are undergoing large-scale, multipurpose development. Most of the other peninsular rivers draining into the Arabian Sea have short courses, and those that flow westward from headwaters in the Western Ghāts have seasonally torrential flows.

Lakes and inland drainage. For such a large country, India has few natural lakes. Most of the lakes in the Himalayas were formed when glaciers either dug out a basin or dammed an area with earth and rocks. Wular Lake in Jammu and Kashmir, by contrast, is the result of a tectonic depression. Although its area fluctuates, Wular Lake is the largest natural freshwater lake in India.

Inland drainage in India is mainly ephemeral and almost entirely in the arid and semiarid part of northwestern India, particularly in the Great Indian Desert of Rājasthān, where there are several ephemeral salt lakes, most prominently Sāmbhar (the largest lake in India). These lakes are fed by short, intermittent streams, which experience flash floods during occasional intense rains and become dry and lose their identity once the rains are over. The water in the lakes also evaporates and subsequently leaves a layer of white saline soils, from which a considerable amount of salt is commercially produced. Many of India's largest lakes are reservoirs formed by damming rivers.

SOILS

Although India is endowed with a wide range of soils, at least two-thirds of the total land area consists of one of three general soil types: alluvial, red-to-yellow (including laterite), and black (regur). Also significant are the desert soils of Rājasthān, saline soils (in Gujarāt, southern Rājasthān, and some coastal areas), and the mountain soils of the Himalayas. The type of soil is determined by numerous factors, including climate, relief, altitude, and drainage, as well as by the composition of the underlying rock material.

Alluvial soils. Alluvial soils are widespread. They occur throughout the Indo-Gangetic Plain and along the lower courses of virtually all the country's major rivers (especially the deltas along the east coast). The nondeltaic plains along India's coasts are also marked by narrow ribbons of alluvium.

New alluvium found on much of the Indo-Gangetic floodplains, which is called *khādar*, is extremely fertile and uniform in texture; conversely, the old alluvium on the slightly elevated terraces, termed *bhāngar*, carries patches of alkaline efflorescences, called *usar*, rendering some areas infertile. In the Ganges basin, sandy aquifers holding an enormous reserve of groundwater ensure irrigation and help make the plain the most agriculturally productive region of the country.

Red-to-yellow soils. These soils are encountered over extensive nonalluvial tracts of peninsular India. They develop in areas in which rainfall leaches soluble minerals out of the ground and results in a loss of chemically basic constituents; a corresponding proportional increase in oxidized iron imparts a reddish hue to many such soils. In wetter areas, these soils are often categorized as lateritic (after *later*, the Latin term for brick). The heavily leached red-to-yellow soils are concentrated in the high-rainfall areas of the Western Ghāts, the western Kāthiāwār Peninsula, eastern Rājasthān, the Eastern Ghāts, the Chota Nāgpur Plateau, and other upland tracts of northeastern India. Less-leached red-to-yellow soils occur in areas of

Khādar, bhāngar, and usar

The
Brahmapu-
tra River

The
Punjab

low rainfall immediately east of the Western Ghāts in the dry interior of the Deccan Plateau. Red-to-yellow soils are usually infertile, but this problem is partly ameliorated in forested tracts, where humus concentration and the recycling of nutrients help restore fertility in the topsoil.

Black soils. Black soils, also called regur or black-cotton soil, are spread mostly across the Deccan Lava Plateau, the Mālwa Plateau, and interior Gujarāt, where there is both moderate rainfall and underlying basaltic rock. Because of their high clay content, black soils develop wide cracks during the dry season, but their iron-rich granular structure makes them resistant to wind and water erosion. They are also highly moisture-retentive, thus responding well to irrigation. Much of the country's cotton is grown in black soils.

CLIMATE

India provides the world's most pronounced example of a monsoon climate. The wet and dry seasons of the monsoon system, along with the annual temperature fluctuations, produce three general climatic periods over much of the country: (1) hot, wet weather from about mid-June to the end of September; (2) cool, dry weather from early October to February; and (3) hot, dry weather (though normally with high atmospheric humidity) from about March to mid-June. The actual duration of these periods may vary by several weeks, not only from one part of India to another but also from year to year. Regional differences, which are often considerable, result from a number of internal factors—including elevation, type of relief, and proximity to bodies of water.

The monsoons. A monsoon system is characterized by a reversal of prevailing wind directions and by alternating wet and dry seasons. In India the wet season, called the southwest monsoon, occurs from about mid-June to early October, when winds from the Indian Ocean carry moisture-laden air across the subcontinent, causing heavy rainfall and often considerable flooding. Usually about three-fourths of the country's total annual precipitation falls during these months. During the driest months (called the retreating monsoon), especially from November through February, this pattern is reversed, as dry air from the Asian interior moves across India toward the ocean. October and March through May, by contrast, are typically periods of desultory breezes with no strong prevailing patterns.

The southwest monsoon. Although the winds of the rainy season are called the southwest monsoon, they actually follow two generally distinct branches, one initially flowing eastward from the Arabian Sea and the other northward from the Bay of Bengal. The former begins by lashing the west coast of peninsular India and rising over the adjacent Western Ghāts. When crossing these mountains, the air cools (thus losing its moisture-bearing capacity) and deposits rain copiously on the windward side of that highland barrier. Annual precipitation in parts of this region exceeds 100 inches (2,540 millimetres) and is as high as 245 inches at Mahābaleshwar on the crest of the Western Ghāts. Conversely, as the winds descend on the leeward side of the Western Ghāts, the air's moisture-bearing capacity increases and the resultant rain shadow makes for a belt of semiarid terrain, much of it with less than 25 inches of rain per year.

The Bay of Bengal branch of the monsoon sweeps across eastern India and Bangladesh and, in several areas, gives rise to rainfall in much the same way as occurs along the Western Ghāts. The effect is particularly pronounced in the Shillong (Meghālaya) Plateau, where at Cherrapunji the average annual rainfall is 450 inches, one of the heaviest in the world. The Brahmaputra valley to the north also experiences a rain-shadow effect; the problem is mitigated, however, by the adjacent Himalayas, which cause the winds to rise again, thereby establishing a parallel belt of heavy rainfall. Blocked by the Himalayas, the Bay of Bengal branch of the monsoon is diverted westward up the Gangetic Plain, reaching Punjab only in the first week of July.

In the Gangetic Plain the two branches merge into one. By the time they reach the Punjab their moisture is largely spent. The gradual reduction in the amount of rainfall to-

ward the west is evidenced by the decline from 64 inches at Calcutta to 26 inches at Delhi and to desert conditions still farther west. Over the northeastern portion of peninsular India, the two branches also intermittently collide, creating weak weather fronts with sufficient rainfall to produce patches of fairly high precipitation (more than 60 inches) in the Chota Nāgpur Plateau.

Rainfall during the retreating monsoon. Much of India experiences infrequent and relatively feeble precipitation during the retreating monsoon. An exception to this rule occurs along the southeastern coast of India and for some distance inland. When the retreating monsoon blows from the northeast across the Bay of Bengal, it picks up a significant amount of moisture, which is subsequently released after moving back onto the peninsula. Thus, from October to December the coast of Tamil Nādu receives at least half of its roughly 40 inches of annual precipitation. This rainy extension of the generally dry retreating monsoon is called the northeast, or winter, monsoon.

Another type of winter rainfall occurs in northern India, which receives weak cyclonic storms originating in the Mediterranean basin. In the Himalayas these storms bring weeks of drizzling rain and cloudiness and are followed by waves of cold temperatures and snowfall. The state of Jammu and Kashmir in particular receives much of its precipitation from these storms.

Tropical cyclones. Fierce tropical cyclones occur in India during what may be called the premonsoon, early monsoon, or postmonsoon periods. Originating in both the Bay of Bengal and the Arabian Sea, tropical cyclones often attain velocities of more than 100 miles per hour and are notorious for causing intense rain and tidal waves as they cross the coast of India. The Andhra, Orissa, and West Bengal coasts are especially susceptible to such storms.

Importance to agriculture. Monsoons play a pivotal role in Indian agriculture, and the substantial year-to-year variability of rainfall, in both timing and quantity, introduces much uncertainty in the country's crop yield. Good years bring bumper crops, but years of poor rain may result in total crop failure over large areas, especially where irrigation is lacking. Large-scale flooding can also cause damage to crops. As a general rule, the higher an area's average annual precipitation, the more dependable is its rainfall, but few areas of India have an average precipitation high enough to be free from the possibility of occasional drought and consequent crop failure.

Temperatures. Temperatures in India generally are the warmest in May or June, just prior to the cooling downpours of the southwest monsoon. A secondary maximum often occurs in September or October when precipitation wanes. The temperature range tends to be significantly less along the coastal plains than in interior locations. The range also tends to increase with latitude. Near India's southern extremity the seasonal range is no more than a few degrees; for example, at Trivandrum, in Kerala, there is an average fluctuation of just 4.3° F (2.4° C) around an annual mean temperature of 81° F (27° C). In the northwest, however, the range is much greater, as, for example, at Ambāla, in Haryāna, where the temperature fluctuates from 56° F (13° C) in January to 92° F (33° C) in June. Temperatures are also moderated wherever elevations are significant, and many Himalayan resort towns, called hill stations (a legacy of British colonial rule), afford welcome relief from India's sometimes oppressive heat.

PLANT AND ANIMAL LIFE

Plant life. The flora of India largely reflect the country's distribution of rainfall. Tropical broad-leaved evergreen and mixed, partially evergreen forests grow in areas with high precipitation; in successively less rainy areas are found moist and dry deciduous forests, scrub jungle, grassland, and desert vegetation. Coniferous forests are confined to the Himalayas. There are about 17,000 species of flowering plants in the country. The subcontinent's physical isolation, caused by its relief and climatic barriers, has resulted in a considerable number of endemic flora.

About 185 million acres (75 million hectares) are officially classified as forest in India; the actual amount of forested area, however, is lower. Tropical evergreen and

The two branches of the southwest monsoon

Effect of latitude on temperature

mixed evergreen-deciduous forests generally occupy areas with more than 80 inches of rainfall per year, mainly in upper Assam, the Western Ghâts (especially in Kerala), parts of Orissa, and the Andaman and Nicobar Islands. Common trees in these tall, multistoried forests include species of *Mesua*, *Toona ciliata*, *Hopea*, and *Eugenia*, as well as gurjun (*Dipterocarpus turbinatus*), which grows to over 165 feet on the Andaman Islands and in Assam. The mixed evergreen-deciduous forests of Kerala and the Bengal Himalayas have a large variety of commercially valuable hardwood trees, of which *Lagerstroemia lanceolata*, East Indian, or Malabar, kino (*Pterocarpus marsupium*), and rosewood (*Dalbergia latifolia*) are well known.

Tropical-moist deciduous forests generally occur in areas with 60 to 80 inches of rainfall, such as the northern part of the Eastern Ghâts, east-central India, and western Karnātaka. Dry deciduous forests, which grow in places receiving less than 60 inches of precipitation, characterize the subhumid and semiarid regions of Gujarāt, Madhya Pradesh, eastern Rājasthān, central Andhra Pradesh, and western Tamil Nādu. Teak, sal, axle-wood, *tendu*, *ain*, and *Adina cardifolia* are some of the major deciduous species.

Tropical thorn forests occupy areas in various parts of the country, though mainly in the northern Gangetic Plain and southern peninsular India. These forests generally grow in areas with less than 24 inches of rain but are also found in more humid areas, where deciduous forests have been degraded because of unregulated grazing, felling, and slash-and-burn agriculture. In such areas, such xerophytic (drought-tolerant) trees as species of *Acacia* (babul and catechu) and *Butea monosperma* predominate.

The important commercial species include teak and sal. Teak, the foremost timber species, is largely confined to the peninsula. During the period of British rule, it was used extensively in ship-building, and certain forests were therefore reserved as teak plantations. Sal is confined to the lower Himalayas, Uttar Pradesh, Bihār, Assam, and Madhya Pradesh. Other species with commercial uses are sandalwood (*Santalum album*), the fragrant wood of which is perhaps the most precious in the world, and rosewood, an evergreen used for carving and furniture.

Many other species are noteworthy, some because of special ecological niches they occupy. Deltaic areas, for example, are fringed with mangrove forests, in which the dominant species, sundri, is characterized by respiratory roots that emerge from the tidal water. Conspicuous features of the tropical landscape are the palms, which are represented in India by some 100 species. Coconut and betel nut (the fruit of which is chewed) are cultivated mainly in coastal Karnātaka and Kerala. Among the common, majestic-looking trees found throughout much of India are the mango—a major source of fruit—and two revered *Ficus* species, the pipal and the banyan. Many types of bamboo (members of the grass family) grow over much of the country, with a concentration in the rainy areas.

Vegetation in the Himalayas can be generally divided into a number of altitude zones. Mixed evergreen-deciduous forests dominate the foothill areas up to a height of 5,000 feet. Beyond this level subtropical pine forests make their appearance, followed by the Himalayan moist-temperate forests of oak, fir, deodar, and spruce. The highest tree zone, consisting of Alpine shrubs, is found to a height of about 15,000 feet. Rhododendrons are common at 12,000 feet, above which occasional junipers and Alpine meadows are encountered. Zones overlap considerably, and there are wide transitional bands.

Animal life. India forms an important segment of what is known as the Oriental, or Indian zoogeographic province, which extends eastward from India to include mainland and much of insular Southeast Asia. Its fauna are numerous and quite diverse.

Mammals. Almost all orders of mammals are encountered in India. Among the primates are various monkeys, including the rhesus monkey and the Hanuman langur, both of which are found in forested areas and near human settlements. Lion-tailed monkeys, denizens of the Western Ghâts, are becoming rare because of poaching.

The country's carnivora include cats, dogs, foxes, jackals, and mongooses. There are also four species of large cats:



A tiger on a road near Ranthambhor, eastern Rājasthān.

G. Ziesler—Bruce Coleman Ltd.

the leopard, ounce (or snow leopard), Bengal tiger (the largest of India's carnivores), and the lion, now confined to the Gir National Park in the Kāthiawār Peninsula of Gujarāt. Tigers are found in the forests of the Tarai region of Uttar Pradesh, Bihār, and Assam; the Ganges delta in West Bengal; the Eastern Ghâts; Madhya Pradesh; and eastern Rājasthān. Once on the verge of extinction, tigers have increased to several thousand, thanks largely to Project Tiger, which has established reserves in various parts of the country.

Other Indian mammals include wild herds of Indian elephants (*Elephas maximus*), which can be observed in several areas, particularly in such renowned national parks as Periyār Lake in Kerala and Bāndipur in Karnātaka. The Indian rhinoceros is protected at Kāziranga National Park and Mānas Wildlife Sanctuary in Assam. The country also has several species of deer. Oxen, buffalo, horses, dromedary camels, sheep, goats, and pigs are common domesticated animals. The cattle breed Brahman, or zebu (*Bos indicus*), a species of ox, is an important draft animal, while the wild Indian bison (*Bos gaurus*) inhabits the peninsular forests.

Birds. India has more than 1,200 species of birds and perhaps 2,000 subspecies, although some migratory species are found in the country only during the winter. Herons, storks, ibises, and flamingos are well represented, and many of these birds frequent the Keoladeo Ghana National Park in Rājasthān. The Rann of Kachchh forms the nesting ground for one of the world's largest breeding colonies of flamingos.

Birds of prey include hawks, vultures, and eagles. Vultures are ubiquitous consumers of carrion. Game birds are represented by pheasants, jungle fowl, partridges, and quails. Peafowls are also common, especially in Gujarāt and Rājasthān, where they are kept as pets. The resplendent feathered peacock has been adopted as India's national bird.

Other notable birds in India include the Indian crane, commonly known as the *sāras*; a large, gray bird with crimson legs, the *sāras* stands as tall as a human. Bustards inhabit India's grasslands. The great Indian bustard (*Choriotis nigricaps*), now confined to central and western India, is an endangered species protected by legislation. Sand grouse, pigeons, doves, parakeets, and cuckoos are found throughout the country. The mainly nonmigratory kingfisher, living close to water bodies, is considered sacred

Commercial tree species

Monkeys

in many areas. Hornbills, barbets, and woodpeckers also are common, as are larks, crows, babblers, and thrushes.

Crocodiles

Reptiles, fish, and insects. Reptiles are well represented in India. Crocodiles inhabit the country's rivers, swamps, and lakes. The estuarine crocodile (*Crocodilus porosus*), attaining a maximum length of 30 feet, usually lives on the fish, birds, and crabs of muddy deltaic regions. The long-snouted gaviol, or gharial (*Gavialis gangeticus*), a species similar to the crocodile, is found in a number of large rivers, including the Ganges and Brahmaputra and their tributaries. Of the nearly 400 species of snakes, one-fifth are poisonous. Kraits and cobras are particularly widespread poisonous species. King cobras often grow to at least 12 feet long. The Indian python frequents marshy areas and grasslands. Lizards also are widespread, and turtles are found throughout India, though especially along the eastern coast.

Of some 2,000 species of fish in India, about one-fifth live in fresh water. Common edible freshwater fish include catfish and several members of the carp family, notably the mahseer, which grows up to 6 feet and 200 pounds (90 kilograms). Sharks are found in India's coastal waters and sometimes travel inland through major estuaries. Commercially valuable marine species include shrimp, prawn, crabs, lobsters, pearl oysters, and conch.

Among the commercially valuable insects are silkworms, bees, and the lac insect (*Laccifer lacca*). The latter secretes a sticky, resinous material called lac, from which shellac and a red dye are produced. Many other insects, such as various species of mosquito, are vectors for disease (e.g., malaria and yellow fever) or for human parasites (e.g., certain flatworms and nematodes).

Conservation. The movement for the protection of forests and wildlife is strong in India. Legislative measures have declared certain animals protected species, and areas with particularly rich floral diversity have been adopted as biosphere reserves. Virtually no forests are left in private hands. Projects likely to cause ecological damage must be cleared by the Ministry of the Environment and Forests. Despite such measures, the reduced acreage of forests, savanna, and grasslands provides little hope that India's population of animals can be restored to what it was at the end of the 19th century. (K.R.D./J.E.Sc.)

The people

ETHNIC COMPOSITION

While humans have probably occupied portions of India for several hundred thousand years, the racial stocks of the earliest inhabitants, as well as the time and place of their arrival, are not known with certainty. There is considerable debate, for example, over the racial affinities of those who lived in the great urban culture of the Indus Civilization (c. 2600–2000 bc). It was long held that a number of groups, most notably the so-called Aryans, came in successive waves during the decline of this civilization, but more recently even that theory has been questioned because of a lack of convincing archaeological evidence. What is generally accepted, however, is that an early "Aryan" civilization—dominated by peoples with linguistic affinities to peoples in Iran and Europe—came to occupy northwestern and then north-central India over a period from roughly 2000 to 1500 bc and subsequently spread southward and eastward at the expense of other indigenous groups. This process was attended by considerable miscegenation, despite caste restrictions; and arguably it is still continuing, although not without considerable opposition from peoples whose own distinctive civilizations had also evolved in early historical times. Among the documented invasions that added significantly to the Indian ethnic mix are those of Persians, Scythians, Arabs, Mongols, Turks, and Afghans. The last and politically most successful of the great invasions—namely, that from Europe—vastly altered Indian culture but had relatively little impact on India's ethnic composition.

The population of present-day India thus includes a number of ethnic groups—descended from several different ancient racial stocks—that collectively have come to be called the Indian, or Indic, geographic race. This des-

ignation is based primarily on biochemical means (e.g., blood types) rather than on external physical attributes (skin colour among Indians, for example, ranges from fair to very dark). Within the larger whole, groups maintaining a certain degree of breeding isolation (e.g., the Dravidian-speaking peoples) constitute local races and microraces.

Broadly speaking, the peoples of north-central and northwestern India tend to have affinities with European and Indo-European peoples from southern Europe, the Caucasus region, and Southwest and Central Asia. In northeastern India, West Bengal (to a lesser degree), the higher reaches of the western Himalayan region, and Ladakh (in the state of Jammu and Kashmir), much of the population more closely resembles Asiatic peoples to the north and east—notably Tibetans and Burmans. Many tribal groups in the Chota Nāgpur Plateau (northeastern peninsular India), whom ethnographers formerly described as Australoid, have affinities to such groups as the Mon, who have long been established in mainland Southeast Asia. Much less numerous are southern groups who appear to be descended, at least in part, either from peoples of East African origin (some of whom settled in historical times on India's western coast) or from a population commonly designated as Negrito, now represented by numerous small and widely dispersed peoples from the Andaman Islands, the Philippines, New Guinea, and other areas.

LINGUISTIC COMPOSITION

Two language families, the Indo-European (also called Indo-Aryan) and the Dravidian, identified somewhat simplistically with the Aryan and Dravidian ethnic groups, account for nearly all of the total population of India. Several other language families, principally the Austro-Asiatic and Sino-Tibetan, spoken mainly by tribal peoples of northeastern India, account for the remainder.

Of the originally 14 (subsequently 18) languages recognized as official in the Indian constitution, 13 are Indo-European (Assamese, Bengali, Gujarātī, Hindi, Kashmiri, Kōṅkaṇī, Marāṭhī, Nepālī, Oṛiyā, Punjābī, Sanskrit, Sindhī, and Ūrdū), 4 are Dravidian (Kannaḍa, Malayālam, Tamil, and Telugu), and 1 is Sino-Tibetan (Manipuri). These languages have become increasingly standardized since independence because of improved education and the influence of mass media.

Indo-European languages. The numerous languages of the Indo-European family all derive from Sanskrit, the language of the ancient Aryans. Although for all practical purposes a dead language, Sanskrit is still important in Hindu rituals and for classical scholarship.

Indo-European languages are collectively spoken as mother tongues by nearly three-fourths of all Indians. By far the most widely spoken is Hindi, the country's official language, with more than 300 million speakers. Hindi has a large number of dialects, generally divided into Eastern and Western Hindi, some of which are mutually unintelligible. Apart from its nationally preeminent position, Hindi has been adopted as the official language by each of a large contiguous bloc of northern states—Bihār, Haryāna, Himāchal Pradesh, Madhya Pradesh, Rājasthān, and Uttar Pradesh—as well as by the union territory of Delhi.

Other Indo-European languages with official status in individual states are Assamese, in Assam; Bengali, in West Bengal and Tripura; Gujarātī, in Gujarāt; Kashmiri, in Jammu and Kashmir; Kōṅkaṇī, in Goa; Marāṭhī, in Mahārāshtra; Nepālī in portions of northern West Bengal, Oṛiyā, in Orissa; and Punjābī, in Punjab. Ūrdū, the official language of Pakistan, is also the language of most Muslims of northern and peninsular India as far south as Madras. Sindhī is spoken mainly by inhabitants of the Kachchh district of Gujarāt, which borders the Pakistani province of Sind, as well as in other areas by immigrants (and their descendants) who fled Sind after the 1947 partition.

Dravidian and other languages. Dravidian languages are spoken by about one-fourth of all Indians, overwhelmingly in southern India. Dravidian speakers among tribal peoples (e.g., Gōṇḍ) in central India, in eastern Bihār, and in the Brahui-speaking region of the distant Pakistani province of Balochistān suggest a much wider distribution in ancient times. The four constitutionally recognized

Officially
recognized
languages

The
Aryans