

REGIONAL GEOGRAPHY OF THE WORLD 18BGE53C

Unit – 1 ASIA

PHYSIOGRAPHY:

Asia, the world's largest and most diverse continent. It occupies the eastern four-fifths of the giant Eurasian landmass. Asia is more a geographic term than a homogeneous continent, and the use of the term to describe such a vast area always carries the potential of obscuring the enormous diversity among the regions it encompasses. Asia has both the highest and the lowest points on the surface of Earth, has the longest coastline of any continent, is subject overall to the world's widest climatic extremes, and, consequently, produces the most varied forms of vegetation and animal life on Earth. In addition, the peoples of Asia have established the broadest variety of human adaptation found on any of the continents.

The name Asia is ancient, and its origin has been variously explained. The Greeks used it to designate the lands situated to the east of their homeland. It is believed that the name may be derived from the Assyrian word *asu*, meaning "east." Another possible explanation is that it was originally a local name given to the plains of Ephesus, which ancient Greeks and Romans extended to refer first to Anatolia (contemporary Asia Minor, which is the western extreme of mainland Asia), and then to the known world east of the Mediterranean Sea. When Western explorers reached South and East Asia in early modern times, they extended that label to the whole of the immense landmass.

Asia is bounded by the Arctic Ocean to the north, the Pacific Ocean to the east, the Indian Ocean to the south, the Red Sea (as well as the inland seas of the Atlantic Ocean—the Mediterranean and the Black) to the southwest, and Europe to the west. Asia is separated from North America to the northeast by the Bering Strait and from Australia to the southeast by the seas and straits connecting the Indian and Pacific oceans. The Isthmus of Suez unites Asia with Africa, and it is generally agreed that the Suez Canal forms the border between them. Two narrow straits, the Bosphorus and the Dardanelles, separate Anatolia from the Balkan Peninsula.

The total area of Asia, including Asian Russia (with the Caucasian isthmus) but excluding the island of New Guinea, amounts to some 17,226,200 square miles (44,614,000 square km), roughly one-third of the land surface of Earth. The islands—including Taiwan, those of Japan

and Indonesia, Sakhalin and other islands of Asian Russia, Sri Lanka, Cyprus, and numerous smaller islands—together constitute 1,240,000 square miles (3,210,000 square km), about 7 percent of the total. (Although New Guinea is mentioned occasionally in this article, it generally is not considered a part of Asia.) The farthest terminal points of the Asian mainland are Cape Chelyuskin in north-central Siberia, Russia ($77^{\circ}43' \text{ N}$), to the north; the tip of the Malay Peninsula, Cape Piai, or Bulus ($1^{\circ}16' \text{ N}$), to the south; Cape Baba in Turkey ($26^{\circ}4' \text{ E}$) to the west; and Cape Dezhnev (Dezhnyov), or East Cape ($169^{\circ}40' \text{ W}$), in north-eastern Siberia, overlooking the Bering Strait, to the east.

Asia has the highest average elevation of the continents and contains the greatest relative relief. The tallest peak in the world, Mount Everest, which reaches an elevation of 29,035 feet (8,850 metres; Height of Mount Everest); the lowest place on Earth's land surface, the Dead Sea, measured in the mid-2010s at about 1,410 feet (430 metres) below sea level; and the world's deepest continental trough, occupied by Lake Baikal, which is 5,315 feet (1,620 metres) deep and whose bottom lies 3,822 feet (1,165 metres) below sea level, are all located in Asia.

Indian subcontinent broke off from Africa and began drifting north-eastward to collide with the southern flank of Asia about 50 million to 40 million years ago. The north-eastward movement of the subcontinent continues at about 2.4 inches (6 cm) per year. The impact and pressure continue to raise the Plateau of Tibet and the Himalayas.

Land - Relief:

The Mountain Belts:

Characteristic of the surface of Asia is the great predominance of mountains and plateaus, constituting about three-fourths of the continent's total area. The mountains are grouped into two belts: those located on the stable platforms (cratons) and those located in active orogenic zones. The former usually occur on the margins of the platforms and generally are characterized by smooth eroded peaks and steep faulted slopes. Marginal mountain ranges, with average heights of 8,200 to 9,850 feet (2,500 to 3,000 metres), usually enclose the inner tablelands and plateaus; examples of such ranges include the Western and Eastern Ghats in India, the mountains of the Hejaz and Yemeni highlands on the Arabian Peninsula, and the Lebanon and Anti-Lebanon mountains in the Levant. The Aldan Plateau and Stanovoy Range lie along the eastern margin of

the Angaran (Siberian) platform, where the isolated and uplifted Putoran Mountains are located in central Siberia.

The Plains and Lowlands:

Low plains occupy the rest of the Asian mainland, particularly the vast West Siberian and Turan plains of the interior. The remaining lowlands are distributed either in the maritime regions—such as the North Siberian and Yana-Indigirka lowlands and the North China Plain—or in the piedmont depressions of Mesopotamia, the Indo-Gangetic Plain, and mainland Southeast Asia. Those plains have monotonously level surfaces with wide valleys, through which the great Asian rivers and their tributaries flow. The topography of the plains in densely populated regions has been greatly modified through the construction of canals, dams, and levees. To the south of the zone of piedmont depressions lie extensive tablelands and plateaus, including the Deccan plateau in India and the Syrian-Arabian Plateau in the west. In addition, there are the intermontane basins of Kashgaria, Junggar, Qaidam (Tsaidam), and Fergana and the plateaus of central Siberia and the Gobi, all of which lie at elevations of 2,600 to 4,900 feet (800 to 1,500 metres). Most of their surfaces are smooth or gently rolling, with isolated hillocks. The plateaus inside the Tibet Autonomous Region of China, the Tien Shan, and the Pamirs lie at elevations of some 12,000 feet (3,700 metres) or more.

The Islands:

A large proportion of the islands of Asia are mountainous. The highlands of Sri Lanka rise to 8,281 feet (2,524 metres); Mount Kinabalu in Malaysia reaches 13,455 feet (4,101 metres); Mount Fuji on the Japanese island of Honshu has an elevation of 12,388 feet (3,776 metres); and numerous volcanoes on Sumatra, Java, and Mindanao reach 10,000 feet (3,000 metres). Among the active volcanoes associated with the Ring of Fire are Krakatoa on Rakata Island in Indonesia, Mount Pinatubo on Luzon in the Philippines, and Mount Aso on Kyushu in Japan.

DRAINAGE:

Rivers:

Asia is a land of great rivers. The Ob, Irtysh, Yenisey with the Angara, Lena (with the waters of the Aldan and the Vilyuy), Yana, Indigirka, and Kolyma rivers all flow northward into the Arctic Ocean. Among rivers draining into the Pacific Ocean are the Anadyr, Amur (combined with the Sungari [Songhua] and the Ussuri rivers), Huang He (Yellow River), Yangtze (Chang), Xi, Red, Mekong, and Chao Phraya.

The Salween, Irrawaddy, Brahmaputra, Ganges (Ganga), Godavari, Krishna, and Indus rivers flow into the Indian Ocean, as does the Shatt al-Arab, which is the confluence of the Tigris and Euphrates rivers. The Kura and Aras rivers flow into the Caspian Sea. Only small mountain rivers flow from Asia into the Sea of Azov, the Black Sea, and the Mediterranean Sea. The Amu Darya (ancient Oxus River), Syr Darya (ancient Jaxartes River), Ili (Yili), Tarim, Helmand, and Harīrūd (Tejen) rivers empty into vast interior basins. Some of those rivers end in lakes; others end in deltas in the sands or salt marshes; and still others flow into oases, where all the water is used to irrigate fields or else evaporates.

All of the Siberian rivers freeze over in the winter, and some freeze to the bottom. In spring widespread flooding occurs as snow fields melt. Those rivers are important communication routes, being used by watercraft during the summer and as roads for sleighs and snowmobiles in winter; they also teem with fish.

In the dry regions where drainage is landlocked, many large rivers are temporary ones fed by melting snow and glaciers in the mountains; they reach their peak water levels in summer. Rivers in dry regions that are not fed by mountain runoff have little water; their levels vary sharply, and periodically or occasionally they dry up completely. The rivers of the monsoon climate regions reach their maximum volume in summer and are utilized for irrigation. The Asian rivers in the vicinity of the Mediterranean that are not fed by mountain snows grow shallow in summer and sometimes even dry up. In the tropical regions, however, the rivers perennially are full of water.

Lakes:

The many lakes of Asia vary considerably in size and origin. The largest of them—the Caspian and Aral seas—are the remains of larger seas. The Caspian has been fluctuating in size, and the Aral has been shrinking, primarily because its tributaries, the Amu Darya and the Syr Darya,

have been tapped heavily for irrigation purposes. Lakes Baikal, Ysyk-Köl, and Hövsgöl (Khubsugul), the Dead Sea, and others lie in tectonic depressions. The basins of Lakes Van, Sevan, and Urmia are, furthermore, encircled by lava, and Lake Telets was gouged out by ancient glaciation. A number of lakes were formed as the result of landslides (Lake Sarez in the Pamirs), karst processes (the lakes of the western Taurus, in Turkey), or the formation of lava dams (Lake Jingpo in north-eastern China and several lakes in the Kuril Islands). In the volcanic regions of the eastern Asian islands, in the Philippines, and in the Malay Archipelago, lakes have formed in craters and calderas. The subarctic has a particularly large number of lakes; in addition to lakes formed as a result of melting permafrost and subsidence, there are also ancient glacial moraine lakes. Many lagoonal lakes occur along low coastlines.

The lakes in the internal drainage basins—such as Koko Nor, Lake Tuz, and others—are usually saline. Lake Balkhash has fresh water in the west and brackish water in the east. Lakes through which rivers flow are freshwater and regulate the flow of the rivers that issue from them or flow into them; notable examples are Lake Baikal, associated with the Angara River; Lake Khanka (the Song'acha and Ussuri rivers); Dongting Lake and Lake Poyang (the Yangtze River); and Tonle Sap (the Mekong). Large reservoirs have also been created by constructing hydroelectric stations.

Groundwater:

In arid regions groundwater (subterranean water) is often the only source of water. Large accumulations are known to exist in artesian basins and beneath the dipping plains at the foot of mountains; those basins are associated with the extensive oases of Central Asia, Kashgaria, and many other regions.

CLIMATE:

Air masses and wind patterns:

Continental climate:

The enormous expanse of Asia and its abundance of mountain barriers and inland depressions have resulted in great differences between regions in solar radiation, atmospheric circulation,

precipitation, and climate as a whole. A continental climate, associated with large landmasses and characterized by an extreme annual range of temperature, prevails over a large part of Asia. Air reaching Asia from the Atlantic Ocean, after passing over Europe or Africa, has had time to be transformed into continental air—i.e., air that has often lost much of the moisture it absorbed over the ocean. As a result of the prevalent eastward movement of the air masses in the mid-latitudes, as well as the isolating effect of the marginal mountain ranges, the influence of sea air from the Pacific Ocean extends only to the eastern margins of Asia. From the north, Arctic air has unimpeded access into the continent. In the south, tropical and equatorial air masses predominate, but their penetration to the centre of Asia is restricted by the ridges of the mountainous belt stretching from the highlands of West Asia through the Himalayas to the mountains of southern China and Southeast Asia; in the winter months (November through March), such penetration is further impeded by the density of the cold air masses over the interior.

The contrast between the strong heating of the continent in the summer months (May to September) and the chilling in winter produces sharp seasonal variations in atmospheric circulation and also enhances the role of local centres of atmospheric activity. Winter chilling of the Asian landmass develops a persistent high-pressure winter anticyclone over Siberia, Mongolia, and the Plateau of Tibet that is normally centred southwest of Lake Baikal. The area affected by the anticyclone is characterized by temperature inversions and by very cold, calm weather with little snowfall. The winter anticyclone is fed by subsiding upper air, by bursts of Arctic air flowing in from the north, and by the persistent westerly air drift that accompanies the gusty cyclonic low-pressure cells operating within the Northern Hemisphere cyclonic storm system. The high pressure propels cold, dry air eastward and southward out of the continent, affecting eastern and southern Asia during the winter. Only a few of the winter cyclonic lows moving eastward out of Europe carry clear across Asia, but they do bring more frequent changes in weather in western Siberia than in central Siberia. The zone of lowest temperature—a so-called cold pole—is found in the northeast, near Verkhoyansk and Oymyakon, where temperatures as low as -90°F (-68°C) and -96°F (-71°C), respectively, have been recorded.

The outward drift of winter air creates a sharp temperature anomaly in eastern and north-eastern Asia, where the climate is colder than the characteristic global average for each given latitude.

On the East Asian islands, the effect of the winter continental monsoon is tempered by the surrounding seas. As the air masses pass over the seas, they become warmed and saturated with moisture, which then falls as either snow or rain on the north-western slopes of the island arcs. Occasionally, however, strong bursts of cold air carry cold spells as far south as Hong Kong and Manila.

The polar front:

Cyclonic storms form and move eastward through the zone where the temperate and tropical air masses are in contact, called the polar front, which shifts southward in winter. The winter rainy season in the southern parts of the West Asian highlands, which is characteristic of the Mediterranean climate, is associated with that southward movement of the polar front.

During the northern winter, South and Southeast Asia are affected by north-easterly winds that blow from high-pressure areas of the North Pacific Ocean to the equatorial low-pressure zone. Those winds are analogous to the trade winds and are known in South Asia as the northeast (or winter) monsoon. The weather is dry and moderately warm. Rainfall occurs only on the windward side of maritime regions (e.g., Tamil Nadu state in south-eastern India and southern Vietnam). Some of the cyclonic storms that move eastward through the Mediterranean Basin during the winter are deflected south of the Plateau of Tibet, crossing northern India and southwestern China.

In summer the polar front shifts northward, causing cyclonic rains in the mountains of Siberia. In West, Middle, and Central Asia, a hot, dry, dusty, continental tropical wind blows at that time. Over the basin of the Indus River, the heating creates a low-pressure area. Known as the South Asian (or Iranian) low, it appears in April and is fully developed from June to August. The onset of monsoon in India and mainland Southeast Asia is related to changes in the circulation pattern that occur by June—specifically, the disintegration of the southern jet stream and the formation of low pressure over southern Asia. The monsoon air masses flow into that monsoonal low-pressure zone from a cell of high pressure just off the eastern coast of southern Africa. Because of the Coriolis force (the force caused by the Earth's rotation), winds south of the Equator change direction from southeast to southwest in the Arabian Sea and the Bay of Bengal. The southwest monsoon bursts upon the Malabar Coast of south-western India in early June and gradually extends northward over most of the Indian subcontinent and mainland Southeast Asia.

It brings considerable rainfall, which in most of those areas accounts for 80 to 90 percent of the total annual precipitation.

Monsoons and typhoons:

Summer in China is a time of variable air movement out of the western Pacific. If that drift is strong and low pressure over the continental interior is intense, the summer monsoon may carry moisture well into Mongolia. If neither the drift nor the continental low is strong, the China summer monsoon may fail, falter over eastern China, or cause irregular weather patterns that threaten the country with crop failure. The monsoon there is less dramatic than in other areas, accounting for 50 to 60 percent of China's annual rainfall.

Tropical cyclones—called typhoons in the Pacific Ocean—may occur in coastal and insular South, Southeast, and East Asia throughout the year but are most severe during the late summer and early autumn. Those storms are accompanied by strong winds and torrential rains so heavy that the maximum precipitation from the typhoons locally may exceed the total amounts received during the normal summer monsoons.

The influence of topography:

Differences between the climatic conditions of the various regions of Asia are determined to a considerable degree by topography. Different elevation-based climatic zones are most clearly defined on the southern slopes of the Himalayas, where they vary from the tropical climates of the foothills, at the lowest levels, to the extreme Arctic-like conditions of the peaks, at the highest elevations. The degree of exposure also plays a large role. The sunny southern slopes differ from the shady northern ones, and windward slopes exposed to moist ocean winds differ from leeward slopes, which, lying in the wind (and rain) shadow, are necessarily drier.

Temperature:

The average January temperature over a considerable part of Siberia is below -4°F (-20°C), and in the region around Verkhoyansk it reaches -58°F (-50°C). Near the coast Pacific Ocean air moderates the average temperature to from 23 to 5°F (-5 to -15°C). The January isotherm (a line connecting points of equal temperature) of 32°F (0°C) extends eastward from the Anatolian and Iranian highlands; skirts the southern edge of the Pamirs, the Karakoram Range,

and the Himalayas; and runs north-eastward through China to south of the Shandong Peninsula and through the southern Korean peninsula and central Honshu. An isotherm of 68 °F (20 °C) is traced along the Tropic of Cancer and one of 77 °F (25 °C) farther south.

In July the maximum temperatures are found in the lowlands of Mesopotamia and the Arabian Peninsula and in the Thar (Great Indian) and TaklaMakan deserts. The 68 °F (20 °C) isotherm moves as far as latitudes 55° to 60° N, but, in the eastern Gobi and near the cool Pacific Ocean, it bends to the south. Along the far north-eastern coast of Asia, the average temperature in July is below 50 °F (10 °C), which is typical for a tundra climate. The greatest amplitude in annual temperature range on Earth occurs near the “cold pole,” which has remarkably warm summers; the annual range may exceed 175 °F (97 °C).

Precipitation:

Annual rainfall in the equatorial belt is approximately 80 inches (2,000 mm); it is 80 to 120 inches (2,000 to 3,000 mm) and more (300 to 500 inches [7,600 to 12,700 mm] in places) on windward maritime slopes in South, Southeast, and East Asia. In Cherrapunji in north-eastern India, some 900 inches (22,900 mm) of rain fell in seven months in 1891. Precipitation averages less than 40 inches (1,000 mm) annually on tropical lee slopes. In the subtropical and temperate monsoon climates there is adequate rainfall, amounting to about 24 to 80 inches (600 to 2,000 mm) annually. Annual precipitation is less than 10 inches (250 mm) in north-eastern Siberia and averages 6 to 8 inches (150 to 200 mm) but may be less than 4 inches (100 mm) in some places in the deserts of West, Middle, and Central Asia.

Climatic regions:

The distribution pattern of precipitation throughout the year is varied. Relatively uniform moisture is characteristic of the Asian equatorial zone. Maximum summer precipitation and minimum winter precipitation are the rule in the subequatorial zones and in other regions with monsoon climates, as well as in those areas where there is summer movement of the fronts—the polar front in the mountains of southern Siberia and the Arctic front in the subarctic regions. Wet winters and dry summers are typical of the Mediterranean climatic region in

West Asia, where precipitation is associated with the winter activity of the polar front. In some areas of Japan, Korea, and eastern China, there is uniform precipitation when, in addition to the summer monsoon, the winter monsoon brings moisture.

SOILS:

The soils of Asia are marked by the combined effects of climate, topography, hydrology, plant and animal life, age, and economic activities. All of those factors vary considerably from one part of that vast continent to another, from north to south, and from lower to higher elevations in mountainous regions. The soil also shows a horizontal zonality that is especially clearly defined in the continental plains.

The Arctic zone:

In the Arctic, where glacial and Arctic deserts predominate, the processes of soil building occur only in rudimentary form. The soils are skeletal and low in humus.

The Forest Tundra:

Farther south stretches the transitional belt of the forest tundra, where tundra and sparse forest alternate with regularity. Tundra soils alternate with the soils of the taiga (boreal forest), the cold, swampy forested region. The soils below the frozen taiga are called cryogenic (influenced by frost action). In the mountainous regions the peaty-gley soils are replaced by mountain tundra and weakly developed, often embryonic soils of detritus and stony fragments.

The Forest Zone:

The forest zone occupies the largest part of the temperate zone. Characteristic of soil formation in the forest zone is the leaching process. The forest leaves and needles that fall, together with dead remains of the sparse grass cover, are subjected to decomposition by organic acids in the litter of the forest floor. The duration of the summer season and the amount of precipitation are sufficient for complete decomposition of the soluble soil components, and the soil solutions transport them and leach them into deeper soil horizons (layers).

The Forest-Steppe and Steppe:

Soil cover in the forest-steppe region is formed when the ratio of precipitation to evaporation is in equilibrium and as the leaching process of the wet season alternates with the upward flow of the soil solutions during the dry period. Under those conditions, with organic material resulting from the dense vegetation abundantly available, humus accumulation in the soil is considerable, and dark-coloured soils are formed that are the most fertile in all Asia; known as chernozems, they are the thickest of the forest-steppe and mixed-grass soils.

Semi-Desert and Desert:

Through inner Kazakhstan and Mongolia stretches a zone of semi-desert, and in Middle Asia, the Junggar (Dzungarian) Basin, the TaklaMakan Desert, and Inner Mongolia, there is a belt of temperate-zone deserts. A belt of subtropical deserts extends through the Levant, the Iranian highlands, and the southern edge of Middle Asia. Beneath the semi-deserts, with their mosaic of desert and arid-steppe vegetation, light chestnut and light brown semi-desert soils form; those are low in humus but contain an abundance of strongly alkaline soil. Beneath the deserts, where the supply of organic substances, as well as the humus content, is extremely low, gray-brown soils form in the temperate zone, while gray desert soils (sierozems) develop in the arid subtropics. A great deal of saline soil is present there, and agriculture is possible only with the use of irrigation, which gives rise to specific cultivated types of sierozems.

The Asian Mediterranean:

In the maritime areas of the Asiatic Mediterranean—Anatolia and the Levant—xerophytic vegetation (vegetation structurally adapted to exist with very little water) of the Mediterranean scrub-woodland types, known as maquis (evergreen), shiblyak (deciduous), and frigana (low-growing thorny, cushionlike bushes), is prevalent. The predominant soils under such vegetation are brown; they have accumulated iron as a result of the intense chemical weathering during the wet Mediterranean winter and of the upward flow of soil solutions during the dry summer. Frigana vegetation is widely represented in the West Asian semi-desert highlands. Here soils have developed that are transitional between the brown soils and the sierozems.

The sub-tropical Monsoonal regions:

Typical of Asia's monsoonal subtropics are soils that formed beneath the evergreen forests that once occupied the southern portion of the Korean peninsula, south-western Japan, and south-eastern China. Intensive chemical weathering during the warm and wet summer monsoon season results—as it also does in the more southerly torrid zones—in the decomposition and leaching of many soil minerals, the accumulation of residual iron and aluminum oxides, and the consequent predominance of red and yellow soils as well as of podzolized soils. Agriculture is especially widespread on the alluvial soils of the plains and on terraced slopes in hilly terrain, in both cases dominated by irrigated paddy-rice cultivation.

The Sub-Equatorial and Equatorial regions:

Savannas (grassy parklands) and dry-tropical deciduous forests predominate in the rain shadow on the leeward slopes of hills, and wet-tropical evergreen forests grow on the rainy windward slopes of hills. Intensive leaching followed by evaporation is characteristic of those soils. Under the wet-tropical forests, red-yellow laterites (leached and hardened iron-bearing soils) predominate; beneath the savannas and dry-tropical forests, there are red lateritic soils that change, with increasing aridity, to red-brown and desert brown soils. Beneath the dry savannas of peninsular India are unique black soils called regurs that are thought to develop from basalt rock.

In the equatorial zone (southern Malaysia and the Greater Sunda Islands), typical tropical rainforests have developed. In south-western Sri Lanka and on the Indonesian island of Java, they have been almost entirely replaced by an agricultural landscape in which mountain slopes and hills are covered with plantations of tea, coconut palms, and rubber trees. The soils are lateritic and are red-yellow or brick-red, with marginal degrees of laterization.

In the valleys of the subequatorial and equatorial zones, alluvial soils predominate; they have been developed by thousands of years of cultivation and irrigation of the rice fields.

The Mountains:

In the mountains zones of different soil types are found at different elevations. As a rule they are skeletal, underdeveloped soils, clearly reflecting the differences in rock structure and origin and in the degree of exposure of the slopes. Mountain soils also correspond to the different vegetation zones that occur at different elevations.

NATURAL VEGETATION:

An immense range of vegetation is found in Asia, the result of the continent's wide diversity of latitude, elevation, and climate. Natural conditions, however, are not entirely responsible for the associations of trees, plants, and grasses of Asia; natural landscapes have been transformed by more than eight millennia of farming and other human activities.

The Geographic pattern of vegetation:

North and Central Asia:

The natural landscape has been least affected by people in sparsely populated North Asia. Vast plains, continentality, and the nearness of the Arctic Ocean explain the presence there of a zone of tundra—cold-tolerant low-lying vegetation in an area of permafrost (permanently frozen subsoil)—similar to that found in the European part of Russia and in Canada and the U.S. state of Alaska. In more flourishing parts, the tundra has a discontinuous covering of lichens, mosses, sedges, rushes, some grasses, cushions of bilberries, and dwarf trees of willow and birch; in the far north, lichens grow on favourable hillsides.

The tundra belt extends still farther south on higher ground. In the Arctic, tundra in the Ural Mountains begins at about 3,000 feet (900 metres), but at latitude 53° N it begins at 4,250 feet (1,300 metres). Tundra extends over large areas of the Chersky, Verkhoyansk, and Kamchatka mountain ranges.

The taiga (boreal forest) zone—a belt of mainly coniferous forest—begins south of the tundra, after a transitional zone of “wooded tundra” and forest galleries found along streams between the tundra-covered watersheds. Taiga, although essentially coniferous, contains hardy deciduous trees such as aspen and birch; there are sections of grass and shrub steppe in the drier zones.

The broad-leaved deciduous forest of western Siberia also does not extend east of the Yenisey—where it gives way to the coniferous forests of central Siberia—but it reappears in eastern Siberia near the Sea of Okhotsk; poplars, birches, and alders are numerous there, as are various conifers and larches. Forests around the Ussuri River include maples, ashes, walnuts, elms, and lindens.

South of the Siberian forests are found forest-steppes, with forest galleries lining the rivers. Forest-steppe and meadow-steppe vegetation is predominant on the Northeast (Manchurian) Plain. The steppe (grassland) zone runs from Kazakhstan in the west through the Altai Mountains to the Da Hinggan (Greater Khingan) Range in the east.

East Asia:

The monsoonal climate in East Asia brings hot and rainy summers, giving rise to a great variety of temperate and tropical vegetation. China has the most varied vegetation of any country in the world, with about 30,000 species, excluding mushrooms and mosses.

About two-thirds of Japan's total area is forested, whereas much of China is deforested (roughly one-seventh of China is under forest cover); sizable tracts remain untouched, however, in the remote rugged regions of China, and many small areas have been reforested. The best examples of East Asian forest, therefore, are found in Japan, such as in the Kii Peninsula of Honshu.

North of the Yangtze River (Chang Jiang), much of China was once covered by primeval deciduous forest, most of which has been removed to create farmland. A wild growth of trees and shrubs survives, however, throughout the cultivated areas, and parklike tree growth and stands of bamboo are widespread. The original forest cover included 60 different genera of tall trees; among the temperate genera were oak, maple, linden, chestnut, hornbeam, and a species of hickory, and among the tropical genera were magnolia, the tulip tree, the camphor tree, the Spanish cedar, sweet gum, catalpa, and lianas (vines). A variety of conifers of both hemispheres also occurred there, and in the mountains of eastern Sichuan there grew a rare and ancient Chinese conifer, the dawn redwood. Palm trees are found throughout South China and southern South Korea, as well as in the southern parts of Japan; many varieties of bamboo also are found in those regions.

South and South-East Asia:

The wettest parts of peninsular India (such as the Western Ghats) and of Southeast Asia have magnificent tropical forests noteworthy for the variety of their plant life.

In parts of peninsular India and Southeast Asia that have a seasonal monsoon climate (with four to eight dry months per year), moist- and dry-deciduous forests thrive. Many of the tree species,

such as teak, sal, and sandalwood, are highly valuable and are heavily exploited. In areas with a prolonged dry season and less precipitation (e.g., north-western India, the interior of the Deccan plateau, and the “dry zone” of Myanmar [Burma]), savanna woodland and thorny thickets of acacias and euphorbias are the predominant natural vegetation. In all of the major climate zones of South and Southeast Asia, and particularly on the alluvial plains, much of the natural vegetation has been cleared to make way for agriculture.

Primeval evergreen rainforest remains in a few parts of South and Southeast Asia. Secondary forest covers a much larger area. Extensive fires have produced a herbaceous landscape, as in the cogonales (areas of coarse tall grasses, used for thatching) of the Philippines.

Hevea brasiliensis, the rubber tree introduced into tropical Asia from South America in the 1870s, is particularly important in plantations in Malaysia and Indonesia.

In the higher mountains of Southeast Asia, the cooler humid-tropical climate gives rise to deciduous and coniferous temperate forest at elevations of between about 4,250 and 10,000 feet (1,300 and 3,000 metres).

In the eastern Himalayas sal is intermingled with *Castanopsis* (a small genus of nut-bearing trees) and pines. Above those are found forests of shrubs and trees of the laurel family and, higher still, oaks and conifers; between about 10,000 and 13,000 feet (3,000 and 4,000 metres), forests of firs occur. The central Himalayas present strikingly beautiful landscapes in the following upward succession: dry sal forest; pine forest; cedars, spruces, pines, and oaks; firs, birches, and tall rhododendrons; rhododendron bushes and junipers above 13,000 feet (4,000 metres); and perpetual snows above 16,000 feet (4,900 metres).

West Asia:

In West Asia naturally wild vegetation no longer occurs in clearly defined zones but is dispersed in small areas. The region is predominantly arid; desert like depressions such as the Kyzylkum Desert of Uzbekistan and Kazakhstan, the Karakum Desert of Turkmenistan, and the Rub' al-Khali (Empty Quarter) of the Arabian Peninsula contrast with the moist, forested mountains that lie between them. Three climatic zones, however, characterize West Asia: a continental climate in the northern regions; a dry zone, except where northerly winds bring moisture to the mountains, to the south; and a Mediterranean climate along the western edges.

A few examples of the variety of vegetation associated with those climatic zones may be cited. In the Karakum Desert grows a strange xerophytic tree, the saxaul, which is oddly shaped, gnarled, and leafless; it is widely used for firewood, and its young sprouts make excellent fodder for camels.