

The Study of Asia

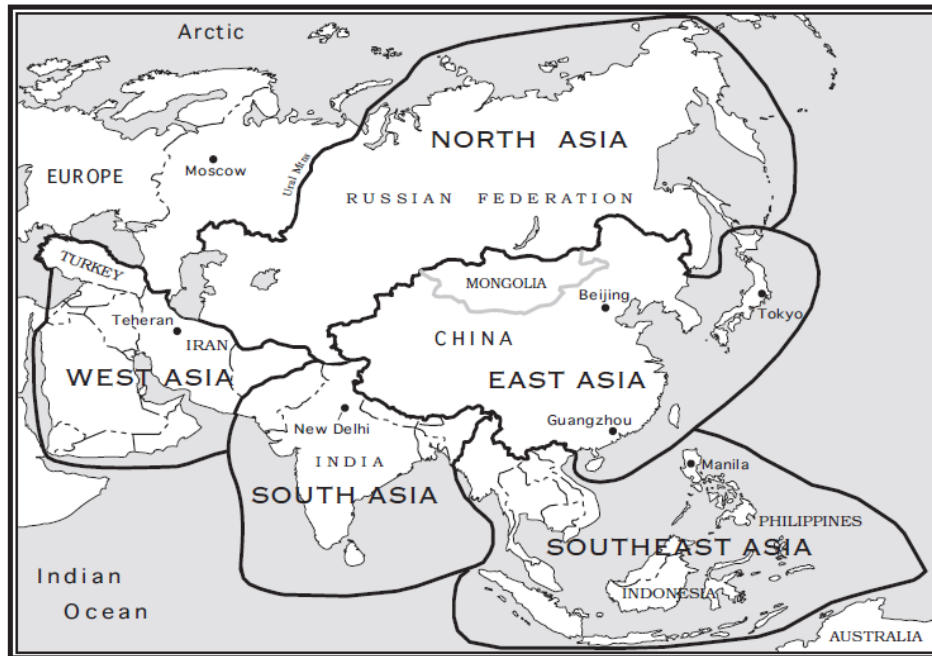
If ever there was a time when Asia could be ignored, that time is not the present. At the end of the twentieth century—a century plagued by war, dominated in its first half by the great European colonial empires in their heyday and in the second half by the “Cold War” between the US and the USSR—most of the old certainties had slipped away. In the first two decades of the twenty-first century, economic and political weight is shifting eastward, to Asia.

An argument could be made that the last 400 years, the centuries of European dominance, have been the aberrant ones. Prior to this period, the great civilizations of Eurasia—China, India, the Middle East, and Europe—maintained a balance of power for many centuries. There were occasional interruptions in this balance by ambitious empires of conquest. The European one from 1700 to 1950 is only the most recent; before that, the Mongols in the thirteenth and fourteenth centuries went thundering in every direction from their Central Asian homeland, conquering China, Iran, Afghanistan, and India, and threatening Europe. But these civilizations absorbed the blows, civilized the invaders, and carried on, enriched by the new cultural strands contributed by the foreigners.

Asia is in such a period of recuperation now, in which great and ancient civilizations, after enduring humiliation and defeat at the hands of colonizing European powers, are absorbing the cultural contributions of the invaders and recasting their civilizations. Meanwhile, the old balance is being restored. Once again there are European, Middle Eastern, Indian, and Chinese cultural spheres.

By “Asia” we mean, in this book, only “monsoon Asia”—the geopolitical regions of South Asia, East Asia, and Southeast Asia (see Map I.1). Our focus is not nationalist, but cultural. We do not take as given or eternal the nation-states that have emerged in the postcolonial world, enduring as those may prove to be. Hard at work as they are at proving ancient natural rights to present borders, none of the current outlines of Asian nation-states, with the single exception of Japan, have a time depth of even a century.

Our subject here is rather more amorphous; it is those old civilizations themselves. Not, of course, “Asian civilization,” for there is not and never has been such a thing. Like “the Orient” and “the East,” “Asia” has always been something of a fiction created by Europeans whose capacities to truly engage with a culture stopped at the eastern edges of the Greek world. Beyond lay “Asia,” the “East.” In fact, the word Asia appears to come from the Assyrian word for east, *asu*. In recent times the simple dichotomy between “the West” and “the East” has contrasted European civilization with all the rest of Eurasia, lumped as “the East.” However, we tend to think, more subtly, of the



Map I.1 Geopolitical regions of Asia.

West as a plural place, but the Japanese playwright, Masakazu Yamazaki (Yamazaki 1996), looking at the history of European civilization, marveled at its early cultural—if not political—unity. Founded on ideas and institutions originating in Greece and Rome, the dominant unifying force of Western civilization from Constantine through the eighth century was Christianity, a fusion of Judaic and Hellenic traditions that gave a common cultural overlay to an ethnically diverse array of peoples in the far west of Eurasia. Even as this unity began to erode at the end of the eighth century, English, Germans, French, Italians, and others continued to think of themselves as sharing in Western civilization even though no single nation could claim to be the heartland of this pluralized civilization.

Nothing like this cultural unity ever existed in Asia. Despite the fact that nearly all rulers claimed to be monarchs of the whole world, no ruler ever conquered it all—though of all peoples, the Mongols came closest to doing so (see chapter 3). Nor is there any one religion that provided a unifying creed for Asia as Christianity did for Europe. One might be tempted to speak of a “Buddhist civilization” in the same vein as one speaks of “Christian civilization” in the West, except for the fact that India, which gave birth to Buddhism, after a dozen centuries repudiated it, and even in China, to which it spread, it never triumphed against Confucianism.

Far more, even than Europe, the regions of Asia we focus on in this book are places of extraordinary and perplexing diversity. The peoples of this vast region have no common political system, no common language, no common history, religion, culture, geography, climate, or economy. To study Asia is to study its diversity. In fact, accounting for that diversity is part of the subject matter of this book. We explore this diversity in several ways. First, we examine it as it exists *spatially*. The cultures of Asia are distributed across a geographically complex expanse whose features partially account for the extraordinary differences we find in human communities. The Himalayas present a barrier between South and East Asia, which ensured that they developed along different lines largely in isolation over 4,000 years. Though they knew about each other in vague ways, there was never an Indian conquest of China or a Chinese conquest of India or any war between them of any great significance (a brief border war occurred in 1962). Yet there were periodic interconnections of profound importance. The Chinese sent emissaries to India to bring back knowledge of Buddhism. The Japanese sent shiploads of courtiers and students to bring civilization from China. Small rulers in Southeast Asia similarly sought ideas of statecraft and kingship from India, and traders from India who settled in Southeast Asia brought along family priests who brought Sanskrit culture, sacred texts, and the art of writing to emerging kingdoms in the valleys and islands there.

The second way of exploring Asia's diversity is in terms of *cultural evolution*. Early states emerged by 2300 B.C.E. in the Indus valley and by 1700 B.C.E. in China, but nonstate cultures have persisted throughout Asia and present problems of integration into modern nations that have, in a way, "captured" peoples who would prefer to remain independent (see chapter 4). Before the period of nation-states defined by boundaries drawn on maps, there were extensive frontier regions between powerful states where small-scale ("tribal") societies lived unmolested or with only cursory acknowledgment of some distant centralized power. The luxury of independence is now lost to these peoples.

A third form of diversity in Asia is *linguistic* (see chapter 2). When William Jones went to India in 1784 and began studying Sanskrit, he made a discovery that would change the way the world thinks about language. The Sanskrit language, he wrote, bore resemblances to both Greek and Latin more far-reaching than possibly could have occurred by chance; they must have all sprung from some common source. His discovery of a great family of languages that spread from England to North India enthralled Europe and was the late-eighteenth century's version of moon rocks; he lectured on the "Indo-European language family" to audiences of over a thousand on his return to England. Tracing the complex family tree of this language family was one of the preoccupations and accomplishments of nineteenth-century linguistics. Only now are equivalent breakthroughs beginning to be made in another great language family, Sino-Tibetan.

The search for sacred texts, which occupied Chinese, Japanese, and Southeast Asian intellectuals for better than half a millennium—India was the source for most of them—involved difficulties of translating mutually unknown languages and deciphering each other’s exotic texts. India had one script, China another. Those who came in search of civilizing texts—Japan to China, Southeast Asia to India—had the problem of fitting scripts meant for one language to their own very different ones. Japan, with its polysyllabic language, could have had a better neighbor than China to borrow a script from; India’s would have suited much better. Southeast Asia’s Sino-Tibetan languages would have done well with China’s logographic script, meant for monosyllabic languages, but the texts they were borrowing were Indian. Thus it went.

India and China are the two foundational civilizations of Asia. These two civilizations were creating their characteristic profiles during the pivotal first millennium B.C.E. Over a thousand year period, both China and India were developing concepts of social order and institutions of civil society that have characterized them into the present. During this period, the Indian caste system was taking form. The Chinese centralized state had its earliest instance under the First Emperor, Qin Shihuang, who became one model of the authoritarian emperor ruling under the Mandate of Heaven. In India, Emperor Ashoka embodied the ideal ruler, the *dharma*raja (“righteous king”) responsible for moral order in the state. The Upanishadic philosophers, Buddha, and Confucius lived and taught during the middle centuries of the first millennium B.C.E., and their philosophies became as foundational for their civilizations as Socrates, Plato, and Aristotle were for Europe. All these thinkers lived within a few centuries of each other during a period sometimes called “the axial age” because it was a kind of axis or pivotal point in history. Both civilizations were decisively configured during this epoch in ways that civilizations in later centuries expanded, elaborated, and reformed.

Southeast Asia and Japan came under influence from India and China, respectively, in the following millennium (the first millennium C.E.), so that the earliest forms of the state and court culture in those hinterlands resembled the more advanced cultures from which they borrowed. The early states of Southeast Asia borrowed, along with sacred texts and scripts from India, concepts of the sacred kingship, the *devaraja* or “god-king.” They accepted first Hinduism and, later, Buddhism. Japan borrowed everything it possibly could from China: books, script, urban planning, Confucianism, Buddhism, and the imperial system—but without the undesirable feature of the Mandate of Heaven that could be withdrawn by Heaven in the case of a successful rebellion. The imperial dynasty founded during the period of borrowing from China, but subsequently projected backward in time to the Sun Goddess, has survived into the present; Emperor Akihito is the 125th emperor of Japan. Of course, both Southeast Asia and Japan made these cultural borrowings their own in unique ways, but their affinities to India and China remain clearly visible even in the present.

Culture Areas of Asia

The terms we have been using—South Asia, East Asia, and Southeast Asia—are fairly recent geopolitical terms that began during World War II and have come into increasing use in the postcolonial period as modern Asian nations have formed regional associations for trade and military security reasons (see map I.1). Such maps represent current political alignments, more than long-term cultural affinities, and lay on desks at the US State Department.

Anthropologists more typically use the concept of “culture area.” Behind the culture area concept is the assumption of a geographical region with some degree of environmental unity within which local societies have made similar cultural adaptations. For instance, humid lowland riverine regions of Southeast Asia have been cultivated by wet-rice methods that have supported a number of small states. By contrast, the cooler uplands support much smaller populations of slash and burn tribal cultivators.

Societies within a single culture area, it is assumed, will share similar political, economic, and religious institutions. Thus, in the Indian cultural sphere we find small, unstable kingdoms where the king models himself after Shiva or Vishnu, his capital is a replica of Heaven, and the Brahman supports the state with appropriate sacrifices and interpretation of sacred texts. Society is hierarchically organized in a moral order based on elaborate codes of rank and honor. The state in the Indian cultural sphere often looked like sacred theatre, as Clifford Geertz describes in a famous study of one of the more byzantine Indic states, the Balinese:

It was a theatre-state in which the kings and princes were impresarios, the priests, the directors, the peasantry, the supporting cast, stage crew, and audience. The stupendous cremations, teeth-filings, temple dedications, the pilgrimages and blood sacrifices, mobilizing hundreds, even thousands of people and great quantities of wealth, were not means to political ends, they were ends themselves, they were what the state was for. Court ceremonialism was the driving force of state politics. Mass ritual was not a device to shore up the state; the state was a device for the enactment of mass ritual. To govern was not so much to choose as to perform. Ceremony was not form but substance. Power served pomp, not pomp power. (Geertz 1980:13)

In the Chinese cultural sphere, by contrast, we find a striving toward perfect centralization and the realization of Confucian norms of the state-as-family. There is a secular quality to the state not seen in the Indian cultural sphere. The state is a problem in management, and bureaucratic machinery has been elaborated to facilitate its effective operation. Scholarship was similarly practical, unlike in India, where books explored metaphysics, the nature of the soul, the doings of the gods, the conduct of rituals, but rarely applied itself to practical matters of governing. You search in vain in India for a historical textual account of the day-to-day workings of a given king; in China, such state

archives are absolutely overwhelming. The minute directives from one minister to a subordinate scholar-official in his local office are preserved in meticulous detail. The Chinese literally invented bureaucracy and created a system for recruitment into that bureaucracy that set generation after generation of young men studying for years to pass the examinations that would open the doors of government to them. Nothing like this ever emerged in India.

These cultural traditions led to the China and India of the present—together almost half the world's people. Jay Taylor, writing in 1987 about the two “Big Sisters” of Asia, contrasted them thus: India has a chaotic but viable democracy, while China has a command politics of the elite. China has been obsessed with uniformity and the doctrinaire, while India has been tolerant of all heresies. Art and literature are more viable and alive in India than in China, even though literacy is high in China and low in India. The Chinese emerge from their ancient classics as sober and down-to-earth, the Indians as mystic and sensual; China is a political society, while India is a spiritual one. These are broad strokes for comparing two very complicated nations, but they capture the “Dragon” (China) and the “Wild Goose” (India) with some clarity.

China and India, of course, are not the sum total of Asia's cultural diversity. In the “lands below the winds,” the islands of Indonesia, Malaysia, and the Philippines, live speakers of Austronesian languages, a vast language family distributed from Madagascar (off the coast of Africa) to Easter Island (off the coast of South America). This vast ethnolinguistic category contains folk at every level of social complexity, from hunter-gatherer bands of Semai in Malaysia to small-scale tribal societies like the Iban, Dayak, Tana Toraja, Ilon-got, and Ifugao, to state societies like those of Java and Bali.

Organization of the Book

The diversity can be overwhelming, and no single book can bring order to all of it. In this one we have tried simply to sketch the more significant and enduring profiles. We have divided the book into six parts, each with a brief introduction. After this brief introduction, part I looks at the natural environment of monsoon Asia, a region of mountains, rivers, lowland valleys, islands, and volcanoes that limit and shape what is humanly possible. The next chapter takes on the complicated matter of languages, texts, and scripts, focusing on the major language families whose speakers are by no means able to speak to one another, but whose linguistic histories suggest common origins in the ancient past.

In part II we turn to peoples who have remained on the peripheries of the great states—for most of the time. These are the “invasion and aversion” cultures, which seemed to have an approach-avoidance relationship to the settled societies that were growing in power and with which they had complicated trade and political relations. In Central Asia, nomadic groups like the Turks and Mongols herded sheep, goats, and yaks, used camels and horses for trans-

port, but needed to trade with settled agricultural peoples for grain and other goods. But as we see in chapter 3, the Turks and Mongols (and also Tibetans) were fierce warriors capable of thundering across grasslands and mountains to conquer the rich states on their peripheries. Other, smaller groups wanted only to keep out of the way, willing to adapt to rugged environments in order to maintain their independence from grasping states short on labor (chapter 4). None of these groups escaped the drawing of borders, but numerous ones are in politically vulnerable positions straddling borders and practicing subtle forms of resistance sometimes referred to as “the weapons of the weak” (Scott 1987).

Part III is devoted to South Asia, part IV to East Asia, and part V to Southeast Asia. The introductions to each section are brief explanations of the approaches taken, different in each case. Finally, part VI summarizes the modern era of colonialism and postcolonialism.

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1

ASIA AS CULTURED SPACE



In the fourteenth century, a Japanese scholar named Chikafusa summarized the knowledge of Asian landforms that had come to Japan from ancient times: four great continents float in four great oceans. There is a tree called Jambu, 1,200 miles high, and it stands on the shore of a lake at the top of Mt. Anavatapta in the center of a continent named Jambu, after the tree. Just south of Mt. Anavatapta are the Himalayas, and south of them lies India, in the true heart of Jambu. To the northwest of India is Persia (now Iran), and to the northeast is China. Because this was not an age when the Japanese deferred to China, Chikafusa added with a sniff: “China is thought to be a large country, but compared to India it is a remote and small land on the periphery of Jambu” (Varley 1980:54-55). Japan, on the other hand, was the “central land” in the ocean between Jambu and the eastern continent, a land apart ruled by a line of sovereigns descended from gods.

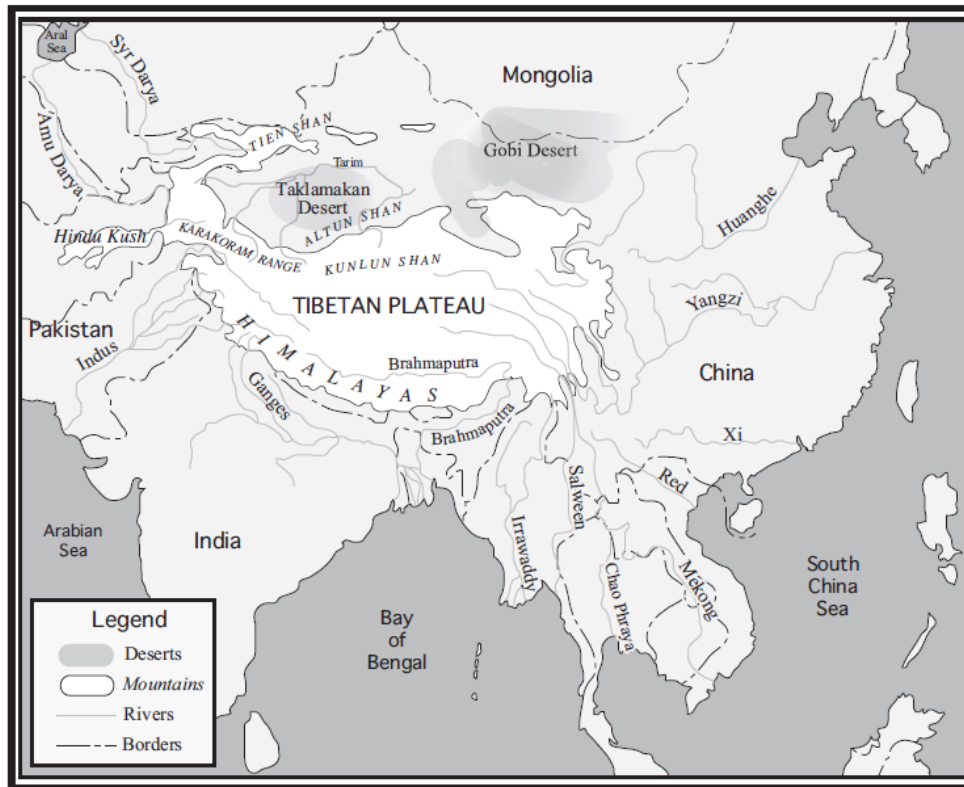
Asia’s landscape has everywhere been overlaid with cultural meanings, both sacred and political. The Ganges River, sacred from source to mouth, comes tumbling out of Heaven and is caught in Shiva’s matted locks to release the waters slowly from his Himalayan abode on Mt. Kailash, thus preventing destruction of the earth by floods. Asian rulers sought to build their capitals at the central axis where Heaven and earth connect, a fitting and authoritative location for a king. Throughout Southeast Asia, the Himalayan “pillar of the universe,” Mount Meru (known to Chikafusa as Mount Anavatapta and to Hindus and Tibetan Buddhists as Mount Kailash), was reconstructed in capital after capital to assert the divinity of the god-king who resided there.

As the above examples show, India plays a central role in most Asian mythogeographies. What is surprising is that India plays a central role in modern geophysics as well.

“The Great Collision” and Asian Landforms

In China, when the earth shook, it was taken as an ominous sign of Heaven’s displeasure with earthly regimes; and when a regime toppled, a heavenly sign was later interpreted as a forewarning. In 1556 an earthquake near Xi’an (Xian) (then the capital Chang’an [Changan]) killed 830,000 people; 70 years later, when another earthquake shook the new capital, Beijing (Peking), the court astrologer said ominously: “The reason why the earth growls is that throughout the empire troops arise to attack one another, and palace women and eunuchs have brought about great disorder” (Lach 1965). The omen was fulfilled 15 years later when China was conquered by the Manchus.

Chapter opener photo: Padi cultivation.



Map 1.1 Physical map of Asia.

Box 1.1 The Highest Mountains in the World

The highest mountains in the world are in the ranges created by the collision of India and Eurasia: the Himalayas, Hindu Kush, Pamir, Kunlun Shan, and Tien Shan.

	Country	Elevation in feet
Everest	China-Nepal	29,029
K2	China-Pakistan	28,251
Kanchenjunga	India-Nepal	28,207
Dhaulagiri	Nepal	26,811
Annapurna	Nepal	26,503
Muztag	China	25,338
Tirich Mir	Pakistan	25,230
Pik Kommuniza	Tajikistan	24,590
Pobeda Peak	China-Kyrgystan	24,406

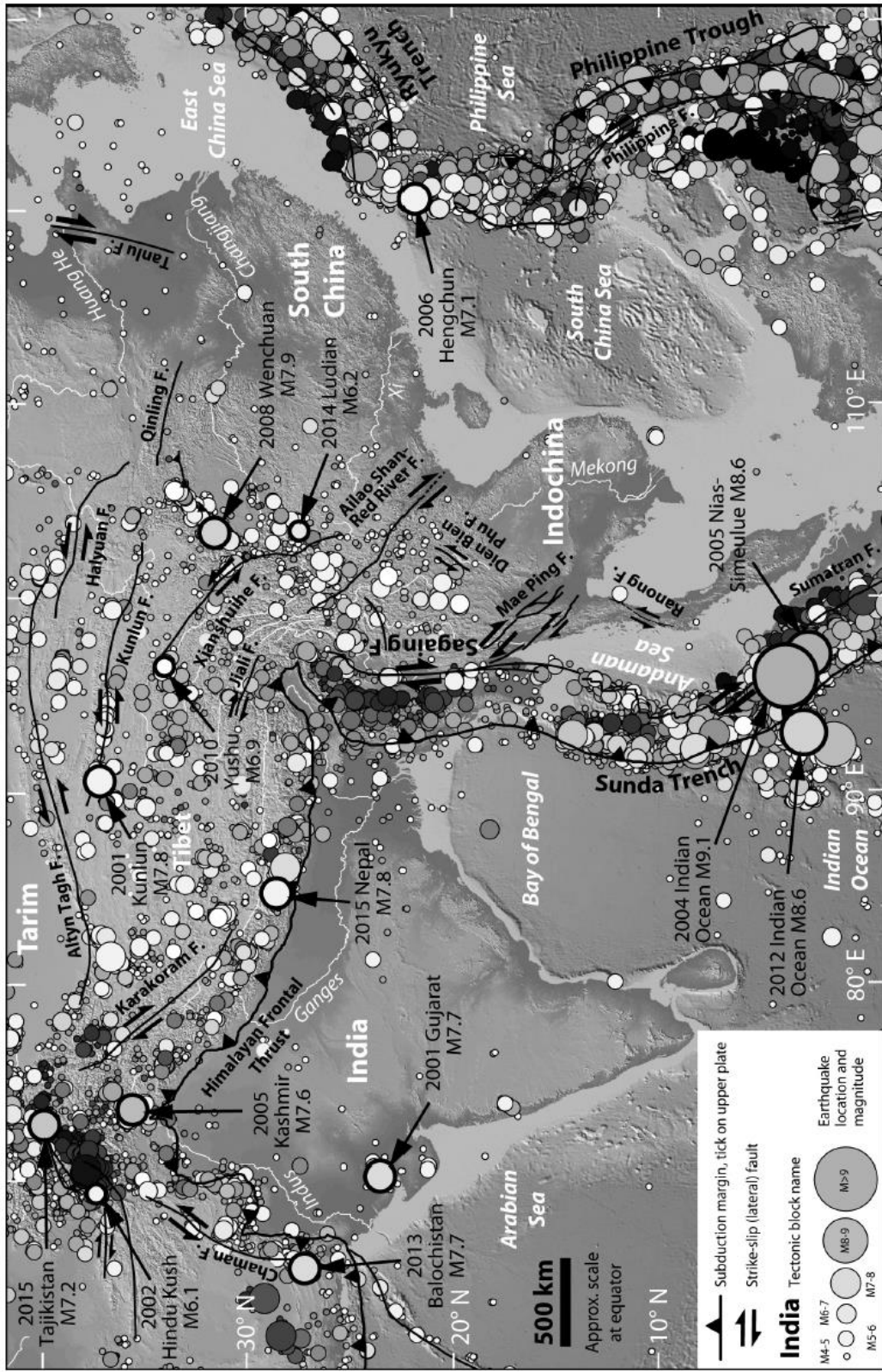
Modern science interprets those disasters differently. All the great earthquakes of India, China, Mongolia, and Tibet are caused by one colossal event: the slow-motion “collision” of India with the Eurasian continent that has been going on for 10 million years without interruption (Molnar and Tapponnier 1977). Riding on its own tectonic plate, India broke off East Africa and drifted north-eastward, traveling 5,000 kilometers before beginning its collision with Eurasia. Isolated in the Indian Ocean during the emergence of mammals in the Eocene, it was only after the beginning of the collision 10 million years ago that mammals from Mongolia swarmed down into the subcontinent.

The collision radically altered Asia’s landforms, compressing and distorting the earth’s crust from the Himalayas to Siberia, and from Afghanistan to the China coast. Where Tibet and North India are now, there was once a low coast and a submerged continental shelf. Colliding with such force that India slid under the Eurasian crust and lifted up the Tibetan Plateau, the continent continued to shove northward another 1,200 miles, and continues its northward push at the rate of two inches a year, or nearly six feet per century. This slide is not a smooth one; India regularly gets stuck, but when the obstruction gives way, there’s a lurch of several feet causing earthquakes and rockslides.

It is unclear exactly where the “suture” of the two continents lies, but several features of the geology of the Tibetan Plateau are becoming clearer. Five major fault lines similar to the San Andreas Fault of California rim the plateau in an east-west direction, clearly visible in satellite photographs and traceable across more than 1,500 miles. The southern block is moving eastward and the northern block is moving westward. This continuing slow-motion collision makes the Himalayas among the most unstable regions of the planet. Frequent earthquakes and landslides cause death and destruction; an earthquake in Nepal in 2015 leveled thousands of buildings and killed over 8,500 people. An even worse earthquake in 2008 in Sichuan Province of China killed more than 70,000 people (see map 1.2 and box 1.2).

Portions of the former ocean floor were lifted high and dry in central Tibet, a high plateau drained by no rivers and containing only brackish lakes that are the remnant of the ancient Tethys Sea. The mountains south of the Tibetan Plateau—the Himalayas—are the old northern portion of India, stacked up slice upon slice, the highest mountains in the world. The Tibetan Plateau was squeezed like an accordion and stretched eastward, creating deep east-west gashes that became rivers draining the Himalayas across China and down into Southeast Asia. The plateau isolates India from Siberia’s cold, winter winds and isolates central Asia from the moderating influences of the southern oceans.

North of the Tibetan Plateau, stretching from the Karakorum Pass into India to the famous Gansu (Kansu) corridor into China proper, lies a region of arid grasslands, dry hills, and sheerest desert. The Gobi Desert is the best known section of this harsh land, too dry for wheat cultivation, where sheep herding is the best option for survival. The Gobi is a *graben*, a sunken region where crustal blocks are being stretched and pulled apart by the pressures of



Map 1.2 Seismic activity along tectonic plate boundaries.

Box 1.2 Earthquakes along the Tectonic Plates

Map 1.2 illustrates just how seismically active Asia is, as a result of the slow-motion collision with India (see also color plate 1). On the map the border of the India plate is marked with a solid line that goes up along the west of the Indus River, crosses North India above the Ganges, and swings down through Burma and the Bay of Bengal. Almost all the seismic activity is on the Eurasia side of the two plates, where the Himalayas, Tibet, the Tarim Basin, and the highlands of Southeast Asia have been lifted up. Five major fault lines are “strike-slip” faults, where the two sides are slipping in opposite directions.

Each circle on the map represents an earthquake that occurred between 2000 and 2016, sized according to its severity. The Richter scale measures the release of energy in an earthquake on a scale in which each point is 10 times greater than the previous point. On the map, white circles represent earthquakes in the 7-point range, which are severe and generally result in great loss of life.

- The 2015 Nepal earthquake, at 7.8 magnitude, killed over 8,000 people and brought down many historic structures in Kathmandu.
- The 2008 Wenchuan earthquake in Sichuan Province killed over 87,000 people.
- The 2004 Indian Ocean quake was a whopping 9.1, sending tsunamis in all directions, as far as Africa on the west. More than 230,000 people in 14 countries died.

the Indian collision. Harsh as the Gobi is, to the west is a far worse place, the dreaded Taklamakan (see map 1.1). The Chinese knew the Taklamakan as the *liu sha*, or “Moving Sands,” but “Taklamakan” is Turki, meaning, “go in and you won’t come out.” One traveler described this environment: “Never once until we reached the plains were we out of sight of skeletons. The continuous line of bones and bodies acted as a gruesome guide whenever we were uncertain of the route” (Hopkirk 1980:10). The French explorer von Le Coq describes being caught in a “black hurricane”:

Quite suddenly the sky grows dark . . . a moment later the storm bursts with appalling violence upon the caravan. Enormous masses of sand, mixed with pebbles, are forcibly lifted up, whirled round, and dashed down on man and beast; the darkness increases and strange clashing noises mingle with the roar and howl of the storm. . . . Any traveler overwhelmed by such a storm must, in spite of the heat, entirely envelop himself in felts to escape injury from the stones dashing around with such mad force. Men and horses must lie down and endure the rage of the hurricane, which often lasts for hours together. (Hopkirk 1980:10)

The Chinese first ventured into this forbidding region in the first century B.C.E. when the Han emperor sent an emissary with a yak tail as sign of his ambassadorial authority. Zhang Qiang’s mission was to check up on the activities of the Xiongnu (Hsiung-nu), nomadic warriors who kept harassing Chinese

Box 1.3 Mapping the Himalayas

Prior to 1865, surveyors had not been able to verify their suspicions that the Himalayas were the highest mountains in the world—a prediction first made as early as 1784 by Sir William Jones, the brilliant founder of the Asiatic Society, after he had gazed upon distant peaks from the plains of Bengal. [European geographers believed the Andes were the highest mountains in the world.] By 1865 the British were standing at the gateways to Nepal and Tibet without hope of entry into the Himalayan fastness. The two states were blanks on the map. Nepal was officially barred to them by treaty, while in Tibet the Chinese Emperor had long declared that all *feringhees*—foreigners—were unwelcome. Anyone who got through in disguise might well be beheaded on the spot. And so the indefatigable officers of the Survey trained Indians to go where they could not.

These intrepid explorers—more than fifteen in all—became known as the Pundits, or teachers, after the best known of them, Naian Singh. For over fifteen years in various guises they tramped the immense bare plateau of Tibet.

Before they went forth they had to be trained. The Survey intended them to take surreptitious measurements of distance, latitude and height. The favorite disguise was that of a Buddhist lama, or priest. A sergeant-major drilled Naian Singh with his pace-stick until he could walk at a precise pace—exactly two thousand steps to the mile. A hundred-bead rosary (instead of the usual 108 beads) allowed him to count his paces, and inside his prayer-wheel constructed in the Survey workshops were compasses for taking bearings while at prayer. In the false bottom of his traveling chest was a sextant, and inside sealed cowry shells mercury for his artificial horizon. Naian Singh's salary was a paltry 20 rupees a month.

When a British surveyor returned to one of these peaks in 1911 he found the raised survey platform and finely chiselled markstone firmly in position. Nearby was a ruined stone shelter, in the corner of which lay a human skeleton.

Source: Simon Berthon and Andrew Robinson, *The Shape of the World: The Mapping and Discovering of the Earth*. Chicago: Rand McNally, 1991, pp. 146–149.

farmers in border areas (see chapter 3). The emissary was gone for 13 years of harrowing adventures, including 10 years of imprisonment by the Hsiung-nu. He finally returned with only one of his hundred men, plus the yak tail, bringing accounts of peoples living far to the west, at Samarkand, Bokhara, Persia, and a place called “Liqian (Li-jien),” which was probably Rome.

The news that there were interesting people to trade with in those distant lands led to caravans filled with Chinese silks and other prestige goods, and soon also to garrisons and watchtowers at the expanding western fringes of Chinese influence. This was the famous Silk Road. It started at Chang’an and led northwestward through a series of oasis towns, including the famous Dunhuang in the Gobi Desert. But the Silk Road could not cross the Taklamakan; instead, a northern and a southern route skirted the perilous wastes of the desert, linking oases watered by short rivers that flowed from fringing mountains and disappeared into the ocean of sand. Most of these oasis towns met the terrible fate of

the shifting sands, suddenly swallowed whole by a black hurricane, not to be rediscovered for a thousand years or more until early in the twentieth century.

Rivers

If you examine map 1.2, it looks as if the Indian continent plunged into Eurasia like a bull, plowing its two horns deep into the continent, pinching the ranges that emerged in the west and in the east; these eastern and western “pinches” are the sources of Asia’s nine greatest rivers.

Part of the romance of great rivers is that they have single “sources” that can be sought and named, around which mythologies can grow and pilgrimages can focus. In fact, all rivers are vast drainage systems whose true source, say in the case of the Yangzi, is its 700,000-square-mile basin. Yet, the headwaters of the Huanghe, Yangzi, Red, Mekong, Salween, and Irrawadi can be traced to a series of parallel gashes in the Tibetan and Qinghai (Chinghai) mountains; at one point the Mekong, Salween, and Yangzi are separated by only 40 miles (see map 1.1).

The distortions of the earth’s surface caused by the Great Collision gave China most of its geographic features: more mountainous terrain and less arable land (11 percent) than any of the world’s large nations. An older east-west range bisects central China almost to the Pacific. This range is the watershed dividing the two great river systems, the Huanghe and the Yangzi, and dividing China into its two critical ecological and cultural regions, North China and South China. North of these mountains, winters are cold, wheat grows better than rice, and for peasants working the powdery soil, life is hard. By contrast, South China is subtropical, with abundant rainfall, hilly green land, tea, bamboo, water buffalo, and two or more crops of rice a year. For centuries Northerners have imagined the south as a lush and sensuous place, but also a dangerous region of “southern barbarians.”

“China’s Sorrow” is the nickname given to the treacherous Huanghe, or Yellow River, that cuts a northern loop through the upland plateau of powdery soil, and then descends to the low-lying North China Plain. The Yellow River gets its name from the ochre-colored soil called *loess* that has been blowing into the North China uplands from Inner Asia for thousands of years, reaching a depth of 400 feet in some areas. This soil, as fine as talcum powder, has been gradually raising the bed of the river, which now is contained only by dikes built along its edges. The result is that after centuries of dike building, the river is actually higher than the surrounding terrain. Chinese historians have counted that it has broken its banks 1,573 times since 602 B.C.E. (roughly every year and a half).

Building these dikes to protect farmers from floods has been considered the duty of rulers since ancient times. According to Sima Qian, a court historian writing in the first century B.C.E., a woman named Jiandi (Chien Ti) found a blackbird egg while taking a bath. She ate it, became pregnant, and gave birth to a son, Xie (Hsieh), who grew up and went to work controlling the floods. This engineering achievement was considered the foundation of Chinese civili-

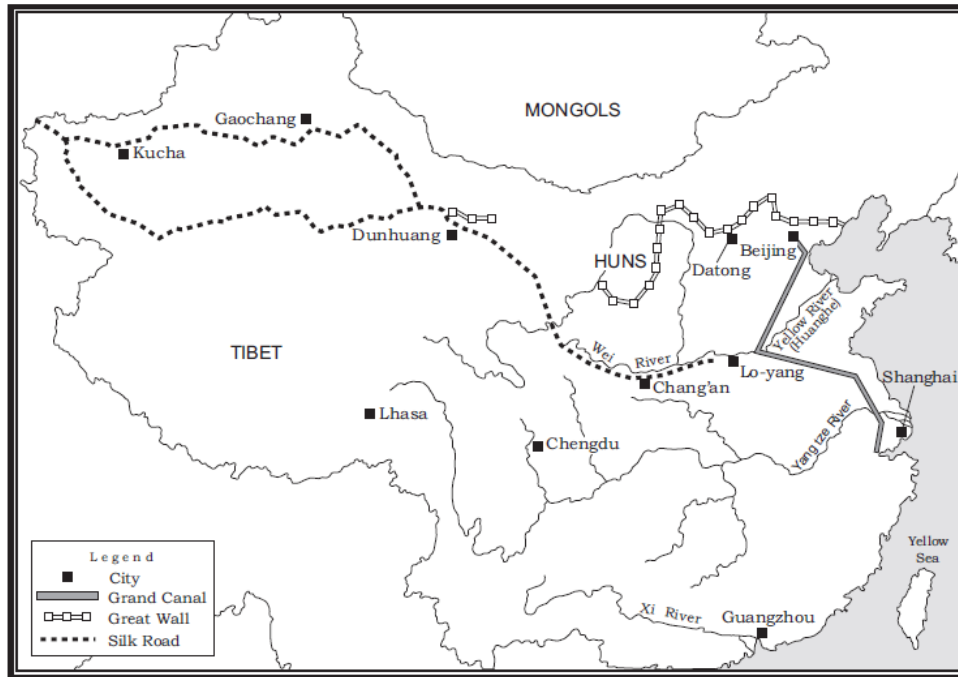
zation and Hsieh the founder of Shang dynasty (1766–1122 B.C.E.). This myth encapsulates the expectation that rulers will be responsible for water control, an essential function of government throughout Chinese history.

The Yellow River generally spills into the Bohai Sea but occasionally catastrophically changes its mind and drops south into the Yellow Sea. Over the last thousand years spectacular course changes have come in 1194 (south into the Yellow Sea), 1855 (north into the Bohai Sea), 1938 (south), 1946 (north—where it flows today). At every course change, human suffering has been immense. In 1938 the change was man-made; Chiang Kai-shek blew up the dikes in order to halt the Japanese advance by flooding the North China Plain. It did slow them down, but it also caused 500,000 deaths and produced six million refugees.

By contrast, the Yangzi is “China’s Main Street,” sometimes compared to the Mississippi for commercially profitable navigability. It has 10 times the volume of the Huanghe/Yellow River and is far more stable. The Italian merchant Marco Polo spent time in the lower Yangzi region in the early 1290s and was impressed by the commercial activity along the river. More than 200 cities in 16 provinces were involved in the river’s great trade network. One of those cities was probably Shanghai, then only a small coastal town. Only after it was acquired as a “Treaty Port” by the British because of its strategic location for international shipping at the mouth of the Yangzi did Shanghai grow into China’s largest and richest city.

The great challenge for early rulers was to link the rich, rice-growing southern provinces with the north so that barges bearing grain, tribute, and taxes could reach the northern capitals. All the rivers flowed east and west; why not build a river that would run north and south? It could connect the Yangzi with the Yellow River and go north to the capital at Xi’an (and later, Beijing). So a “Grand Canal” was begun in the sixth century B.C.E. at the same time as the earliest stretches of the Great Wall (see map 1.3). Over the next centuries, work on the Grand Canal was undertaken during periods of strong regimes and was allowed to fall into disrepair during periods of disorder. Between 600 and 610 C.E., two to three million laborers (including women when they ran short of men) constructed over 1,400 miles of canal. It began at Hangzhou (Hang-chou) on the coast, cut north to the Yangzi, curved around several large lakes and then northeast to meet the Yellow River, from where it was an upriver journey to the capital, Chang’an (Xi’an), with a 500-mile extension northeast toward a town near what later became Beijing. This canal was in use for the next 700 years. After the Mongol conquest in 1279, the Yuan dynasty made a new capital at Beijing so they rerouted the canal, shortening it to just over 1,000 miles—about the distance from Miami to New York. Nothing comparable existed anywhere else in the world.

That ancient canal is by no means obsolete. In yet another astonishing hydraulics project, China is currently reexcavating and reengineering the Grand Canal to transfer water from South China to the north, where half of China’s population lives with only one-fifth of China’s water. It won’t be finished until 2050; the water will end up flowing in the opposite direction (south



Map 1.3 The Grand Canal, Great Wall, and Silk Road.

to north), and it will cost far more than the initial \$22 billion, but it will be the largest megaproject ever undertaken anywhere.

In the western Himalayas India's three great rivers—the Indus, Brahmaputra, and Ganges—are formed from melting snowpack and summer rains draining the high mountains (see map 1.1). Their “sources”—much sought by Hindu and Buddhist pilgrims—are within 75 miles of each other at the foot of Mt. Kailash near the northwestern corner of Nepal in Tibet.¹ Pilgrims circumambulate the mountain in arduous but holy three-day treks.

In the west, the Brahmaputra flows eastward across Tibet, almost to the Mekong-Salween-Yangzi group, but then suddenly plunges south to mix its waters with the Ganges in the Bengal Delta. At the same time, across the entire southern fringe of the Himalayas, more than a dozen smaller rivers drain south, caught like so many ribbons in the two great North Indian rivers, the Indus and the Ganges.

Every day several million Hindus bathe away not only their physical dirt but also their sins in the holy waters of the Ganges. No Asian river is more beloved, more revered, or more transformed by mythology than the Ganges. This river is also a goddess the Hindus call “Ganga Ma” (Mother Ganges), one of the wives of Shiva. The river is said to flow out of his hair at his abode on Mt. Kailash and down through the Himalayan foothills, spilling out onto the

plains of North India at the sacred town of Haridwar. Gathering river after river in her eastward flow, Ganga Ma finally empties into the Bay of Bengal. In sacred towns up and down the river, Ganga Ma is worshipped daily at dawn and dusk by priests waving sacred flames while devout Hindus sing the great hymn, “*Om Jai Gange Mata*” (“Hail to Mother Ganga”).

However, there is constant worry about the health of the river. With millions washing and shampooing, “doing latrine,” laundering clothes, dumping the remains of cremation and often enough uncremated bodies into the river, Mother Ganga does indeed carry away the pollution of humans. “Ganga coex-



Worship of Ganga Ma at Rishikesh on the Ganges. At hundreds of sites all along the Ganges River, but especially at certain sacred sites like the upriver towns of Rishikesh and Haridwar, the Goddess Ganga—i.e., the river itself—is worshipped with fire (*arati*) at dawn and dusk. Brahmans perform the worship, joined by hundreds of worshippers.

ists with this *gandagi* (pollution) and lovingly carries it out of sight,” anthropologist Kelly Alley was told in Banaras. “Ganga is like a mother who cleans up the messes her child makes” (Alley 1994). Yet, scientists report that levels of *Pseudomonas*, *Escherichia coli*, *Enterobacter*, *Klebsiella*, and *Acinetobacter* are alarmingly high, and since the nineteenth century, epidemiologists have traced cholera outbreaks to major festival bathing such as happens every 12 years at Allahabad, the confluence of the Ganges and the Yamuna.

The Outer Ring of Islands

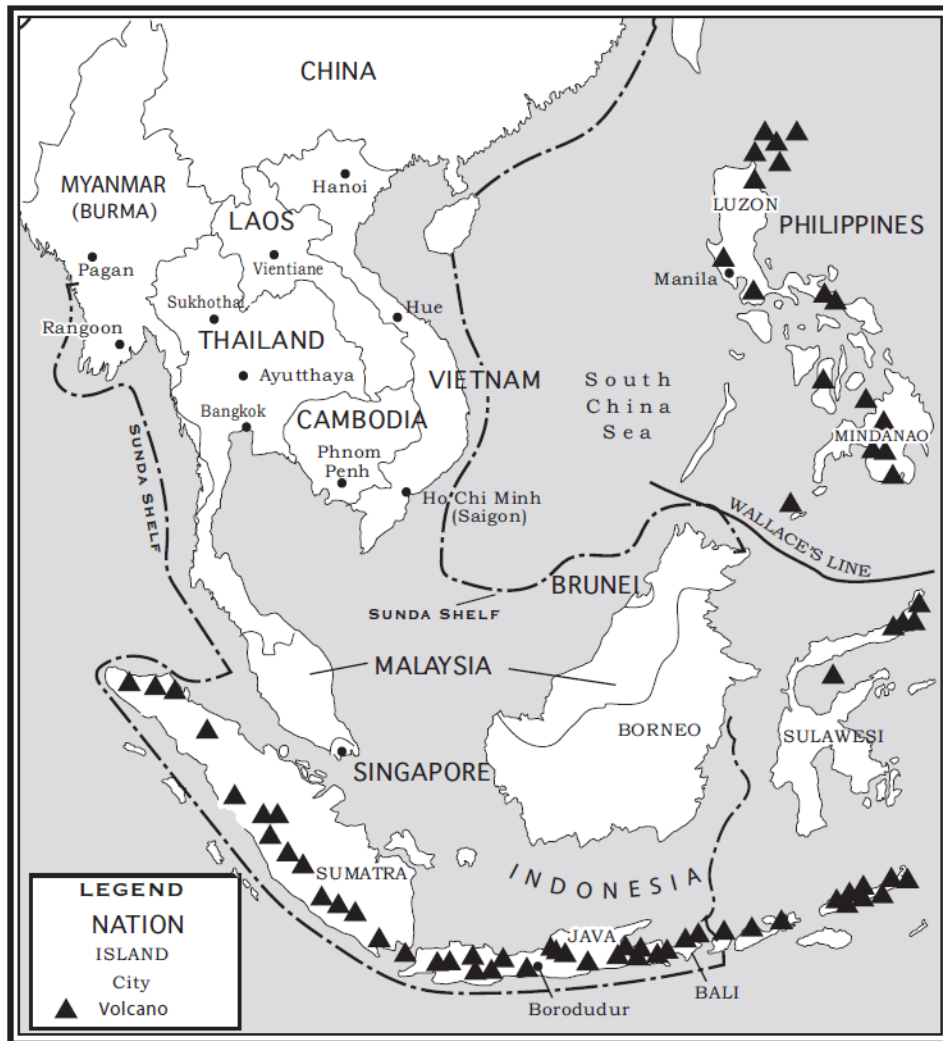
Where, exactly, is the eastern edge of Asia? Looking at a map of Southeast Asia as it is today, we see the familiar southwestward curve of Vietnam, ending just a little beyond the Mekong Delta. The shallow (118 feet) South China Sea separates Mainland Southeast Asia from Island (Insular) Southeast Asia, the group of islands that make up Indonesia and the Philippines. A long peninsula of which Burma, Thailand, and Malaysia own pieces, drops almost to the equator and comes within a few miles of Sumatra. But this is today (see map 1.4).

If we were to look back a mere 10,000 years, we would see a far different coastline. The eastern protrusion of Vietnam dropped straight down to Borneo. Sumatra, Java, and Borneo were the southern highlands of mainland Southeast Asia. A vast and fertile riverine basin was drained by Thailand’s Chao Phraya River, then the largest river system in Southeast Asia (Higham 1989). The only islands in Southeast Asia were the Philippines, Sulawesi, and the smaller islands east of Bali. The area that was exposed above the seabed is known as the Sunda Shelf, the true eastern limit of Asia. During glacial periods, when waters are locked up in the Arctic, the Sunda Shelf is exposed and dries; during warm interglacials such as the one we have been in for the last several thousand years, the South China Sea rises and inundates it. The inundating of the coastline has been going on very recently, perhaps as recently as a thousand years ago, though the main inundation was between 8,000 and 4,000 years ago, and with ongoing global warming and glacial melting, the coastlines are again at risk. These changes were in comparatively recent times; ancestors of present populations, including human ones, have lived through at least three of these cycles.

Beyond the true eastern edge of Asia—beyond Borneo and beyond what is called “Wallace’s Line”²—is a biogeographically distinct region. Placental mammals are found on the Asia side; marsupials are on the far side.³ Since there was never a time when a land bridge connected New Guinea and Australia to Asia, human settlement there depended on seagoing skills, which must have developed early (see later in this chapter).

A spectacular arc of volcanic peaks follows the outer curve of Indonesia, north through Sulawesi and the Philippines, and on to Japan. The most famous of the volcanic eruptions in recent times occurred on August 27, 1883, when an island between Sumatra and Java called Krakatau began a series of paroxysmal explosions that ended blowing away two-thirds of the island (Francis and Self 1983). No witnesses survived. Its effects, however, were felt around the world.

The explosion was heard 1,500 miles away in Australia and in South India, and the ash caused atmospheric effects and gorgeous sunsets around the world for months. Tsunamis moving as fast as air waves churned through the Sunda Straits and lashed the shores of Sumatra and Java, killing over 30,000 people. Waves from Krakatau reached Honolulu in 11 hours. It is thought that the thick ash in the immediate aftermath of the eruption may have muffled the noise of the explosion for people nearby (though heard quite well in Australia 1,500 miles away) and so failed to warn them of the coming tidal waves.



Map 1.4 Southeast Asia showing volcanism and the Sunda Shelf.

Sixty-eight years earlier an even more devastating eruption occurred, whose global destruction has only recently come to be understood. We know now that bad as Krakatoa was, it was only *half* the magnitude of Tambora, on a nearby island. (See box 1.4.)

But Krakatau and Tambora were exceptional events (Tambora was a “thousand-year eruption”); most people in the island regions live near potentially dangerous active volcanoes and simply get used to the danger. To the east of Java is the small island of Bali (only 90 by 50 miles wide), which has its own chain of volcanic mountains. The highest (3,142 meters) of these peaks is Mt. Agung (which erupted in November 2017) and is presided over by a male god who has power over fire. A lower but perhaps more sacred cone is Mt. Batur, a young volcano in the heart of an ancient crater. Part of this crater is Lake Batur, home of the Goddess of the Lake. Both of these deities, it is said, were given authority over Bali by the great god of Mt. Mahameru (i.e., Kailash), Shiva, on the Indian continent. These deities preside over highly active volcanoes, which erupt with disastrous frequency, burying whole villages but often miraculously sparing temples.

Box 1.4 1816: The Year with No Summer

Benjamin Franklin was the first person to suggest that extreme weather could be linked to volcanism. In 1783–84 he speculated that a universal fog and cold that blanketed Europe could have something to do with the recent eruption of Iceland’s Laki volcano. No one else thought that could be true. The subject was dropped.

Two decades later the largest volcanic eruption in a thousand years on planet Earth occurred on Sumbawa Island in the East Indies (a small island just east of Bali in Indonesia). Hardly anyone outside those islands, other than a few passing ships, took note, although over 10,000 people died on the first day alone. What followed over the next three years was a painful demonstration of the global nature of many natural forces, although even the best scientific minds of the period 1815–1818 had no idea of the interconnection of the disasters that assaulted societies around the planet. Only in the last few decades as meteorology has had the computerized data to understand global weather patterns, along with other scientific investigations (such as analysis of ice core data), have the pieces of the Tambora puzzle been fit together.

In 1815, Tambora was a “dormant” volcano that had begun to rumble a bit and send out dark clouds of ash. Local folk thought the gods might be celebrating a marriage, or maybe one of them was angry. On April 10, whole villages and 10,000 people were consumed within “a vertical hell of flames, ash, boiling magma, and hurricane-strength winds” (Wood 2014:17). The raja of Sanggar escaped, with his family, to tell the tale of the local destruction. In the following weeks, some 40,000 people died from sickness and starvation as their wells were poisoned by ash and their crops destroyed. The raja of Sanggar’s report to a lieutenant of the British Royal Navy is the sole eyewitness account.

(continued)

Unlike Krakatoa, Tambora's eruption was hardly noted in Europe in these pretelegraph times. No one understood that *global* temperatures had lowered by one degree, though they were dismayed by frosts and snowfalls in June and July of the following year. Crops worldwide failed in 1816, a year later, as volcanic aerosols circled the globe in the jet streams, darkening the sun, and creating disastrous weather patterns. In Shanxi, China, summer frosts destroyed crops and provoked mass immigration and starvation. In Yunnan, China, "Famished corpses lay unmourned on the roads; mothers sold their children or killed them out of mercy, and human skeletons wandered the fields, feeding on white clay" (Wood 2014:98). In India, the monsoons failed, and cholera swept the subcontinent, which over the next years became a global pandemic. In Ireland, that same summer saw cold and ceaseless rain that fell week after week, month after month, in the "Year without a Summer," as the wheat crop failed and potatoes rotted in saturated soil. The next year, 1817–1818, there was a typhus epidemic.

Artists, poets, and writers around the world responded to these global conditions with paintings, poems, and stories that reflect—unbeknownst to them—the global impact of the Tambora eruption. There were spectacular skyscapes by J. M. W. Turner and John Constable portraying vivid turbulence dominating human life. A small group of English poets happened to spend the summer of 1816 holed up in a mansion in Lake Geneva, Switzerland. They included the rock star poet, Lord Byron, his friends Mary and Percy Shelley, and Byron's lover Claire Clairmont. They passed the time telling ghost stories, out of which came Mary Shelley's famous *Frankenstein*, created on a dark and stormy night just like the ones they were enduring. Byron wrote a long apocalyptic poem called "Darkness," which began:

I had a dream, which was not all a dream.
The bright sun was extinguish'ed, and the stars
did wander darkling in the eternal space,
rayless, and pathless, and the icy earth
swung blind and blackening in the moonless air. . . .

Meanwhile in China, a 32-year-old poet named Li Yuyang living in Yunnan Province recorded the suffering around him in a series of poems:

Outside, the starved corpses pile high,
While in her room the young mother
Waits upon her child's death. Unbearable
Sorrow. My love, you cry to me to feed you—
But no one sees my tears. Who can I tell which aches
More? My heart or my body wasting away?
She takes her baby out to the deep river.
Clear and cool, welcome water. . . .
She will care for that child in the life to come.
(Quoted in Wood 2014:114)

These global experiences brought about by the great volcanic eruption of Mt. Tambora have only recently been pieced together by scholars from a variety of disciplines, showing how interconnected our world has been for longer than we have been aware.

For more on the Tambora eruption and aftermath, see Gillen D'Arcy Wood, *Tambora, The Eruption that Changed the World*, Princeton, 2014.

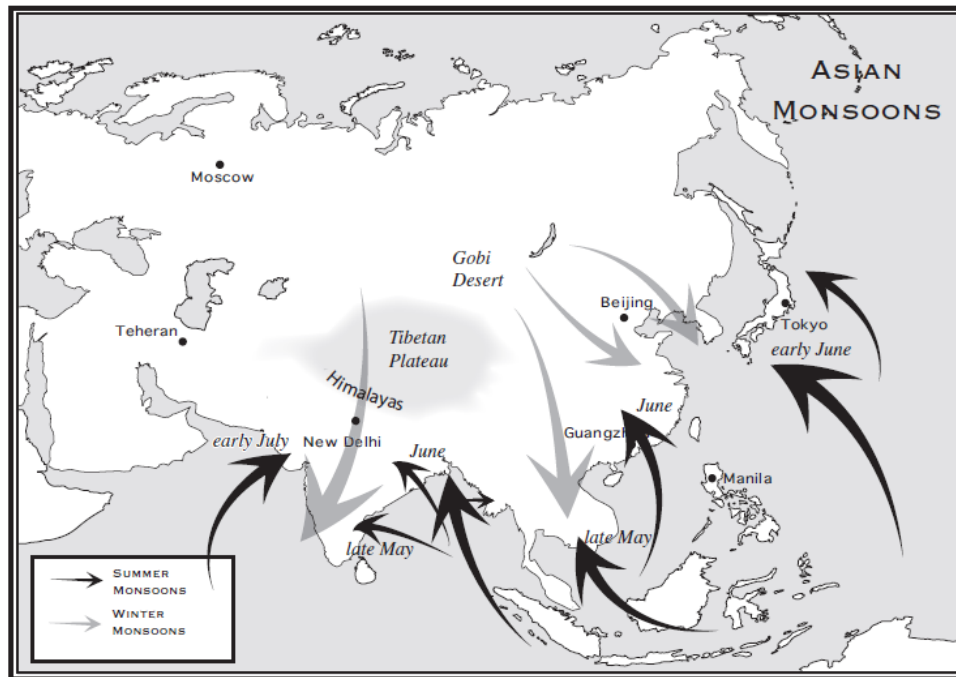
These Asian volcanoes are part of the great “arc of fire” that rims the Pacific Ocean. Its American arm includes the Cascades, Sierras, and Andes. Another type of volcano in the mid-Pacific is of the basaltic type: great, fast-moving, fast-spreading, enormous volcanoes, such as Mauna Loa and Kilauea in Hawaii, which build up from the ocean floor to the surface. But the volcanoes of the Pacific Rim are of a type known as andesitic; they erupt at lower temperatures, are stickier, and tend to pile up around the vent. They often throw large amounts of broken rock into the air and build the pile of material around the rim higher and higher into pointy peaks, like Mount Fuji in Japan, which we tend to admire as graceful and symmetrical. By contrast, Mauna Loa has about a hundred times more material in it than Mt. Fuji.

The reward for living with dangerous volcanoes is the most fertile soils in the world. In nonvolcanic regions of Indonesia, soils are often poor and the land sparsely populated, but volcanic areas have soil and climate conditions that allow for the highest population densities and some of the most successful agricultural systems ever devised. Before turning to those human adaptations, however, one more piece of the geographic picture must be put in place: the monsoons.

Monsoon Asia and Rice Adaptations

At midwinter in Asia, when the sun is far south over the Tropic of Capricorn, Central Asia and Siberia are intensely cold. The Tibetan Plateau prevents the warm southern oceans from moderating the frigidity, and (since cold air sinks) a vast region of high pressure pushes this cold air eastward into North China and southward over the edge of the Himalayas to spill onto the North Indian plains. But throughout the spring, as the sun begins moving northward, the situation reverses. Temperatures rise in North India and Southeast Asia, and accumulated ground water slowly evaporates. April and May are intensely hot and dry. The same thing is going on over the Indian Ocean and the seas of Southeast Asia, where ocean water is evaporating and rising into the atmosphere as moisture-laden clouds. These are the conditions that create the monsoons. Because the land heats faster than the ocean, the warmer air over the land rises. As it rises, denser, moisture-filled air from the ocean is pulled in to fill the vacuum. These are the monsoon winds. As the winds blow inland, this air, too, rises, releasing its heavy load of water vapor as monsoon rains (Webster 1981).

The coming of the monsoons is greeted with celebration throughout “monsoon Asia,” even by the casual visitor who happens to experience the shift from the numbing heat of May to the dripping humidity—briefly relieved by daily deluges—of June and July. For farmers, it means their paddy fields, which they have plowed and weeded and repaired in preparation, will now fill with the water essential to the first growth of rice. If the monsoons come consistently over the next few months, they will have a good crop; if, as sometimes inexplicably happens, the rains begin and then stop, the young rice shoots will



Map 1.5 Arrival of monsoons in Asia.

yellow in their dried-out fields, and then wither away. If the monsoons are overgenerous, the waters will rise until the ridges separating fields disappear, and the rice drowns.

Rice, Dry and Wet

Monsoon Asia is the natural habitat for rice. “Monsoon Asia”—the portions of Asia dominated by the wet–dry pattern described in the last section—is not the whole of Asia, by any means. In the equatorial islands of Indonesia, rain falls more or less evenly throughout the year, and little seasonal variation can be detected. And of course the mountainous regions of Tibet and the arid regions to the north are outside “monsoon Asia.” But India, mainland Southeast Asia, the lower, eastern regions of China, Korea, Manchuria, and southern Japan are all influenced by the monsoons. In monsoon Asia, rice is the single most important crop, covering one-third of the total cultivated area. Parts of monsoon Asia have longer dry and weaker wet seasons, and so grains like wheat, millet, and sorghum are more reliable crops. You can draw an imaginary line north–south in India, leaving the southern tip of India and Sri Lanka on the eastern side; to the west is wheat, to the east is rice cultivation. You can draw another line east–west across China north of a rough line lying between the Yangzi and the Yellow Rivers. South is rice cultivation, north is millet and wheat.

Origins of Rice Cultivation

We know that rice originated someplace in monsoon Asia, but its prehistory is far less well documented than that of wheat in the Middle East. Rice still grows wild in the three valleys of the Red, Mekong, and Chao Phrya Rivers. All Asian rice belongs to a single species of annual grass: *Oryza sativa*. There the simplicity ends. There are over 120,000 varieties among the three subspecies, *indica*, *japonica* (also known as *sinica*), and *javanica*. The *japonica* variety evolved along a Chinese branch of the Brahmaputra River (and so the Chinese call it *sinica*). And in the Indonesian islands, a third race of rice, *javanica*, evolved in adaptation to equatorial conditions. The huge number of varieties is a fabulous genetic resource that has made possible the hybridizing of a whole set of high-yield varieties of rice (HYVs) since the 1960s. These thousands of strains are treated as national treasures in rice-growing nations, preserved in “germ plasm banks” where they are stored on shelves like so many tins of tuna.

Because of its efficient system for transporting oxygen from shoots to roots (10 times better than barley and four times better than maize), rice is highly adaptable to hot, wet, waterlogged environments such as are common throughout monsoon Asia, where rice is typically grown in several inches of water throughout most of its growing cycle. It was probably in such environments that rice as a cultivar first evolved, with later adaptations to dry “hill rice” conditions. A second characteristic of rice is its extreme photosensitivity, requiring a precise number of *minutes* of sunlight per day at various stages of its growing season. This is why thousands of varieties have emerged in adaptation to micro-regions throughout monsoon Asia. It is this photosensitivity that required emergence of the *javanica* subspecies before rice could survive in the very different solar conditions of the equatorial region.

In the search for the origin of rice cultivation, however, the picture is not yet clear. Archaeology in Southeast Asia has documented a long period of successful foraging by peoples such as those who inhabited Spirit Cave in the northwestern hills of Thailand, and there is no easy explanation why they gave up their adaptation for the hard work of rice cultivation (Higham 1984). We assume it took some kind of as-yet unidentified pressure to push them to it. The oldest phase of the Chinese Neolithic is about 6000 B.C.E., but that was based on millet, not rice, in the Huanghe basin. The oldest sites of rice cultivating appear to be in southern Chinese coastal areas, running down as far south as the Red River basin in Vietnam. At the site of Hemudu in Zhejiang Province, dated at 5000 B.C.E., is a whole Neolithic assemblage: pottery, carpentry, stone adzes, boats, paddles, spindle whorls for weaving, ropes and mats, evidence of domesticated pigs, dogs, chickens, possibly cattle and water buffalo—and lots of rice. There were layers of rice husks, grains, straw, and leaves 20 inches thick. Bellwood summarizes:

The main significance of southern China, and one which becomes ever firmer as the archaeological record unfolds, is that it was the zone where

first developed the Neolithic technological and economic “package” that fueled all later population expansions into mainland and island Southeast Asia. (1992:91)

Two Rice Cultures

Since the earliest domestication of rice, its cultivation has diverged into two distinct patterns: Swidden (known by a number of different terms, including “slash and burn,” “shifting cultivation,” “dry rice cultivation,” and various indigenous terms such as *jhum*, *taungya*) and padi cultivation (“wet-rice cultivation”). A wet-rice terrace boldly rebuilds the natural landscape through earthmoving and channeling water downhill into level after level; a swidden imitates nature by leaving hillsides alone and sowing seed in the sunny spaces of burnt-off trees.

Throughout much of rice-growing Asia, the two rice ecosystems correspond with two forms of societal complexity. Prestate peoples mostly inhabit upland environments where they practice swidden cultivation, while state societies have emerged in the fertile riverine areas where they practice intensive wet-rice cultivation. We will return to these social concomitants in chapter 4, and for now keep our focus on the ecological dimensions of rice cultivation.



This hill field has been slashed and burned prior to planting. Stumps of burned trees still stand in the field, but their removal allows essential sunlight to reach the young plants. These varieties of rice do not require standing in water as does padi rice. The field will only be cultivated for a year or two before it must be abandoned.



Wet-rice cultivation is practiced in this newly terraced field. Wet-rice varieties must stand in water during the first phases of the growth cycle; as the plant matures, the seedlings must be transplanted from nursery beds to fields where they can continue to grow, an extremely labor intensive process.

Swidden. The swidden plot often looks like a haphazard field of grain sown on a hillside amidst blackened stumps and logs (see photo). This is because a hillside has been burnt of its original forest and undergrowth to allow sunlight to reach the growing rice. In actuality, the swidden plot is a “generalized ecosystem” with a high diversity of species, as many as 40 different species in one field.

Vegetation debris rapidly decays in the humidity, but this does not produce the good soils that one might expect. The soil in swidden areas is often a bright red that is better used for making brick than growing rice. This soil is porous and crumbly, badly leached of nutrients by the process of lukewarm monsoonal rainwater soaking downward, carrying away important silicates and bases and leaving behind an unhealthy mix of iron oxides and clay. Because so few nutrients remain in the upper levels of the soil where shallow plant roots can reach them, most of the minerals available to crops come from the ash produced in the burning phase of slash and burn. Between the first and second crop in a newly burned field, rice production drops as much as 80 percent because of the leaching process and using up the value of the ash by the first crop. The combination of loss of soil fertility and weed growth will make swiddeners decide,

after a few years, that it is easier to move than to keep working harder for less return in the same field.

Paddy (Wet-Rice) Cultivation. The large states of East and Southeast Asia are based on wet-rice cultivation, a system that supports vastly larger and denser populations than swidden agriculture.

In China, wet-rice cultivation is known as the “four stoops”—stoop to plant, stoop to transplant, stoop to weed, and stoop to harvest. The phrase conveys something of the labor intensiveness of this system. Paddy cultivation has an endless capacity to respond to loving care. You can pregerminate seeds in the house; you can sow seeds in nurseries rather than broadcast them as in upland swidden practice; you can hand-transplant in tight and even rows; you can weed three or more times during the growing season; you can double-crop and even triple-crop. You can dig irrigation channels, and you can go up mountainsides by carving terraces and channeling waters at enormous expenditures of labor. If you do these things, you can support population densities as high as 3,200 persons per square mile in fields that never suffer a decline in productivity even after 1,400 years of continuous use.

Rice and the Green Revolution

Green Revolution scientists have tended to assume that correct technology is all that really counts in getting high yields from agricultural land. Farmers could get three crops a year on irrigated paddies with a new hybrid like IR36 (a “high-yield variety” bred to resist four major rice diseases and four damaging rice insects, including the brown planthopper) along with appropriate fertilizers and pesticides. Premodern forms of agricultural activity—the ones that are responsible for the high population densities and longevity of paddies mentioned above—can then be modified or abandoned.

This proved to be an inadequate view in many parts of the world. In Bali, for instance, where some terraces have existed for more than a thousand years of continuous use, anthropologist Stephen Lansing discovered a complex interrelation between the ritual system and the agricultural system (Lansing 1991). Individual family-owned paddies are the elementary unit, locked in a system of ever more inclusive temple congregations and irrigation management. To begin with the rice paddy, according to Stephen Lansing:

In essence, the flow of water—the planned alternation of wet and dry phases—governs the basic biochemical processes of the terrace ecosystem. A general theory in ecology holds that ecosystems that are characterized by steady, unchanging nutrient flows tend to be less productive than systems with nutrient cycles or “Pulses.” Rice paddies are an excellent example of this principle. Controlled changes in water levels create pulses in several important biochemical cycles. The cycle of wet and dry phases alters soil pH; induces a cycle of aerobic and anaerobic conditions in the soil that determines the activity of microorganisms; circulates mineral nutrients; fosters the growth of nitrogen fixing algae; excludes weeds; stabilizes soil tem-

perature; and over the long term governs the formation of a plough pan that prevents nutrients from being leached into the subsoil. Potassium, for example, is needed for rice growth and depends largely on drainage. Phosphorus is also essential and may be increased more than tenfold by submergence.

The main crop produced is, of course, rice. But in addition, the paddy also produces important sources of animal protein, such as eels, frogs, and fish. . . . After each harvest, flocks of ducks are driven from field to field, gleaned leftover grain and eating some of the insects, like brown planthoppers, that would otherwise attack the next rice crop. Traditional harvesting techniques remove only the seed-bearing tassel, leaving the rest of the stalk to decompose in the water, returning most of its nutrients to the system. (Lansing 1991:39)

From the Balinese point of view, all water has its source in a lake high in the crater of Mt. Batur presided over by the Goddess of the Lake, Dewi Danu (Day-we DAH-nu). Her human representative is the High Priest, the Jero Gde (jeer-o g'DAY), and together they reside in the Temple of the Crater Lake on the shores of Lake Batur. The life-giving waters of Lake Batur flow downhill via various rivers and streams, ultimately spilling out into the ocean, the end point of dissolution and regeneration. These streams are not broad meandering rivers that would be easy to dam and divert for agricultural use, but they flow through precipitous clefts where they may actually disappear underground for a length before reappearing. Nevertheless, over centuries an intricate web of thousands of diversionary weirs and channels have been built to bring this sacred water to irrigate the terraces of the Balinese.

Such a system needs careful management, since many hundreds of farmers are upstream and downstream of each other, all dependent on a fair share of the available water in the right amounts at critical points in their growing season. Yet, unlike in China, this management was never the responsibility of any state official or bureaucracy. There were kings of Bali, but they ruled by rituals focused on a different god, a different mountain, and a different chief temple.

Rather, it was the system of temple worship, by farmers organized into worship-groups, that managed not only the flow of water but also a number of collective cultivation issues, such as when to plant, when to burn to control pests across a whole hillside, when to harvest, and when to fallow. At every node of water diversion—that is, at every weir across a stream or river—there is an altar or temple and a deity associated with it. Everyone downstream of that altar is part of its congregation. At the village level, water management associations composed of all farmers in the vicinity, known as *subaks* (soo-buks), were responsible both for worship and for collective agricultural and water-use decisions. The temple festivals require obtaining holy water from upstream sources; the need to collect this holy water provides the means by which temple congregations are linked in ever more inclusive units. The intricate annual calendar for all those temple festivals is simultaneously the calendar for opening and closing the irrigation weirs. Ultimately, the high priest, the Jero Gde, has the

right to make certain decisions with implications for the entire watershed, such as whether to open a new region to terracing and cultivation.

Although this system has tremendous practical results for life in Bali, notice that its practical effects are not distinct from its ritual ones. For Balinese, the earth is a sacred place, the waters are sacred, life is sacred, and because the Goddess of the Lake makes the waters flow, “those who do not follow her laws may not possess her rice terraces.”

The lessons for the Green Revolution scientists were serious. As much good as rice research has done for rice-producing nations in Asia, there was also wisdom in patterns of rice cultivation honed over centuries of experimentation in Bali that technology alone could not improve upon. The Balinese have returned to the ancient system of management of irrigation by means of temple festivals and the ritual calendar.

Early Asians

In traditional Chinese pharmacology, one of the most potent of substances is “dragon bones.” In powdered form, stirred into tea, it is a remedy for a great number of ailments, from general weakness to specific illnesses such as dysentery and malaria. One might think dragon bones would be hard to come by, but an excellent source of them about 30 miles southwest of Beijing supplied the pharmacologists of the capital for many years. Around the turn of the twentieth century, a few scientists came to recognize that these dragon bones were actually fossils of ancient animals, some of them extinct, including saber-tooth tigers, rhinoceroses, horses, bears, hyenas, and buffaloes. Among these fossils were two teeth that ended up in the Swedish laboratory of paleontologist J. G. Andersson. In 1926 he made the astonishing announcement to the scientific world that they were “human.” That is, they were of genus *Homo*, but of species *erectus*, not *sapiens*. They were thought to be an evolutionary precursor to modern humans.

The first *Homo erectus* fossils had been discovered in 1891 in what is now Indonesia, and these were dubbed “Java Man.” *H. erectus* may have been in Java as early as a million years ago, having migrated out of Africa in waves, and spread throughout the islands and southern China for millennia. It made repeated efforts to move north during periods between glacials when the north was less frigid; Peking Man is part of that northern movement, a late arrival 550,000 to 300,000 years ago.

The scientific world responded cautiously to Andersson’s assertion that Peking Man was “human.” It was a fabulous find, if true. These teeth were found in association with extinct species like saber-tooth tigers in a bed assumed to be over a million years old. But it was, after all, only two teeth, a molar and a premolar. There was already controversy over a few specimens of an early man called Piltdown Man, found in England, which was later proved to be an elaborate fake and exposed the scientific world to ridicule by the press.

But the announcement of a hominid find at Dragon Bone Hill, now better known as Zhoukoudian (jo-ko-dee-an), led to a long but intermittent sequence of excavations and the discovery of a great many more remains of what is now called Peking Man, or *H. erectus pekinensis*.

There are now remains of 40 individuals, males and females of various ages, plus tens of thousands of stone tools made by them (Wu and Lin 1983). They inhabited a large cave where they first took shelter about 460,000 years ago and continued to live until about 230,000 years ago. Something of the significance of that length of time can be grasped if we remember that only 8,000 years have passed since humans began cultivating grains in northern China. This earliest population is classified as *Homo* (“man”) *erectus* (“upright”), not *sapiens* (“thinking”); that is, it is the same genus but not the same species as modern humans. The average size of modern *H. sapiens*’s braincases is 1,450 cc; Peking Man had an average cranial capacity of 1,054 cc. The skull was thicker and flatter, with protruding brows, and a marked protrusion in the rear of the skull, very similar to *H. erectus* specimens found widely throughout Eurasia and Africa. Over the long period of life in the cave, evolution of cranial capacity seems to have been occurring, since the most recent skull, dated at 200,000 B.P. (before the present) was 1,140 cc. During that time, their tools got nicer, too, beginning with awkward choppers (a few flakes knocked off a large pebble to produce a sharp ridge) and ending with delicate and well-made points that could be tied to sticks to make hunting spears. Moreover, *H. erectus pekinensis* had front teeth that were slightly curved in the back, a type known as shovel-shaped incisors that are common in modern Chinese populations. This was taken as evidence that modern Chinese evolved directly out of Peking Man. In the 1930s Franz Weidenreich argued that populations descended from Peking Man evolved into the “Mongoloid Race” of modern East Asian peoples. In addition, according to this now-outdated racial theory, there are two other great human races: the Caucasoid and the Negroid. Further subdivisions were arrived at based on observable physical (phenotypical) characteristics like skin color and hair type.

The appeal of Peking Man to contemporary Chinese may seem obvious: the ancestor of all Chinese already on the scene half a million years ago. We are all descended from this common ancestor! We have been here practically forever. Millennia later comes the Yellow Emperor and all of Chinese civilization flowers. Unfortunately, the picture isn’t that simple.

Modern paleontologists believe that *H. sapiens* originated as recently as 143,000 years ago in East Africa and migrated north and eastward, often into areas where late *H. erectus* still lived. In Europe, for example, Neanderthal evolved from *H. erectus* that died out with modern *H. sapiens* when they entered 30,000–40,000 years ago. Whether they interbred was long in doubt, but in 2013 it was established that modern Europeans have some Neanderthal genes.

The evidence for the late date of *H. sapiens* comes from DNA studies beginning in the 1980s, which showed that *all* modern humans are descended from a

small early population in East Africa that replaced *H. erectus*. One type of DNA known as mitochondrial DNA, which transmits through females only, allows geneticists to determine the degree of differentiation of human populations worldwide. These studies show that all contemporary humans are recent descendants of a small group of Africans, numbering only about 10,000 individuals (Sautman 2001; Ziętkiewicz et al. 1998). Only about .01 percent of all genes in the human genome relate to physical features that are used to distinguish the “races.” This new genetic evidence has meant that the old racial categories have little scientific significance (except culturally, of course, which we will get to later).

The results of these newer studies involving the science of genetics is that *H. sapiens* reached China from Africa very recently—around 60,000 years ago—via India and Southeast Asia. They spread north into China and may have encountered “Peking Man” (i.e., *H. erectus*), but this population died out and was replaced by the newcomers.⁴ Asians separated from Africans no earlier than 100,000 years ago, from Australians 50,000 years ago, and from Europeans only 30,000 years ago (Sautman 2001:100). Features that are identified as “Mongoloid,” that is, supposed East Asian physical characteristics like flat faces, shovel-shaped incisors, and epicanthic folds of the eyelids evolved within the last 50,000 years.

However, cultural categories of race, and all the issues of national and ethnic identity that accompany them, have been slow to catch up with the scientific facts. After a century of thinking about race in the old three races way (see above), these ideas have embedded themselves in national cultures in a pretty fixed manner and are very difficult to change. In China, for instance, the idea of a continuous racial identity from earliest Peking Man half a million years ago to the present provides a mythology of Chineseness that transcends dynasties and regimes. It is a myth that attempts to overcome separate identities as Han, Uighur, Tibetan, Miao, and so on as more recent environmental developments from an original common racial stock, allowing for the argument that ultimately, “we are all Chinese.” There is plenty of political utility in such a myth. But the truth, as now understood through paleoanthropological and genetic studies, is that small groups of East Africans in the last 60,000 years migrated along the shores of Africa, the Middle East, and India, eventually reaching Southeast Asia, from where they finally spread north into China. Branches of them settled in each place along the way. Only much later did various kinds of cultural identities emerge. Someday, perhaps, our common human identity will be as celebrated as our separate national and “racial” ones.

ENDNOTES

¹ Since international borders are now guarded and unfriendly, pilgrimage to Kailash from India is rare, and Hindus have adapted by revering a source of the Ganges called Gaumukh, “the Mouth of the Cow,” slightly to the southwest in the Indian Himalayas.

- ² In 1859 the naturalist Alfred Russel Wallace noted distinct differences in ecozones between Asia and Australia, with distributions of fauna distinct on the two sides (e.g., kangaroos, koalas, and wombats in Australia, but not monkeys, tigers, or deer).
- ³ The exception: a few species of bats and rodents (placental mammals) managed to swim or float to Australia and New Guinea in pre-human times.
- ⁴ The spread of modern humans probably also eradicated a puzzling species discovered in Indonesia in 2003 and dubbed “hobbits” (*Homo floresiensis*) because of their small size. Early studies concluded they were as recent as 11,000 years, but recent retesting of rock and sediment has pushed that date back. Paleontologists now think they were gone by 50,000 years ago, about the time of the arrival of modern humans (Callaway 2016).

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