




STEVEN WALLECH

China and the West to 1600

Empire, Philosophy, and the Paradox of Culture



WILEY Blackwell

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Preface

Teaching and studying world history at the college level is a uniquely challenging endeavor, the subject so immense that it can at times overwhelm the novice—first-time instructors and students alike—with its wealth of details.

Nearly all other college or university courses in history tend to focus on a single culture or region, distinguishing it from all other human communities. As a result, such courses tend to highlight differences. To teach world history, however, the instructor must reverse this emphasis. Theme or themes must be found to explain the common problems faced by humanity, and then explore how each culture did or did not find solutions. In this manner, the instructor deals with the commonality of our shared humanity, from which certain patterns over time, or themes, emerge.

This text uses one such theme to consider the comparative histories presented. This is the artificial relationship between humans and the plants they grow, and the animals they raise, to feed their population. This theme sets the material limits that confront a culture: how many people it can feed, how much geographic space it can command, and how effectively it can use its resources. In addition, this theme reveals how the nature of the relationship between humans and their food supply produces a continuous paradox, one that every civilization must face: an abundance of food generated by agriculture feeds a growing population that soon outstrips the food surpluses generated and threatens famine, epidemic disease, and exhaustion of the land that in the extreme can lead to ecocide, or the collapse of the ecosystem. Two subordinate themes are also useful in explaining how this paradox unfolds in world history: 1) the beliefs (religions and philosophies) that the production of surplus food supplies supports as civilization tries to address the central paradox cited above, and 2) the consequences of the close association between farmers and herders as they compete for use of the land.

Two civilizations are singled out in the pages that follow to facilitate this study: China and Western civilization. These two make good case studies because they were the richest and most powerful civilizations in world history during the ancient era. They produced material features that were remarkably similar. They faced the same internal problems at roughly the same time. They generated great philosophies in an attempt to find solutions to common problems. And they both faced the threat of invasion by a nomadic enemy as they spiraled into collapse at the end of the ancient era.

Post-Han Empire China and post-Roman Empire Western civilization diverged during the course of the Middle Ages. This divergence, the different paths China and “the West” took after the fall of their respective ancient empires, was in part a reflection of the varying degree of success they achieved in implementing the different philosophies they had developed to try to address the central paradox of culture. This divergence also reflects their levels of success and failure in dealing with nomads, ever present on their frontiers.

Furthermore, as the paradox of agriculture unfolds, subordinate paradoxes appear. The most important one to the study of world history is that the success China achieved in maintaining its ancient traditions ended up trapping Chinese culture in these traditions. In contrast, medieval Europe failed to recover the unity of Rome. Also, institutional contradictions emerged as a result of trying to mix surviving features of Greco-Roman culture with Christian practices and values and Germanic (and nomadic) customs. This created a dysfunctional feudalism that failed so spectacularly that Europe broke with tradition and modernized, making Western civilization the first to do so. Hence, the original paradox of culture, agriculture, spawned a series of subordinate ones considered by this study. The subordinate paradoxes reveal the great complexity of a great civilization in a simple, and, we hope, engaging way.

One still might ask: Why compare the ancient civilizations of China and Western civilization? The answer rests on the brilliance of both. Since these two civilizations achieved the pinnacle of material success in the ancient world, both examples can be used by the student of world history to study other human communities. An understanding of how both China and Western civilization struggled with the paradox of agriculture also provides a useful method of historical analysis.

Finally, this text can serve as supplemental reading for both halves of the world history survey. In ancient and medieval world history, it explains the complex consequences caused by humanity’s choice to abandon a natural way of making a living and adopt the artificial lifestyle that agriculture

created. This book also provides a complete treatment of the tensions between nomads and sedentary farmers that persisted throughout most of ancient and medieval Eurasian history. Finally, this book explains why modernization began in Europe and not in China, which might relieve the instructor of a course on the history of the modern world from having to spend a great deal of time laying a foundation for the course.

Introduction

The paradox of culture refers to the inescapable contradictions that marked civilizations throughout world history. The oldest and most significant paradox surfaced with the agricultural revolution. Once discovered and mastered sometime near the end of the last Ice Age, agriculture, a reliable method of producing food, gave rise to civilization, but at the same time trapped humans in a cycle of unwelcome consequences. When ancient farmers began to cultivate specific plants and raise specific animals to support sedentary communities, they deviated from nature, creating an artificial setting for human survival. By giving up a nomadic lifestyle and cultivating these organisms, the first agriculturalists not only produced their own food, but generated the first food surpluses in world history, launching a human population explosion. People began to settle down in ever-greater numbers, organizing and then reorganizing their methods and systems of food production. In so doing they changed the landscape.

The increasing numbers of people who had adopted agricultural and permanent living sites soon began to place pressures on the local environment. One consequence of adopting a sedentary lifestyle to cultivate food was the attraction of parasites, not only insects and rodents that wished to feed on humans or their food supplies, but pathogens that spread easily among concentrated populations of people and their domesticated plants and animals. Periodically these pathogens devastated local populations in the form of epidemic disease. In addition, this new, artificial relationship called “agriculture” set in motion periodic episodes of “eccocide.” In other words, the very methods the early farming communities employed to generate food eventually ended up undercutting their capacity to produce

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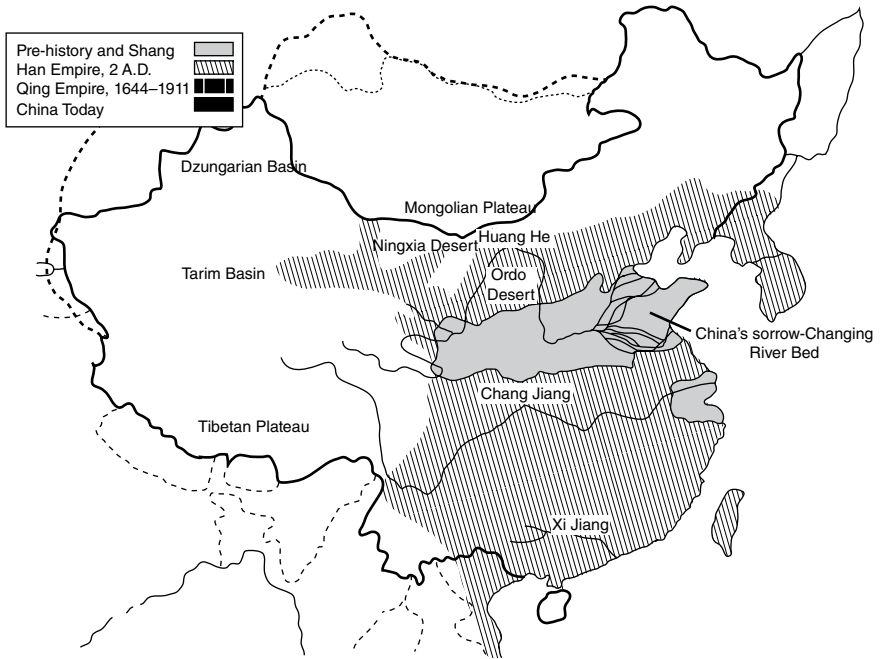
sufficient supplies of food by causing soil erosion, soil exhaustion, deforestation, or all three simultaneously. The end result was that the agricultural revolution created a fundamental paradox: the more successful the society is in producing plenty of food, the more potential there was for ecological disasters, whether biological or environmental.

In an attempt to defeat this fundamental paradox, each ancient civilization developed its own system of beliefs and practices, known collectively as its *culture*, designed to try to increase its control over the natural world. The various cultures attempted to integrate human actions, expectations, and agriculture, with the end goal of creating a steady flow of food to feed the ever-increasing needs of their ever-increasing populations. Nonetheless, none of these early cultivating communities could escape the consequences of its actions, as the artificial conditions under which they lived generated ever-greater distances between human civilizations and the natural environment.

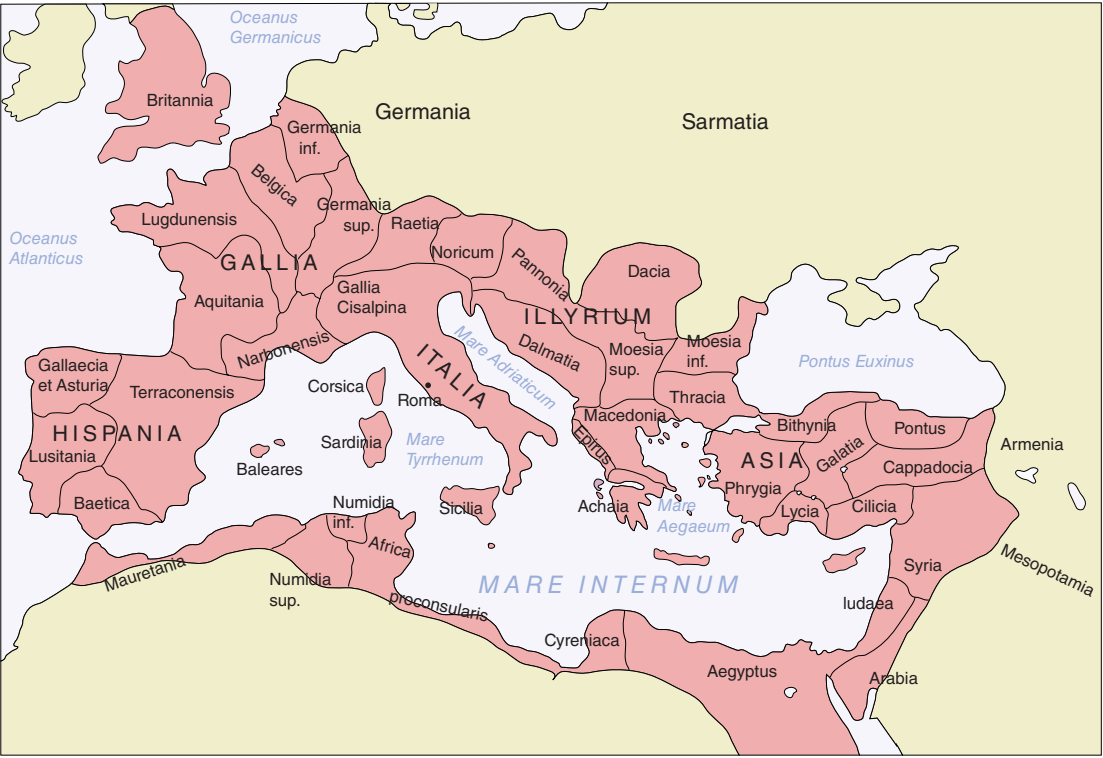
Two such societies, China and the Western world, provide excellent examples of human culture's struggle with the fundamental paradox agriculture created. Singling out China and the West for a comparative study is instructive, for both civilizations experienced striking similarities during the ancient era, and then dramatically diverged during the Middle Ages. Both societies matured roughly at the same time and at the same rate. Both grew to roughly the same size in terms of the number of people and amount of land under political control. And both suffered similar fates at the end of the ancient era for roughly the same reasons. Yet, with the beginning of the medieval era, China managed to hold the center, recover, and keep its ancient, classical institutions intact, while the post-Roman West collapsed and splintered into the eclectic European cultures of the Middle Ages. Furthermore, once the medieval era began, China entered a golden age of traditional practices that set it apart as the richest culture in Eurasia. In contrast, Western civilization lurched from one institutional design to another, from the Early to the High and then to the Late Middle Ages (500–1500 CE). Ultimately, and ironically, China's great success in maintaining its traditional culture throughout the upheaval of the Middle Ages trapped its society in stasis, even as Europe's stunning failure to maintain its traditional society set in motion great upheaval and change, a process that, ultimately and ironically, led to modernization, leaving China "behind" for centuries.

To accomplish the task of comparing and contrasting the paradoxes embedded in China and the West, we will consider three major themes: agriculture, philosophy, and the threat of and interaction with nomads. Agriculture is an obvious choice since the central paradox under study in

this book springs from the singular event of humans selecting and planting specific domesticated plants. Chinese and Western philosophy is not as obvious a choice as agriculture, but one that nonetheless reflects the cultural paradoxes derived from changes in agricultural production. Finally, responses to, and interaction with, nomads serve as the third choice. The nomadic lifestyle required the breeding, raising, and herding of livestock and the ability to continually pick up and move in order to find fresh pastures. In contrast, cultivating domesticated plants required the adoption of a sedentary lifestyle: staying in one place, building fences, maintaining borders, and excluding intruders. These major differences in food production and lifestyles led to open conflicts between farmers and herders, struggles that played out over the entire course of ancient and medieval world history.



Map 1 Shifting Historical Borders of China



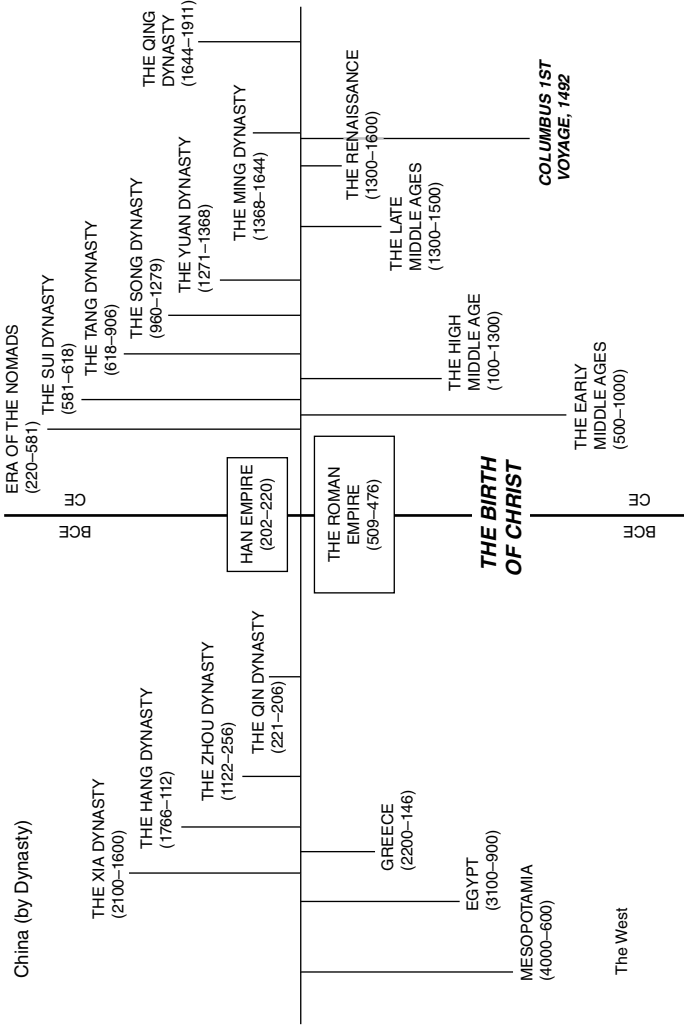
Map 2 Roman Empire

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Map 3 The Nomadic Steppe

CIVILIZATIONS OF THE ANCIENT WORLD CHINA AND THE WEST



The Paradox of Agriculture and its Impact on China and Western Civilization

The Oldest Paradox

The use of agriculture created the first cultural paradox in world history, in that it both enabled the development and rise of the first civilizations and continuously threatened to undermine them and lead to their fall. This is because in the ancient era, they unintentionally created an artificial relationship with domesticated plants (and later animals) that was not permanently sustainable.

The first groups of people working in agriculture created a relationship with plants that proved to be quite unnatural. The circumstances that created this bond combined the warmth of a new climatic era at the end of the last Ice Age (around 18,000 years ago) with the appearance of an abundance of seed-bearing grasses that promised a bounty of new foods. In this new setting of melting ice, exposed new lands, and seed producing plants, hunters and gatherers began a new economy called foraging. These foragers collected seeds in different locations around the world by studying such plants as wild wheat, barley, rice, corn, lentils, chickpeas, peas, flax, rye, millets, sorghum, and so on, to learn their life cycles. These foragers learned that wild varieties of these plants produced pods that spontaneously opened to scatter their seeds on the wind and spread throughout the landscape. Studying the life cycle of these wild varieties taught these foragers when to approach clusters of these seed-bearing plants and harvest their kernels of food before they dispersed in the wind. Learning so much about the wild plants, these foragers noticed that every once in a while a rare genetic mutant appeared that did not scatter its seeds. This rare plant

(one mutant in every two to four million wild plants) stood out because its pod did not open, its seeds grew to an unusually large size, and these seeds remained trapped with the parent plant.¹ The large seeds in these unopened pods promised to provide a very rich diet if more of these plants could be found. But these plants did not reproduce.

Having learned a great deal about wild seed producing grasses, these foragers collected these mutant seeds whenever they appeared and sowed them rather than ate them. Very quickly, the number of mutant plants increased each year, changing fields of wild, seed-bearing plants into this rare mutant variety. By eating some of the large seeds, and planting the rest, these foragers unintentionally became farmers and rapidly began raising fields of mutant plants that could not reproduce on their own. A new bond had been forged: the first farmers in world history perpetuated the existence of plants that could not generate their numbers without human intervention.

Not surprisingly, this artificial bond between humans and their mutant plants led to a dramatic increase in the population of both. In a relatively short time this mutually beneficial relationship, which biologists call a “symbiosis,” changed the landscape. Wild varieties of seed-producing grasses gave way to human cultivators planting their mutant food sources. But this new symbiosis was not a natural relationship because these ancient farmers had sowed the seeds of plants that should have disappeared after one growing season.

Biologists refer to individual organisms that do not reproduce in the wild as *omegas*. The mutant plants that ancient farmers chose to cultivate certainly belonged to this category of life form. In contrast, biologists call successful organisms that do reproduce in the wild *alphas*. The wild variety of seed-producing grasses that scatter their seeds, sending them flying on the wind far away from the parent plant certainly belong to this category. These proved the most successful in the process Charles Darwin called “Natural Selection,” while planting mutant *omega* grasses required human intervention, or what biologists called “artificial selection.” All agricultural communities used artificial selection.

By selecting *omega* plants, the first farmers secured a reliable food source. The predictability of producing seeds from single *omega* parent plants provided offspring that matured at the same time and at the same rate. Also, since grasses are hermaphrodites, the male and female sex organs on the same mutant parent plant produced seeds with a very stable DNA. Such an abundance of food from a stable gene pool fed growing numbers of people and soon ancient farmers and their *omega* plants thrived together. The result was the rapid increase in the number of

omega plants, as well as the number of those groups of people who had turned to agriculture (and by extension a sedentary lifestyle). As the number of humans and *omega* plants linked in the symbiotic relationship we know as agriculture continued to increase, these groups began to move aside the once widespread *alpha* plants, changed the physical landscape, and (unintentionally) narrowed the range of food sources available for human consumption. Soon thereafter, unintended consequences followed.

These consequences played out following a long and tortuous scenario, one repeated in more or less the same order in all long-lasting agricultural communities:

- 1 The earliest form of agriculture, known as “slash and burn,” involved the killing of large forests of trees by stripping off their bark, burning the dead trees, and using the ash as fertilizer to grow *omega* plants.
- 2 The human-*omega* plant symbiosis supported by slash and burn agriculture increased the total population of both groups of organisms.
- 3 Continuous growth in the populations of sedentary human farmers and *omega* plants resulted in deforestation and altered the local landscape.
- 4 Deforestation exposed the land under cultivation to soil depletion and erosion, making it particularly vulnerable to changes in climate, which could in turn lead to great ecological damage and even the collapse of the local ecosystem, the latter known as ecocide.
- 5 Great ecological damage forced farmers to abandon exhausted fields and seek new locations in which they could settle and grow the crops upon which they had grown dependent for sustenance.
- 6 The most desirable locations for permanent fields in which to grow crops were near rivers that could provide season after season of fresh soil and water thanks to annual floods of the river valleys and their nearby floodplains.
- 7 In order to avoid drowning during these annual floods, local farmers began irrigation projects in attempt to both bring the water of the river closer to their fields and regulate the impact of the floods.
- 8 Long periods of successful growing seasons and increased human numbers soon required farmers to devise methods to count their seeds, store them, and ration their supply in order to ensure a continuous supply of food to eat from harvest to harvest, year after year.
- 9 The need to count seeds, measure time, and ration food supplies led to the development of mathematics, writing, and calendars by the people living in the successful farming communities.

- 10 Those individuals who developed numbers, letters, characters, and concepts of time held specialized occupations, did not spend their days farming, and lived near one another in towns. These were near but separate from the fields and those individuals who remained tied to the land and had to tend to the crops on a daily basis.
- 11 As human numbers continued to grow, towns became cities and the urban centers became the foundations of civilizations.
- 12 As a civilization expanded, more and more of the surrounding local landscape fell under human control, causing nature to continue to retreat.

Eventually, however, nature always seemed to rebel. The increasingly large human imprint on the local ecology upset the delicate balance between ancient farmers, their *omega* plants, and the conditions that both needed to exist. This apparent natural rebellion could take the form of droughts, soil exhaustion, increased local aridity, violent floods, the sudden eruption of epidemic disease (whether in the human, or domesticated plant, or domesticated animal populations), or, most destructive of all, complete ecocide, or collapse of the power of the ecosystem to sustain life. Any and all of the unpleasant consequences of agriculture that inflicted damage on the natural environment could and usually did disrupt the human organization needed to continue to cultivate the local landscape. Such disruptions could cause a very high death rate among farmers and threaten the very foundations of a given civilization. Sometimes the inhabitants of the ancient farming community would find a way to recover from the disruption and continue to develop; sometimes the community would unravel and simply cease to exist. In either case, any surviving farmers found themselves still caught up in the incessant struggle to exist, but now sustenance by agricultural was the only way they knew how to feed themselves, so all who could do so moved to a new location, inevitably altering the landscape wherever they settled.

As agriculture developed in the ancient world, two very successful human communities that followed the above-mentioned scenario of humanity's struggle with food production, its ecological impact, and its mounting population pressures, were China and the Western world. Within Chinese and Western civilizations' long histories, Han China and Imperial Rome managed to produce the richest empires of the world's ancient era and maintain a remarkably long period of command over their respective domains. Han China rose to power in 202 BCE and fell in CE 220. The Roman Republic began in 509 BCE, with the Roman Empire officially coming to an end in CE 476. During these long periods of rule, and within their respective parts of Eurasia, these civilizations were unrivaled

in the number of people they could feed, the size of the geographic area they commanded, the amount of wealth that they produced and amassed, and the length of time they managed to secure their borders from nomadic raiders.

To understand the conditions that underpinned such major imperial successes requires an analysis of two central themes of world history: cultural diffusion and geographic isolation. The history of Eurasia, and the adjacent lands of North Africa, is one of frequent intercultural contacts, or much cultural diffusion. This is because an east-west land axis dominates the geography of Eurasia and North Africa, a physical alignment that allowed the many different peoples of Europe, North Africa, and Asia to range far and wide and engage in considerable cultural interaction. Frequent cultural exchanges resulted in the transference of all manner of domesticated plants and animals, tools, ideas, and commercial goods, from one end of this large portion of the world to the other. It also accelerated the development of civilizations throughout the entire geographic zone. For this reason, the ancient civilizations of Eurasia and North Africa developed more quickly than did those of sub-Saharan Africa or the Americas. Still, of all the ancient civilizations of Eurasia, none achieved as great a material success as did Han China and the Roman Empire.

In contrast, geographic isolation, which of course limits cultural diffusion, dominated the history of the Americas and sub-Saharan Africa. In the Americas, the land axis runs north to south, which precludes the easy movement of domesticated plants and animals due to dramatic changes in climatic zones and habitats as one moves farther north or south of the equator. In addition, the Atlantic and the Pacific Oceans virtually quarantined the peoples of the Americas from those of Eurasia and Africa, effectively denying almost all forms of cultural and even biological contact.

Finally, and unlike the Americas or Eurasia, the land axis of sub-Saharan Africa runs both north and south and east and west. The Sahara Desert, however, dominates most of the east-to-west axis. This means that this massive desert, one of the largest in the world, undid most of the advantages an east-west land axis might otherwise have afforded the peoples who inhabited the zone. Climate and habitat remained similar along this east-west axis, but sand dominates much of the landscape. The only area where humans could thrive was the grasslands just below the Sahara, but until the arrival of the camel, an animal not native to the area, foreigners had no way to reach the grasslands. Therefore, the grasslands of sub-Saharan Africa would go undeveloped until the rise of Islam and the use of the Arabian camel to cross the Sahara in large numbers and open trade routes during the Middle Ages (CE 500–1500). The only exception to this

condition of severe isolation was sub-Saharan cultures situated on or near the Nile River. Ancient Kush (1700 BCE– CE 350) had a history anchored in its contact with Egypt situated to the north, and along the Red Sea coast a later civilization called Axum (CE 100–700) thrived after the beginning of the Common Era. But south of Kush and Axum, climate denied further cultural penetration into sub-Saharan Africa because summer rains drowned Egypt winter grass crops.² This helps explain why no civilization in the Americas or sub-Saharan Africa ever matched the material successes found in Eurasia and North Africa during the ancient era.

Even though both Han China and the Roman Empire were unrivaled in the ancient world, neither was immune to the trappings of the paradox of agriculture. The strain on the local ecology of increasing human and *omega* plant numbers resulted in periods of decay in both. In addition, the success of China and Western civilization increased the distance between their human populations and the natural setting in which these people lived. Ultimately, the more both cultures succeeded, the more population pressures they created. And the more population pressures they created, the more likely they were to face massive failures. These continuous issues of human numbers and the spread of *omega* plants required constant adjustments to maintain order in both civilizations. Finally, the Han Dynasty and the Roman Empire represent the most complex cultural developments of ancient Chinese and Western civilizations.

This chapter explores the paradox of agriculture, ties it to the biology and geography of cultivation in these two cultures, and considers the developmental adaptations of both. Below is the history of this paradox as it unfolded in the ancient era in both China and Western civilization. Each responded by continually adjusting institutions to the organizational needs of food production as they teetered between order and chaos.

Chinese Agriculture

For much of world history, China maintained the globe's most dynamic culture. Chinese wealth and power enjoyed pre-eminence from the Han Dynasty (202 BCE– CE 220) to the beginning of the modern age (*c.* CE 1500). Each ruling dynasty, or imperial family, that governed China, did so with absolute power. That power, however, was tempered by the necessity to delegate authority to highly trained bureaucrats who administered the emperor's will. Chinese emperors selected these officials from individuals who had passed the rigorous Confucian examination system, which promoted the most talented men of each generation. These Chinese

scholar-bureaucrats then rose in rank, based on their interpersonal skills and bureaucratic cunning. This system of centralized authority allowed each imperial family to rule China for centuries. The end result was the creation of the Chinese dynastic cycle: the ability of traditional China to regenerate its political organization century after century despite the fact that each ruling family eventually fell from power.

Through their dynastic cycle, the Chinese developed and maintained a highly successful political organization. Despite periodic disruptions due to internal rebellions or nomadic invasions, the Chinese managed to return to their well-tested system. In short, China exhibited an ancient form of internal coherence that the cultures of India, Europe, the Middle East, the Americas, and Africa never equaled. A critical underpinning of this successful rule lay in the Chinese system of agriculture.

The history of Chinese civilization began on the northern plain, situated around the massive Huang He (Yellow River). This is an area rich in a fine-grained yellow soil called loess, a wind-deposited dust comprised of lime derived from the decomposition of tiny organisms. The fertility of loess is without equal, and it served to support a style of cultivation that was distinctly Chinese.³ In short, the Yellow River carried loess to its floodplain and thereby offered rich rewards to ancient Chinese farmers. This offering, however, came at a big price. Due to periodic and often violent flooding, the Yellow River also bears another name: “China’s sorrow.”⁴ The Yellow River gained this second name because it drew Chinese farmers to its rich soils, and regularly drowned them with disastrous floods. The Chinese soon learned to work together in specialized tasks and on a large scale to develop systems of irrigation to produce their crops and prevent these ruinous floods.⁵

Most of China is unproductive agriculturally. Only relatively thin bands of land support crops. These thin bands are concentrated in river valleys, or across acreage found on local floodplains, and along coastal plains. These few areas attracted the Chinese, who figured out how to use them by building an irrigation system that permitted the development of ever-wider bands of arable acreage than those offered by nature.⁶ At the dawn of Chinese civilization, during the Xia Dynasty (*c.* 2207–1766 BCE), the Chinese mastered the techniques of irrigation necessary to harness the waters of the Yellow River to increase food production, indeed to create food surpluses, and see their culture expand. The entire length of the Yellow River came under human control by the start of the Han Dynasty (202 BCE–CE 220). But the Chinese never fully mastered the continued violent flooding of the Yellow River. This river produced such disastrous floods because it was a waterway that carried more silt than the Amazon,

the Mississippi, and the Nile combined. This silt fell in the Yellow River's riverbed, forcing the Chinese continually to build up their irrigation levees, the embankments they used to prevent the water from inundating the surrounding land. Eventually, the silt in the Yellow River raised the riverbed until it towered as high as 50 feet above the floodplain in several locations. At those locations where the river levees reached their greatest height, weaknesses in the irrigation system led to massive breaches in the levees. This led to massive floods that spread across the landscape and swept across the North China Plain. Sometimes this extended hundreds of miles from the river's banks, killing all the farmers in its path. Such colossal disasters reminded the Chinese people time and again that they needed a strong centralized political system, one that could marshal the resources of capital and labor necessary to build projects to manage the water supply of the great Yellow River and try to keep its murderous waters at bay. These reminders led to the central theses of Chinese history: political unity, highly organized divisions of labor, specialized tasks, and numerous large-scale enterprises worked best to produce food.

Origins of Chinese Agriculture

The earliest Chinese farmers who used their domesticated plants as food unwittingly unleashed population pressures, but had taken the first steps toward the process of a developing a civilization. In so doing China followed the common historical scenario laid out above, taking on increased institutional complexity as more and more people came to depend on agriculture for food. In China's case, ancient cultivation began when a set of farmers domesticated millets on the loess plains along the Yellow River. This domestication occurred sometime around 5000 BCE. These farmers, situated in northern China, were the first to begin to change China's countryside in order to meet their needs and provided the staple crop that gave life to the first Chinese dynasties. Attributing social order to Hou Ji ("Lord Millets," a Chinese name praising the value of millets), the agricultural sites these farmers founded laid a foundation for the first Chinese cities. But long before any cities appeared, the early Chinese farmers practiced slash and burn agriculture to clear forests for crops, secure ash to enrich the soil, and plant their millet seeds. Whenever soil exhaustion reduced their crop yields, the farmers, who belonged to the prehistoric Yangshao culture (c.5100–2950 BCE), were forced to relocate and clear land for new fields.

Archaeologists have uncovered several hundred Yangshao culture village sites widely scattered across the central Yellow River basin, from Henan to

Shaanxi and Shanxi. Collectively, the artifacts unearthed at these sites provide evidence that these peoples lived a semi-sedentary lifestyle common to all those who practiced slash and burn agriculture. It also tells us that they had domesticated different varieties of millets, supplementing the grains these plants yielded by hunting and fishing. The evidence does not, however, indicate any sort of central government that would have united the many villages.

Following the peoples of the Yangshao culture, were the Dawenkou people (*c.*4700–3600 BCE). This new culture, which also cultivated millets, developed later than the Yangshao and lived in village sites farther to the east, on the Shandong Peninsula on the north-eastern coast of China. Exploiting the resources of the mouth of the Yellow River, Dawenkou farmers left evidence that suggests that they had abandoned slash and burn cultivation. They built semi-permanent villages, taking advantage of the rich loess soils deposits of the Yellow River's delta to grow their crops. It also appears that they engaged in small-scale irrigation projects. The artifacts left by these semi-permanent agricultural villages suggest a more highly developed culture, one on the verge of city building. Typically, archaeologists have found that as any given farming population grew, and its villages became more permanent, a central village ultimately emerged as an administrative center. Dawenkou culture exhibited such developmental signs.⁷

The Longshan people were the next group to produce farming communities in northern China (*c.*3000–1900 BCE). Longshan farmers lived in far more permanent settlements than those of the Dawenkou culture, although they, too, lived on the Shandong Peninsula. Longshan cultures improved upon earlier millet-cultivating techniques and spread out to cover a much broader area than the Yangshao and Dawenkou peoples combined. Longshan farmers used different soil-renewing methods prior to gaining control over the Yellow River's flood cycle through irrigation. The Longshan people spread fertilizers based on animal waste, as opposed to ash, and left some of their fields "fallow," letting the field rest for a year, giving the land a chance to recover from agricultural use. The permanence of Longshan sites supported a steady increase in human numbers that, in turn, caused significant population pressures. Longshan villages spread from their original location on the Shandong Peninsula both north and west, making them, in the eyes of most Chinese scholars, the founders of the first Chinese civilization.

A look at the artifacts of each of these early Chinese peoples reveals a steady development of Chinese technique in cultivation. The increasing level of permanence in farming settlements from the Yangshao to the

Longshan cultures points to a growing need for sedentary agriculture on sites where the Yellow river's floods regularly renewed soil fertility. The early farming communities did not endure, but they did lay the foundation for Chinese civilization, as well as a legacy of domesticated plants that would continue to feed a growing Chinese population dependent on well-established farming practices.

China's Domesticated Animals

Along with the domestication of millets, northern Chinese farmers added domesticated dogs, pigs, water buffalo, cattle, sheep, goats, horses, chickens, geese, ducks, and silk worms to their agricultural resource base. These ancient farmers acquired their animals by domesticating certain native species and, in time, importing others. Archaeologists have determined which of the animals listed above were actually domesticated by the Chinese by looking at skeletal remains. Did the remains of these animals indicate a transition from wild *alpha*s to domestic *omega* species, or did they indicate only the domesticated skeletons of beasts belonging to some other local culture? The first animal to exhibit evidence of domestication was the dog, although since dogs played no role in agriculture they are of little relevance here.⁸

Sometime around 6200 BCE the Chinese domesticated the pig, the first useful beast as a food source in an agricultural community. Archaeologists found the remains of the earliest domesticated pigs at Kuahuqiao in Zhejiang province, near the mouth of the Yangzi River (the great waterway that dominated the southern half of China and its history). The remains indicate that the wild variety of pig had given way to the domesticated version in much the same way *omega* plants had replaced *alpha* grasses. The evidence of these changes lies in the skeletal size and the teeth of the pigs. In comparison to wild pigs, domesticated pigs are larger and also have distorted teeth, because they are bred to have teeth capable of chewing cast-off food, which tended to be quite coarse. Chinese pigs came under human control gradually, as the skeletal remains reveal, and in time the domesticated varieties became a standard food source, one celebrated in later Chinese literature.⁹

Archaeologists also found cattle remains in a cave at a Shantaisi site near modern Lizhuang in Henan province in central China. These remains date back to 2500 BCE, but the spread of cattle continued westward until 2200 BCE. The archaeologists who found these cattle bones in the Shantaisi cave could not determine if they were native to China or imported from abroad because they found too few specimens to examine.