very human in their protests—and so perfectly within their rights! They had done nothing to deserve it; and it was adding insult to injury as the thing was done here—swinging them up in this cold-blooded, impersonal way, without a pretense of apology, without the homage of a tear. Now and then a visitor wept, to be sure; but this slaughtering-machine ran on, visitors or no visitors.... Who would take this pig into his arms and comfort him, reward him for his work well done, and show him the meaning of his sacrifice? For all the while there was a meaning—if only the poor pig could have known it. Perhaps if he had, he would not have squealed at all, but died happy! If only he had known that he was to figure in the bank-account of some great captain of industry, and perhaps help to found a university, or endow a handful of libraries, when the captain of industry died! It is one of the crimes of commercialism that it thus cruelly leaves its victims to grope in darkness; that delicate women and little children, who toil and groan in factories and mines and sweatshops and die of starvation and loathsome diseases, are not taught and consoled by the reflection that they are adding to the wealth of society, and to the power and greatness of some eminent philanthropist.²²⁶

This spirit visible in the relationship between Chicago and its hinterland was also increasingly evident on a world scale in the larger division between global center and periphery. Here too the environment was being systematically “liberated” from both nature and geography in the endless search for economic gain. We turn to this now.

5

IMPERIALISM AND ECOLOGY

From its very earliest beginnings in the late fifteenth and early sixteenth centuries, capitalism has always been a world system, dividing the globe into center and periphery. The existence of such a hierarchy has meant that the people and the ecosystems of the periphery have been treated as appendages to the growth requirements of the advanced capitalist center. Each stage of capitalist development—mercantilism, early industrial capitalism, and monopoly capitalism—has seen the expansion of this imperialist relation to the planet.

COLONIALISM AND ECOLOGY

Parts of the Americas were fully integrated as dependent peripheries within the world economy by the seventeenth century,
but the integration of Asia and Africa occurred later. When European sea merchants first began to expand into Asia in the sixteenth century, the land mass was still under the control of powerful tributary states—states that were larger, more densely populated, and frequently more productive than European capitalist states of the period. Superior sea power, however, allowed the Europeans to dominate the oceans and establish footholds on the "tidal margins" in certain key areas. In the sixteenth century, the leading European power to expand into Asia was Portugal, which during the seventeenth century was increasingly displaced by the Netherlands and England.1

The English concentrated their activities on the Indian subcontinent, where, beginning in 1611, they established what were called "factories"—points of settlement and commerce—along the coast. Eventually the British East India Company (a Crown-licensed monopolistic trading company) went to war against the local rulers in Bengal, defeating them in the battle of Plassey in 1757.

Following this, the Company rapidly expanded its territorial domain, largely by means of successive wars, taking over some areas directly while leaving others to the administration of local rulers (under the Company's sponsorship). After 1814, the high-quality textile crafts of the Indian towns collapsed when British machine-manufactured cotton textiles flooded the market. Meanwhile, Indian property holders began to produce cash crops for export to Europe. In the case of British India, however, this occurred not through the creation of single-crop plantations but through the formation of an agricultural putting-out system in which crops were purchased by intermediaries, who passed them on to the final buyer. In this situation, moneylenders increasingly preyed upon hard-pressed peasant producers. The imposition of heavy land taxes under British rule paralyzed agriculture, preventing its development. At the same time, the economic surplus siphoned from India helped feed British industrialization. In this way, India was gradually integrated into the capitalist world economy as a dependency of Britain, the most important possession in the British empire.2

The conquest of India eventually created the conditions for the British penetration of China. Desiring tea and other goods, the British organized the production of opium in Bengal in order to obtain a commodity that would finally open the door to extensive trade in China. This was to lead to the Opium Wars in China, as the Chinese resisted the systematic imposition of this addictive drug on their society. The defeat of the Chinese Empire in the first Opium War (1839-1842) signalled that all non-Western societies had become helpless in the face of Western military and economic aggression.3

By the end of the nineteenth century, prospects for further expansion were limited because most of the earth had been parcelled out to one metropolitan power or another. Between 1876 and 1915, around one-quarter of the land surface of the globe was formally annexed and distributed as colonies to half a dozen states. Except for Ethiopia, Liberia, and part of Morocco, Africa was divided between Britain, France, Germany, Belgium, Portugal, and Spain. Although most of the great traditional empires of Asia remained nominally independent, the leading capitalist powers had carved out "zones of influence" and subjected these to unequal treaties.4 In Latin America, most states, though also nominally independent, had been reduced to being British and U.S. economic dependencies.

The spirit of imperialism was best conveyed by the British statesman Cecil Rhodes, founder of Rhodesia, who is reported to have stated: "I would annex the planets if I could." And there was never any doubt about the ultimate means of such annexation. In the immortal lines of poet Hilaire Belloc, "Whatever happens, we have got/The Maxim Gun, and they have not."5 Rhodes explained the motivation behind British imperialism in this way: "We must find new lands from which we can easily obtain raw materials and at the same time exploit the cheap slave labour that is available from the natives of the colonies. The
colonies would also provide a dumping ground for the surplus goods produced in our factories. European economic historians dubbed the entire period from the mid-1870s to the mid-1890s as the "Great Depression." Imperialism was the most widely advocated remedy for this condition, both in Europe and the United States.

For Frederick Jackson Turner and Theodore Roosevelt, such expansion was simply an extension of the frontier. As Turner wrote in the *Atlantic Monthly* in 1896, "For nearly three centuries the dominant fact of American life has been expansion... The demands for a vigorous foreign policy, for an interoceanic canal, for a revival of our power upon the seas, and for the extension of American influence to outlying islands and adjoining countries, are indications that the movement will continue." In April 1898 the United States launched the Spanish-American War. Within three months the Spanish had been defeated and the United States had laid claim to an informal empire consisting of Cuba, Puerto Rico, Guam, and the Philippines. In 1898 the United States annexed Hawaii, and in 1899 the Samoan Islands were partitioned between the United States and Germany.

Little attempt was made by the dominant business interests to disguise the fact that the main objectives of this expansion were economic. In the midst of the war, the *Lumberman's Review*, a key organ of the lumber industry, declared: "The moment Spain drops the reins of government in Cuba... the moment will arrive for American lumber interests to move into the island for the products of Cuban forests. Cuba still possesses 10,000,000 acres of virgin forest abounding in valuable timber... nearly every foot of which would be saleable in the United States and bring high prices." Colonialism and imperialism pillaged the ecologies and societies of the conquered territories, while contributing relatively little to their economic progress. In the periphery of the world economy, the Industrial Revolution led not to development but to what Andre Gunder Frank has called "the development of underdevelopment." This can be seen most clearly in the case of the railways. Of all the nations that built large railway lines in the nineteenth century—in order of magnitude (in 1900), the United States, Russia, Germany, British India, France, Britain, and Canada—only British India failed to industrialize during the railway boom. The reason was that the goal of railway building in India was not to develop India but to develop Britain. The cotton manufacturers of Lancashire saw the Indian railway as a mere extension of the line from Manchester to the port of Liverpool. In addition, the Indian Mutiny of 1857 had demonstrated the strategic value of railways in moving troops and equipment rapidly. Railways were therefore built to serve the economic and military objectives of British colonialism. Although 4 percent of the locomotives used in British India were built there, British imperial policy ensured that 80 percent were imported from Britain, while the remaining 16 percent were imported from Germany and the United States. As a result of this policy, India was the only country with extensive railways that did not also develop a strong locomotive-building industry.

India's fate in this respect contrasts sharply with that of Japan, which was exceptional in the sense that it was never colonized. There the number of foreign railway technicians rose from 19 in 1870 to 113 in 1874 and then dropped to 43 in 1879 and 15 in 1885—after which the Japanese dispensed with foreign technicians altogether. Unlike those of India, Japan's railways were directed to the needs of the domestic economy, not to the interests of a colonial power. Colonialization in the industrial age meant that the division between town and country was extended into the periphery of the world economy. Western urban technologies of water supply and sewage disposal were also imported, but while in the advanced capitalist countries there was generally a lag before the benefits of these new facilities reached the poor, in the colonial
world they frequently never did. As historian Daniel Headrick has written: “Colonial cities gathered increasing numbers of people with little access to those sanitary improvements which European city planners and administrators were so proud to have introduced.... In the Western world after the mid-nineteenth century, municipal health officials and sanitation engineers strove to separate the germs from the people. In tropical cities, when the officials could not achieve this objective, they substituted another: to separate the people with germs from those without.”

In Dakar, Senegal, in the early twentieth century the segregation of the city into a European town and a native town was justified by the colonial authorities in terms of the types of buildings and hygienic habits that characterized the distinct lifestyles of the Europeans and non-Europeans. As the municipal governor of Senegal wrote to the municipal council, “Let us allow them, if need be let us make them, have two different installations conforming to their tastes: on the one side the European town with all the requirements of modern hygiene, on the other the native town with all the freedom to build out of wood or straw, to play the tom-toms all night, and to pound millet from four in the morning on.” The inequalities in the distribution of wealth, availability of accommodation, and provision of water and sewage facilities that lay behind these differences in “taste” and hygiene were simply ignored—as if they were all a product of different “lifestyles.”

The international division of labor that concentrated industrialization in the advanced capitalist countries and the production of agricultural export crops and extractive industries in the periphery contributed to the rapid rate of ecological degradation in the periphery. In places as varied as Brazil, Egypt, Gambia, the Gold Coast, and Senegal, export agriculture severely eroded and depleted the soil. Throughout the periphery, the neglect of subsistence food production resulted in the death from famine and nutritional deficiencies of untold numbers of people. In contrast, by the 1890s Japan was able to enter the ranks of the advanced capitalist states and was largely free of such problems. Up to the 1950s, in fact, it was possible to contend that “for all practical purposes, there is no such thing as erosion in Japan.”

**ECOLOGICAL IMPERIALISM**

The extent to which the ecology of the periphery was transformed to meet the requirements of the center can be seen dramatically in the way in which European botanical science was organized so as to exploit tropical agriculture. From the beginning of colonization, Europeans had craved tropical products: at first sugar, coffee, and tea, and later cotton, quinine, and rubber. As Daniel Headrick has observed, “Plants are the wealth of the tropical world and the livelihood of most of its people.” But it was not until the Industrial Revolution that global plant transfers began to be systematized.

The key institutions in this process were the botanical gardens. The Netherlands, Britain, and France all used a system of botanical gardens to control plant transfers across their empires. The most important of these was Kew Gardens, the royal botanical garden outside London, which was founded in 1772 and soon emerged as a center for botanical research. In the eighteenth century, plant transport was difficult, since living plants tended to perish in the long journey across the seas. For this reason the early botanical gardens mainly collected and classified information about tropical plants. In 1829, however, Dr. Nathaniel Ward invented a large terrarium—a wooden box with a glass top—that kept delicate plants from drying out and allowed them to be transported over great distances. The “Wardian case” initiated a new era of plant transfer and Kew became the central institution in a hierarchy of botanical gardens that was established throughout the British empire.

Beginning in the 1840s, botanists at Kew began to work systematically on plant transfers. In 1872, Liberian coffee was first
the calendar introduced by Julius Caesar in 45 B.C., it encourages us to place our lives in the context of centuries and epochs rather than mere years and decades. It therefore raises, in a very poignant way, the question of the intersection of our biographies with historical time.

In writing this book I deliberately employed three different time scales. The initial perspective was that of the millennia that describe the period of written history, stretching from the rise of the earliest tributary civilizations to the advent of capitalism more than five thousand years later. This was subsequently narrowed down to a time scale of a few centuries when capitalism entered the picture some five hundred years ago, followed by machine capitalism two hundred years ago. Later the time frame was narrowed down even further, to a scale of decades, when the question of “the synthetic age” arose around fifty years ago. Such an approach allowed me to devote increasing space to historical developments as we moved closer to the present.

But much more was involved here than mere convenience of exposition. More important was a conviction that the relevant time frame for viewing environmental problems was rapidly contracting as we moved closer to the present. This was strongly impressed upon my mind by a vivid sense of the exponential growth tendencies of capitalist society, with its dynamic of accumulation and its tendency to revolutionize all fixed, fast-frozen relations. We can get a clear sense of the enormous impact of this stepped-up pace of change if we recognize that over the course of geological time there have been five great periods of mass extinction in which 65 percent or more of all species have died out (most recently the end-Cretaceous extinction of the dinosaurs). Today some leading scientists are pointing to the possibility of a “sixth extinction”—this time at the hand of humanity. Half of the species on earth are now threatened with extinction on a scale of decades as a result of the rapid elimination of the world’s tropical rainforests alone.

Here it is useful to draw on an insight that originated in the nineteenth century. Only two years after Karl Marx completed the first volume of *Capital* and five years after George Perkins Marsh published *Man and Nature*, the great conservative historian Jacob Burckhardt introduced the concept of the “acceleration of historical processes” in order to define the phenomenon of “historical crisis.” For Burckhardt a “historical crisis” exists when “a crisis in the whole state of things is produced, involving whole epochs and all or many peoples of the same civilization. . . . The historical process is suddenly accelerated in terrifying fashion. Developments which otherwise take centuries seem to flit by like phantoms in months or weeks, and are fulfilled.” Burckhardt was of course aware of the enormous changes taking place in the area of production (including technological changes) which in many ways set the stage for this “acceleration of historical processes,” but his chief concern was the revolution in social relations—particularly with regard to the state, religion, and culture.

As a romantic pessimist Burckhardt could identify neither with the kind of working-class revolt evident in his time nor with the purely money-grubbing society growing up around him, so he sought solace in the study of cultural history. Still, his concepts of the “acceleration of history” and “historical crisis” had certain features that were parallel to the thinking of his great contemporaries Marx and Marsh. For Marx, human productive forces and the human relation to nature were changing at a bewildering rate in the capitalist epoch. But as a revolutionary optimist (quite the opposite in this respect to Burckhardt) he identified with the social revolutions and class struggles occurring in his time and saw this as pointing beyond the mere triumph of bourgeois society. Marx believed that it would be possible, not all at once but through a process of historical struggle, to create a society aimed at the transcendence of human self-alienation and of the alienation of human beings from nature. Marsh, in contrast to both Burckhardt and Marx, did not present a social vision. He described only the tremendous pace and growing spatial scale with which the new industrial society was transforming and
degrading the earth. The end result of such ecological destruction, he warned, might be the destruction of human society itself.

Recently the Worldwatch Institute, the leading think tank on global environmental change, has reintroduced the concept of "the acceleration of history" (though without any mention of Burckhardt, Marx or Marsh) in order to explain the phenomenon of environmental crisis as it presents itself in our time. According to the Worldwatch analysts, the acceleration of human history began some forty thousand years ago when ever-more sophisticated tools were developed for hunting, cooking, and other tasks related to subsistence production. Another burst of accelerated change occurred ten thousand years ago with the rise of settled agriculture. A third acceleration occurred in the middle centuries of the current millennium in the form of a scientific and technological revolution, eventually leading to the Industrial Revolution of the eighteenth century. Finally, over the last century a technological and scientific explosion has led to an "accelerating pace of change" revolutionizing "virtually every field of human activity"—manifested in what the Worldwatch analysts call "the growth century."

These analysts end with the observation that "history will undoubtedly continue to accelerate" but "historical trends will have to move in a new direction" if we are not to destroy the ecological bases of human development. At present certain critical ecological thresholds or limits are being fast approached (in some cases crossed) that portend global catastrophe if we do not mend our ways. "Are we headed," they ask, "for a world in which accelerating change outstrips our management capacity, overwhelms our political institutions, and leads to extensive breakdown of the ecological systems on which the economy depends? . . . Even in a high-tech information age, human societies cannot continue to prosper while the natural world is progressively degraded."

But although the Worldwatch analysts raise the question of "the acceleration of history" in this dramatic way, the solutions they offer consist entirely of technological and demographic adjustments, as if this will be sufficient. Calling for a "new economy," they tell us that this simply means moving from fossil fuels to solar power, from cars to bicycles and railroads, from a throwaway society to one dedicated to recycling. The overall approach is one of improved management engineered by technological elites within the present global socio-economic order.

Not even economic growth is seriously addressed. Rather we are told that enlightened leadership within multinational corporations may offer the way out: a new "eco-industrial world." "Corporate behemoths, such as BP, General Motors, and DuPont, that rose on the crest of the fossil fuel revolution could capture many of the new opportunities" represented by a switch to a sustainable society. "Or they could be elbowed aside by the Microsofts of the new technological generation." Bill Ford, who became Chairman of the Ford Motor Company in 1998, we are told, is a self-described "passionate environmentalist" who is predicting the eventual demise of the automobile. Such changes in thinking at the top, coupled with changes in consumer behavior encouraged by green taxes, will be adequate, we are led to believe, to cope with the acceleration of history and the terrifying environmental threat that it has engendered. The fact that corporations are essentially enormous engines of concentrated economic expansion, and that CEOs are obligated to serve these interests, is passed by in silence.

Indeed, what is most notable about this analysis is what it leaves out. In this discussion of the acceleration of history there is no mention of historical crisis in the Burckhardtian sense, of "a crisis in the whole state of things . . . involving whole epochs." Instead, historical crisis in this sense is seemingly a phenomenon of the past, not deserving mention, except as part of a general threat of apocalypse encompassing all cultures and species. All that is deemed necessary is to discuss the technological acceleration of history, which is subject to purely utilitarian, technological solutions by means of improved management or what is now
sometimes called “ecological modernization.” Fundamental issues of democracy are ignored from the outset, as is the nature of world capitalism, including its built-in dynamic of accumulation. In this one-sided view, only productive forces matter (along with human population trends); social organization and social relations do not.

The argument of *The Vulnerable Planet*, in contrast, is that environmental history is not simply a product of technological or demographic change; rather, it is inseparable from, even subordinate to, the way we organize our social relations. The environmental crisis is a crisis of society in the fullest sense. It signals the fact that a one-sided development of human productive powers without a commensurate change in the social relations by which we govern society spells social and ecological disaster. What is needed under present circumstances is an acceleration of history once again in the social realm, however terrifying that may be from a Burckhardtian viewpoint or a contemporary Worldwatch perspective. At issue is the possibility of a radical transformation of society: the creation of a society of equals dedicated to social justice and environmental sustainability.

From the standpoint of the hundreds of millions of years of geological time, the earth is of course immune to anything that we can do. It will recover from our greatest acts of malfeasance. Its “vulnerability” exists only in our limited, “parochial” (some would say “anthropocentric”) outlook, which identifies the planet with our own species and those species with which we cohabit the earth. What is really at issue is not the survival of the earth as such but the integrity of the biosphere as we know it. It is “our” planet earth and not “the” planet earth which is in trouble.

What we must guard against the most as we endeavor to address our ecological crisis is the notion that history has in some way reached its end or that there are no genuine alternatives. Such beliefs of received ideology, if followed, would guarantee a barbaric, even apocalyptic, outcome. The real future of human-