

## Introduction

Cambridge University Press  
978-1-108-47819-9 — A History of Humanity  
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Excerpt  
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## 1 The Human System

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How did the human condition of today come to be? We live in a world created by human energies and activities, in which “nature” is receding steadily. The cities in which most of us live are the results of human construction – out of concrete, asphalt, iron, glass, and bricks. Even the wooden elements of cities are cut and reshaped by human energy. Water is piped in or transported in bottles; we bring gasoline in tanks and natural gas by pipeline. We communicate by electronic telephones, televisions, and computers that are built in factories. Even the countryside depends heavily on human construction and creativity – while the wonders of nature are a pleasure to see, the rural world is charted and exploited by humanity. The crops on farmlands have been bred and protected by chemical and biological engineering. Our cattle, sheep, pigs, and chickens live and die under human control: these domesticated species are the majority of all the large and medium-sized animals. Even the insects and the bacteria fall increasingly under human control. Fishing has transformed the populations of oceans, while plastic waste materials mark the oceanic currents and shores. Of course, Earth remains in its orbit so that the sun appears to rise and fall each day, yet even the seasons are changing.

The achievements of human energies have created a Human System, a complex set of social interactions and structures from local to global levels. This system reproduces and transforms itself on every continent, creating social institutions, material goods, and new knowledge, including science and culture. The system generates achievements and distributes benefits – yet the course of human expansion has brought oppression and destruction, leading in some cases to destruction of whole societies. The natural world, though increasingly marginalized, has not yet been tamed. New strains of bacteria and viruses overwhelm pharmaceuticals and vaccines, spreading disease where medical science thought it had achieved conquest. Cancers arise in response to the new creations of chemistry and petroleum. The burning of petrochemicals and the methane created by domestic animals are raising Earth’s temperature

4 Introduction

at a rate that is bringing short-term climate fluctuations and long-term disaster for human life.

In this book I trace four agencies of change in human history. The first three are the processes of biological, cultural, and social evolution, which add up to the Human System. In a grand process of coevolution, these three types of changes in humans have consistently interacted with each other and with the natural environment. Biological evolution, as theorized by Darwin, brought the rise of bipedal species with large brains. Cultural evolution, as theorized since the 1980s, explores the learning processes of big-brained human individuals, especially through cooperation. Social evolution, for which I present an expanded theory in this book, results from conscious group behavior in which humans create a succession of social institutions. Institutions include language, communities, migration, agriculture, writing, and economic systems – each growing in its own way. The fourth agent of historical change is Gaia – the overall system of life on Earth. Gaia, as theorized in the 1970s by James Lovelock, is the part of the natural environment that generates oxygen through plant forms in an interaction of biosphere, atmosphere, and lithosphere, producing fluctuations in climate but also long-term stability in temperature.<sup>1</sup> The Human System began as a tiny portion of Gaia but has grown and created new tensions. Humanity is now the greatest influence on Gaia yet Gaia still has great influence over humanity. Human history is then a story of exploitation – of the natural resources of Gaia, of the energies and imagination of individual humans, and of humans in groups as they found new ways to combine.<sup>2</sup>

In the gradual evolution and coevolution of the human order, I argue that many past choices have accumulated sufficiently to expand the dangers we face today. At the same time, I argue that current conditions provide important new patterns of group behavior with the potential to address and even resolve the great crises of today. I treat human groups as the governing factor in coevolution: group behavior has created immense advances in which humans have formed huge groups sharing common interests – languages spoken by millions of people; nations of millions sharing common citizenship; corporations of thousands of workers producing goods and services under a small but expert and privileged management. Yet the creation of larger groups has permitted the rise of larger-scale hatreds, such as between pro-communists and pro-capitalists or Christians and Muslims. Group behavior also involves debate among alternative views of social priorities, so that ideology and ideological dispute have been with us from the beginning.

Humanity and its system now appear to be in a period of crisis. How and when did we reach this point, with its strange mix of triumphal advance for some, relentless discrimination against others, and threatened collapse or war for all? Are these dilemmas the consequence of capitalism and the last

few generations of rapid change? Could it be that the founding days of great empires and great religions, 2000 years ago, started us on a path to this difficult situation? Or could it be that the early days of human emergence and expansion instilled habits in our ancestors that prevented them – and us – from guarding against the difficulties that now threaten us so deeply?<sup>3</sup> In any case, I argue that humanity faces two great crises. In a crisis of environmental degradation, we face climate fluctuation, predictions from the scientific community of acceleration in climate disasters, extinctions of species at all levels, destruction of water supplies, and more. The crisis of social inequality is bringing divergence and deprivation in social welfare, economic life, employment, and participation in governance. Health conditions, life course, and education levels have narrowed in their discrepancies, but the recognition of human equality has only diverged.

Further, I argue, we face a third dimension in our current crisis – the inability of our system of knowledge to respond to the crises in environment and social inequality. To a large degree, it appears that humans prefer to ignore and deny the challenges facing Earth and humanity. Why is it that leaders of corporations, governments, and communities deny the existence of climate change? Why is it that they put so little energy into policies to limit climate change or adjust to it? Why do these same institutions deny the negative effects of social inequality and deprivation? And why is it that the knowledge specialists, those who have generated so much learning, seem unable to diagnose the crises in environment and society and unable to investigate the reasons for denial?

In response to these crises, I offer a concluding emphasis on further transformations in the Human System – the contemporary development of larger-scale and even planetary human groups. That is, we have now experienced the rise of popular culture (drawing inspiration from multiple communities and not just from one's parents) and dramatic expansions in knowledge (at both general and specialized levels). Out of these changes is arising a global popular discourse – agreements and disagreements on social priorities that have the potential to generate global consensus on the great choices we face. I acknowledge the disappointments brought by the negative sides of national discrimination and exclusion, the turn of formally constitutional government to dictatorship, the recurring violation of elegant proclamations of human rights, and the narrowness of corporate profiteering. We proclaim the equal rights of women and children, yet the stories from every part of the world tell of the exploitation of these and others. Yet I emphasize that global standards, articulated by steadily broader groupings of humans, have been met in some cases and are gradually gaining in prestige even though they are still violated with impunity. Despite the denial of crisis that remains widespread, humanity is experiencing a steady rise in mutual

6 Introduction

understanding that is increasingly critical of discrimination and exploitation by gender, age, or racial categorization.

One of the choices before the human community is whether to focus attention on learning more about the Human System – its evolution, its flaws, and the questions we face in seeking to guide it. As humans formed groups to achieve a common purpose, did they seek to assess how the common welfare would be affected? What is it that enables leading figures in institutions to profit for themselves and ignore the general welfare? To address this question, throughout this book, I trace the expansion of networks connecting humans for common purposes, and the parallel expansion of hierarchies – vertical networks that might also yield a division of labor that benefits human welfare. As I argue, human nature, though deeply embedded, has changed with time. A global consensus on social welfare, should it arise, might modify human nature once again and, with it, the direction of human history.

The adventures of *Homo sapiens* began more than 200,000 years ago and reach up to our day. The story traces drama in family life, in learning to speak, building social institutions, migrating to new lands, creating a Human System through maintaining connections, and encountering global crises in today's urban society. More than a story, the book presents puzzles to solve. I hope readers will join in working to reveal how our ancestors took each turn in their complex trajectory. We will explore data, logic, and terminology across many disciplines. My narrative centers on processes of evolution and migration in human history. I divide the narrative into four main periods, beginning with hominin biological and cultural evolution from the early Pleistocene epoch up to 70,000 years ago. I then trace three epochs dominated by social evolution – the late Pleistocene, from 70,000 years ago; the Holocene, from 12,000 years ago to 1800 CE; and the Anthropocene with its new levels of social evolution. I treat the issue of migration as subordinate to the overall question of social evolution, yet I see migration as essential to the human trajectory: it maintains diversity and originality in every region. More generally, my approach to human evolution highlights diversity in populations, to guard against the reasoning that there might have existed selected groups that carried forth the essence of human excellence. I emphasize genetic diversity, in reasoning analogous to that of Theodosius Dobzhansky who, writing in the 1930s to advance the neo-Darwinian hypothesis, emphasized the broad diversity of human populations in contrast to the arguments of eugenicists that excellence could be purified in a few key genes.<sup>4</sup> Further, I emphasize diversity in the learning processes of cultural evolution, in the institutions of social evolution, and in the expressions of emotions at individual and group levels. This is one reason for my emphasis on

migration and comprehensive regional coverage in this volume: it is an effort to point to the full range of human diversity over time.

### **Evolution of the Human System: Key Questions, Key Assumptions**

Between the crowded world of today and the days of our ancestors on the East African savanna lies a missing link – a disconnect in knowledge linking the biological emergence of humankind to the social complexity of humanity today. The missing link is temporal, disciplinary, and theoretical. Temporal, because some 70,000 years separate humans today from our ancestors as they began speaking and migrating to new lands. Disciplinary, since the training and reading of biologists, social scientists, and historians address significantly different materials. The gap is also theoretical. That is, biologists are guided by Darwinian theory, by the recent advances in genetics and epigenetics, and by connection to disciplines including physics and biochemistry; historians and social scientists have worked less with theories than with narrative, though their facility with theories is advancing. Between the natural sciences and the social sciences lies the gap on which I seek to focus – although I emphasize the thread of erudite discussion among scholars linking those disciplines, whose contributions may be resolving aspects of the big questions about human growth and change.<sup>5</sup>

How can one hope to bridge the gap between biological study of humanity (for early times) and historical study of humanity (for early and especially recent times)? The first step in bridging is to identify major questions that point us toward exploring the gap. To begin this study of the Human System, I pose four questions that will be pursued throughout the book:

- System. How does humanity function as a system?
- Evolution. What are the processes of human evolution?
- Natural World. How are humanity and the natural world linked?
- Transformation. What major transformations has humanity faced in the past and the present?

These four questions, in varying ways, focus on two big issues: system behavior and human evolution. Such questions lead us deeply into exploring processes and events in human history. Study of growth and change in the Human System involves identifying the system's elements, tracing their interplay, and analyzing their transformations up to today – especially with attention to the roles of individual and collective consciousness – our “behavior” and “human nature.” By “human evolution” I mean several overlapping processes: not only biological evolution but

8 Introduction

also the processes of cultural and social change, right up to the present. Is the Human System now prepared with adaptive responses that will respond automatically to current crises? Is the system capable of changing its direction in time to limit the damage and threat that it faces from within and without? Or, to anticipate a question that will be central in this book: can human nature change, either at the level of individuals or in group behavior?

The four questions just posed will not answer themselves: they must be addressed by analysts who frame their inquiry with well-chosen *assumptions*. In the selection of assumptions, I have been inspired (as have been many others) by Charles Darwin's assumptions and analyses in the study of biological change. Darwin specified with remarkable clarity the key assumptions in his *On the Origin of Species by Means of Natural Selection* (1859):

Owing to this struggle for life, any variation, however slight and from whatever cause proceeding, if it be in any degree profitable to an individual of any species, in its infinitely complex relations to other organic beings and to external nature, will tend to the preservation of that individual, and will generally be inherited by its offspring . . . I have called this principle, by which each slight variation, if useful, is preserved, by the term of Natural Selection.<sup>6</sup>

Darwin thus emphasized his assumptions on the struggle for existence, variation, and inheritance, summarizing them as natural selection. The principal effect of natural selection was *divergence* among the species.<sup>7</sup>

In contrast to Darwin's specificity, Herbert Spencer, the wide-ranging sociologist, published a vaguer and more general overview of "progress" in 1857. Spencer ranged across the natural and social sciences, highlighting "evolution" and "progress" as characteristic of every field of study.

The advance from the simple to the complex, through a process of successive differentiations . . . is seen in the geologic and climatic evolution of the earth, and of every single organism on its surface; it is seen in the evolution of humanity, whether contemplated in the civilized individual or in the aggregation of races; it is seen in the evolution of society in respect alike of its political, its religious, and its economical organization; and it is seen in the evolution of all those endless concrete and abstract products of human activity which constitute the environment of our daily life.<sup>8</sup>

Spencer's logic was to lump together, under the term "evolution," every sort of transformation, assuming that "progress" was inherent at each level. While he would soon accept the mechanism that Darwin proposed for biological change, labeling it "evolution," Spencer did not propose equivalent mechanisms for other sorts of change. He described what he



saw as a universal result, then vaguely referred to a universal cause but without offering specifics. Spencer was the theorist of progress in every domain; Darwin was the theorist of divergence in the biological domain. Darwin's theory, since it included a specific mechanism to back up its overall hypothesis, was testable and ultimately verifiable, while Spencer provided no mechanism for "the transformation of the homogeneous into the heterogeneous" and simply repeated his overall hypothesis. Darwin launched a concrete research project on biological evolution, while Spencer's speculations fueled debate yet did not launch organized study of human social change. The problem of ensuring that analytical assumptions are sufficiently specific will occupy us significantly in this book.

Darwin's analysis provoked a related question: how does the history of human social and cultural change fit into biological evolution? Edward B. Tylor, a founding figure in anthropology, began his *Primitive Culture* (1871) with a definition that has since remained famous: "Culture or Civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society."<sup>9</sup> This definition of culture left unspecified whether its locus is the human individual or the social group, though Tylor's focus on law and custom implies that he saw culture as existing at the level of groups.<sup>10</sup> Tylor proceeded to discuss racial differences in humans, concluding that distinct races had arisen from a uniform original human species, and he emphasized the special roles of language and consciousness in human history. Tylor supported scientific study of human change but expressed his methods in terms of narrative and description rather than proposing mechanisms of change. Thus, Tylor saw anthropology, the study of humanity, as scientific study that was separate from the study of biological evolution.<sup>11</sup>

The specificity of Darwin's theorization meant that, with time, his errors have been identified and addressed. Darwin assumed a set of workings of natural selection, relying on individual level motivation and action. In the time since these initial statements, biological analysis has developed with great complexity, mostly reinforcing rather than negating Darwin's early insights. In contrast, the imprecision of nineteenth-century social-science analysis hid both the strengths and the weaknesses of social science. Spencer assumed an inevitable result of progress from unity to diversity, but without assuming a process that would yield the result. Many analysts of change in human society, in addition to Spencer, tended to assume a general and unspecified impulse to progress rather than any more specific mechanism.<sup>12</sup> Tylor assumed the existence of culture that relied in unspecified ways on human groups, but he described

10 Introduction

culture rather than analyzing it. Social scientists in general, lacking specific theoretical mechanisms for social change, failed also to establish a basis for their studies that could match that of biology.<sup>13</sup> This failure resulted not from weakness of the scholars but, at least in part, from the complexity of consciousness and the sensitivity of social science to ideological claims.

While today's analysis of human biological evolution is coherent though imperfect, we do not yet have a coherent analysis of human social evolution. My understanding of social evolution relies significantly on the insights of psychologist Donald T. Campbell, who asserted the centrality of social evolution in human society and modeled it in Darwinian terms.<sup>14</sup> Yet I revise Campbell's approach, based on advances since his time in fields that are discussed throughout this book. The analysis of social evolution, in my opinion, should center on group behavior and social institutions. Still-unresolved issues include: How do we explain the functioning of human groups? What is the role of spoken language in human evolution? What is the place of migration in human history and evolution? At a larger scale, we do not yet have a coherent analysis linking the roles of individual and group behavior in human change, the functioning of humanity as a system, the place of cultural production in that system, the interplay of humanity and the environment of the natural world, and the major transformations in the human experience – especially the expansion of human knowledge about our past. To that end, this book is to propose a framework for analysis of overall human evolution, focusing especially on the logic of social evolution. In an Appendix, I provide a compact summary of methods within that framework.<sup>15</sup>

### **A World-Historical Approach**

The discipline of world history provides an appropriate institutional framework for exploring this set of big questions. With this framework, I seek to provide a new analysis and a new narrative of world history. The world-historical framework includes working with such valuable conceptual resources as multiple perspectives (disciplinary and ideological), multiple scales of existence (in humanity and in the natural world), and systemic interactions among the elements of society – those thought to be central but also other elements. World history, while a relatively new field of study and not yet a large one, presents advantages for this task because of its focus on coordinating study across multiple disciplines. Here I offer a statement of the broad scope of the field. At the birth of world-historical studies, the founding analysts participated actively and successfully in advancing environmental history, including climate history and history of