

# Chapter 1

## Culture and Economics

The world today is richer than it has ever been. We know a great deal about the economic transformations that made it this way thanks to a vast literature examining every possible aspect of modern economic growth taking place since ca. 1800. We know *what* happened, and we know more or less *how* and *where* it happened. What remains very much a mystery is *why*. This book tries to provide an answer.

The basic facts are not in dispute. The British Industrial Revolution of the late eighteenth century unleashed a phenomenon never before even remotely experienced by any society. Of course, innovation has taken place throughout history. Milestone breakthroughs in earlier times—such as water mills, the horse collar, and the printing press—can all be traced more or less, and their economic effects can be assessed. They appeared, often transformed an industry affected, but once incorporated, further progress slowed and sometimes stopped altogether. They did not trigger anything resembling sustained technological progress, and their effects on income were small and in many cases barely enough to offset population increase. As late as 1754 David Hume summarized the economic history of the world until that time by noting that “if the general system of things, and human society of course, have any ... gradual revolution, they are too slow to be discerned in that short period. ... Stature and force of body, length of life, even courage and genius, seem hitherto to have been in all ages pretty much the same” (Hume [1754] 1985, p. 378). As a description of the past, Hume’s summary is consistent with much of the consensus in economic history today (leaving aside, perhaps, courage, on which little has been said).

But as a prognostication of what was to come, this turned out to be spectacularly incorrect, and Hume was wise to add the qualification “hitherto.” The early advances in the cotton industry, iron manufacturing, and steam power of the years after 1760 became in the nineteenth century

a self-reinforcing cascade of innovation, one that is still very much with us today and seems to grow ever more pervasive and powerful. If economic growth before the Industrial Revolution, such as it was, was largely driven by trade, more effective markets and improved allocations of resources, growth in the modern era has been increasingly driven by the expansion of what was known in the age of Enlightenment as “useful knowledge.”

What had started in a few counties in the English midlands and the Scottish lowlands soon spread to the European continent and to America. By the end of the nineteenth century, the Industrial Revolution had transformed the economies of much of Europe and the European offshoots, and it began to spread to Japan and other non-Western economies. Transformative technological change turned from an unusual and remarkable phenomenon to something routine, expected. By 1890, one might not know what kind of and where a wave of technological progress would erupt, but one got accustomed to *something* happening. The results were inescapable: nearly everywhere on the planet men and women lived longer, ate better, enjoyed more leisure, and had access to resources and delights that previously had been reserved for the very rich and powerful, or more commonly, had been utterly unknown. With these blessings came disruptions, environmental disasters, and at times utter destruction. Technology and economic might provide the human race with more powerful tools, nothing more. Today, although the rate of measured economic growth in the industrialized world has slowed down, such blessings and curses are still piling up. Measured economic growth in the industrializing economies in the nineteenth and twentieth centuries approached a rate of 1.5–2.0 percent a year, perhaps ten times faster than before. Moreover, the resulting prosperity turned out to be persistent. Despite a series of self-inflicted political and economic disasters in the twentieth century, the industrialized West recovered miraculously after 1950 and was able to reach living standards that would have been unthinkable in 1914, let alone in 1800.

There can be no doubt that growth of this kind, while of global consequences, started in the West. What used to be known as the literature on “the rise of the west” or “the European Miracle” (following E. L. Jones’s seminal 1981 book)—now more commonly referred to as “the Great Divergence” or “the Great Enrichment”—documents and describes the West’s leadership in the emergence of Modern Growth. But a consensus on why this happened seems remote.<sup>1</sup> Some scholars have branded the writings of those who point to the Western origins of modern

<sup>1</sup> In a recent tour d’horizon, Peer Vries (2013) has surveyed many explanations offered over the years for the origins of the Great Divergence and the escape from poverty. In the end, however, he finds the bulk of them unpersuasive, and even the ones he favors seem to lack precision and are hard to test.

economic growth as “Eurocentric,” implying that such explanations suggest some kind of inherent superiority of European culture or institutions. While it is undeniable that some accounts have tried to credit some aspect or other of Western civilization, most scholars have eschewed such simple arguments and tried either to avoid cultural explanations altogether or to come to grips with the question of why certain values and beliefs differed systematically. One can write such histories without sounding “triumphalist” (Goldstone, 2012). The account below should be seen as part of this tradition.

In this book, I propose a new explanation, largely based on events in Europe. It is one that relies on something I call “culture,” but unlike most accounts that rely on this vague concept, the notion of culture I deploy will be circumscribed and defined with precision. The great economist Robert Solow once remarked that all attempts to explain differences in economic performance and growth using culture “end up in a blaze of amateur sociology” (quoted in Krugman, 1991, p. 93, n. 3). Perhaps. But if we are to look for institutions to explain historical development, can culture be far behind?

My approach simultaneously resolves two difficulties in the “Great Divergence” literature, one historical and one economic. The *historical* riddle is what might be called the great dilemma of the new institutional economic history: much of the literature in economic history that is trying to explain differences in economic performance and living standards, both by economists and historians, has accepted in one way or another Douglass North’s call for the integration of institutions into our narrative of economic growth (Acemoglu and Robinson, 2012; Sened and Galiani, 2014). An economy that grows as a result of favorable institutions requires a world of well-delineated and respected property rights, enforceable contracts, law and order, a low level of opportunism and rent-seeking, a high degree of inclusion in political decision making and the benefits of growth, and a political organization in which power and wealth are as separate as is humanly possible. Such institutions—whether part of the formal political structure (as embodied for example in a constitution) or based on private-order institutions—are credited with many positive economic developments in the past: the rise of more effective product and factor markets (and thus more efficient allocations), the growth of international and interregional trade, and the accumulation of capital, to name a few. But, as other scholars (Vries, 2013, p. 433; McCloskey, 2016b) have argued, the puzzle is that better markets, more cooperative behavior, and more efficient allocations simply do not in themselves account for modern economic growth. What is far harder to explain is the growth of technological creativity and innovation in Europe and especially the surge following the middle of the eighteenth century. The Industrial Revolution, in the sense of an acceleration of technological progress, at first blush does

not seem to have been a response to any obvious institutional stimulus. We actually know remarkably little about the kind of institutions that foster and stimulate technological progress and more widely, intellectual innovation.

The second riddle is closely related but looks at the problem from a different, more economic, point of view. If the generation and continuous improvement of new “useful knowledge”—both scientific and technological—is at the core of modern economic growth, the riddle is one of motivation or incentives. Knowledge, as has long been understood, is an unusual commodity, subject to rather serious public good properties: it is very hard to exclude others from using it, and the cost to the owner from sharing it is negligible or zero. As a result, economists suspect that knowledge tends to be chronically underproduced, because those who spend resources, time, and effort generating it have difficulty appropriating any returns. As far as technology or prescriptive knowledge is concerned, the existence of a patent system or other ways to reward inventors has provided a (very) partial solution.<sup>2</sup> But advances in natural philosophy and propositional knowledge could not be patented. This is especially problematic because the growth of technological knowledge by itself, without the constant interaction with some form of formal or informal science, would not have been able to generate growth and development at the rates observed. The issue of the exact role of science in the Industrial Revolution is still debated, but there can be no doubt that as growth accelerated, the input from science increased and became the dominant motive power at some point after 1830.

As this book makes clear, the solutions to the historical and the economic riddles coincide. My focus is on the period from 1500 to 1700, during which the cultural foundations of modern growth were laid. These foundations grew out of a set of political and institutional developments and cultural changes that were not intended to produce these results, and their deeply contingent nature is a recurrent theme in these pages.

A famous distinction made in Jewish law illustrates the difference between the type of phenomena we associate with institutions, on the one hand, and the importance of process and product innovation fed by growing human knowledge of natural forces on the other. The Talmudic tradition distinguishes between affairs that concern relations between the individual and others, and the relations between the individual and *makom*—a somewhat unusual name for the deity, meaning literally “place”

<sup>2</sup> For an assessment of the patent system in the early stages of economic growth in Europe, see Mokyr (2009b).

and practically interpreted as one's physical environment.<sup>3</sup> Commerce, the division of labor, effective markets in labor, credit and land, and similar institutions associated with Smithian growth were all outcomes of games between people. They depended on what values people adhered to and what they believed about others' values and behavior. What is less discussed is a set of cultural beliefs that pertain to games against *nature*, in which individuals try to understand natural regularities and exploit them to their advantage. Religious beliefs and metaphysical attitudes condition a society's willingness to investigate the secrets of nature, alter its physical environment irreversibly, and "play God." Technology is at its very core a relation of people with the physical environment and not with other people. For such practical matters as the diffusion and implementation of new techniques, of course, social relations are central to technological progress. But in the end the willingness to challenge nature in some way to reveal one of her secrets is based on metaphysical beliefs held at the individual level.

The drivers of technological progress and eventually economic performance were attitude and aptitude. The former set the willingness and energy with which people try to understand the natural world around them; the latter determines their success in turning such knowledge into higher productivity and living standards.<sup>4</sup> In this book I will be concerned with attitudes. The proposition I put forward here is that the explosion of technological progress in the West was made possible by cultural changes. "Culture" affected technology both directly, by changing attitudes toward the natural world, and indirectly, by creating and nurturing institutions that stimulated and supported the accumulation and diffusion of "useful knowledge." For quite a few years now, economists have become increasingly open to the idea that long-term economic change cannot be seriously analyzed without some concept of "culture" and some idea of how it changes and why these changes matter. McCloskey's massive trilogy (2006, 2010, 2016a) is by far the most significant of these analyses, but many mainstream economists are now committed to the significance of culture in the evolution of modern economies.<sup>5</sup> The reason this is so has been ob-

<sup>3</sup> This distinction has also found its way into the writings of Freud, who notes that "civilization" describes the sum of achievements that serve two types of purposes: "to protect men against nature, and to adjust their mutual relations" (Freud, [1930] 1961, p. 36).

<sup>4</sup> Differences in aptitude explain, for instance, why the Industrial Revolution started in Britain and not elsewhere in Europe (Mokyr, 2009a; Kelly, Mokyr, and Ó Gráda, 2014).

<sup>5</sup> Two particularly interesting examples are Doepke and Zilibotti (2008) and Clark (2007). Both stress the growth of certain cultural features associated with entrepreneurial behavior such as hard work and willingness to postpone gratification, and explicitly stress how these features are passed on from generation to generation. For a recent survey, see Alesina and Giuliano (2016).

vious for a long time. Individuals are assumed to have preferences and beliefs that determine how they are likely to act both toward others and toward their natural environment. However, these cultural elements can change, and we want to know why they change, and why at times culture changes at a tectonic pace, and at others with startling rapidity (Jones, 2006). But “culture” is a vague and mushy word, and as such is not a satisfactory term: here we need to be much more specific about whose culture and what specific elements of it mattered. Moreover, we must understand how culture changes and why societies have different cultures. If economists cannot contribute to this literature, they should leave it to other social scientists, but in that case they must concede much of the explanation of modern economic growth to others. An alternative is to see what historians and students of “culture” (in a certain sense) have had to say and incorporate their insights into the economic narrative (Vries, 2001).

To start with: Culture means various things to different people, and to begin, we need to clarify the concept and our use of it. Given the rather astonishing popularity of the concept of culture in the social sciences and the humanities and the mind-boggling number of definitions employed, it is useful for an economist to start off by defining precisely what is included in and excluded from “culture” and how it differs from “institutions,” before we examine its role in the origins of modern economic growth.<sup>6</sup> The definition I use here (and one very similar to the definition proposed by Boyd and Richerson, 1985, p. 2) is: *Culture is a set of beliefs, values, and preferences, capable of affecting behavior, that are socially (not genetically) transmitted and that are shared by some subset of society.* In what follows, my approach is similar to and inspired by the literature on cultural evolution proposed by some anthropologists. It will have little in common with “cultural studies” and the cultural analysis implied by social constructivism.

What does this definition buy us? First, **beliefs** contain statements of a positive (factual) nature that pertain to the state of the world, including the physical and metaphysical environments and social relations.<sup>7</sup> Second, **values** pertain to normative statements about society and social relations (often thought of as ethics and ideology), whereas **preferences** are normative statements about individual matters such as consumption and personal affairs. Third, culture is decomposable, that is, it consists of separate cultural elements or features. Much like genes, these traits are

<sup>6</sup> In a famous essay, Kroeber and Kluckhohn (1952) assembled no fewer than 156 different definitions of the term culture. It goes without saying that since then the term has been used and abused in different contexts by social scientists and historians, so that the number of different definitions would be larger today.

<sup>7</sup> As such, “beliefs” should be interpreted as containing knowledge, both codifiable and tacit, as well as human skills and capabilities. The most important component of these beliefs for my purpose is useful knowledge.

largely shared by people of the same culture; a single individual cannot have a cultural trait that is not shared by others, but each individual is unique in that it is highly unlikely that two people share precisely the same combination of cultural elements. There is no puzzle here: by analogy, all individuals have somewhat different genotypes (identical twins excluded) yet they share the vast bulk of their genes with other people and even with other mammals that have quite different phenotypes. Furthermore, this definition stresses that culture involves social learning, so that one's beliefs, values, and knowledge are not built-up from scratch for each individual but are acquired from others. The key concepts of attitude and aptitude are contained in the larger category of culture, and they will remain at the center of the discussion.

One could argue whether *behavior* itself (that is, actions) should be included in the concept of culture, but it seems useful to separate actions (which may be driven by a combination of cultural and other causes) from culture that guides and constrains it, although a great deal of culture, much like junk DNA that does not code for any known proteins, just "is" there in our minds and conditions no actions. The use of these evolutionary terms suggests an analogy that treats culture as genotypical and actions as phenotypical. Although tempting (and the subject of a large literature), such analogies should be carried out cautiously, as facile projections from one subject area to another are fraught with pitfalls. The argument that social phenomena or historical developments can be analyzed as analogous *to* biological processes is more misleading than helpful. Rather, my approach here is derived directly from the approach outlined in Aldrich et al. (2008), in which we argued that Darwinism in a historical framework is more of a general tool of analysis. The basic argument is not a facile shoe-horning of complex social phenomena into a framework derived from biology but rather a *generalized Darwinism* that "relies on the claim of common abstract features in both the social and the biological world; it is essentially a contention of a degree of ontological communality, at a high level of abstraction and not at the level of detail" (Aldrich et al., p. 579).<sup>8</sup>

Before proceeding, it is important to distinguish between such terms as "culture" and "institutions." For my purposes it seems best to regard culture as something *entirely of the mind*, which can differ from individual to individual and is, to an extent, a matter of individual *choice*. Institutions are socially determined conditional incentives and consequences to actions. These incentives are parametrically given to every individual and are beyond their control. In that way institutions produce the incentive structure in a society. Institutions as "rules" can be seen as a special case:

<sup>8</sup> Many scholars have argued for more precise isomorphisms between natural and economic history. For instance, Vermeij (2004, p. 247) has argued that "human history recapitulates the much more protracted history of life as a whole."

the rules specify certain behaviors to be proper and legal, but they also specify the penalties for breaking them and the rewards for meeting them.<sup>9</sup> Beliefs and preferences are the “scaffolds,” to use Douglass North’s (2005) term, of institutions. In a sense culture forms the foundation of institutions, in that it provides them with legitimacy.<sup>10</sup> In a different context, Leighton and López (2013, pp. 11, 112–22) create a similar framework, in which incentives determine behavior, institutions “frame” incentives, ideas influence institutions (provided circumstances are favorable), and entrepreneurs make change happen. That is not to say, of course, that every institution is necessarily supported by a majority of the population; many institutions serve a small minority that uses its power to extract resources from others (Acemoglu and Robinson, 2012). Regarding beliefs as the foundation of institutions is oversimplified. Greif, in his attempt to define institutions with care, points out a problem with the “institutions-as-rules” idea, namely that without a meta-rule (or ethic) that rules should be respected and followed, rules and laws may well be empty and unenforced suggestions.<sup>11</sup> For him, institutions should be seen as a set of factors that generate regularities in behavior. By this definition, institutions however, inevitably contain in some measure beliefs as well, and thus would violate my attempt to keep them apart. To be sure, institutions in turn affect cultural beliefs in many ways and through many mechanisms (Alesina and Giuliano, 2016, pp. 6–7). Perhaps the best way of thinking of the relationship between the two concepts is to realize that they coevolve, much like a species and its environment. Recent research by economists and other social scientists has examined the details of this coevolution process in detail and concluded that it can easily lead to multiple equilibria outcomes, in which “good institutions” (defined as those that lead to better economic

<sup>9</sup> This is a variation on Bowles (2004, pp. 47–48) who defines institutions as “laws, informal rules, and conventions that give a durable structure to social interactions ... and make conformity a best response to virtually all members of the relevant groups.”

<sup>10</sup> The mapping from one to the other is far from monotonic, however. The political process that converts beliefs into institutions is noisy and depends not only on beliefs but also on the ability of those who hold the beliefs to persuade or coerce others to accede to the institutions. As Szostak (2009, p. 234) notes, many institutions are little more than the “codification” of beliefs. Thus, an aversion of violence in a society may lead to formal legislation against it, and the conviction that wearing seatbelts in cars (a cultural belief) reduces accident fatalities leads to legislation making them mandatory (an institution). A cultural belief that the use of narcotics is bad may lead to an institution that mandates prison terms for drug use.

<sup>11</sup> As Greif (2006, p. 7) put it, rules “are nothing more than instructions that can be ignored. If prescriptive rules of behavior are to have an impact, individuals must be motivated to follow them. ... By ‘motivation’ I mean here incentives broadly defined to include expectations, beliefs, and internalized norms.”

performance and growth) interact with a culture that enforces them, whereas bad institutions may reinforce a culture that perpetuates them.

Other scholars have used related if somewhat different definitions. Thus Roland (2004) suggests that culture as defined be included as a “slow-moving institution” that affects political and legal arrangements that can be changed faster; he prefers to limit the word “culture” to beliefs about the interaction of individuals, driven by social norms. Either way, however, there is a consensus that the incentive structure of society rests on a foundation of ideas, some of them about nature, some about human interactions, and still others of a moral nature. In other words, institutions rest on a bedrock of what people believe and know (or, to be more precise, *think* they know). If the culture and the institutions are misaligned, the foundations become unstable. If there is a clash between culture and institutions, in the sense that the underlying belief or legitimacy for certain institutions has eroded, a political disequilibrium has emerged. Unfortunately, there is no good theory to predict what happens then; in some cases the institutions are overthrown, but in others through political and military means, those who benefit from the institutional status quo can hold on to power and the resources that come with it for a long time.

If institutions have indeed become one of the main explanations of why some nations are economically successful—as the modern consensus increasingly seems to suggest—how do institutions relate to cultural beliefs?<sup>12</sup> At first glance the connection between culture and institutions seems tenuous. The institutional variation on our planet suggests that societies with similar cultural and environmental characteristics can have quite different institutional set-ups. The almost hackneyed example is of course Korea, where an arbitrary line dividing a single nation in two created two dramatically different societies. The different development in the past decade between Venezuela and Colombia could be cited as another example. Through sheer bad luck some countries ended up with predatory rulers or aggressive neighbors who created bad institutions that thwarted economic growth and caused a great deal of human misery. While such institutions have low legitimacy, they can survive by using a high level of coercion—which itself is a costly and inefficient way of maintaining bad institutions, thus compounding poverty and backwardness.

Culture, then, helps determine what kind of institutions emerge, but it does not guarantee outcomes. Indeed, one of the first and most influential papers in the analysis of the role of institutions in economic history (Greif, 1994) used the term “cultural beliefs” to identify the forces that underpin changes in institutions and thus to understand how they

<sup>12</sup> Acemoglu and Robinson (2012, pp. 56–63) dismiss the role of culture as an independent factor, and stress the importance of institutions without fully recognizing the possible effect of the dominant beliefs and values on the kind of institutions that emerge.

supported markets and exchange. Greif's point was that if the economic game is to have a cooperative equilibrium, what people actually believe about how others behave helps determine how they themselves will act in a variety of situations of interest to the economic historian. In short, if economists admit that economic history cannot do without institutions, it cannot do without a better understanding of culture. They like things, however, clear-cut, precise, and if possible formally modeled and testable. This is a daunting task.

Moreover, as already noted, causality does not run purely from culture to institutions. Institutions create the environment in which cultural evolution occurs. Much of what is to follow describes cultural changes as a result of the incentives and stimuli provided by an institutional environment. Institutional outcomes, moreover, have a large aleatory component. They are the result of battles, dynastic arrangements, power struggles, the arbitrary preferences of unusually influential or powerful individuals, political compromises, and maps drawn by generals or politicians. There was nothing inevitable in the survival of relatively tolerant institutions in the Low Countries and Britain in the seventeenth century, any more than in the emergence of very different institutional outcomes in Korea or Germany after World War II. Such differences often seem to be the outcome of historical flukes rather than of deep cultural processes. Furthermore, institutions, once in place, can display considerable durability and persistence even if they do not conform with the cultural beliefs of most people. As long as the interests of a few powerful groups are served, they can maintain a set of institutions for a very long time (Acemoglu and Robinson, 2006). It is hard to deny that importing such institutions as free-entry markets, fair and general-franchise elections, and freedom of speech and association into a society in which the Enlightenment culture that underpins them is not widely shared is at best an uphill struggle. Yet, perplexingly, it is not impossible.

As already noted, culture is shared, yet individuals will normally differ in some ways from one another in what they precisely believe, just as they differ in genotype. This analogy should also not be pushed too far; above all, cultural beliefs are not like genes in that the latter are "immutable for life." Above all, they are a matter of choice.<sup>13</sup> Individuals can make explicit choices to either accept the default cultural characteristics they were born with or to reject them and replace them with something else that they select from their cultural menu. Of course, we do not always know how

<sup>13</sup> To be sure, even in biology, modern research has blurred some of these sharp distinctions. While the inherited DNA sequence is immutable over a lifetime, cells can acquire and pass on to their progeny information acquired over their lives through epigenetic inheritance using methylated bases in the DNA. These do not alter the proteins but affect the chances of their being transcribed. See Jablonka and Lamb (2005, pp. 113–46).

and even when some preferences and beliefs are acquired, and shedding them may be difficult. However, it is not quite correct to compare preferences to accents (Bowles, 2004, p. 372), because accents for most people become fixed as teenagers, whereas a taste for certain forms of art or food can continue to evolve over a lifetime, even if the likelihood of change declines with age.

Some pathbreaking research on the economics of culture and how beliefs can affect economic performance has recently been carried out by theorists and empirical economists alike.<sup>14</sup> One mechanism through which culture is believed to have affected economic performance is through the idea that higher trust and cooperation reduce transaction costs and thus facilitate exchange and emergence of well-functioning markets. Another is civic-mindedness. A spirit of public consciousness and willingness to abstain from free-riding behavior in collective actions supports a higher supply of public goods and investment in infrastructure than is otherwise possible. The beliefs that makes such behavior possible depend crucially on the beliefs regarding the behavior of others; this is a classic example of frequency-dependence in the choice of beliefs, a topic I return to below in chapter 5.<sup>15</sup> The importance of these elements was already pointed out by John Stuart Mill ([1848], 1929, pp. 111–12) and different levels of trust have been shown to explain income differences between nations (Zak and Knack, 2001).

As noted, both theorists and applied economists have shown a growing interest in the economics of culture. Among the theoretical works by economists on the origins of culture are the pathbreaking papers by Bisin and Verdier (1998, 2011), which for the first time brought to economics the important work on cultural evolution done by scholars of cultural anthropology and population dynamics. The empirical work on the economics of culture depends heavily on data from the World Values Survey, Gallup World Poll, and similar data (Guiso, Sapienza, and Zingales, 2006; Tabellini, 2008, 2010; Deaton, 2011). This work has successfully addressed a whole set of issues of supreme importance to economists such as household behavior and female labor force participation, corruption, and migration (Fernández, 2011). It also draws heavily on experimental data, which suggest that culture modifies behavior in many ways that qualify and nuance the standard economic assumptions of individual utility maximization in such obvious set-ups as simple ulti-

<sup>14</sup> Much of this work is surveyed in Bisin and Verdier (2011) and Alesina and Giuliano (2016). It is striking that there seems to be very little work so far done on the cultural factors behind scientific and technological progress.

<sup>15</sup> In Greif's (1994, p. 915) terms, cultural beliefs are the expectations that individuals have about the actions that others will take. To that we should add the further belief that individuals hold regarding the morality of a particular action.

matum games (Bowles, 2004, pp. 110–19). A recent essay by Rodrik (2014, p. 189) complains that ideas are “strangely absent” from modern models of political econom—but the same might be said about models of economic growth and innovation, though recent work has made a beginning at coming to grips with the cultural roots of these phenomena (Spolaore and Wacziarg, 2013).

Most research by economists on culture as they see it focuses primarily on social attitudes, beliefs, and preferences supporting informal and formal institutions that increase cooperation, reciprocity, trust, and the efficient operation of the economy (Guiso, Sapienza, and Zingales, 2008; Bowles and Gintis, 2011). More recently, economists have become interested in attitudes toward discipline, education, work, time, self-control, and similar areas. Cultural beliefs also help determine, for instance, whether preferences might be “other-regarding” (that is, whether the consumption of others affects one’s well-being) and whether they might be “process-regarding” (that is, whether the utility one derives from being in a particular state of the world depends on the way that state was reached rather than on the intrinsic quality of the state itself). Both of those types of preferences are not normally part of the analysis of economic preferences, but there is no inherent reason they should not be.<sup>16</sup> A good example of process-regarding preferences is when an individual cares whether he or she earns income by creating wealth through entrepreneurial activity or by redistributing it from others through rent-seeking or corruption. Does one regard a dollar in the same way no matter how it was earned, or does one care whether it was made while providing a socially useful activity? Is a dollar earned the same as a dollar stolen? Such preferences could make a difference in the institutions that are critical to the emergence of a civil economy and economic growth (Bowles, 2004, pp. 109–11; Bowles and Gintis, 2011, pp. 10–11, 32–35).

In what follows, I concentrate primarily on the one element in cultural beliefs that economists have so far neglected almost entirely, namely the attitude toward Nature and the willingness and ability to harness it to human material needs. Ultimately the relations with *makom*, or the physical world around us in the end determine the growth of useful knowledge and eventually that of technology-driven growth.<sup>17</sup> Technology is above all a consequence of human willingness to investigate, manipulate,

<sup>16</sup> Many modern economists have, of course, seen the obvious connections here. Thus one has summarized that “what people believe what it takes to become prosperous has much to do with how they behave” (M. Porter, 2000).

<sup>17</sup> In her excellent and exhaustive surveys of the literature on culture and economics, Raquel Fernández (2008, 2011) does not deal much science or technology or indeed the accumulation of knowledge in any form, although she stresses that “The relationship between technology and culture also needs to be investigated” (2008, p. 10).

and exploit natural phenomena and regularities, and given such willingness, the growth of the stock of knowledge that underpins and conditions the exploitation of knowledge. The willingness and ability to acquire, disseminate, and harness such knowledge are themselves part of culture and thus determine the intensity of the search for knowledge of nature, the agenda of the research, the institutions that govern the community doing the research, the methods of acquiring and vetting it, the conventions by which such knowledge is accepted as valid, and its dissemination to others who might make use of it. It is in this general area that the roots of modern economic growth should be sought—specifically in events and phenomena that precede the eighteenth-century Enlightenment and Industrial Revolution in the centuries that are known, for better or for worse, as “early modern Europe,” roughly speaking between the first voyage to America by Columbus and the publication of the *Principia Mathematica* by Newton. It is the basic argument of this book that European culture and institutions were shaped in those centuries to become more conducive to the kind of activities that eventually led to the economic sea changes that created the modern economies.