CHAPTER 1

EACH AGE GETS THE THOUGHT IT NEEDS

Mr. George

In 1982, I went on my first archaeological excavation in Greece. I was thrilled: I had dug a lot in Britain, but this was something else entirely. An ancient Land Rover took me from Birmingham as far as Thessaloniki, where I caught an even more ancient bus to Assiros, the farming village where we would be working (figure 1.1).[1] There I settled into the project's routine. All day long we would count, weigh, and catalogue fragments of prehistoric pottery, and as the sun went down, we would revive ourselves with a glass or two of ouzo in the dig house's dusty front yard.

One evening, an old man came down the dirt road past the house, riding sidesaddle on a donkey, tapping the animal with a stick. Next to him was an old woman, on foot, bent under the weight of a bulging sack. As they passed, one of my fellow students greeted them in broken Greek.

The old man stopped, all smiles. He exchanged a few sentences with our spokesman, and then the little party trudged on.

"That was Mr. George," our interpreter explained.

"What did you ask him?" one of us said.

"How he's doing. And why his wife isn't riding the donkey."

There was a pause. "And?"

"He says she doesn't have one."

It was my first taste of the classic anthropological experience of culture shock. Back in Birmingham, a man who rode a donkey

Figure 1.1. Locations and groups mentioned in chapter 1.

while his wife[2] struggled with a huge sack would have seemed selfish (or worse). Here in Assiros, however, the arrangement was clearly so natural, and the reasons for it so self-evident, that our question apparently struck Mr. George as simpleminded.

A third of a century later, this book is an attempt to explain what I saw in Assiros. It is based on the two Tanner Lectures in Human Values that I delivered at Princeton University in October 2012.[3] Being asked to give the Tanners is one of the highest honors in academic life, but I was especially delighted by the invitation because I am, frankly, such an unlikely person to receive it. In the thirty years since I met Mr. George, I had never written a single word about moral philosophy. Needless to say, that detail gave me pause, but on reflection, I convinced myself that Princeton's Center for Human Values was actually the perfect setting for me to hold forth on the events in Assiros, because explaining Mr. George's comment and my own reaction to it requires nothing less than a general theory of the cultural evolution of human values across the last twenty thousand years. For that task, a background in history and archaeology rather than in moral philosophy struck me as just the right skillset, and, I told myself, such a general theory of the cultural evolution of human values might be of some interest to moral philosophers too.

Whether I am right or wrong is for you to decide, with some input from the experts. After five chapters in which I set out my theory, in chapters 6 to 9 the four respondents to the original lectures—the classicist Richard Seaford, the Sinologist Jonathan D. Spence, the philosopher Christine M. Korsgaard, and the novelist Margaret Atwood—will have their say. But I get the last word, responding to the responses in chapter 10.

The Argument

In the last forty or fifty years, academics have written hundreds of books and thousands of articles about culture shocks similar to (and often much odder than) my encounter with Mr. George, his donkey, and his wife. What I offer here, though, is rather different from

most of these studies. When we look at the entire planet across the last twenty thousand years, I argue, we see three broadly successive systems of human values. Each is associated with a particular way of organizing society, and each form of organization is dictated by a particular way of capturing energy from the world around us. Energy capture ultimately explains not only what Mr. George said but also why it surprised me so much.

Immediately, though, I must make a caveat: because value systems—or cultures, or whatever we want to call them—are such shapeless entities, the only way to present this argument in the space of a hundred or so pages is by focusing on specific subsets of the broader systems. In my comparisons here, I therefore limit myself to ideas about equality and hierarchy (including politics, economics, and gender) and attitudes toward violence. I pick these topics partly because I am interested in them and partly because they seem to be important. However, I also suspect that most subsets of values would reveal similar patterns; and if they do not, comparisons between different subsets of values will be one obvious way that critics might falsify my argument.

I will spend chapters 2 to 4 trying to demonstrate the reality of these three broadly successive systems of human values. I call the first of them "foraging values," because it is associated with societies that support themselves primarily by gathering wild plants and hunting wild animals. Foragers tend to value equality over most kinds of hierarchy and are quite tolerant of violence. The second system I call "farming values," because it is associated with societies that support themselves primarily off domesticated plants and animals. Farmers tend to value hierarchy over equality and are less tolerant of violence. The third system, which I call "fossil-fuel values," is associated with societies that augment the energy of living plants and animals by tapping into the energy of fossilized plants that have turned into coal, gas, and oil. Fossil-fuel users tend to value equality of most kinds over hierarchy and to be very intolerant of violence.[4]

This framework not only explains why Mr. George's comment seemed so odd to me in 1982 (his values were largely those of the

farming phase, while mine belonged to the fossil-fuel phase) but also seems to have two broader implications for the study of human values. If I am right that energy capture determines values, it perhaps follows (1) that those moral philosophers who try to identify a one-size-fits-all, perfect system of human values are wasting their time, and (2) that the values that we (whoever "we" happen to be) hold dearest today are very likely to turn out—at some point fairly soon—not to be helpful any more. At that point (again, if I am right), we will abandon these values and will move on to a fourth, post-fossil-fuel, stage. I close, in chapter 5, with some speculations on what such values might look like.

Explaining and Understanding

My study of culture shock differs from most recent studies in trying to *explain* the experience rather than *understand* it. This distinction is usually traced back almost a century, to Max Weber, the founding father of sociology.[5] Weber, however, was not the first scholar to contrast understanding (*verstehen*) and explaining (*erklären*) as ways of thinking about social action. That honor seems to belong to the philosopher and historian Johann Gustav Droysen,[6] who suggested in the 1850s that historians and natural scientists were engaged in fundamentally different activities. Historians, he said, were trying to understand (by which he meant grasping past actors' subjective meanings) their subject matter, while natural scientists were trying to explain (by which he meant identifying causes) theirs.

Weber not only elaborated Droysen's original formulation on a massive scale but also suggested that sociology has a third goal, distinct from both history and science: to synthesize explaining and understanding. "A correct causal interpretation of a concrete course of action is arrived at," he insisted, "when the overt action and the motives have both been correctly apprehended and at the same time their relation has become meaningfully comprehensible. . . . If adequacy in respect to meaning is lacking," he added, "then no matter how high the degree of uniformity and how precisely its probability can be numerically determined, it is still an incomprehensible

statistical probability, whether we deal with overt or subjective processes."[7]

In the 1930s, the sociologist Talcott Parsons brought Weber's thought to a broad audience among American social scientists,[8] but the anthropologist Clifford Geertz (who began his career as a student of Parsons) put a very new spin on it in the 1960s–1970s. "Believing, with Max Weber, that man is an animal suspended in webs of significance that he himself has spun," Geertz wrote, "I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning."[9] Building on this interpretation of Weber, Geertz concluded that making sense of social action must be based on "long-term, mainly (though not exclusively) qualitative, highly participatory, and almost obsessively fine-comb field study," producing what he famously labeled "thick description."[10]

Thick description, said Geertz, should normally take the form of "the essay, whether of thirty pages or three hundred, [which is] the natural genre in which to present cultural interpretations and the theories sustaining them." That said, "the claim to attention of an ethnographic account . . . does not rest on its author's ability to capture primitive facts in faraway places, but on the degree to which he is able to clarify what goes on in such places, to reduce the puzzlement—what manner of men are these?—to which unfamiliar acts emerging out of unknown backgrounds naturally give rise."[11]

In arguing that social scientists should focus on understanding, rather than the synthesis of understanding and explaining that Weber promoted, Geertz caught a larger mood in American academia. By the mid-1980s, most humanists and many social scientists had followed his lead, transforming culture shock from a problem into an opportunity. We should rejoice, the historian Robert Darnton (at the time, a colleague of Geertz's at Princeton) wrote just a couple of years after my encounter with Mr. George, that "what is proverbial wisdom for our ancestors is completely opaque to us," because "when we cannot get a proverb, or a joke, or a ritual, or a poem, we know we are on to something. By picking at the document where it is most opaque, we may be able to unravel an alien

system of meaning. The thread might even lead into a strange and wonderful worldview."[12]

It did cross my mind back in 1982 that Mr. George might be having a little joke at our expense, poking fun at our First World condescension toward his rural ways. And yet the facts remained that it was Mr. George sitting on the donkey and his wife struggling with the bulging sack. I do not doubt that contextualizing his comments within a thick description of Assirote village life would unravel a strange and wonderful worldview,[13] but here I want to do something different. Instead of understanding Mr. and Mrs. George's behavior, I want to explain it.

In doing so, I will draw on a line of inquiry that goes back not just beyond Geertz but also beyond Droysen.[14] If we go back far enough, particularly to the half-century between the 1720s and 1770s, we come to a time when explanation, not understanding, dominated the scholarly study of culture. From Montesquieu to Adam Smith, many of Western Europe's intellectual giants reacted to the flood of information coming in about other continents by positing—as I do here—that humanity had moved through a series of stages of economic development (usually some variation on hunting, pastoralism, farming, and commerce), each of which had its own characteristic system of manners.

Some of these theorists called their work "philosophical history," because they felt that they were using the past to answer some of the central questions of moral philosophy, but others preferred "conjectural history," for the equally good reason that they knew that the schemes rested on conjecture rather than real evidence about the past. From the very beginning, conjectural history attracted a combination of mockery (Walter Bagehot joked that Adam Smith "wanted to show how from being a savage, [man] rose to be a Scotchman") and rage (in the first volume of the *Historisches Journal*, published in 1773, Johann Christoph Gatterer railed against the "pretentious little Humes or Robertsons, the little German Voltaires," and promised "to hunt down these insects without mercy, wherever they may be").[15] By the 1790s, many scholars had concluded that the costs of conjecturing without evidence outweighed the gains

of philosophizing, and conjectural/philosophical history went into sharp decline.[16]

But the urge to explain culture shock would not go away. A new approach, which has come to be known as "classical evolutionism," took shape in and after the 1850s, as missionaries and administrators produced a new wave of stories about the weird ways of non-Europeans, and academics developed new explanatory frameworks.[17] By the 1920s, however, the first professional anthropologists had shown that classical evolutionism was almost as conjectural as eighteenth-century philosophical history. Explanation once again went into retreat—only to enjoy another great revival (now in a form called "neo-evolutionism") in the 1950s. By this point, a significant body of archaeological and ethnographic evidence had been gathered, and explainers could ground their claims in statistical analyses of massive datasets, but by the 1980s thick description had routed this third wave of explainers too, albeit this time more on theoretical than empirical grounds.[18]

It might be tempting to interpret this story as just one more piece of evidence that there is no such thing as progress in the humanities and social sciences, but that, I think, would be a mistake. What we really see here is scholarship working the way it is supposed to.[19] Since the eighteenth century, one group of scholars after another has conjectured about the causes of cultural variation, and one group of critics after another has refuted them. In each round of debate, the explainers and understanders forced each other to come up with better theories and data, and in the 2010s, with the understanders in the ascendant, we would-be explainers need to raise our game once again.

Isms

To do this, explainers need to complement the hundreds of thick descriptions of meaning in specific cultures with broad comparisons spanning large areas and long periods of time. These will be thin descriptions, largely (though not exclusively) quantitative, and not very participatory. They will be coarse-grained, because they sweep

up into a single story hundreds of societies, thousands of years, and millions of people, and reductionist, because they seek answers by boiling down the teeming variety of lived experience to simpler underlying principles.

The three value systems that I identify—those of foragers, farmers, and fossil-fuel users—are examples of what Weber called ideal types, "achieved," he explained, "by the one-sided *accentuation* of one or more points of view and by the synthesis of many diffuse, discrete, more or less present and occasionally absent *individual* phenomena, which are arranged according to those one-sidedly emphasized viewpoints into a unified mental construct. In its conceptual purity, this mental construct can never be found empirically in reality. It is a *utopia*."[20] Ideal types reduce the real lives of billions of people to a few simple models, and because they subsume such enormous empirical variation, they are necessarily riddled with exceptions. But this is the price we have to pay if we are to identify causes behind the chaos of real life.

This path is bound to strike some readers as leading us into -isms of all the wrong kinds. To begin with, it is reductionist. In most branches of the humanities and some of the social sciences, "reductionist" is a term of abuse, but rather than denying the obvious fact of my reductionism, I want to embrace the charge. My defense is that *all* scholarship is reductionist. Anyone who denies this is not thinking hard enough. To give just one example: I recently had occasion to look up some details in Martin Gilbert's eight-volume biography of Winston Churchill (which was actually published as thirteen separate books, because some of the volumes were too big to be constrained within a single pair of covers).[21] This must be one of the biggest biographies ever written, but it is still reductionist. Reducing any individual's life to words on a page—even five thousand such pages—necessarily involves distorting a more complex reality; reducing the lives of everyone who lived in the last twenty millennia to a few short chapters necessarily does so more. But that is fine. The question we should be asking is not whether a historian, an anthropologist, or a sociologist is being reductionist—the answer is always yes—but what level of reduction is required to resolve the

problem being posed. Big questions often need a lot of abstraction, and so that is what I provide.

My argument is also strongly materialist. The labels I use for my three stages give this away: I am convinced, like the eighteenth-century philosophical historians, that the sources of energy available to a society set the limits on what kinds of values can flourish. Foragers living off wild plants and animals find that only a rather narrow range of ways of organizing their societies works out well, and these forms of organization tend to reward particular kinds of values. Living off domesticated plants and animals pushes farmers toward different organizations and values, and people able to tap into the energy locked in fossil fuels find that still another kind of organization and value system works best for them. If I am right, we have to conclude that culture, religion, and moral philosophy play only rather small causal roles in the story of human values. Culture, religion, and moral philosophy certainly do shape the regional versions of each of my three stages—no one would mistake, say, Plato's *Apology* for Confucius's *Analects*—and I devote a lot of space to them in chapters 2 to 4. That said, though, the bottom line is that while cultural traditions generate variations on the central themes, energy capture is the motor driving the big pattern.

Further, my argument is almost—but not quite—universalist. There are some parts of the planet that it does not cover, such as the arid steppe grasslands that stretch from Manchuria to Hungary. This territory cannot support what we normally think of as foraging or farming, because very few plants (other than grass) can grow there, but it has for thousands of years supported distinct kinds of pastoralist societies, whose members eat animals (horses, cows) that can live off grass.[22] However, despite failing the universalism test, my framework does incorporate the overwhelming majority (probably more than 95 percent) of all the people who have ever lived.

I am also guilty of functionalism.[23] Values are adaptive traits, which people adjust to maximize their effectiveness as the larger social system around them changes. This does not mean that what is (let alone what has been) is what ought to be, but it does mean that what is (and what has been) is what was always highly likely to

be. Values are functioning parts of larger wholes. Tearing them out of context, weighing them in an imaginary scale, and judging them does not get us any closer to designing a one-size-fits-all, perfect set of values, because values always exist only in the real world, as parts of actual social systems.

Last but not least, my argument is also explicitly evolutionist. Human nature is not a blank slate on which foragers, farmers, and fossil-fuel users just decided to write any moral systems that took their fancy. The three systems I will describe are evolutionary adaptations to changing circumstances.

What I mean by this is that human values have evolved biologically in the seven to eight million years since we split off genetically from the last common ancestor we shared with the other great apes.[24] Because our biology has not changed very much in the ten to fifteen thousand years since farming began, anthropologists, psychologists, and historians find that a few core concerns—treating people fairly, being just, love and hate, preventing harm, agreeing that some things are sacred—recur all over the world, regardless of time or place. To some extent, they recur in our closest kin among the great apes, and perhaps among dolphins and whales too. Up to a point, at least, human values are genetically hardwired, and because of this, the biologist E. O. Wilson observed forty years ago, "Scientists and humanists should consider together the possibility that the time has come for ethics to be removed temporarily from the hands of philosophers and biologicized."[25]

To date, most of the consideration of this possibility has come from scientists, who have made great progress in explaining how these core values of fairness, justice, and so on, descended from those of our apish ancestors, but humanists have been markedly less enthusiastic about biologicizing anything.[26] Perhaps because of this, there has been much less scholarship on how human values have continued to evolve across the last twenty thousand years, and why there are such enormous differences through time and space in what humans have taken fairness, justice, and so on, to mean. Explaining the biological roots of human values is a major achievement, but it is only the first step in the evolutionary explanation of values.

The second step begins from the fact that humans are, with only trivial exceptions, the only animals whose biological evolution has given them the brainpower to invent culture, by which I mean the cumulative body of information that we acquire from other people through teaching, imitation, and other kinds of transmission.[27] Our moral systems are cultural adaptations. As our environments change, we, like other living things, continue to evolve biologically, but humans alone also evolve culturally, changing our behaviors and institutions so that they remain useful (or even become more useful) as the world around us changes.[28]

Evolutionists argue heatedly over every aspect of the workings of cultural selection. Some scholars insist that the main mechanism is something very like natural selection in biological evolution, in which one cultural variant replaces another because it preferentially affects the likelihood that people who adopt it will survive and pass on their genes; others insist that biased transmission (in which one cultural variant replaces another because it affects people's lives in ways that make it more likely to be imitated), which has much less in common with natural selection, is the main force, and that cultural evolution is really very different from the biological version.[29] Units of selection are equally controversial. Here the main argument is between scholars who hypothesize cultural replicators very like the genes of biological evolution (what the biologist Richard Dawkins called "memes"), which are transmitted whole from one mind to another, and those who insist that the units involved would be better labeled "attractors," because attractive ideas are creatively reinterpreted rather than being faithfully transmitted from one mind to another.[30] Finally, the scale (or level) at which cultural selection operates has generated a particularly large literature. This pits those who insist that all selection operates ultimately on the gene (with individuals, kin, and larger groups functioning only as different vehicles for expressing genetic fitness) against those who see selection operating at multiple levels, suggesting that traits that might prove disastrous at the genetic level, such as altruism, are able to flourish because they are highly adaptive at the level of larger groups.[31]

These are all huge and important questions, but—fortunately—we can explain how human values evolve without having to wait until the experts have agreed on the mechanisms, units, and levels of selection. "The evidence suggests that sometimes cultural variants *are* somewhat genelike, while at other times they are decidedly not," observe the evolutionary scientist Peter Richerson and the anthropologist Robert Boyd; "But—and this is a big but—in either case, the Darwinian approach remains useful." The same is true of the kin and multilevel selection debates. After all, Richerson and Boyd observe, no one in the 1850s knew how genetic inheritance worked, but that did not stop Darwin from reasoning his way to the principle of natural selection. "For the same reason," they suggest, "we can black-box the problem of how culture is stored in brains by using plausible models based on observable features that we do understand, and forge ahead."[32] And when we do that, they conclude, we see that "Some moral values [become] more appealing and thus more likely to spread from one individual to another. Those will tend to persist, while less attractive alternatives tend to disappear."[33]

The biggest changes in humanity's environment since the end of the Ice Age have been the explosions in energy capture that we normally call the agricultural and industrial revolutions, which is why the three main systems of values in human history broadly coincide the three main systems of energy capture. In the 1940s, the anthropologist Leslie White suggested that the whole of history can in fact be reduced to the simple equation $C = E \times T$, where C stands for culture, E for energy, and T for technology.[34] "*Culture*," he concluded, "*develops when the amount of energy harnessed by man per capita per year is increased; or as the efficiency of the technological means of putting this energy to work is increased; or as both factors are simultaneously increased*."[35] White has been unpopular in recent years, but I will argue in this book that he was largely correct. The spiraling amount of energy humans have harvested across the last twenty thousand years has driven a process of cultural evolution, and human values have changed as part of this.

If it is right to think of value systems in these terms, we should probably also conclude—as I argue in this book—that each age gets the thought it needs. According to the psychologist Jonathan Haidt, "We're born to be righteous, but we have to learn what, exactly, people like us should be righteous about,"[36] and long-term history suggests that our choices of what to be righteous about are, to a great extent, forced on us by the ways we extract energy from the world. Methods of energy capture largely dictate what demographic regimes and forms of organization will work best, and these in turn dictate what kind of values will flourish.

Evolution—cultural as well as biological—is a competitive process, played out through millions of tiny experiments. It is path-dependent, meaning that the state of an organism or society today constrains what it might turn into tomorrow, and it is usually messy, noisy, and even violent. But as these competitions between mutations get resolved, traits that work well in a particular environment replace traits that don't. That, I think, is why we see so many similarities in behavior, institutions, and value systems within each of my three broad stages of foraging, farming, and fossil-fuel society—why, for instance, godlike kings and slavery were so common (but not universal) in farming societies and so rare (but not completely absent) in fossil-fuel societies. Peasants tended to opt for hierarchy not because they were all bullies, but because that was what worked; fossil-fuel users tended to opt for democracy not because they were saints, but because a flood of energy had changed the world so much that democracy was now what worked.

Long-term history, then, suggests that the competitive process of cultural evolution shoves us toward whatever values work best at a particular stage of energy capture, regardless of what we may think about it. This has certainly been my own experience of the back-and-forth relationship between values and environment. In 1986, four years after my time in Assiros, I made a brief detour into cultural anthropology. I went to Kenya to visit my wife (then girlfriend), who was studying traditional medicine among the Luhya people.[37] We both took our full-blown fossil-fuel

graduate-student values with us, and were particularly keen not to be like the colonialist anthropologists of yesteryear, with staffs of underpaid locals carrying their belongings around. What we discovered, though, was that what sounded good in a pub in Cambridge, UK, didn't translate very well to the hill country between Kakamega and Kisumu. This was largely a pre-fossil-fuel world, even more embedded in the age of farming than Assiros. Consequently, we found ourselves spending several hours each day fetching water from the river and collecting sticks to boil it before we could drink, cook, or wash anything. Kathy needed to teach and do interviews, I needed to finish my first book and write a job talk to give at the University of Chicago, and neither of us had time for hours of waterbearing.

But in a farming economy crippled by underemployment, plenty of local women did have time. For a dollar or so a day, we could buy back several hours. The cash was reasonably small change to us but a huge bonus for a local family. It was a win-win situation, but it was also a classic colonial relationship, and we didn't want to do it. For about a week, we slithered round in the mud, dropping buckets and building fires that wouldn't light. Finally—to everyone's relief, I think—we reassessed our principles. Money changed hands. Interviews got done, I finished my book and got hired, and a couple of family budgets got healthy cash infusions (figure 1.2).

Perhaps we were just weak-willed. Maybe Kant wouldn't have done what we did (although I also have trouble seeing him carrying buckets of water up from the stream). However, I suspect that almost everyone else on earth would have acted like us. There is a story that the economist John Maynard Keynes, when charged with inconsistency, replied "When the facts change, I change my opinion. What do you do, sir?" Whether Keynes actually said this or not,[38] it remains a good description of what has gone on billions of times around the world across the last twenty thousand years. One of the things biological evolution has given us is common sense, and common sense tells us to adapt to the facts.

Figure 1.2. The water bearers: Kenyan women collecting water at a stream (from a postcard bought in Kisumu in 1986; author's collection).

On Being Wrong

Ever since the days of the philosophical historians, the greatest challenge for builders of large-scale explanatory models has been how to test them against reality. Because ideal types are so messy, there are inevitably constant exceptions to every generalization; so how do we know when we have reached the point that there are there so many exceptions that the theory must be wrong?

This problem came up the first time I ever attended a Tanner Lecture, when I was invited out from Chicago to respond to Colin Renfrew's lectures on archaeology, language, and identity at Stanford University in 1993.[39] In the seminar following his first talk, Professor Renfrew and the philosopher Alison Wylie had a spirited exchange over falsification. The archaeologists in the room came up with one exception after another to his theory linking population movements and language change, but it was never really clear whether it had been (or could be) falsified.

The biologist-turned-macrohistorian Peter Turchin has suggested that on this, as on many other points, "The history of science is emphatic: a discipline usually matures only after it has developed mathematical theory."[40] If he is right (and I think he is), the obvious solution to the problem of falsification is to reject Geertz's claim that the essay is the natural genre for analyzing culture shock. Rather, I should begin this book by taking a representative sample of societies at different stages of energy capture, reducing their value systems to a numerical code, and comparing the fit between value systems and energy capture. A χ^2 (chi-square) or other significance test could then establish whether we should reject the null hypothesis (that there is no correlation between energy capture and values) at 0.05 or whatever other threshold seems appropriate. I would need to spend several pages explaining my coding system and sampling strategy, but if the test showed a statistically significant correlation between values and energy capture I could move on quickly to my explanation of the causes and implications of the correlation.

For many kinds of large-scale, cross-cultural comparison, this is, in principle, a straightforward business (even if in practice the outcomes of quantitative tests tend to be less straightforward). Big databases (particularly the Human Relations Area Files)[41] already exist, and even better ones are currently under construction.[42] However, if you look for information on values in these databases, you will have little joy. The core problem is that moral values are nominal not interval data—that is, saying that people in one society typically think that wealth inequality is good while those in another think it is bad conveys no information other than that the two societies are different. Their attitudes cannot be ranked or measured: "good" and "bad" are just names (hence "nominal" data), rather than points on a continuous scale that allow us to measure and quantify the distance between them (hence "interval" data).

Because of these (and other) problems, cross-cultural index makers normally avoid values vigorously, and in my own earlier venture into quantitative indices, I happily followed their lead.[43] Of course, it may be that I did not try hard enough, just as I perhaps did not try hard enough to adhere to my fossil-fuel values when I was among the Luhya, and other analysts do, in fact, claim to have found ways to convert human values from nominal to interval data. Since 1981, a large European project called the World Values Survey (WVS)[44] has interviewed more than 400,000 people in 100 countries about their values, ranking the responses along two axes. The first of these runs from "traditional" to "secular-rational" values (measuring attitudes toward religion, family, and authority), and the second from "survival" to "self-expression" (involving concerns with physical and economic security and levels of trust and tolerance). The WVS then bundled the numerical scores together to calculate a single score that could locate each country in the world within a grid of values.[45]

What all this shows, say the political scientists Ronald Inglehart and Christian Welzel, is "that socioeconomic development tends to transform people's basic values and beliefs—and it does so in a roughly predictable fashion."[46] What they mean by socioeconomic development—the transition from predominantly rural societies to

industrial and post-industrial, service-based economies—is similar to but not exactly the same as what I mean by energy capture, and so in figures 1.3 and 1.4 I attempt a more direct test, correlating WVS scores with a crude measure of energy capture. Figure 1.3 is the simplest version, plotting national scores on the WVS's traditional to secular-rational axis against the proportion of each nation's wealth generated in the agricultural sector.[47] There is a clear linear correlation, with values shifting from "traditional" to "secular-rational" as fossil fuels supplant farming; however, the correlation is weak, with a score for R^2 (the correlation coefficient) of just 0.24.[48] The relationship between energy capture and values is real, but figure 1.3 suggests that it is loose. So long as at least one-quarter of the national wealth comes from farming, values remain quite traditional, but once nonagricultural sectors rise above 75 percent, values shift rapidly (but with enormous variation) toward secular-rational norms. This pattern, as we shall see in chapter 4, is strongly borne out by the historical evidence.

Statistics being what they are, there are many ways to arrange the WVS data, but all the comparisons I tried produced roughly the same results. Figure 1.4, for instance, shows on the vertical axis the sum of the WVS's traditional-to-secular/rational and survival-to-self-expression scores for each country. The horizontal axis provides a composite measure of economic development, dividing output between the primary sector of farming, the secondary sector of industry, and the tertiary sector of services, and then assigning each country one point for each percentage of the work force in the primary sector, two for each percentage in the secondary sector, and three for each percentage in the tertiary. This produces a more respectable correlation ($R^2 = 0.43$), but the overall picture remains very like figure 1.3. The less developed the economy, the more likely people are to have traditional values, but as industry and services become important, people's values generally (albeit with enormous variation) shift toward rationalism, secularism, and self-expression.

The reason for the messiness of the pattern, the WVS concludes, is that development is not the only force affecting values. "Although socioeconomic development tends to bring predictable changes in

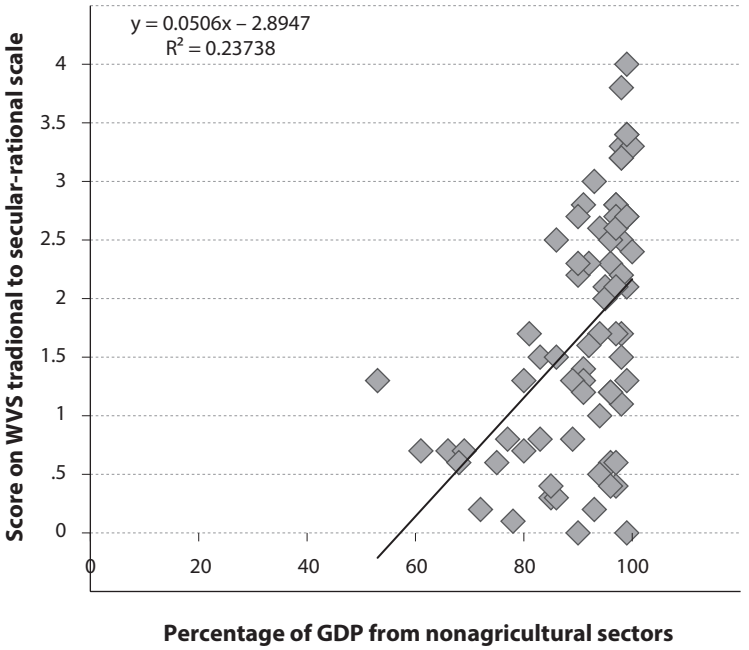

FIGURE 1.3. Values and energy capture, version I: national scores on the World Values Survey's traditional to secular-rational values scale plotted against the proportion of each nation's wealth generated by nonagricultural work ($y = 0.0506x - 2.8947$; $R^2 = 0.23738$).

people's worldviews," say Inglehart and Welzel, "cultural traditions—such as whether a society has been historically shaped by Protestantism, Confucianism, or communism—continue to show a lasting imprint on a society's worldview. History matters, and a society's prevailing value orientations reflect an interaction between the driving forces of modernization and the retarding influence of tradition."[49]

Inglehart and Welzel's "culture map," based on 2010 data and showing seventy-four of the countries they studied[50] (figure 1.5), illustrates this interaction. The cultural and/or linguistic clusters are striking, and cannot be mere coincidences, but there are also numerous anomalies that need to be explained. Inglehart and Welzel's category of "Catholic Europe," for instance, with its narrow

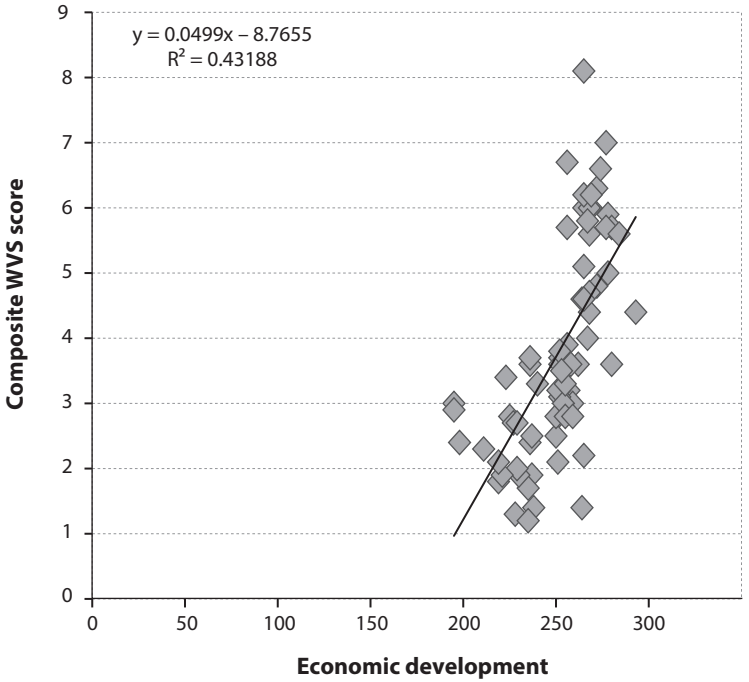

FIGURE 1.4. Values and energy capture, version II: composite scores combining the World Values Survey's traditional to secular-rational and security to self-expression scales plotted against a composite score reflecting the importance of the primary, secondary, and tertiary sectors in the national economy ($y = 0.0499x - 8.7655$; $R^2 = 0.43188$).

corridor connecting Poland to the rest of the cluster, looks alarmingly like a gerrymandered electoral district. According to their positions on the map, most Romanians would like to be Muslims, while Guatemalans want to be Africans, and the Irish (Protestants as well as Catholics) would be most comfortable in Latin America. Neither Greece nor Israel is marked on this edition of the cultural map (although they did appear on earlier versions), but their WVS scores suggest that the home of Orthodox Christianity really lies midway between Slovenia and Belgium, far from its co-religionists, and the Jewish state falls in the very center of Catholic Europe.

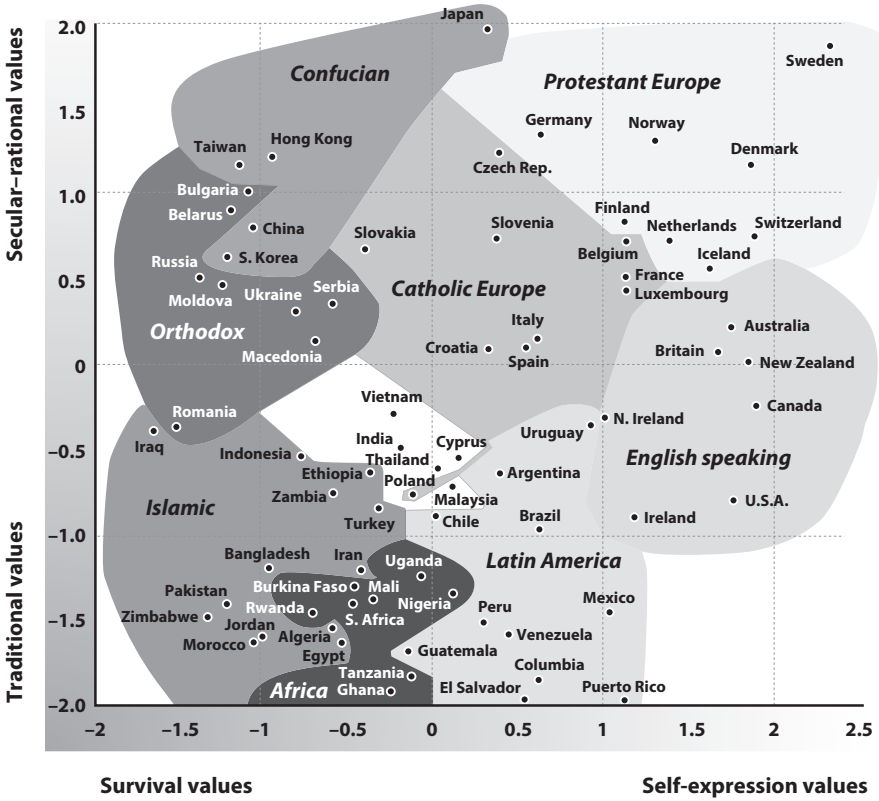

FIGURE 1.5. The "culture map" of World Values Survey data drawn by political scientists Ronald Inglehart and Christian Welzel, demonstrating the correlation between cultural traditions and values.

These quirky outcomes are amusing, but the most instructive anomaly is the cluster of countries in the middle of the diagram. Chile, Cyprus, Ethiopia, India, Malaysia, Poland, Thailand, Turkey, and Vietnam have little in common beyond the fact that they are all going through rapid economic transition—which points, the WVS concludes, to the conclusion that development is the real force driving values, with culture merely inflecting the paths that values take. "Following an increase in standards of living, and a transit

from development country via industrialization to post-industrial knowledge society," the WVS website observes, "a country tends to move diagonally in the direction from lower-left corner (poor) to upper-right corner (rich)":[51] development determines the path, and tradition bends it one way or another. The industrialized societies of Latin America and Eastern Europe all score higher in the WVS than the much less industrialized ones of Africa and the Middle East, but thanks to culture, Latin Americans tend to score high on self-expression but low on secular-rational values, while Orthodox Europeans tend to do the opposite.

The WVS data are strongly suggestive. In the end, though, they provide only a very partial test of this book's thesis. The basic problem is that the only way to generate systematic data on values is through opinion polls, and these are available only for very recent times. By 1981, when the WVS began its research, foragers made up just tiny minorities within larger nation-states. Even in Botswana, which probably has a higher percentage of foragers in its population than any other country, the ten thousand hunter-gatherers in the Kalahari Desert are outnumbered more than 200:1 by people who support themselves from farming, factory work, or the service sector. Further, by 1981 almost every farming society—including Mr. George's Macedonia[52]—was moving rapidly along the path toward fossil-fuel dependence. In 2012, there were only seven nations on earth (out of a total of 223) in which farmers generated more than half of the national wealth.[53] By contrast, the whole history of the world from the agricultural revolution up until about AD 1500 had probably produced no more than seven cases in which farmers generated *less* than half of the national wealth.

The only way to carry out rigorous, large-*n* statistical studies of the relationships between human values and energy capture is by restricting ourselves to the last thirty years, which means ignoring almost all of the story. Consequently, I fall back in chapters 2 to 4 on more traditional methods. In fact, this book is an essay along just the lines that Geertz recommended, sketching suggestions rather than demonstrating correlations. Drawing on well-established qualitative generalizations in anthropology, archaeology, and historical

sociology, I try to make the case that three broad systems of human values have existed across the last twenty thousand years, and that they roughly correlate with systems of energy capture—in short, that each age gets the thought it needs. My plan is straightforward. In chapters 2, 3, and 4, I look at foragers, farmers, and fossil-fuel users respectively, and in chapter 5, I ask why systems of energy capture changed, whether the changes were inevitable, and what will happen next. In chapters 6 to 9, the experts will explain where I went wrong, and in chapter 10, I will try to salvage whatever remains of my thesis.