A Hunter-Gatherer's Guide to the 21st Century

Evolution and the Challenges of Modern Life

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and **BRET WEINSTEIN**

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To Douglas W. Heying and Harry Rubin,
who saw so much, so early, and with such clarity

Introduction

IN 1994, WE SPENT OUR FIRST SUMMER IN GRADUATE SCHOOL AT A TINY field station in the Sarapiquí region of Costa Rica. Heather was studying dart-poison frogs; Bret homed in on tent-making bats. Every morning we did fieldwork in the rain forest, where it was green and lush and dark.

We remember a particular afternoon in July. A pair of macaws flew overhead, silhouetted against the sky. The river was cool and clear, and trees full of orchids crowded the bank. It was a perfect antidote to the sweat and heat of the day. On beautiful afternoons like this one, we would walk across the paved road that went all the way to the capital, onto a smaller dirt road, and cross a steel bridge that spanned the Río Sarapiquí, to take a swim at the beach below.

We paused on the bridge to admire the view: the river wending its way between walls of forest, a toucan flying between trees, the distant calls of howler monkeys. A local man whom we did not know approached and began talking to us.

"You are going to swim?" he asked, pointing at the sandy bank where we were headed.

"Yes."

"Today there was rain in the mountains," he said, pointing to the south. The river's source was in those mountains, in the cordillera. We nodded. Earlier, we had seen the thunderclouds above the mountains from the field station. "Today there was rain in the mountains," he said again.

"But no rain here," one of us said, laughing lightly, not knowing how

to make small talk in a language we weren't fluent in, while standing on a bridge, eager to swim.

"Today there was rain in the mountains," he said a third time, more emphatically. We looked at each other. Perhaps it was time to take our leave, to walk down to the river and get in the water. The sun was now directly on us. It was desperately hot.

"Okay, see you later," we said, waving, moving on. We were barely fifty feet from getting in the water.

"But the river," the man said to us, now with some urgency.

"Yes?" we asked him, confused.

"Look at the river," he said, pointing. We looked down. It looked like the river always did. Running fast and clean, smooth and . . .

"Wait," said Bret. "Is that a whirlpool? That wasn't there before." We looked at the man again, questions in our eyes. He pointed again to the south.

"Today there was a *lot* of rain in the mountains." He moved his focus back to the river. "Look at the water now."

In the moments we had been looking away, the water had come up visibly. It was moving chaotically, roiling. It had changed color, too—from dark and calm, it had become pale and filled with silt. In short order, it was filled with more than that.

The three of us stood transfixed, as the river rose spectacularly, many feet in just a few minutes. The beach disappeared under a huge volume of rushing water. Anyone on it would have been swept away. Debris, including several logs, began to hurtle past. Anything that hit that new whirlpool disappeared, then shot back up beyond the bridge.

The man turned around and began to walk off the way that he had come. He was a campesino, a farmer, but we didn't know where he was from, or how he knew that we were there, about to descend to what could easily have been our deaths.

"Wait," Bret called, then realized that we had nothing to offer him but gratitude. We literally had nothing on us but our clothes. "Thank you," we said. "Thank you so much." And Bret took off his shirt and gave it to the man.

"Really?" the man asked, as Bret held out his shirt.

"Really," Bret confirmed.

"Thank you," he said, accepting the shirt. "Good luck. And remember to think about the rain in the mountains." With that, he left.

We had been living by that river for a month, swimming in it nearly every day, sometimes alongside local people. Suddenly, we felt like strangers. We'd mistaken our few experiences swimming in the river for the wisdom of actually knowing a place. How could we have been so wrong?

At no other time in history has it been possible to think that you are a local but to be so lacking the deep knowledge of a place that keeps you safe during rare events. We moderns struggle to grasp this gap in our knowledge for many reasons. For starters, we no longer rely on tight-knit communities or a deep understanding of local terrain like humans did until recently. Given how easy it is to move from place to place with relative ease, many people tend not to stay in one locale for long at all. The facts of our individualistic lifestyles and transience tend never to strike us as odd, simply because we've neither seen nor can imagine an alternative to the world we live in right now: one where abundance and choice are ubiquitous, we rely on global systems too complex to understand, and everyone feels safe.

Until they don't.

The truth is, safety too often proves to be a facade: products on supermarket shelves turn out to be dangerous; a frightening diagnosis reveals weaknesses in a health-care system too focused on symptoms and profits; an economic downturn stresses a disintegrating social safety net; legitimate concerns about injustice become excuses for violence and anarchy while civic leaders offer pablum rather than solutions.

The problems that we face today are both more complex and simpler than experts make them seem. Depending on whom you've asked, you may have heard that we are living in the best, most prosperous time in human history. You may have also heard that we are living through the worst and most dangerous time. You may not know which side to believe. What you do know is that you can't seem to keep up.

Over the past few hundred years, developments in technology, medicine, education, and so much more have accelerated the rate at which we

are exposed to change in our environments—including our geographic, social, and interpersonal environments. Some of this change has been wildly positive, but hardly all, and other changes appear positive but have consequences so devastating that, once discovered, we struggle even to conceptualize them. All of this has encouraged the postindustrial, high-tech, progress-oriented culture we live in now. This culture, we propose, partially explains our collective troubles, from political unrest to widespread failing health and broken social systems.

The best, most all-encompassing way to describe our world is **hypernovel**. As we will show throughout the book, humans are extraordinarily well adapted to, and equipped for, change. But the rate of change itself is so rapid now that our brains, bodies, and social systems are perpetually out of sync. For millions of years we lived among friends and extended family, but today many people don't even know their neighbors' names. Some of the most fundamental truths—like the fact of two sexes—are increasingly dismissed as lies. The cognitive dissonance spawned by trying to live in a society that is changing faster than we can accommodate is turning us into people who cannot fend for ourselves.

Simply put, it's killing us.

In part, this book is about generalizing this message to all aspects of our lives: when it rains in the mountains, stay out of the river.

Many people have attempted to explain the cultural dissolution we face, but most have failed to provide a holistic explanation that not only examines our present, but also looks back into our past—our whole past—and into the future. We are evolutionary biologists who have done empirical work on sexual selection and the evolution of sociality, and theoretical work on the evolution of trade-offs, senescence, and morality. We are also married to each other, have a family together, and have often been side by side while exploring many parts of the globe. Well over a decade ago, when we were still college professors, we began formulating the idea for this book. We stood on the shoulders of giants—our mentors and senior colleagues, as well as many intellectual ancestors whom we never met—but

were also building curriculum that was unlike any that came before. We forged new paths, and posited new explanations for patterns, both old and new. We came to know our undergraduate students well, and as they engaged our curricula, they asked questions across domains: What should I be eating? Why is dating so difficult? How do we create a more just and free society? The common threads throughout these conversations—in classrooms and labs, in jungles and around campfires—were logic, evolution, and science.

Science is a method that oscillates between induction and deduction—we observe patterns, propose explanations, and test them to see how well they predict things we do not yet know. We thus generate models of the world that, when we do the scientific work correctly, achieve three things: they *predict more* than what came before, *assume less*, and come to *fit with one another*, merging into a seamless whole.

Ultimately, in this book and with these models, we seek a single, consistent explanation of the observable universe that has no gaps, takes nothing on faith, and rigorously describes every pattern at every scale. This goal almost certainly cannot be attained, but there is every indication that it can be approached. Though we may glimpse this end point from our modern perch, we are a long way from reaching the limits of what can be known.

That said, we are much closer to the goal in some areas than in others. In physics we seem tantalizingly near a "theory of everything,"[1] which really means a complete model of the least complex, most fundamental layer of explanation. As we move up in complexity, things become less and less predictable. Near the top of the stack we reach biology, where processes inside even the simplest living cells are nowhere near fully understood. Things only get more complex from there. As cells begin to function in coordinated ways, becoming organisms made up of distinct tissues, the degree of mystery compounds. The unpredictability jumps again in animals, governed by sophisticated neurological feedbacks that themselves investigate and predict the world, and once again as animals become social and begin to pool their understanding and divide their labor. Nowhere are we more regularly stumped than we are in understanding ourselves. We

Homo sapiens are brimming over with profound mysteries—surrounded by paradoxes born of the very things that make us distinct from the rest of the biota.

Why do we laugh, cry, or dream? Why do we mourn our dead? Why do we make up stories about people who never lived at all? Why do we sing? Fall in love? Go to war? If it's all about reproduction, why do we take so many years to get on with it? Why are we so picky about with whom we choose to do it? Why are we fascinated by the reproductive behavior of others? Why do we, sometimes, choose to impair and disrupt our own cognition? The list of human mysteries is endless.

This book will address many of those questions. It will bypass others. Our primary aim here is not to simply answer questions but to introduce you to a robust scientific framework for understanding ourselves, one we have developed over decades of study and teaching on the topic. It is not a framework you will find elsewhere; we developed it by working from first principles as much as possible.

First principles are those assumptions that cannot be deduced from any other assumption. They are foundational (like axioms, in math), and so thinking from first principles is a powerful mechanism for deducing truth, and a worthy goal if you are interested in fact over fiction.

Among the many benefits of first principles thinking is that it helps one avoid falling prey to the naturalistic fallacy,[2] which is the idea that "what is" in nature is "what ought to be." The framework that we present here is built to free us from these sorts of traps. It is intended to allow us humans to make sense enough of ourselves that we can, at a minimum, protect ourselves from self-inflicted harm. In this book, we will identify the most large-scale problems of our time, not through the limiting, divisive lens of politics, but through the indiscriminate lens of our evolution. One of our hopes is that we can help you to see through the noise of our modern world and become a better problem solver.

Modern *Homo sapiens* arose approximately two hundred thousand years ago, the product of 3.5 billion years of adaptive evolution. We are, in most ways, a generic species. Our morphology and physiology, though stag-

gering and marvelous when considered in isolation, are not special when compared to those of our nearest relatives. But we, uniquely, have transformed the globe and become a threat to the planet on which we still thoroughly depend.

We might have called this book *A Postindustrialist's Guide to the 21st Century*. Or An Agriculturalist's Guide. Or A Monkey's Guide, or A Mammal's Guide, or A Fish's Guide. Every one of those represents a stage of evolutionary history to which we have adapted, and from which we carry evolutionary baggage: our Environment of Evolutionary Adaptedness, or EEA, to use the term of art. In this book, we speak to our Environments of Evolutionary Adaptedness—which is to say, not just the EEA of the title, such as the African grasslands and woodlands and coasts on which our ancestors were hunter-gatherers for so long, but the many other EEAs to which we are adapted. We emerged onto land as early tetrapods; became lactating, fur-bearing mammals; developed dexterity with our hands and visual acuity as monkeys; grew and harvested our own food as agriculturalists; and live cheek to jowl with millions of anonymous others as postindustrialists.

We chose to include *hunter-gatherer* in the title of the book because our recent ancestors spent millions of years adapting to that niche. This is the reason so many people romanticize this particular phase of our evolution. But there was not just one hunter-gatherer way of life, any more than there is one mammalian way of life, or a single way to farm. And we are not adapted only to being hunter-gatherers—we also adapted, long ago, to being fish; more recently, to being primates; and most recently, to being postindustrialists. All of these are part of our evolutionary history.

This wide-ranging view is necessary if we are to understand the biggest problem of our time: Our species' pace of change now outstrips our ability to adapt. We are generating new problems at a new and accelerating rate, and it is making us sick—physically, psychologically, socially, and environmentally. If we don't figure out how to grapple with the problem of accelerating novelty, humanity will perish, a victim of its success.

This is a book not only about how our species is in danger of destroying

our world. It is also about the beauty humans have discovered and created, and how we can save it. An irrefutable evolutionary truth undergirding this book is that humans are excellent at responding to change and adapting to the unknown. We are explorers and innovators by design, and the same impulses that have created our troublesome modern condition are the only hope for saving it.

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