Preface

The title of this book, *Reinventing the Sacred*, states its aim. I will present a new view of a fully natural God and of the sacred, based on a new, emerging scientific worldview. This new worldview reaches further than science itself and invites a new view of God, the sacred, and ourselves—ultimately including our science, art, ethics, politics, and spirituality. My field of research, complexity theory, is leading toward the reintegration of science with the ancient Greek ideal of the good life, well lived. It is not some tortured interpretation of fundamentally lifeless facts that prompts me to say this; the science itself compels it.

This is not the outlook science has presented up to now. Our current scientific worldview, derived from Galileo, Newton, and their followers, is the foundation of modern secular society, itself the child of the Enlightenment. At base, our contemporary perspective is reductionist: all phenomena are ultimately to be explained in terms of the interactions of fundamental particles. Perhaps the simplest statement of reductionism is due to Simon Pierre Laplace early in the nineteenth century, who said that a sufficient intelligence, if given the positions and velocities of all the particles in the universe, could compute the universe's entire future and past. As Nobel laureate physicist Stephen Weinberg famously says, "All the explanatory arrows point downward, from societies to people, to organs, to cells, to biochemistry, to chemistry, and ultimately to physics." Weinberg also says, "The more we know of the universe, the more meaningless it appears."

Reductionism has led to very powerful science. One has only to think of Einstein's general relativity and the current standard model in quantum physics, the twin pillars of twentieth century physics. Molecular biology is a product of reductionism, as is the Human Genome Project.

But Laplace's particles in motion allow only *happenings*. There are no meanings, no values, no doings. The reductionist worldview led the existentialists in the mid-twentieth century to try to find value in an absurd, meaningless universe, in our human choices. But to the reductionist, the existentialists' arguments are as void as the spacetime in which their particles move. Our human choices, made by ourselves as human agents, are still, when the full science shall have been done, mere happenings, ultimately to be explained by physics.

In this book I will demonstrate the inadequacy of reductionism. Even major physicists now doubt its full legitimacy. I shall show that biology and its evolution cannot be reduced to physics alone but stand in their own right. Life, and with it agency, came naturally to exist in the universe. With agency came values, meaning, and doing, all of which are as real in the universe as particles in motion. "Real" here has a particular meaning: while life, agency, value, and doing presumably have physical explanations in any specific organism, *the evolutionary emergence of these cannot be derived from or reduced to physics alone.* Thus, life, agency, value, and doing are real in the universe. This stance is called emergence. Weinberg notwithstanding, there are explanatory arrows in the universe that do not point downward. A couple in love walking along the banks of the Seine are, in real fact, a couple in love walking along the banks of the Seine, not mere particles in motion. More, all this came to exist without our need to call upon a Creator God.

Emergence is therefore a major part of the new scientific worldview. Emergence says that, while no laws of physics are violated, life in the biosphere, the evolution of the biosphere, the fullness of our human historicity, and our practical everyday worlds are also real, are not reducible to physics nor explicable from it, and are central to our lives. Emergence, already both contentious and transformative, is but one part of the new scientific worldview I shall discuss.

Even deeper than emergence and its challenge to reductionism in this new scientific worldview is what I shall call breaking the Galilean spell. Galileo

rolled balls down incline planes and showed that the distance traveled varied as the square of the time elapsed. From this he obtained a universal law of motion. Newton followed with his *Principia*, setting the stage for all of modern science. With these triumphs, the Western world came to the view that all that happens in the universe is governed by natural law. Indeed, this is the heart of reductionism. Another Nobel laureate physicist, Murray Gell-Mann, has defined a natural law as a compressed description, available beforehand, of the regularities of a phenomenon. The Galilean spell that has driven so much science is the faith that all aspects of the natural world can be described by such laws. Perhaps the most radical scientific claim I shall make is that we can and must break the Galilean spell. I will show that the evolution of the biosphere, human economic life, and human history are partially indescribable by natural law. This claim flies in the face of our settled convictions since Galileo, Newton, and the Enlightenment.

If no natural law suffices to describe the evolution of the biosphere, of technological evolution, of human history, what replaces it? In its place is a wondrous radical creativity without a supernatural Creator. Look out your window at the life teeming about you. All that has been going on is that the sun has been shining on the earth for some 5 billion years. Life is about 3.8 billion years old. The vast tangled bank of life, as Darwin phrased it, arose all on its own. This web of life, the most complex system we know of in the universe, breaks no law of physics, yet is partially lawless, ceaselessly creative. So, too, are human history and human lives. This creativity is stunning, awesome, and worthy of reverence. One view of God is that God is our chosen name for the ceaseless creativity in the natural universe, biosphere, and human cultures.

Because of this ceaseless creativity, we typically do not and cannot know what will happen. We live our lives forward, as Kierkegaard said. We live as if we knew, as Nietzsche said. We live our lives forward into mystery, and do so with faith and courage, for that is the mandate of life itself. But the fact that we must live our lives forward into a ceaseless creativity that we cannot fully understand means that *reason alone* is an insufficient guide to living our lives. Reason, the center of the Enlightenment, is but one of the evolved, fully human means we use to live our lives. Reason itself has finally led us to see the inadequacy of reason. We must therefore reunite

our full humanity. We must see ourselves whole, living in a creative world we can never fully know. The Enlightenment's reliance on reason is too narrow a view of how we flourish or flounder. It is important to the Western Hebraic-Hellenic tradition that the ancient Greeks relied preeminently on reason to seek, with Plato, the True, the Good, and the Beautiful. The ancient Jews, living with their God, relied more broadly on their full humanity.

The ancient Jews and Greeks split the ancient Western world. The Jews, as Paul Johnson wrote in his *History of the Jews*, were the best historians of the ancient world, stubbornly commemorating the situated history of a people and their universal, single God, our Abrahamic God. With this part of our Western Hebraic-Hellenic tradition comes our Western sense of history and progress, alive in the creativity of human history. In contrast, Greek thought was universalist and sought natural laws. The Greeks were the first scientists in the West.

If both natural law and ceaseless creativity partially beyond natural law are necessary for understanding our world, and if we as whole human beings live in this real world of law and unknowable creativity, these two ancient strands of Western civilization can reunite in ways we cannot foresee. Out of this union can arise a healing of the long split between science and the humanities, and the schism between pure reason and practical life, both subjects of interest to Immanuel Kant. Science is not, as Galileo claimed, the only pathway to truth. History, the situated richness of the humanities, and the law are true as well, as we will see. This potential union invites a fuller understanding of ourselves creating our histories and our sacred, as we create our lives.

Across our globe, about half of us believe in a Creator God. Some billions of us believe in an Abrahamic supernatural God, and some in the ancient Hindu gods. Wisdom traditions such as Buddhism often have no gods. About a billion of us are secular but bereft of our spirituality and reduced to being materialist consumers in a secular society. If we the secular hold to anything it is to "humanism." But humanism, in a narrow sense, is too thin to nourish us as human agents in the vast universe we partially cocreate. I believe we need a domain for our lives as wide as reality. If half of us believe in a supernatural God, science will not disprove that belief.

We need a place for our spirituality, and a Creator God is one such place. I hold that it is we who have invented God, to serve as our most powerful symbol. It is our choice how wisely to use our own symbol to orient our lives and our civilizations. I believe we can reinvent the sacred. We can invent a global ethic, in a shared space, safe to all of us, with one view of God as the natural creativity in the universe.