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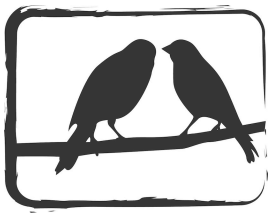

PROVOCATIONS

A NeoPresocratic Manifesto

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ABSTRACT Ancient Greek philosophy begins with natural philosophy (the Milesians, Heraclitus, Empedocles, Anaxagoras), followed after about a century by a focus on moral philosophy (Socrates and the sophists). The pattern is repeated in the Modern period: first natural philosophy re-emerged after the Dark and Middle Ages (Copernicus, Galileo, Descartes, Newton) followed by a correlative revolution in moral philosophy (Hobbes, Hume, Kant). In particular, moral ontology (externally related individuals) reflected the ontology of physics (externally related atoms). Individuals are, in effect, social atoms. Curiously, 20th-century philosophy has largely turned a blind eye and deaf ear to the vast philosophical implications of the second scientific revolution in 20th-century science, among them a correlative moral ontology of internal relations and social wholes. The environmental turn in the humanities, grounded in ecology and evolutionary biology, is a harbinger of the re-orientation of philosophy to the revolutionary ideas in the sciences and foreshadows an emerging NeoPresocratic revival in 21st-century philosophy.

According to Aristotle in Book IV (Γ) of the *Metaphysics*, the philosophy of being as such—being *qua* being—is "first philosophy." By "first," Aristotle did not mean that the philosophy of being as such was first in the order of time—although Heidegger seems to ignore the distinction—but rather first in the hierarchical order of thought. In the temporal sequence that Aristotle himself outlines in Book I (A) of the *Metaphysics*, the first philosophy that the Greeks pursued—beginning with Thales, according to Aristotle—was natural philosophy. Aristotle maps the progress of the natural philosophy of his predecessors onto his own scheme of causes. Thales and his fellow Milesians in the sixth century BCE were concerned with the material cause (positing water, air, and the like as the material "substrate"). After Parmenides had problematized motion and change, fifth century philosophers, such as Anaxagoras and Empedocles also concerned themselves with the moving or "efficient" cause (Mind and Love and Hate, respectively)—the force or forces that move material things. Following the fifth century Pythagoreans, Plato, in the fourth century, focused attention on the formal cause—the Numbers, according to Aristotle, who was certainly in a better position to know than we. (To understand this equation of Number and Form, we must remember that the ancient Greeks thought of number exclusively in geometrical terms—such "numbers" as the several species of triangle, the circle, the several species of polyhedron, and the sphere.)

We call the ancient Greek natural philosophers the "pre-Socratics"—but not just because they lived and worked before Socrates. Indeed many were contemporaries of Socrates.

Rather, Socrates and his fellow moral philosophers—whom Plato, unfortunately as well as unfairly, denigrates as "sophists"—expanded the scope of philosophy to include epistemology, ethics, and political theory as well as nature. The philosophers coming after Socrates, most notably Plato and Aristotle, were polymaths, taking up and synthesizing—each in his own way—both natural and moral philosophy, the philosophy of nature and the philosophy of things human.

The seamless union of natural and moral philosophy was not a peculiarity of ancient Greek philosophy. The early modern philosophers also united the two. Descartes—"the father of modern philosophy"—was a natural philosopher of the first water. He was better known among his contemporaries for his *Principles* than for his *Meditations*; and even today, outside philosophical circles, he is more celebrated for his analytic geometry, an enduring contribution to mathematics, than for his now-much-maligned contribution to moral philosophy—his rationalistic epistemology. In the 18th century, Kant, who is most celebrated today for his contributions to moral philosophy—especially for his epistemology and also for his ethics—was a celebrated cosmologist in his own time. In the 19th century, certainly Hegel attempted a synthesis (no pun intended) of natural and moral philosophy. But during the 20th century, almost all the self-styled philosophers who claim to have inherited the grand tradition of philosophy going all the way back to Thales (if we can trust Aristotle's historical sketch in the *Metaphysics*), have almost totally neglected natural philosophy. To be sure, there is Whitehead, Bergson, and perhaps a few other 20th century natural philosophers, but they are the exceptions. In regard to the neglect of natural philosophy—as in regard to so many other of its peculiarities—20th century philosophy, in my opinion, is an anomaly, indeed an aberration. The 20th century is now over—way over. The signs of the times seem clear: One distinguishing characteristic of 21st century philosophy will be a return to natural philosophy. Or, more precisely put, 21st century philosophers will be more cognizant of the revolutionary natural philosophy latent in 20th century science and will use it to inform and reform moral philosophy. The philosophy of the future, I suggest, is NeoPresocratic. (My rhetorical inspiration here is the Pre-Raphaelite movement of the mid-19th century. If they could create a new and progressive anti-mechanismic and anti-academic style in the arts by reviving a pre-modern sensibility, so might we philosophers create a new and progressive movement in philosophy by reconstituting the original impetus for philosophy itself.)

So profound had become the disengagement from science—not only of philosophy, but of the humanities generally—that, in the dry intellectual depths of the 20th century, the knighted Cambridge physicist and successful novelist C. P. Snow[1] identified two coexisting but mutually estranged cultures: that of cutting-edge science and that of the humanities. As the 20th century recedes into the past and 20th century philosophy becomes a period in the history of philosophy, just how can we 21st-century philosophers reunite those two cultures and fuse them into one? The need to do so is political no less than intellectual. In American politics, at least, the epistemology of science is losing ground to the epistemology of religion. Political parties, especially those on the right—the Republican Party, the Tea Party—have "beliefs" (ideologies) that are immune to logical criticism, intractable to contrary evidence, and remain firmly held in defiance of disastrous experience forthcoming from pursuing public policies

[1] C. P. Snow, *The Two Cultures and the Scientific Revolution* (London: Spectator Lmt., 1962).

based on those beliefs. I suggest that we philosophers and humanists generally can do our part to reintegrate science and its epistemology into the wider culture by expressing the new nature of Nature, as revealed by the sciences, in the grammar of the humanities. The putatively "value-free" discourse of science—a mixture of mathematics, statistics, and technical terminology—is not readily or easily accessible. The discourse of the humanities—rich with imagery, metaphor, emotion, and honest moral judgment—resonates with a much wider audience.

I suspect, however, that many if not most humanists believe that they will find little in science to fire the imagination, to stir the emotions, to stimulate our aesthetic sensibilities, and to touch our deepest moral sentiments. The world revealed by science is as dull as the language scientists use to characterize it—if the attitudes of my incoming philosophy graduate students are any indication of a prevailing humanistic alienation from a scientific worldview. They thrill to the scorn for "naturalism" evinced by Husserl and to the contra-scientific romanticism of Heidegger, innocent (or dismissive) of its resonance with the ideology of National Socialism. Many appear to be seeking in philosophy a counter-scientific worldview—even an anti-scientific worldview—and seem disappointed when my enticingly titled course, "Philosophy of Ecology," turns out actually to be about ecology, the science.

Science did, indeed, once represent a natural world that was imaginatively, emotionally, aesthetically, and morally unappealing, even repugnant to most non-scientists and especially to most humanists. Well, it was not altogether aesthetically unattractive, but its beauty was of a sterile mathematical kind, that only a logician could love. What did the late Harvard logician W. V. O. Quine once proclaim?—"a taste for desert landscapes"—something like that.[2] The erstwhile Newtonian world was populated by inert, externally related bodies, moving along straight lines, subject to various forces that are communicated by impact—a fragmented, material, mechanical world, devoid of life, spirit, mind, and meaning. And what of the organic world emergent from the mechanical and ultimately reducible to it? It popped up as a happy accident of chemistry and evolved by the blind (ateleological) forces that the ancient Greek philosophers called τυχη and αναγκη "chance and necessity." The ever-increasing complexity of the organic world is driven by the competitive interactions among its excessively fecund organisms. It is all a matter of "survival of the fittest" and "devil take the hindmost" in a living nature that is "red in tooth and claw." The whole organic world presents a disgusting spectacle—a violent, meaningless, pointless drama, like "a tale told by an idiot; full of sound and fury; signifying nothing."

Thus alienated by classical Newtonian and Darwinian science, most 20th-century philosophers—of both the analytic and continental persuasions—narcissistically occupied their minds with narrowly circumscribed, arcane, and abstract conceptual "puzzles" or equally arcane explorations of their own states of consciousness. Thus they took little if any notice when a second scientific revolution occurred in the early 20th century; and, even now, few take much if any interest in exploring and helping to articulate the post-Newtonian worldview. Equally indifferent to the second scientific revolution, some other humanists repaired to their hermeneutical studies of the sacred texts, the great secular books, classical music, the old-master painters. Alternatively, yet others provided a playful analysis and celebration of a contemporary literature, art, and music that ignores— or even rebels against—the supposedly

[2] W. V. O. Quine, *From a Logical Point of View* (Cambridge, Mass.: Harvard University Press, 1953).

sterile world depicted by scientists. That I mean no disrespect for hermeneutic studies is testified to by my personal love of Plato, especially, and the other ancient Greek philosophers, generally—a love that I continue to try to inspire in every new cohort of students that I teach at both the undergraduate and graduate levels. And while I am not personally engaged in the sophisticated study of contemporary high, low, and hybrid culture, I have the greatest respect for my colleagues who are—and I am delighted when I receive an invitation to their hip soirées and salons.

While the two cultures passed one another by in the 20th century, like the proverbial ships in the night, the scientific worldview was indeed undergoing revolutionary change. At the turn of the 20th century, space, time, and matter became anything but dull and unexciting. Our universe had become non-Euclidean, with space and time constituting one curved, warped four-dimensional continuum. The solid Democritean/Newtonian corpuscles, which had been located in Euclidean/Cartesian space, had become nano-scaled solar systems, spun out of the very fabric of non-Euclidean space, with only vaguely located, leaping electrons orbiting tightly bound nuclei that might lose mass and emit energy. Not only were energy and matter convertible, mind and energy-matter were conversable—as scientific observation of quantum systems actualizes one potential reality rather than another. Being is as being is interrogated and observed. At the opposite end of the spatio-temporal spectrum of scale, the unimaginably immense universe of stars and galaxies came to be understood as evolving and expanding, instead of, as formerly, in a static steady state. The universe is now understood to have originated in a dramatic Big Bang and to be riddled with mysterious and awesome Black Holes. A whole new holistic biology—ecology—took shape in the 20th century.

Despite the many popular science magazines, websites, television shows, zoos, aquariums, and other forms of publicity, what is going on in quantum physics, astrophysics, and ecology seems to be neither popularly appreciated fully nor, certainly, does it seem to have rent the fabric of the prevailing metaphysic. Perhaps because the revolutionary worldview latent in contemporary science has gone unexplored and unexplained by humanists, it is not registering in the public zeitgeist. Now and again a scientist with a gift for accessible prose—a Carl Sagan, a Stephen Hawking, a Stephen J. Gould, a Brian Greene, a Jacques Cousteau, a Carl Safina—will popularize one or another domain of new scientific discovery. But articulating the newly enchanted *worldview* latent in science requires the synthesizing genius of philosophers and the capacity of poets to move the human heart. Yet philosophers have pretty much remained indifferent to the opportunity and poets unresponsive to the challenge.

This is puzzling because the first scientific revolution—which we may regard as a revolution in natural philosophy—did produce a corresponding revolution in moral philosophy and in the fine arts. Why, in the 17th century, did Descartes entertain such extravagant doubts about the reliability of his senses, even about the very existence of his own body? Because up until Copernicus, a century before, all humankind had labored under a colossal and nearly universal deception, fairly attributable to too trusting a reliance on our senses. We believed that the earth upon which we stand lay immobile at the center of the universe and that the sun and moon, planets and stars revolved around us. After all, that's how it looks and feels! If we could be so wrong about that, who knows what else we might be wrong about? The old empirical/inductive epistemology inherited ultimately from Aristotle had to be swept away at a

stroke and replaced by a new rational/deductive one erected upon fresh and hypercritical foundations—or so Descartes believed. In the visual arts, linear perspective, which is but an application of projective geometry, created the life-like illusion of three-dimensional space, the space of Euclid, Galileo, Descartes, and Newton. New forms of literature, such as the novel, not accidentally or coincidentally emerged. The studied mathematical precision of the music that we now call classical constitutes, in effect, a new modern science of music. Even theology became rational and deistic.

The original scientific revolution, that of the 16th and 17th centuries, even more insidiously transformed ethics and politics. The free-standing, free-thinking human individual is, in effect, the social analogue of an atom. Formed from the alpha-privative, ατομος in Greek means "indivisible." We social atoms were conceived by Thomas Hobbes originally to live a life that was "solitary [as well as] poor, nasty, brutish, and short" as we moved in a pre-social vacuum driven on our inertial courses impelled by two simple forces: desire and aversion. In the absence of a social contract to give law and order to their movements these social atoms were bound to collide in a mutually destructive war of each against all. After the original atomism of Democritus and the correlative ancient social contract theory of the sophists had been forgotten, and prior to the revival of atomism in the 17th century, to conceive of human existence in a pre-social condition would have been nearly impossible.

That's right, for better or worse, our vaunted social and political individualism—which seems so natural, a matter of fact not of thought—originated as a conceptual adaptation in the sphere of ethics and political philosophy of atomism in classical physics. That the same sequence of intellectual events occurred two millennia earlier proves my point. Can it be a mere coincidence that—during both the fifth century BCE and the 17th century CE—atomism in natural philosophy was soon followed, in moral philosophy, by social and political individualism and the social contract theory of the origin of law, society, and ethics? Just as the ontology of the physical world was reductively conceived to be an aggregation of externally related indivisibles, so the ontology of the social world was also reductively conceived to be but an aggregate of externally related individuals. But whatever the cause, individualistic social ontology took hold of the Western zeitgeist after the 17th century and has become the foundation for our human rights, especially our rights to life, limited liberty, and property. The price we pay, however, is a tragic unawareness of the robust ontology of social wholes.

This unawareness of the robust ontology of social wholes is, incidentally, particularly costly today as we face problems, such as global climate change, that are of such unprecedented spatial and temporal scales that they cannot be effectively addressed by individual responses. When I speak to the public about the ethical challenge of climate change, I am invariably asked, "What can I do to address the problem?" The expectation is that I will recite a list of things that each of us, individually and voluntarily, can do to reduce our carbon emissions. I myself do most of those things: replace halogen light bulbs with compact fluorescents; make my home-to-office-and-back commute by bicycle; etc. But I live in Denton, Texas—not Berkeley, California, Ashland, Oregon, or Boulder, Colorado—in the United States. And Denton, Texas is a more representative microcosm of the United States than those precious centers of progressive sophistication. So I am painfully aware that my individual efforts to lessen the size and weight of my own personal carbon footprint are swamped by the recalcitrance of the overwhelming majority of my fellow citizens. Many of them have never

heard of global climate change. Many of those who have prefer to believe that it is the function of a "natural cycle" or an "act of God," not that it is anthropogenic. Many others are convinced that global climate change is a hoax cooked up by self-righteous pinko environmentalists who can't stand to see common people enjoy their mechanized fun. And many of those who think that it's for real welcome it as a sign that the End Times are upon us, the horrors of which they will be spared by the Rapture. It will not suffice, therefore, to simply encourage people individually and voluntarily to build green and drive hybrid. But what's worse is the implication that that's all we can do about it; that the ultimate responsibility for dampening the adverse effects of global climate change devolves to each of us as individuals. On the contrary, the only hope we have to temper global climate change is a collective social response in the form of policy, regulation, treaty, and law. What is required, in the words of Garrett Hardin's classic treatise, "Tragedy of the Commons," is "mutual coercion mutually agreed upon."[3]

Please forgive this peevish digression. I've just been frustrated by the way discussion of the ethical aspect of anthropogenic global climate change has been limited to individual responsibility. I return now to the two-cultures theme of this essay. So ... after the excitement of the Enlightenment, the fine arts and the humanities rebelled against the Newtonian worldview—for better or worse. The romantic counterculture in the humanities was openly antagonistic to the modern scientific worldview in both philosophy and the fine arts—albeit still colonized by the insidious atomic sense of self and aggregative sense of society. And while romanticism per se may have come and gone, indifference—if not antagonism—to the other culture, that of science, became entrenched in philosophy and the humanities generally and in the fine arts.

Perhaps for this reason, the response of the fine arts and humanities to the second scientific revolution, that of the 20th century, has been anemic. In the visual arts, Cubism is, arguably, an expression of non-Euclidean geometry, but it hardly conveys the geometry of Einsteinian space-time as perfectly and faithfully as linear perspective conveys the geometry of Euclidean-Galilean-Cartesian-Newtonian space. In music we have the aleatoric music of such composers and performers as John Cage, which beautifully reflects the indeterminacy and stochastic nature of the quantum world—but Cage and his few exponents remain marginalized and unpopular. Twelve-tone compositions, jazz, blues, folk, rock, pop, rap, and hip-hop all may be revolutionary—but in ways disconnected, so far as I can tell, from the second scientific revolution. In literature there have been some interesting experiments with what might be called the relativity genre, in which time is as fractured as Cubist space and characters have incommensurable perceptions of a common reality—James Joyce's *Ulysses*, Virginia Wolfe's *Mrs. Dalloway*, and Vladimir Nabokov's *Pale Fire* come to mind—but it remains a genre for the rare genius and has not taken the literary arts by storm. The theory of relativity is best reflected in culture studies, a central dogma of which is that all cultural reference systems are equal and none is privileged. But the scientific worldview, even as it evolves and changes, is regarded in culture studies as illegitimately hegemonic and a prime target for deflation and deconstruction. What about science fiction? With a few exceptions, such as the novels of Isaac Asimov, Arthur C. Clarke, Robert Heinlein, and Kim Stanley Robinson, science fiction is no better informed by state-of-the art science than other genres of pulp fiction.

[3] Garrett Hardin, "Tragedy of the Commons," *Science* 162 (1968): 1243-1248.

The reaction of 20th-century philosophy to 20th-century science was particularly unfortunate. Phenomenology, the dominant movement in continental philosophy, hubristically aspired to replace science as we know it—disparaged as "naturalism" by Husserl and most subsequent phenomenologists—with something truer to the phenomena immediately given to our intentional consciousnesses. Science had become, in their view, a skein of abstractions, of theoretical entities, such as atoms, which we do not—indeed cannot—directly experience. And the social sciences, especially psychology, are alleged to falsely objectify the pure subjectivity of the transcendental ego, first discovered by Kant and subsequently explored by Husserl. The alternative "science" that phenomenologists offer up is based on the assumption that we could "bracket" the abstract concepts that obscure the pure phenomena and accurately and exhaustively describe the phenomena as they present themselves to consciousness in raw form. By the same token, we could reveal to ourselves the very essence of intentional consciousness itself. Such bracketing, of course, is impossible to do; and even if it could be done, the value of doing it is by no means obvious. All along, however, science as we know it—increasingly abstract and theoretical—continued to thrive and attract funding and prestige, while phenomenology remains an arcane and marginalized specialty in academic philosophy, exerting little influence in the larger intellectual community of academe, with the exception of the faddish influence of "French Theory" in Literary Criticism, much of which has historical links to phenomenology.

By contrast, Anglo-American "analytic" philosophy held up scientific knowledge as the epitome of positive truth. Anglo-American philosophy of science is largely dedicated to setting forth the methods and means by which such magisterial knowledge is obtained. Surely then the traditional concerns of philosophy—ontology, metaphysics, ethics—could themselves become domains of positive knowledge by imitating the rigorous epistemological methods and means of science. Accordingly, such fields of study were isolated and divided into their microscopic elemental parts and painstakingly argued to putatively certain conclusions—about which, however, little agreement is ever reached. This virtual worship of scientific epistemology—obeisance to the ways and means of positive knowledge—combined with an application of it to the special turf marked out as their own by analytic philosophers, rendered 20th-century Anglo-American philosophy as isolated from the dynamic *substance* of 20th century science as was 20th-century continental philosophy. Bertrand Russell, for example, a founding figure of 20th-century analytic philosophy, retrogressively espoused "logical atomism" and eschewed the notion of internal relations, which characterizes the ontology of quantum field theory. Russell typifies, in a particularly spectacular fashion, the way in which 20th-century Anglo-American analytic philosophy was completely blind and deaf to the holism implicit in the revolutionary theories of relativity and of quantum physics.

Simply but boldly stated, what I am suggesting is that philosophy reoccupy the place in the panoply of disciplines reserved for theology in the High Middle Ages as "Queen of the Sciences." Unfortunately, 20th-century Anglo-American analytic philosophy exchanged that exalted office for something more like Handmaiden to the Sciences, while Continental philosophy—to continue the royal metaphor here running wild—abdicated the throne of Queen of the Sciences for some little Duchy in the intellectual Balkans. As scientific knowledge grows in volume, scientists themselves must ever more narrowly focus their research, exchanging breadth of knowledge for depth. Unless someone steps forward to

synthesize, integrate, interpret, and extract meaning and morality out of all that specialized knowledge, we—scientists and humanists alike—shall remain bewildered and adrift in a world bursting at the seams with information and devoid of sense and direction. That's a heavy burden for us philosophers to shoulder. To ever more narrowly specialize ourselves in the ever more careful and detailed dissection of the relationship of "sense data" to the "external world," sentences to propositions, words to objects, supervenient properties to their base properties, Frege to Carnap, the early Wittgenstein to the late is much more comfortable and manageable.

Or is it? Poet and essayist Gary Snyder—who ought to know—thinks it is easier than one might imagine to synthesize, integrate, interpret, and extract meaning and morality from the raw material of the sciences. In a delightful essay titled, "The Forest in the Library," he compares the academic information community to the biotic community of a forest. In the basements and windowless laboratories scattered across the campus, the data gatherers—the science graduate students and bench scientists—tediously work away at small scales, just like the detritus reducers on the forest floor and photosynthesizers in the understory. At the next trophic level "the dissertations, technical reports, and papers of the primary workers are ... gobbled up by senior researchers and condensed into conclusion and theory."[4]

> When asked, "What is finally over the top of all the information chains?" one might reply that it must be the artists and writers, because they are among the most ruthless and efficient information predators. They are light and mobile, and can swoop across the tops of all the disciplines to make off with what they take to be the best parts, and convert them into novels, mythologies, dense and esoteric essays, visual or other arts, or poems.[5]

Settling into a comfortable academic sinecure, in any case, is not what attracted me to philosophy as a young humanist. I was inspired by the audacity of the pre-Socratics, such as Heraclitus, who tried to paint a picture of the whole universe in a series of enigmatic epigrams, or such as Empedocles, who tried to best Heraclitus in two grand didactic poems, one titled "On Nature," the other "The Purifications." For me, the opportunity to do natural and moral philosophy like the pre-Socratics—to paint in bold strokes with a broad brush—came with the advent of the environmental crisis. Nature was talking back. It was saying that the prevailing, still essentially Newtonian assumptions—about the nature of Nature, human nature, and the proper relationship between people and Nature—that were still informing industrial development, were flawed. The message came across loud and clear in the form of unbreathable air over our big cities, fouled and stinking rivers and seashores, coastal dead zones, disappearing flora and fauna, statistically anomalous outbreaks of cancer, the threat of silent springs. Just as Descartes did half a millennium before me, I felt we needed to rebuild again from the foundations and ask anew the oldest and most fundamental questions of philosophy: What is the nature of Nature? What is human nature? What is the proper relationship between people and Nature?

Other humanists also seized the opportunity afforded by the environmental crisis to try to transform their respective disciplines. The first to respond were a couple of historians. The

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[4] Gary Snyder, "The Forest in the Library," in Gary Snyder, *A Place in Space: Ethics, Aesthetics, and Watersheds* (New York: Counterpoint, 1995), 119-204.

[5] Ibid.

signal year was 1967. Roderick Nash's *Wilderness and the American Mind* was published that year and so was Lynn White Jr.'s (in)famous essay, "The Historical Roots of Our Ecologic Crisis."[6] Donald Worster, the former dean of environmental history, once remarked that what historians do is to spin good stories based on otherwise mute facts. Nash's classic represents much more than a history of wilderness. The story he tells became the canonical story of the American environmental movement. Nash identifies and delineates its founding figures: George Perkins Marsh, Henry David Thoreau, John Muir, and Aldo Leopold. In addition to these vernacular philosophers, he ranges comfortably over the natural sciences, literature, and the visual arts, discussing the contributions to an evolving environmental awareness of Alexander von Humboldt, Alexis de Tocqueville, James Fennimore Cooper, Thomas Cole, and George Catlin, to mention but a few.

In retrospect, Lynn White Jr.'s essay provided the mandate and set the agenda for a future environmental philosophy, which got underway in the 1970s. White was an historian of technology and made the obvious point that the then newly discovered environmental crisis was a serious side effect of "modern" technology. What made modern technology modern was its unprecedented union with modern classical science. Ever since the Greeks and up until the 18th century, natural philosophy and eventually science was pursued only by leisured aristocrats who prided themselves on seeking knowledge of Nature for knowledge's sake and disdained any practical application of their theories as beneath their social station. And technology was the concern of only the working classes to whom fell the burden of supporting the privileged intellectuals as well as themselves.

Both science and an aggressive technological esprit are Western in provenance, argued White, and could be traced to the late Middle Ages when Europe was steeped in the Judeo-Christian worldview. Created in the image of God, man's mind might recapitulate that of the Creator as He created the world. That was the inspiration for scientific inquiry. And God commanded man to be fruitful, to multiply, to have dominion over the creation and to subdue it. That was the motivation for developing an aggressive technology. In short, White placed ultimate blame for the environmental crisis on Genesis 1:26-28. Of course, White's thesis is both jejune and cavalier. But obscured by his lurid and brassy text was a more general and plausible subtext: that what we do in relationship to Nature depends on what we think about Nature, about ourselves as human beings, and about our proper relationship to Nature; and, corollary to that, effectively to change what we do in relationship to Nature, we first have to change what we think about Nature, about ourselves as human beings, and about our relationship to Nature.

Exposing what we think about things and changing what we think about them is the work of philosophers—or at least it used to be and, hopefully, soon will be again. There are two moments to this process. The first is critical, the second creative. White himself had taken the first, critical initiative. He criticized the ideas about the man-Nature relationship that we had inherited from our Judeo-Christian cultural roots. But those are not our only cultural roots. The Greco-Roman cultural roots run at least as deep and bequeathed to modern Western

[6] Nash, Roderick. *Wilderness and the American Mind* (New Haven, Conn.: Yale University Press, 1967); Lynn White Jr. "The Historical Roots of our Ecologic Crisis," *Science* 155 (1967): 1203-1207.

civilization just as many environmentally noisome notions. Thus a few philosophers and intellectual historians, such as J. Donald Hughes[7] and Carolyn Merchant[8], began to reread Plato's otherworldly theory of forms and Aristotle's anthropocentric teleology, Bacon's coercive epistemology and Descartes' divisive dualism through the new lens of environmental crisis. They afford good examples of the way humanists can use their hermeneutical expertise in new, socially relevant, and exciting ways. I, for example, was able to use my knowledge of ancient Greek natural philosophy to call attention to the way physical atomism in natural philosophy was followed by social atomism and social contract theory in ancient Greek moral philosophy. As noted here already, after atomism was revived in the modern scientific worldview, it was followed once more by social atomism and social contract theory in modern moral philosophy. In doing so, my purpose is to provide much more than a nifty historical insight. I aim to reveal the contingency of our prevailing individualistic social ontology and sense of self, opening us up, hopefully, to possibilities for alternative social ontologies and senses of self latent in the ontologies of contemporary science: the ontology of the space-time continuum; the unified quantum fields; the integrated ecosystems; and the self-regulating, superorganismic biosphere—which are more commensurate with the political and environmental problems we face as the 21st century unfolds.

The second, creative moment in the agenda for an environmental philosophy set by White is more difficult to pull off. How do we generate new ideas about the nature of Nature, human nature, and the proper relationship of people to Nature? We cannot just gin them up from scratch; just make them up out of the blue. Not even Thales, the very first philosopher in the Western tradition, operated in an intellectual vacuum. Two early approaches were (1) to look for an alternative worldview in non-Western intellectual traditions and (2) to scour the theological and philosophical canon of the West for alternative worldviews that had not found their way into the mainstream but had been washed into intellectual side channels. Here again, White showed the way. (1) He suggested, but ultimately rejected, adopting the Zen Buddhist worldview. That got what we now call comparative environmental philosophy started; and essays soon appeared that proposed that we adopt other strains of Buddhism (such as Hwa-yen), or Daoism, Hinduism, and other non-Western worldviews. Huston Smith, for example, wrote a piece titled "Tao Now: An Ecological Testament."[9] White himself thought that the West was unlikely to convert wholesale to a foreign worldview. (2) So he concluded his essay by recommending that we in the West resurrect and mainstream the heretical and radical ideas of St. Francis of Assisi, according to which animals too had immortal souls and man was brother to the Earth and its many creatures. Following White in method, but looking to the secular Western canon, Arne Naess recommended reviving and mainstreaming the monistic philosophy of Spinoza; Michael Zimmerman suggested we take Heidegger's advice to "let beings be"; and so on.

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[7] J. Donald Hughes, *Ecology in Ancient Civilizations* (Albuquerque: University of New Mexico Press, 1975).

[8] Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (San Francisco: Harper and Row, 1980).

[9] Huston Smith, 'Tao Now: An Ecological Testament," in *Earth Might be Fair: Reflections of Ethics, Religion, and Ecology*, ed. Ian Barbour (Englewood Cliffs, NJ: Prentice-Hall, 1972), 62-81.

The approach that I took (3)—and am here recommending to those of my fellow philosophers looking for a way to escape the 20th century analytic and continental culs de sac—is to espress the natural philosophical essence out of contemporary scientific theories. We in the West are as unlikely to dust off and collectively adopt an idiosyncratic historical worldview, especially one that never made it into the Western mainstream in the first place, as we are to adopt a foreign worldview. Science is what is happening now in the West. Moreover, while it may have been Western in provenance, it is no longer Western in practice and pursuit. Science has international cachet and currency. And it is one of the few intellectual endeavors, if not the only one, that is culturally unaccented. While, for example, we can instantly tell the difference between Bollywood and Hollywood cinema, the string theory cogitated in Beijing is no more distinctly Chinese than that cogitated in Berkeley. Further, as already noted, science serves up some ideas with extremely exciting and congenial philosophical potential. And abstracting a contemporary philosophical worldview from the sciences is not the exclusive province of philosophers. Theologians, most notably Thomas Berry, have found ideas in contemporary cosmology that bespeak a human harmony with Nature.[10] Scientists themselves who have a philosophical bent have also contributed to the work of worldview reconfiguration. Indeed many of the great architects of the second scientific revolution were well aware that they were the latest contributors to the Western tradition of natural philosophy. Albert Einstein, Werner Heisenberg, Niels Bohr, Erwin Schrödinger all reflected publicly on the new worldview emerging from the new physics. More recently, physicist Fritjof Capra has explored the general implications of quantum theory for a new more integrative and holistic ontology and physicist Brian Swimme has teamed with Thomas Berry to tell "the universe story."[11]

My own past work dabbled a bit in the philosophical implications of relativity and quantum theory, but has concentrated more on evolutionary biology and ecology than on any of the other sciences. Following the lead of Aldo Leopold, in the former I find three very useful things.[12] First, from an evolutionary point of view, with all other species on our small planet, we are descended from a common ancestor—which would instill in us, if we took the trouble to think about it, Leopold believes, "a sense of kinship with fellow-creatures; a wish to live and let live." Second, we may derive a kind of neo-pagan spirituality from the theory of evolution, "a sense," as Leopold put it, "of wonder over the magnitude and duration of the biotic enterprise."[13] Third, Darwin provided a detailed account of the origin and evolution of ethics in *The Descent of Man*, which represents the best foundation, in my opinion, for contemporary environmental ethics. Darwin himself was no Social Darwinist. If not in *The Origin of Species* then certainly in *The Descent of Man*, Darwin's views are closer to those of Peter Kropotkin in *Mutual Aid* than to those of Herbert Spencer in "Progress: Its Law and Cause".[14] Darwin argued that ethics evolved to facilitate social organization and community. One of the most fundamental concepts in ecology is that of a biotic community. When this ecological concept

[10] Thomas Berry and Brian Swimme, *The Universe Story from the Primordial Flaring Forth to the Ecozoic Era: A Celebration of the Unfolding of the Cosmos* (San Francisco: Harper SanFrancisco, 1992).

[11] Fritjof Capra, *The Tao of Physics: An Exploration of the Parallels between Modern Physics and Eastern Mysticism* (Berkeley, Cal: Shambala, 1975); Brian Swimme and Thomas Berry, The Universe Story.

[12] Aldo Leopold, *A Sand County Almanac and Sketches Here and There* (New York: Oxford University Press, 1949).

[13] Ibid.

[14] Peter Kropotkin, *Mutual Aid* (London: Heinemann, 1902); Herbert Spencer, "Progress: Its Law and Cause," *Westminster Review* 67 (1857): 445-447, 451, 454-456, 464-465.

of a biotic community is overlain on Darwin's analysis of the origin and evolution of ethics, an environmental ethic clearly takes shape. Just as all our memberships in various human communities—in families, municipalities, nation states, the global village—generate peculiar duties and obligations, so our memberships in various biotic communities also generate peculiar duties and obligations.

Lynn White Jr.'s (in)famous essay also induced a dialectical response among Christian apologists. They responded less with a revival of Franciscan theology, as White himself had suggested, than with an alternative, theocentric/stewardship reading of the early chapters of Genesis to counter White's anthropocentric/despotism reading of the same texts. The Judeo-Christian stewardship environmental ethic is very potent: His creation belongs to God, not us humans; in declaring it to be "good," God invested the creation with what environmental philosophers call "intrinsic value"; and He turned it over to us humans, not to exploit and destroy, but to dress and keep. If Christianity could be greened in this fashion, what about the possibility of greening other religious traditions?

While Westerners are unlikely to convert en masse to a foreign worldview such as Japanese Zen Buddhism, perhaps those for whom such worldviews are not foreign, but are their own living traditions of faith, could also find in them an environmental ethic. We must remember that the environmental crisis, popularly recognized as such in the 1960s, was then understood to be global in scope, and so it remains, now more than ever. If adherents of Buddhism, Islam, Hinduism, etc., could also find a potent ecological ethic in their worldviews, a network of religiously grounded ecological ethics could be formed around the globe. I barely scratched the surface of this possibility in my book, *Earth's Insights*: *A Multicultural Survey of Ecological Ethics from the Mediterranean Basin to the Australian Outback*.[15] But it was fully cultivated and brought to full flower by the great vision and the great work of Mary Evelyn Tucker and John Grim. They gathered leading representatives of the religions of the world in a series of conferences convened at the Harvard Center for the Study of World Religions in the last decade of the 20th century and then published the fruits of those gatherings in a series of Harvard University Press books.

History, philosophy, theology, religious studies—all humanities disciplines—have taken an environmental turn and in so doing have bridged, to one degree or another, the gulf isolating them from the sciences. It is not accidental that we almost unconsciously link environmental history, environmental philosophy, and so on, with ecology, and thus with the sciences generally, by means of such labels as "Deep Ecology," "religion and ecology," "eco-theology," "ecological ethics," "eco-health," ecofeminism, and so on. We now even have "ecological economics" (as distinct from "environmental economics") which indeed most academic economists would prefer to think of as one among the humanities rather than as one among the social sciences.

Arrested by the narcissism and cynicism of French Theory, the critical study of literature has most recently taken an environmental turn, and is now commonly referred to as "ecocriticism" by those engaged in the specialty. As ecocriticism emerged institutionally it focused largely on the study of what I call "cabin narratives." Such works typically feature a

[15] J. Baird Callicott, *Earth's Insights: A Multicultural Survey of Ecological Ethics from the Mediterranean Basin to the Australian Outback* (California: University of California Press, 1994).

solitary, ruggedly individual individualist—usually a male protagonist—seeking himself, in communion with Nature, and measuring the culture from which he retreats by the norms of Nature. Leopold, for example, concludes the "Foreword" to his cabin narrative by envisioning "a shift of values ... achieved by reappraising things unnatural, tame, and confined in terms of things natural, wild, and free."[16] Very often the first-person protagonist of such narratives is deeply engaged in the scientific study of Nature, most often in scientific natural history. Thoreau's *Walden* is the prototype—the genre exemplar—of the cabin narrative. And Lawrence Buell's study of Thoreau is the prototype and genre exemplar of ecocriticism.[17] Other cabin-narrative classics are, Henry Beston's *Outermost House*, Leopold's *A Sand County Almanac*, Edward Abbey's *Desert Solitaire*, Edward Lueders' *Clam Lake Papers*, Annie Dillard's *Pilgrim at Tinker Creek*, and Rick Bass's *Winter: Notes from Montana*.[18]

Environmental history and environmental philosophy have been around long enough to greatly diversify; the latter into a number of antagonistic camps: anthropocentrists (strong and weak), biocentrists, and ecocentrists; deep ecologists; ecophenomenologists; environmental pragmatists. More deeply and more significantly, it also diversified by including the voices of those historically marginalized. Ecofeminism, as the name suggests, is a species of environmental philosophy representing a female point of view; and analyses of race and class are central to environmental justice. Ecofeminism, environmental justice, more recently environmental queer theory provide unique epistemological points of view, in addition to wider demographic representation. There are stirrings of such diversification now detectable in ecocriticism as the nature of nature writing is being contested. And just as in environmental philosophy, so in ecocriticism, we find that epistemic diversity accompanies representative diversity. For example, Priscilla Solis Ybarra, a young ecocritic, contends that the works of Chicana/o (Mexican American) writers—which often lament the dispossession of and longing for their ancestral homelands in what is now the American Southwest—should be counted as nature writing equally with the cabin-narrative canon.[19] The cabin narrator, from a liminal epistemological point of view, is a man, or less commonly a woman, who is repairing to Nature from a position of social privilege. Thus, Ybarra argues, we can begin to see social privilege, through the lens of ecocriticism, as insulation from Nature by strata of mediators—the people whom the cabin narrator conveniently erases who work the fields and forests, producing the staple foodstuffs, nature-writing paper, and cabin-building materials for the cabin narrator who is connecting with Nature, from which he or she was alienated precisely by his or her privileged social station. Thus nature writing is also expanded to include the cultural productions of those whose social and economic status puts them in daily, unmediated, often uncomfortable, and certainly unromantic contact with Nature.

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[16] Aldo Leopold, *A Sand County Almanac*.

[17] Lawrence Buell, *The Environmental Imagination: Thoreau, Nature Writing, and the Formation of American Culture* (Cambridge, Mass.: The Belknap Press of Harvard University, 1995).

[18] Henry Beston, *Outermost House* (New York: Henry Holt & CO., 1928); Leopold, *A Sand County Almanac*, Edward Abbey, *Desert Solitaire* (New York: McGraw-Hill, 1968); Edward Lueders, *Clam Lake Papers* (New York: Harper and Row, 1977); Annie Dillard, *Pilgrim at Tinker Creek* (New York: HarperCollins, 1999[1974]) and Rick Bass, *Winter: Notes from Montana* (New York: Houghton Mifflin Company, 1991).

[19] Ybarra, Priscilla Solis. "'Lo que quiero es tierra': Longing and Belonging in Cherríe Moraga's Ecological Vision," in *New Perspectives on Environmental Justice: Gender, Sexuality, and Activism*, ed. Rachel Stein (New Brunswick, NJ: Rutgers University Press, 2004), 240-248.

Let me now bring this essay full circle and return it to the point at which it begins. According to Aristotle, as noted, metaphysics is first philosophy, but by that he meant it was first in the hierarchical order of knowledge, not the first to be pursued. Aristotle himself is the first systematic historian of philosophy and informs us that the first philosophy, in order of occurrence, is physics, in the Greek sense of the word, περι φυσις, concerning Nature—that is, natural philosophy. After ancient Greek natural philosophy was recovered during the Late Middle Ages and Renaissance it evolved thereafter into science proper. Natural philosophy got underway in the sixth century BCE and culminated with atomism in the mid-fifth century. While many of the natural philosophers had something to say about ethics and politics—some more than others—moral philosophy did not become a central preoccupation of philosophers until the time of Socrates and his contemporaries (the much maligned "sophists") in the second half of the fifth century. Plato and Aristotle systematically integrated natural and moral philosophy, each in his own way, during the fourth century. Both were, however, adamantly opposed to ateleological atomic materialism (physical and social) and countered it with their own teleological natural and moral philosophies. This pattern of development—a change in natural philosophy followed by a change in moral philosophy—is repeated after the Renaissance. First comes a revolution in natural philosophy, which was started by Copernicus in the 16th century and completed by Newton in the 17th, followed by a revolution in moral philosophy, which was started by Descartes and Hobbes in the 17th century and completed by Kant and Bentham in the 18th. In both instances we find some overlap, but also a lag-time of about a century between the thoroughgoing changes in natural philosophy and those in moral philosophy.

Why this sequence? In the first instance, the Greek gods were closely associated with the forms and forces of Nature. Zeus, for example, is a weather god. Alternative, naturalistic explanations of weather and other natural phenomena led to skepticism among sophisticated (pun intended) Greeks about the existence of the gods. But Zeus was also the institutor and enforcer of justice. So if there is no Zeus, why should we be just?—the overarching question of Plato's *Republic*. The first philosophical explanation of the origin and nature of justice (and ethics more generally) was, as already noted, the social contract theory, a variation on which theme was played by practically all the so-called sophists—including Thrasymachus in the first book of the *Republic*. And as I have also here repeatedly noted, the moral ontology of the social contract theory—egoistic, externally related individuals colliding in a perpetual state of war, each with all, in a social vacuum—mirrors the physical ontology of the atomists: externally related bits of indivisible matter violently colliding in a physical vacuum.

The sequence is only slightly more complicated in the second instance. The Christian worldview had become entangled with Aristotelian geocentric cosmology and dynamics, due in large part to the efforts of Thomas Aquinas in the 13th century. When the Earth was displaced from the center of the universe by Copernicus; and then, as the sun became a star and the putatively infinite universe lost its center altogether, not only had Aristotelian dynamics lost its reference point—a center toward which earth moves and away from which fire moves and around which the ethereal heavenly bodies move—Christianity also lost its locations for heaven and hell. So again, religious skepticism ensued, which in turn led to moral skepticism—because God is the author and enforcer of the Ten Commandments and the lesser

moral rules—and the need for a naturalistic theory of the origin and nature of ethics was again felt. And once more the same social contract theory, only slightly modified by Hobbes, filled the void, as it were. (Greek social contract theorists —such as Thrasymachus, if we are to believe Plato—thought that some were naturally stronger than others. And thus the strong, Plato notes with alarm, would be reluctant signatories of the social contract, because it would deprive them of their natural prey. Therefore, Hobbes insisted that—despite clear differences in strength, intelligence, and other natural endowments—all human social atoms were sufficiently equal that no one could win the war of each against all; and therefore all should be willing signatories of the social contract.)

Given this clear historical pattern, the scientific revolution of the 20th century should be followed with some overlap, but also after a lag time of about a century, by a revolution in moral philosophy. Evidence that this is occurring has been detectable for somewhere between a quarter and a half century in the environmental turn in various disciplines of the humanities reviewed here—environmental history, environmental philosophy, religion and ecology, ecotheology, ecocriticism, ecological economics. Further, in the two historical precedents, moral ontology mirrors natural ontology. And the ontology of the contemporary sciences appears to me to be more systemic, holistic, and internally related than that in the Newtonian sciences. This of course is highly debatable. While, for example, ecology in biology is all these things, molecular biology appears to be more and more reductive and materialistic. However, with the advent of a second moment of environmental-crisis awareness—increasing awareness of the crisis of global climate change—the science thrust to the forefront of attention is biogeochemistry, which reveals a Gaian Earth that is certainly systemic, holistic, internally related, and indeed self-organizing and self-regulating.

Finally, there is an even larger, more profound revolution afoot, the likes of which has occurred only once before in history, so we have a less reliable basis of anticipating its philosophical ramifications. This is a revolution in communications and information technology. The first such revolution was the shift from orality to literacy. A few humanists—Walter Ong, Eric Havelock, Marshall McLuhan, David Abram—have given it serious study.[20] They generally conclude that the invention of letters was accompanied by a profound shift in human consciousness—from a sense of community identity to personal identity and from mythic thought to abstract philosophical and scientific thought being the most salient. Why after all, did a Thales emerge in Greece, just when he did—neither earlier nor later—to be followed by a steady stream of natural philosophers and then moral philosophers? Because, answers Havelock, the Greeks became literate; and, adds Abram, the Greeks were the first to have a fully phonetic alphabet, enabling them perfectly and completely to supplant the oral word with the written word, in contrast to other emerging alphabetical writing techniques. We are presently in the midst of another revolution in communications and information technology, from literacy to Googality—I'm sorry, but I cannot think of a better name. If these scholars are right about the transformation of human consciousness effected by the transition from orality to

[20] Walter Ong, *Literacy and Orality: The Technologizing of the Word*, 2nd ed. (New York, Routledge, 2002); Eric Havelock, *The Muse Learns to Write: Reflections on Orality and Literacy from Antiquity to the Present* (New Haven, Conn.: Yale University Press, 1986); Marshall McLuhan, *The Gutenberg Galaxy: The Making of Typographical Man* (Toronto: University of Toronto Press, 1962); David Abram, *The Spell of the Sensuous: Perception and Language in a More than Human World* (New York: Pantheon Books, 1996).

literacy, then another transformation of human consciousness may be forthcoming as we leave the linear world of letters and the privacy and intimacy of the one-way conversations we have with books, for the simultaneity, interconnectedness, and interactivity of protean social media—Facebook, texting (and sexting), twitter—and the cyber "cloud."

Comprehending, understanding, and making sense of all these things is what 21st-century philosophy should be all about—as I see it, as a philosopher; and indeed as I have been doing it, as a philosopher. But not only should philosophers and other humanists witness and testify to these changes, driven by science and communications and information technology, I believe that philosophers and humanists more generally are one of the main channels through which a new worldview and perhaps even a new modality of human consciousness might flow. Not only can we articulate and interpret the wonderful new natural world that the sciences are revealing, we can even steer consciousness change in positive and hopeful ways. In our collective cultural life, as in our individual personal lives, I believe in the power of optimism. A new collective worldview and perhaps even a new modality of human consciousness will come about—if it does come about—partly through an inexorable historical dialectic, which has a life of its own, and partly because we humanists have tried with our historiographies, philosophies, theologies, and other scholarly endeavors to put sails and rudders on the boats riding the prevailing winds and currents of thought and steer them in the best directions that we can make out for them to go. And, as I am sure you can now tell, this essay is also an exercise in such humanistic optimism.

Following reflections on "first philosophy," in beginning this essay I suggest that the humanities forge a partnership with the sciences to create a new worldview. From all I have written here, one might suppose that the sciences need only go on, pretty much as they have, ignoring the humanities, and that the humanities should take the initiative to open themselves up to the wonders of the sciences. I seem to be suggesting that the humanities are a χωρα, receiving the ειδη of the sciences. But it's not much of a contemporary marriage if the memetic flow is all in one direction. Here I am primarily addressing my fellow humanists. Were I addressing scientists I would remind them of the origins of science in natural philosophy and that the high-end scientists—"the noble monarchs of the academy forest," in Gary Snyder's idyll, "who come out with some unified theory or perhaps a new paradigm"[21]—are still essentially natural philosophers, (as the architects of the second scientific revolution were keenly aware), only now they wear lab coats and comfortably inhabit cloistered institutes of advanced study. I would point out the dynamic nature of science, rendering current "truths" at best provisional. I would argue that facts are theory-laden and theories are value-laden. I would note the insidious ways in which science is embedded in society and not immune from influence by social biases, politics, economics, and funding sources.[22] Above all I would insist that claims to objectivity and value-free discourse are a pernicious and dangerous pretense. And finally, I would conclude that—for all these reasons and more—the sciences need to open themselves to the wonders of the humanities. But that is a topic for a whole 'nother essay.

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[21] Gary Snyder, "The Forest in the Library."

[22] Bruno Latour, *Laboratory Life: The Social Construction of Scientific Facts* (Los Angeles: Sage Publications, 1979); *How to Follow Scientists and Engineers through Society* (Cambridge, Mass.: Harvard University Press, 1987).

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