Articles

WHAT POETRY BRINGS TO THE TABLE OF SCIENCE AND RELIGION

by Robert M. Schaible

Abstract. Ever since Plato's famous attack on artists and poets in Book 10 of *The Republic*, lovers of literature have felt pressed to defend poetry, and indeed from ancient times down to the present, literature and art have had to fight various battles against philosophy, religion, and science. After providing a brief overview of this conflict and then arguing that between poetry and science there are some noteworthy similarities–that is, that some of the basic mental structures with which the scientist studies the "text" of nature (facts, laws, theories) find their counterparts in ways an informed reader studies the poetic text, I develop what I see as the most important differences between poetry, on the one hand, and science, philosophy, and theology, on the other. These differences lie chiefly in two areas: (1) in the stance that each takes toward language itself and (2) in the stance each takes toward that ancient polarity between the one and the many. The aim of my argument is neither to privilege poetry over the other modes of knowing the world nor to grant, particularly to science in its reductive "objectivity," a higher epistemological status than that accorded to poetry and the arts. Instead, I wish to argue that science, by pushing the boundaries of knowledge about the material world, shows the poet, as well as the theologian, some of the more important work to be done and that poetry, with its emphasis on the particular over the abstract and on the ambiguities and paradoxes of language as inherently metaphorical, serves science and religion by providing a caution against the naive acceptance of language as literal and the consequent enthrallment to the power of absolutes and totalizing abstractions.

Robert Schaible is Professor of Arts and Humanities at Lewiston-Auburn College of the University of Southern Maine and the current occupant of the Walter E. Russell Chair in Philosophy and Education. His mailing address is 51-55 Westminster St., Lewiston, ME 04240; e-mail schaible@usm.maine.edu.

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The relationships between and among art, science, and religion/philosophy are part of a flow of history that reaches back almost 2,500 years, during which time there has always been a tendency toward conflict between poetry and the arts, on the one hand, and philosophy and natural philosophy (as science was called in its earlier days), on the other. And although art and poetry have served religion, producing magnificent traditions of religious art and religious poetry, even here there have been at particular times, and continue to be today, hostilities and suspicions between these two quite different ways of approaching and making sense of the world. From Plato's decision to banish poetry from his utopia, found in Book 10 of *The Republic* (1945) to recent attacks by the religious right on the National Endowment for the Arts, the arts have felt a need to defend and justify their existence. And, of course, the huge funding disparity between the National Science Foundation and the National Endowments for the Arts and for the Humanities combined reflects a profound gap between the importance attached to the kinds of knowledge and utility provided by these different ways of knowing.

This essay focuses on poetry, but most of it applies, with appropriate adjustments, to other art forms as well. I offer a brief historical overview of the conflict that pitted poetry against philosophy and then science before arguing against the grain to reveal some basic commonalities between poetry and science. I dispute the conventional wisdom that science and literature are so very different in that science is all about empiricism and rationality while art is only subjective and emotional. Then, drawing chiefly upon A. R. Ammons, along with several other poets, I look at how art is indeed different from other ways of knowing and at how this difference informs what art brings to the table of knowledge set by both science and philosophy/theology.

Long before science and literature began their quarrel, philosophy seemed intent on belittling poetry. Indeed, right in the cradle of Western civilization, that most famous of philosophers, Plato, declared that poets should be banished from his proposed well-ordered commonwealth. Why? Because philosophy then, like science later, did not see poetry and art as serious contributors to the search for truth. For Plato the "Really Real" was a permanent, metaphysical, Ideal Form, an abstract essence that somehow informed and gave a secondary, merely transient type of reality to all ordinary objects and values; and because the painter and the poet give us representations of these merely secondary realities, the poet "and all other artists are, as it were, third in succession from the throne of truth" (1945, Bk. 10, 595A–602B).[1]

This thinking is unfortunately reflected in attitudes still with us. I've heard many intelligent persons say that they don't read novels because if they are going to spend their time reading a book they at least want to be reading about something "real," something that "really happened," so they read biography or history. The reading of poetry, of course, is not even in the ball park of discussable possibilities.

There were other reasons Plato wished to banish poetry. According to Socrates, poetry (and here he meant dramatic poetry) either gives rise to tragic passions, which eclipse our reason, or makes us laugh at buffoonery. He reasoned that if we regularly sympathize with tragic figures in the theater, over time we may, with our own personal sorrow, give in to our emotions and become "womanish" instead of "being able to bear it quietly like a man." Or, on the other hand, by watching too much theatrical comedy, "you may be unconsciously carried away into playing the comedian in your private life" (1945, Bk. 10, 605C–608B). If we are tempted to dismiss all this as a mere extremity from ancient times, we might recall the Puritans of Elizabethan and Jacobean London some 2,000 years later who wished to shut down all theaters due to their supposed deleterious effects on citizens' morality, and then there were those thinkers in the eighteenth and nineteenth centuries who disparaged novel reading as a practice bad for the moral development of young girls and women of all ages.

The quarrel between Western science and literature came to the fore after the great successes of Newtonian science during the Enlightenment. Reacting against the obsession with order and reason that characterized English literature in the eighteenth century, the Romantic poets argued for imagination and intuition as better guides to truth than reason and cold empirical facts. In his poem "A Poet's Epitaph," William Wordsworth slanders the man of medical science as "a fingering slave,/One that would peep and botanize/Upon his mother's grave" (1911a, 173). In his 1802 Preface to *Lyrical Ballads*, Wordsworth is much less hostile to science, yet even here he says its knowledge is "slow coming to us, and by no habitual and direct sympathy connecting us with our fellow beings" (1911b, 23).

Later in the century, Thomas Henry Huxley and Matthew Arnold crossed their rhetorical swords over the relative value of science and literature in a well-rounded education. Addressing the South London Working Men's College in 1868, Huxley argued for the worth of a scientific education, describing its recipient as one "whose intellect is a clear, cold, logic engine . . . ready, like a steam engine, to be turned to any kind of work, and spin the gossamers as well as forge the anchors of the mind . . . one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will" (1970a, 86). A dozen years later, Huxley found himself speaking at the recently formed Scientific College at Birmingham, where the study of politics and of theology were forbidden, and students could not major in what the businessman founder of the college

(Sir Josiah Mason) called "'mere literary instruction and education'" (1970b, 141). Heartily approving of these policies, Huxley declared, "for the purpose of attaining real culture, an exclusively scientific education is at least as effectual as an exclusively literary education" (p. 141).

Arnold's response to Huxley, in his essay "Literature and Science," delivered on his 1883 American tour, boils down to his belief that while science gives us much interesting knowledge, that knowledge stays in the realm of intellect and fact, and we want to know how to relate science "to the sense in us for conduct and to the sense in us for beauty. But this," he adds, "the men of science will not do for us, and will hardly even profess to do" (Arnold 1947, 64–65).

The divisions between science and literature hardened by the middle of the twentieth century into what C. P. Snow (1959) called "the two cultures." Yet it seems reasonable to assert that we are poised today to bridge this gulf. We know that science is not nearly as remote as Wordsworth thought, that the biological sciences have provided a stronger base than we ever had before for "connecting us with our fellow beings"; indeed, these sciences have expanded our understanding of the phrase "fellow beings" such that we now see more accurately our place as an integral fellow traveler within nature rather than a superior over it. And many twentieth-century poets have done what Aldous Huxley challenged them to do in his *Literature and Science* (1963); that is, they have used science as a source of raw materials for their poetic imaginations.[2]

But my quick overview of the conflicts may have given a wrong impression. As early as Aristotle, some philosophers were able to see dramatic poetry as a good, providing as it does a catharsis for the passions and thereby contributing to the viewer's emotional balance. And while Wordsworth was suspicious of the unfeeling botanist, he nonetheless saw the possibility of a positive relationship between science and literature. After a bit of poetic arrogance—"Poetry is the first and last of all knowledge"—Wordsworth waxed oracular, imagining a future of collaboration that, I think, describes precisely where we are today,[3] a point we have been traveling toward ever since Charles Darwin published his *Origin of Species* in 1859:

> If the labors of Men of science should ever create any material revolution, direct or indirect, in our condition, and in the impressions which we habitually receive, the poet . . . will be ready to follow the steps of the Man of science . . . he will be at his side, carrying sensation into the midst of the objects of the science itself. The remotest discoveries of the Chemist, the Botanist, or Mineralogist will be as proper objects of the Poet's art as any upon which it can be employed, *if the time should ever come when these things shall be familiar to us . . . and palpably material to us as enjoying and suffering beings. If the time should ever come when what is now called science, thus familiarized to men, shall be ready to put on, as it were, a form of flesh and blood*, the Poet will lend his divine spirit to aid the transfiguration, and will welcome the Being thus produced, as a dear and genuine inmate of the household of man. (Wordsworth 1911b, 24; emphasis added).

That time has come. Science—with its great story of cosmogenesis, evolution, and ecology, with its genetics and cloning, its heart transplants and its pharmacological and technological offspring, including, of course, the omnipresent computer—this science, I think it is fair to say, *is* manifestly and "palpably material to us as enjoying and suffering beings." Science has indeed "put on . . . a form of flesh and blood," and we need our artists and poets as much as we need our philosophers and theologians *and* our scientists to tell us where we are going and what we are becoming.[4]

True to Wordsworth's vision, as we think about the poet working at the side of the scientist, it might be good to note quickly a few similarities between the two in terms of the mental and emotional structures they entail and evoke. First, when a poet begins to write, he or she can be thought of as conducting an experiment, as observing and selecting data in order to find something of value. As Ammons once put it, "The work of art is undertaken by the practitioner as a means of finding out and defining (if just tonally) something he doesn't already know" (1996c, 28). Both poet and scientist often bring great passion to the task at hand and shiver with excitement when a consilience, a "jumping together," occurs among their various observations. And, of course, as Jacob Bronowski (1971) and others have noted, similar uses of the creative imagination are practiced by both poet and scientist as each attempts to select and create from an abundance of chaotic data new patterns, new understandings.

A more systematic comparison can be made by looking at three concepts fundamental to science: fact, law, and theory. A biochemist colleague and I proposed in a paper several years ago that these terms can be usefully defined for the scientist in ways that illuminate comparable realities in the reading, interpretation, and evaluation of literature (Rhodes and Schaible 1989). Let me briefly summarize our ideas. We can think of a fact as the result of a measurement or observation, a law as the description (often, but not always, expressed as an equation) of a pattern or trend discovered in a collection of facts, and a theory as an explanation of why the laws hold; the theory, that is, attempts to explain the nature of the fundamental reality under investigation such that it causes the facts to fall out as they do.[5]

The process that the scientist goes through in making discoveries in the "text" of nature, we proposed, is roughly parallel to the process used by a reader seeking to understand a literary text. In a poem, for example, the individual words, phrases, images, figures of speech, grammatical elements, sounds, and rhythms can all be regarded as facts, or data. And like any working scientist, the poet, as well as the astute reader of poetry, must begin as an empiricist—must be, that is, a close observer of the data, of the details, the facts of whatever text is being investigated. It is also important to note that a fact in science, as well as the literary fact, carries with it what we call a "halo of uncertainty" (Rhodes and Schaible 1989, 229) determined by the conditions under which the fact is observed and the precision or

accuracy with which one's "instruments" allow a recording. Whenever the investigator is a sloppy empiricist, be she a student of stars, scallops, or sonnets, this halo of uncertainty can expand greatly, and the knowledge gained will be commensurately compromised.

Since the reader of a poem is generally no happier with a proliferation of facts than is the scientist, he or she tries to make sense of the many verbal, conceptual, and sensory facts of the poem, looking for a pattern or trend, which we commonly call an interpretation of the poem. And once an interpretation begins to form, it offers, as does the law in science, predictive power. That is, the reader tries to make sense of new facts encountered within the poem or in a different poem by the same poet and reads with some confidence that the new facts will conform with the emerging or already established interpretation. Just as the scientist moves back and forth between a law and a collection of new facts to find meaning in the facts and to test the law for coherence, comprehensiveness, and range, and in the process perhaps creates a more inclusive pattern/law, the reader of a poem moves back and forth between the innumerable facets of a poem and its emerging or established interpretation. In both cases, the investigator must be a hyperempiricist and must do a great deal of comparing and judging via the application of logic and reason.

Earlier I referred to the halo of uncertainty influenced by context and instruments used. For the reader of a poem as well as the reader of nature, the "instruments" include the mind, with its competencies, memories, knowledges, and biases. One might think that subjectivity and bias, while posing a considerable risk in the reading of poetry, offers few problems in the sphere of objective science. The history of science, however, is replete with evidence to the contrary. As David Wilson observes, "Bias can influence experimental design, data collection, analysis, and interpretation in ways that are sometimes subtle—and sometimes not so subtle" (Wilson and Bowen 2001, 90). In both spheres, then, the more informed and competent the mind of the investigator, and the more aware she is of her own biases, the greater her chances of producing a sound and plausible interpretation of the data at hand.

We can also equate something in the study of literature with what we call theory in natural science. Like the scientist, the reader of literature is interested in theory that provides context for patterns; but, reflecting literature's different aim, the question in this case must be framed differently. Instead of asking, What is reality such that natural laws unfold as they do? we ask, What is the nature of *human* reality, as I know it, that this poem, with the pattern or theme I have found in it, illuminates that reality and moves me, is meaningful to me? or, What is the nature of human reality that the poem is *not* illuminating and moving and thus is not meaningful to me?

Let me offer a quick example from poetry. If you have a largely pessimistic view of things, or if you are a philosophical materialist with little

patience for talk of metaphysics, divinity, or transcendence, you are very likely, at the level I call theory, to turn thumbs down to Walt Whitman's poem "Song of Myself" (1959). You may greatly admire the poem at the level of its data (its images, metaphors, startlingly fresh diction, and the bold sweep of its lines); you may, like others, find that the data fall into patterns suggesting that the individual self is part of some larger, transcendent Self, which is one with the entire universe. And yet, these facts and laws are unsatisfying to you because they do not conform to the larger reality of human experience as you know it. Or, at the level of interpretation (which is lawlike), you may disagree with the standard reading; you may argue that certain facts or ways of viewing the facts are being overlooked, that a hidden variable, as it were, is present, which, when taken into account, leads to a different interpretation, one that you do indeed find meaningful. For example, it is possible to read Whitman's poem in a nontheistic, naturalistic way. It takes some tweaking of the data, perhaps, but it can be done. In this case, the reader hypothesized here could more readily appreciate the poem.

Theory, as I have described it here, often functions similarly in science. Almost a decade after the standard interpretation of quantum physics, known as the Copenhagen Interpretation, had been established to the satisfaction of most physicists, Einstein still resisted it because it embraced the principle of randomness, of indeterminism. In 1936 he declared it "an incomplete representation of real things" (quoted in McAllister 1996, 199). This conclusion was not based on science. "It was," according to two of his biographers, "a matter of faith and feeling and intuition" (Hoffmann and Dukas 1972, 193). Explaining his position metaphorically, he declared, "God doesn't play dice" with the universe (p. 193). In other words, Einstein came to quantum physics with his own intuitive theory of what fundamental material reality is like, and when the facts and laws of quantum mechanics did not conform to his theory, he denied their status as satisfactory indicators of what reality is like.

Werner Heisenberg offered an even more colorful instance of the role played by theory as we have defined it. When Erwin Schrödinger, in 1926, presented his soon-to-be famous equation designed to account for virtually all aspects of the patterns observed in the laboratory facts of subatomic behavior, this lawlike equation was undergird by his assumption (theory) that fundamental reality was visualizable and could be visualized as waves. It was an assumption very pleasing to many physicists but not to Heisenberg, who assumed that reality at the quantum level was purely abstract and whose rival mathematical formulation, known as matrix mechanics, was based on that assumption. Manifesting the more human, emotive side of the scientist at work, Heisenberg wrote to Wolfgang Pauli, "The more I think about the physical side of Schrödinger's theory, the more loathsome I find it. . . . When Schrödinger writes about the visualizability of his theory, I find it crap" (Crease and Mann 1986, 427 n. 17).

In both science and poetry, then, we observe the data, discern and account for patterns in the data, and accept or reject the patterns on the basis of our fundamental assumptions about reality. Having established that there are more fundamental affinities between science and poetry than is ordinarily thought to be the case, I want now to look at the more important differences, differences to be found on the level at which each activity is normally practiced and regarded, differences that bring into focus what poetry has to offer not only to science but to religion and philosophy as well.

These differences lie chiefly in two areas: (1) in the stance that each takes toward language itself and (2) in the stance each takes toward that ancient polarity between the one and the many. These two stances, as we shall see, are closely interrelated.

In science, knowledge is primary; language is secondary. In other words, language is viewed primarily as a tool, a vehicle for conveying and applying whatever knowledge is discovered. But in poetry, the language is primary; it is the main show. Some sixty years ago Wallace Stevens maintained that "above everything else, poetry is words, and . . . words, above everything else, are, in poetry, sounds." He then went on to speak of "listen[ing] to words . . . loving them and feeling them . . . search[ing] the sound of them, for a finality, a perfection, an unalterable vibration, which it is only within the power of the acutest poet to give them" (1965, 32). More recently, poet Kenneth Koch has observed that poetic language "can be defined first as a language in which the sound of the words is raised to an importance equal to that of their meaning, and also equal to the importance of grammar and syntax. . . . Poets think of how they want something to sound as much as they think of what they want to say" (1998, 44). The language that poets use, of course, is taken from ordinary language, and it is the skill with which poets select and manipulate that language that renders it poetic. "Each word," says Koch, " has a little music of its own, which poetry arranges so it can be heard." And then he offers this wonderful metaphor: "If you think of each word as a note, this ordinary language is like an enormous keyboard, and wherever it is, the poet has a medium, just as the painter has one wherever there are paints, the sculptor wherever there is wood or stone" (p. 45).

According to Ammons, when you begin to write, "you're attracted to an image or a phrase or a rhythm, and the poem starts to do its dance, picking up images and assertion and rhythms, as it goes" (1996d, 47). And again, "the purpose of a poem . . . is to go past telling, to be recognized by burning" (1968, 114). Here's Koch again with another delightful metaphor: "Language is like a car able to go 200 miles an hour but which is restricted by the traffic laws of prose to a reasonable speed. Poets are fond of accelerating" (1998, 45). All of this is indeed true of poets, but many fiction writers—such as James Joyce, F. Scott Fitzgerald, and William Faulkner—also care greatly for the magic inherent in words. Joseph Conrad perhaps

says it best in his preface to *The Nigger of the Narcissus*, where he writes of his "unremitting never-discouraged care for the shape and ring of sentences" so that "the light of magic suggestiveness may be brought to play . . . over the commonplace surface of words: of the old, old words, worn thin, defaced by ages of careless usage" (1914, 13–14).[6]

Thus we can say that, generally, the poet cares more for the powers and enticements of language itself than for the message that might come with the language. Perhaps, then, it will do no harm to imagine the poet as akin to the Creator found in many religious myths who might well have spoken into being all the wondrous particulars of the universe for the sheer delight of it all. I was drawn to this comparison by something the Trappist monk Thomas Merton wrote in *New Seeds of Contemplation*:

> What is serious to men is often very trivial in the sight of God. What in God might appear to us as "play" is perhaps what He Himself takes most seriously. At any rate the Lord plays and diverts Himself in the garden of His creation, and if we could let go of our own obsession with what we think is the meaning of it all, we might be able to hear his call and follow Him in His mysterious, cosmic dance. We do not have to go very far to catch echoes of that game, and of that dancing. When we are alone on a starlit night; when by chance we see the migrating birds in autumn descending on a grove of junipers . . . ; when we see children in a moment when they are really children; when we know love in our own hearts; or when, like the Japanese poet Basho we hear an old frog land in a quiet pond with a solitary splash—at such times the awakening, the turning inside out of all values, the "newness," the emptiness and the purity of vision that make themselves evident, provide a glimpse of the cosmic dance. (1961, 296–97)

So, if poetry is the creation of a playful god, metaphorically speaking, does that mean there is no useful knowledge in such art? Not at all; it means only that art can be said to exist *primarily* for the sheer pleasure of itself and that this pleasure is, in and of itself, preeminently worthy.[7] Poet Robert Pinsky has written about the "gift of pleasure" in poetry and argues that minus this pleasure, no matter how profound the message or sophisticated the technique in the poem, it elicits from us "mere piety, or mere astonishment" (1988, 31). So pleasure is supreme but not all alone in poetry. As Robert Frost once put it, a poem "begins in delight and ends in wisdom" (1995b, 777). And to draw from Koch once again, "Poetry lasts because it gives the ambiguous and ever-changing pleasure of being both a statement and a song" (1998, 44).

Okay, but what kind of statement? What kind of knowledge or wisdom? It would be easy enough to say that, whereas science gives us knowledge of the physical universe, poetry gives us knowledge of the *human* universe, of human relations and emotions; and of course, this is in part true. But then, so do evolutionary psychology and sociobiology and just plain old sociology and psychology. Frost, I propose, is closer to the mark when he suggests that the wisdom of poetry is often "a momentary stay against confusion," an ordering of data (images, ideas, feelings, rhythms,

sounds) drawn from what he terms "the vast chaos of all I have lived through" (1995b, 777, 778). What poetry offers is what I want to call an *ecology* of knowing: cognition, intuition, emotion, and experience.

Ammons has argued that "the critical function [i.e., reasoned analysis] . . . engages the intelligence primarily as a conceptual function, and I take that to be a very small part of a possible human response—that is, the physiological, the emotional, the visceral, whatever, so that I distrust the conceptual in that it separates out and over-emphasizes one particular function of the human organism" (1973, 48). He is not, however, antirational, for, he goes on to say, "the rational, critical mind is essential to making poems: it protects the real poem (which is nonrational) from blunders, misconceptions, incompetences; it weeds out the second rate" (1968, 116).[8] He is interested, as I read him, in a more ecological knowing and believes *that* is what poetry offers. He thinks of the poem as "a body in motion" (1973, 47) that reflects the always-in-motion reality of both human consciousness and the material world.

Ammons does not think there is "*a* truth somewhere and that poets are the only ones who have access to it" (1996, 50). Indeed, listen to these lines from his poem "Motion" (1972, 146–47):

> poems
> are fingers, methods,
> nets,
> not what is or
> was:
> but the music
> in poems
> is different,
> points to nothing,
> traps no
> realities, takes
> no game, but
> by the motion of
> its motions
> resembles
> what, moving, is—
> the wind
> underleaf white against
> the tree.

In its many motions, that is, the poem resembles what reality, which is always moving, truly is, a reality suggested in the poem's closing lines by the metaphoric image of the leaf moving in the wind.

In a later poem, "Saying Saying Away" (1996a, 53), he returns to the question of the kind of knowing the poem provides:

> The point of a poem is to become wordless, to find
> the rounding out that assimilates reductiveness and
> assertion to an unspeakable whole: . . .
> . . . . . .
>
> . . . the end of a poem is to lose itself
> in itself, to give over the partialities of rhythm,
> image, and sense to coherences words can give no access
>
> to and have no access to, a place where the distinction
> between meaning and being is erased into the meaning of
> being: what a poem says may be its least and most
> misleading ploy: how it holds its behavior opens the poem
> up to indefinableness and inexhaustibility.

He thinks of poems, then, in their complexities, ambiguities, paradoxes, richness, movement, intuitive suggestiveness, and openness as a credible, verbal "imitation of reality" (1996c, 50).[9]

This leads quite naturally into the second key difference between poetry and science, the stance each takes toward the one/many conundrum. Let me begin by returning to the ancient conflict between philosophy and poetry. In Mark Edmundson's book *Literature Against Philosophy* (1995), we are reminded that poetry dwells upon, exalts, the particular— the instance, the moment, the slice, the fragment—whereas philosophy *begins* with the phrase *per se*; we are doing philosophy, that is, when we raise the instance to the abstract. Recall that Plato was interested not in the particular bed but in *Bedness*, the Ideal Form of bed. And Georg Hegel's understanding of the flow of history is equally demeaning of art, as Edmundson's summation of Hegel's thought makes clear: "art is philosophy in embryonic form. . . . [Art] is one stage of the unfolding of spirit, and philosophy the next." Or, in another rendition of Hegel, Edmundson wittily quips: "Where artistic id was, there philosophical ego shall be" (1995, 8).

So, philosophically speaking, we are not so much interested in what particular act of justice is manifest in, say, *Antigone* or *King Lear*, but in what justice is per se. Thus, to become a philosopher, you must "become abstract, intellectual. You become a knower with an object of knowledge" (Edmundson 1995, 12). And this commitment to the abstract, to the per se, is, Edmundson observes, "at enmity with something that has been a part of literature since Homer, the urge to proliferate narrative, to spread before the reader a vast array of incidents that, while they may have much to teach, resist being housed under any given sign or system of signs" (pp. 13– 14). In the words of Henry Bech, Updike's harried writer in *Bech at Bay*, the artist is "determined not to generalize away the miracle, the quizzical quiddity, of the specific" (Updike 1998, 240).

As a segue into science, let me suggest that art works as art because statistical significance is irrelevant to what makes a work of art significant as art.[10] This is just another way of saying that an artwork is valued only insofar as it palpably captures the particular. Art cares for the particular the same way God, according to one of the Gospel writers, cares for the fallen sparrow or the numbered hairs upon your particular head (Matthew 10:30). That sparrow may be quantitatively insignificant, but God, like the artist, cares deeply about it.[11]

Science, too, of course, must pay attention to particulars; else it will be doing what it did prior to Francis Bacon, when deduction from general principles was seen as the way to knowledge. But science quite simply is not science without its laws and theories, and these, by their very nature, apply to a congregation of data with some sort of statistical significance. Science, in a sense, can be said to exist *beyond* the particulars once it has used them on its way to a generality. Bronowski makes the point metaphorically: "The Greeks peopled nature with a rowdy, happy-go-lucky train of gods and spirits. Science arrived like an Old Testament prophet, with a puritan and obsessed vision of single-minded coherence, to sweep that pagan plenty out of the window and put in its place the Jehovah who orders all things under laws" (1971, 52).

Science must, of course, periodically return to particulars to retest the laws and theories, but its goal is the law and the theory. For artist and poet, on the other hand, the goal is actually the particular, the fragment, the captured moment. "The task [of the artist]," says Joseph Conrad, "approached in tenderness and faith is to hold up unquestioningly . . . the rescued fragment. . . . It is to show its vibration, its color, its form; and through its movement, its form, and its color, reveal the substance of its truth . . . : the stress and passion within the core of each convincing moment" (1914, 14). Readers of poetry sometimes search for lawlike interpretations and in the process may well articulate, or reveal indirectly, their own guiding theories, yet they can also find the work of art meaningful *as* a work of art by immersing themselves in the "stress and passion" of the particulars alone.[12]

The poet, then, accepts the philosopher's point that poetry occupies itself primarily with the particular bed or sparrow or act of justice rather than with the abstract principle or form of each. But far from apologizing for this proclivity or accepting a lower epistemological status than that claimed by the philosopher and scientist, the poet celebrates her or his commitment to particulars, asserting the difference, the complexity, and the aesthetic, moral, and ultimately even the political value of the endeavor. The aim of art, Conrad argues, "is not in the clear logic of a triumphant conclusion; it is not in the unveiling of one of . . . the Laws of Nature. It is not less great, but only more difficult" (1914, 16).

Ammons has used the mythological figures of Proteus and Poseidon to convey what a poem is and is not. Proteus, he points out, was a god people

came to for clearly defined knowledge, for answers. Poseidon, on the other hand, was associated with a bewildering sea of fluctuating particulars, with, in Ammons's words, "every structure in the ocean as well as the unstructured ocean itself" (1968, 115). Proteus served as an attendant on Poseidon and was regarded as a minor god. Says Ammons, "Definite knowledge, knowledge specific and clear enough to be recognizable as knowledge, is . . . already limited into a minor view. [Kenneth] Burke . . . said that a clear idea is another name for a little idea" (pp. 115–16).

Now science, I am trying to say, can be viewed as an enterprise suggestive of Proteus, as are philosophy and theology. People come to all three seeking clear answers, unifying abstractions, resolution, or closure. Poetry and the other arts, however, are closer to Poseidon in their oceanic urge to proliferate images, stories, and incidents that cannot be readily grouped under a single sign. In his book-length poem *Sphere*, Ammons celebrates the myriad discrete manifestations of being and defiantly declares, "I do not smooth into groups." He rejects lakes and bays, preferring to sail in "open sea water" because he "prize[s] the/choppy, difficult, and swift" (1974, 16). The Poseidon of art, in other words, at its finest is the whole, or rather the innumerable, proliferating fragments of the whole not reduced or translated into abstraction, the whole in its terrible and grand multiplicity and palpability.

I do not mean, in making this comparison, to diminish science. Indeed, it is precisely the great success and blessing of science that it knows how, through useful reduction, to separate things out, to define, analyze, clarify, and apply.[13] Science's great genius is to provide us a map of the physical universe. Still, one should bear in mind what Burke said about maps: "A road map that helps us easily find our way from one side of the continent to the other owes its great utility to its exceptional existential poverty. It tells us absurdly little about the trip that is to be experienced in a welter of detail" (1966, 5). This is very similar to Bronowski's point that with science the aim "is to weed out the proliferation of new ideas. In science, the grand view is a miserly view, and a rich model of the universe is one . . . as poor as possible in hypotheses" (1971, 51).

Reductionism is central to science but is also, of course, necessary in philosophy and theology and even in art. Religious doctrines and icons and philosophic concepts and systems are all reductions of near-chaotic complexity that help us find order and meaning. And every work of art is the result of drastic culling and selection from among innumerable options.[14] Still, in putting the arts with Poseidon and placing science, philosophy, and theology with Proteus, I mean to suggest an important difference in the reductionism as it ordinarily exists in the two groupings. This difference is captured quite eloquently in a letter I and a coauthor received from Roald Hoffmann. Responding to our paper on fact, law, and theory, he concluded his letter with this observation:

A comment about your analogy between "facts" in literature and science. The "halo of uncertainty" [surrounding all facts] carries a rather different value in science and literature. We try to reduce it in science (though we never can). But don't you think that it is the halo that makes the poem work. Without the alternative meanings, [the] deep allusions, with all that stripped away, the word would have no power over our souls. (Hoffmann 1989)

It is here that the arts are perhaps most distinctive and here that they have something truly of value to bring to the table of knowledge. Art seeks to heighten ambiguity; it revels in ambiguity—finds its birth and its home there. What art offers in place of answers, doctrines, and abstractions of high unity is not knowledge so much as experience. Experience of what? Well, experience of all the messy particulars that resist being "smoothed into groups," that get left out of the maps; experience of the unavoidable uncertainties that arise from a willingness to live with language, accepting language as creatively opaque rather than transparently literal, which is to say, accepting that most likely we do not ever get an unmediated reality, a literal reality; accepting, as Hoffmann puts it in his poem "Real," that each time you grapple with the real "you come back/again, carrying sacks/of words (which is all you have)" (1990, 12).[15]

The desire for an unmediated reality is powerful and widespread. We find it across the spectrum, ranging from the fans of professional wrestling and televised evangelism to some philosophers, theologians, and practitioners of what we call "hard" science. I witnessed this desire for unmediated reality at a very sophisticated level several years ago at the annual conference of the Institute on Religion in an Age of Science on Star Island, when a physicist and a Hindu scholar vigorously debated the question of whether or not time had a beginning. Each argued, convinced and convincingly, from within his and her own set of established metaphors.

A poet would appreciate the metaphors on each side while recognizing that questions of this fundamental sort do not allow a complete or final answer. It is the recognition, to borrow again from Hoffmann's poem "Real" (1990, 13–14) that when we "strip the curtains" from our language-constructed knowledges, we find

> nothing there—the sea
> as it was
> as it will be—the sea
> and around you the words rise, only words,
> entwined, composing
> a trellis on an ark,
> gulls diving for jellyfish. (1990, 13–14).

Perhaps the primary reason poets have this level of comfort with uncertainty lies in their long and close association with metaphor.[16] According

to Robert Frost, "unless you are at home in the metaphor, unless you have had your proper poetical education in the metaphor, you are not safe anywhere. Because you are not at ease with figurative values: you don't know the metaphor in its strength and its weakness. You don't know how far you may expect to ride it and when it may break down with you" (1995a, 721–22).

Frost made these remarks to a group of Amherst alumni, and his tone is whimsical and playful; yet the notion of not having a proper poetical education and of seeking an unmediated reality is not, in my view, to be taken lightly, nor is it properly regarded as merely "academic." Terrible violence and suffering have occurred and daily do occur due to worshiped abstractions in the form of stiffened, dead metaphors. Abstractions taken as unfiltered reality easily shade over into euphemism and dogma, in the name of which much violence is committed. In the best book on Ammons I know of, *Imagining the Earth*, John Elder makes the point: "Clearcutting a forest and blanket-bombing a city are both the results of blinding abstraction: service to a 'reason' as dead to mercy as it is to the sensuous revelations of this earthly life" (1985, 193). In the Foreword to his first book of poems, *Ommateum*, Ammons states as one of his themes "the creation of false gods to serve real human needs" and a related "belief that forms of thought, like physical forms, are, in so far as they resist it, susceptible to change, increasingly costly and violent" (1996, 5). In the Middle East men and women, along with young boys and girls, are today twisted together in a tortuous dance of death, fueled at least in part, and perhaps at its very core, by religious dogmas and passions. People imprisoned in ancient forms of thought are willing to kill one another for false gods, which are what all gods become when their worshipers fail to understand the play of metaphor at the very core of their beliefs.

Christianity, of course, with its metaphor of God's eye on the fallen sparrow, should keep us attuned to the statistically insignificant suffering individual, and from time to time it does so. But historically it has failed more often than not, because, like other religions, it has also forgotten the metaphoricity of its truths, got caught up in its unifying abstractions, and, as Ammons reminds us, "delivered death to plenitudes/in scatterings, swingings, stakes/of grubbed up flesh (set afire),/limbs, heads cut off, etc." If "belief, at any cost,/serves life: let life do without" is Ammons's ironic and bitter conclusion (1996a, 26). Theologian John Cobb, concerned with Christianity's lack of openness to other traditions in this pluralistic age, argues that the church has preached "the absolutization of particulars" and thus has made the single figure and name of Christ repressive rather than liberating and "in opposition to our real need today" (1975, 19–21). False gods abound in this democracy of literalists, where the unholy marriage of Christianity and capitalism produces slogans like "Greed is good" (from the 1980s) and the consequent spate of accounting scandals in the early years of the new century.

Science, unfortunately, is not exempt from this propensity toward taking its language as literal and privileged. In my view, there is often more heat than light in the disputes over teaching evolution in the schools largely because of scientists who do not see the limitations of their own metaphors and speak *ex cathedra* as if they, and they alone, speak an unmediated truth. What we hear are fundamentalist preachers not only from religion but also from science. Richard Dawkins (1976), for example, perhaps overly fond of his seminal metaphor of the "selfish" gene, continues to attack religious belief with a simplicity and rigidity of thought unbecoming a good scientist.[17]

One way of talking about the "poetic mission," if it's not oxymoronic to speak in such a way, is to say that poetry's chief task is to keep metaphors alive—to keep, indeed, the pervasive metaphoricity of all language alive. I say so because, when our metaphors die, we get everything from dull loving to the Christian Coalition, the Likud party, the violent version of Islamic jihad, arrogant academics, and smugly confident scientists. I am strongly inclined to say it's less important that we find answers to our pressing questions than it is that we keep our metaphors alive. When our metaphors live, we live, too—and live somewhat uncertain, off balance, and inclined more to humility than dominance. Poems issuing from or received by minds always alert to the figurative essence of language promote, according to Ammons, "a many-sided view of reality; an adoption of tentative, provisional attitudes, replacing the partial, unified, prejudicial, and rigid" (1996b, 5). He further maintains that on a deeper level

> poetry leads us to the unstructured sources of our beings, to the unknown, and returns us to our rational, structured selves refreshed. Having once experienced the mystery, plenitude, contradiction, and composure of a work of art, we afterwards have a built-in resistance to the slogans and propaganda of over-simplification that have often contributed to the destruction of human life. (1968, 119)

Perhaps, then, it is reasonable to say that Frost was more profoundly right than he knew in observing that we are unsafe without a proper poetical education in the metaphor.

Working with the relevant data, ideas, and experiences of science, philosophy, religion, and politics, the practitioners of these fields are usually looking for the "truth" and all too often fail to realize the fragility of their conclusions. Author, photographer, and environmental activist Rebecca Solnit offers several striking metaphors about truth and about metaphor itself: "Truth is the vanishing point at which everything converges, and if there is one thing we can be confident about with vanishing points, it's that we never arrive at them, never vanish into that realm of rightness and silence" (1994). Because the word *metaphor* comes from the Greek and is, in fact, what Athenians call their public transit system, Solnit is drawn to the following interesting observations about this all-important figure of speech:

> Metaphor . . . is about keeping things moving, and about paradox, about pointing in two directions at once. . . . [Metaphors] connect one place to another, allow us to experience two places, but they are not that ultimate railroad of truth, they don't take us to the vanishing point.
>
> In fact, a metaphor is the opposite of truth in some ways. We think of a lie as the opposite of truth, but truth might be better pictured as a singularity, an absolutism, a being in only one place, and a metaphor acknowledges it is possible to be in two, that the world is going on at many levels and not pointing toward one place. (1994)

In his poem "Guide" (1972, 79) Ammons captures these same ideas with his own profoundly rich metaphor developed in the six brief lines of stanza 2:

> you cannot
> turn around in
> the Absolute: there are no entrances or exits
> no precipitations of forms
> to use like tongs against the formless:
> no freedom to choose.

Perhaps we should think of metaphors with their two poles (*this* in terms of *that*) as the tongs that allow us to get some sort of hold on the formless, some freedom to choose and create the world in which we live. When we are locked into literalist and absolutist modes of thought, new metaphors do not rain down upon us with all their fresh fertility, because there are no clouds of complexity and confusion out of which they can precipitate.

Thus it is that Ammons prefers "confusion to oversimplified clarity, meaninglessness to neat, precise meaning, uselessness to overdirected usefulness" (1968, 116). We need this kind of acceptance of epistemological imprecision, I would submit, because we are not in the Age of Aquarius but in the Age of Poseidon, an age of oceanic multiplicity and complexity, in which totalizing clarities all too often produce absolutisms that become the basis for exclusions, oppressions, and even violence.

We're in an oceanic age of dwindling continents and proliferating islands. The islands have been proliferating with increasing rapidity ever since Copernicus inconspicuously challenged the established truth about Earth's centrality in the cosmos. The entire continent of the stability of species and of the centrality of our own human species, so important to religious believers and thinkers of the nineteenth century, was exploded by Darwin; and in the twentieth century, the stability and solidity of the sign (of language itself) was severely shaken and fractured by Jacques Derrida and others who have sent up cultural grenades of a magnitude similar to those lofted by Darwin. Burke captured the essence of what this means more than three decades ago when he wrote: "To meditate on . . . [the instability of the sign, on the mediated nature of our known reality] until one sees its full implications is much like peering over the edge of things

into an ultimate abyss." Our discomfort leads us to cling, according to Burke, "to a kind of naive verbal realism" (1966, 5), a realism that has justified oppressions of all kinds: racial, religious, sexual, political, and intellectual. But instead of clinging to absolutes, we must learn to swim, to be able, like our best metaphors, to stay alive by connecting unlike realities, one connection perhaps at a time, until we have created for ourselves an island sufficiently large and lovely and lush to sustain us in relationships of love and justice and mutual respect.

It's not that we can live without any generalities or unities. Even poetry, after all, requires its abstractions and its unities of form. And Ammons feels the psychological tug, like the rest of us, toward unification. But he, and all good poets, would have us live in creative tension between the particular and unity, just as we must live between the two poles of a living metaphor if we would truly live rather than die among a host of cliches and lifeless yet competing absolutes.

So Ammons feels the tension between one and many, abstraction and particular, but ultimately he is drawn to the particular for some form of salvation: "wisdom, wisdom:" he writes near the end of "Guide," "a peach blossom blooms on a particular /tree on a particular day:/unity cannot do anything in particular:" (1972, 80). In one of his most anthologized poems, "Corson's Inlet," Ammons takes us on a walk among the dunes along an ocean shore, where he finds in the natural world a fitting metaphor for the liberating wisdom of shunning the sharp boundaries of absolutes:

> the walk liberating, I was released from forms,
> from the perpendiculars,
> straight lines, blocks, boxes, binds
> of thought
> into the hues, shadings; rises; flowing bends and blends
> of sight:
> I allow myself eddies of meaning:
> . . . . . .
> there are dunes of motion,
> organizations of grass, white sandy paths of remembrance
> in the overall wandering of mirroring mind:
> but Overall is beyond me: is the sum of these events
> I cannot draw, the ledger I cannot keep, the accounting
> beyond the account: (1972, 148).

Toward the close of the poem, the speaker sees order in nature and desires to create a wider scope of understanding for himself but remains provisional:

> I see narrow order, limited tightness, but will
> not run to that easy victory:
> still around the looser, wider forces work:

I will try
to fasten into order enlarging grasps of disorder, widening
scope, but enjoying the freedom that
Scope eludes my grasp, that there is no finality of vision,
that I have perceived nothing completely,
that tomorrow a new walk is a new walk. (1972, 151)

Let me sum up, then, the wisdom, as I see it, that poetry brings to the table: Slow down, it says. Back up. Look at all the particulars, smell the ambiguities, savor the language rolling on your tongue, remember the role your language is playing from the teeth to the tail-feathers of all described reality. Resist the rush to resolution, finality, judgment day; become a breathing metaphor by keeping the play of opposites in your mind; know that both *is* and *is not* can be true, that incomplete eyesight is not the same as poor eyesight. Don't be seduced by the comfort of easy abstractions, systems, categories. Don't believe the great lie of monotheism in any of its multiple guises (religious, scientific, aesthetic, political, cultural). Pay homage to many gods. Learn to recognize where your metaphors bump up against their limits and accept that eventually they always break down or die and call for resurrection, renewal, or replacement. Argue for the metaphors you believe in, but hold them inside a larger awareness that, ultimately, they must be held *provisionally*. Learn to live your life from time to time with the "tense and happy indecision" that Bronowski says we find in all great art (1971, 64).

My aim has been to pay great respect to both the sciences and their cousins, the arts and humanities, and to argue that they are all at their best when they respect what each brings to the table and when they understand that the feast overflows the table and is a moving feast, an unending feast, that will always lure us back for more.

Notes

1. The specific example Plato has Socrates use is that of a bed. The carpenter makes a bed, which is, of course, only a pale participant in the Ideal Form of Bed. And the painter then paints for us an imitation of that which is already an imitation. So the reality the painter, as well as the poet, presents is twice removed from the Truth or the Real.
2. For a recent compilation of such poets, see Brown 1998.
3. I am aware that my view of the close relationship between science and literature may seem quite odd to those familiar with the more commonly expressed postmodern critique of science offered by sociologists, feminists, and literary theorists. While I find much of value in that critique and applaud the many insights it offers, I do not share its more extreme formulations and do not believe it rules out the kind of relationship between the two fields of study I am trying to articulate here.
4. I include scientists in this grouping because in centuries past they were known as "natural philosophers" and because scientists of our era are increasingly becoming philosophers and even poets. I have in mind people like Stephen Gould, Ruth Hubbard, Richard Dawkins, E. O. Wilson, and noted medical researcher and biology observer Lewis Thomas, whose prose so often resonates with poetry. I think, too, of Roald Hoffmann, the Nobel laureate chemist at Cornell, who is also a fine poet. And, of course, there's Ursula Goodenough, a cell biologist at Washington

University, whose book *The Sacred Depths of Nature* (1998) contains, in addition to a lucid account of much science, its own measure of both philosophic reflection and poetry.

5. Our definition of *fact* sidesteps all the complications of facts as being historically and culturally contingent, influenced by prior-held theories, and so forth. We can sidestep such issues because this definition in and of itself does not privilege the fact with any sort of objective, impartial, higher truth. The definition does, of course, assume honesty and competence on behalf of the experimenter. (Otherwise, we're working with fraud or ignorance instead of fact.) So, a reading on a pressure gauge, a flash on a phosphor screen at which electrons are being shot, the chest beating of one male chimpanzee challenging another, the existence of a type of bacterium in mud extracted from the deepest part of the ocean floor—all of these qualify as data, or facts, the results of some observation or measurement. But scientists are never satisfied, of course, with just collecting facts. As philosopher Mary Midgley has noted, "Merely to pile up information indiscriminately is an idiot's task" (1985, 3), so scientists seek patterns or trends in the facts, such results being what we call laws.

6. At a reading I attended in the mid-1970s, given by poet Richard Wilbur, he explained before reading a particular poem that he had deliberately used the word *inventory* in the poem because he wanted to rescue it from its imprisonment in the language of business. I do not recall the poem he read, but a brief experiment will demonstrate the possibilities of which Conrad and Wilbur have spoken. If read aloud, the following words—*inventory*, *incantation*, *incantatory, inventory, incantatory*—make clear how placing a common word with another word, the right word, will begin to release that word's musical possibilities.

7. I have been told by some mathematicians that they feel the same way about "pure" mathematics and regard the application of this kind of math to the problems and discoveries of science as an unwelcome intrusion upon the beauty of their language for the sake of mere utility. Poet Rodney Jones captures the spirit of such a mathematician in his richly comic poem "Pure Mathematics" (1989).

8. The same is true for readers of poems. Although an entirely rational approach will never tap into the full delight of a good poem, the rational, critical mind is often necessary to steer the reader away from blunders of many sorts.

9. It is interesting here to note that Plato rejected poetry because it was an imitation, and Ammons is defending it on precisely those same grounds. But, of course, Plato lived in a more optimistic age with regard to belief in our ability to apprehend reality directly through reason.

10. It doesn't, in other words, rely on the numbers in a representative sampling and the empirical testing so critical to establishing statistical significance. The work of art is not required to make a general statement. The particular may often evoke some universal, but it is a universal evoked by the vivid particular, not arrived at by a statistical sampling.

11. We might recall, too, the parables of the lost sheep and the prodigal son, in which we learn that heaven rejoices more over finding one lost little lamb (a repentant sinner) than it does over a whole fold of safe/saved sheep (Luke 15:4–32).

12. The interpretation garnered from reading a poem or viewing a painting is not the essence of the art; it is instead an add-on, and a number of contradictory interpretations may coexist as valid responses to the same piece of art. In science, on the other hand, the interpretation of the data is what constitutes the science. Data without interpretation are just data—fascinating and intriguing, perhaps, but not science unless there is also interpretation.

13. Also, in this age of science, indeed of a consilient science that forms the foundation of E. O. Wilson's hope for a unity of all knowledge (1998), I am inclined to invert the classical relationship between the two gods and, in this particular instance, align art with religion and philosophy. I mean to assert that it is the Poseidon of art, along with theology and philosophy, that tends to the Proteus of science, a relationship intuited by Wordsworth in the early nineteenth century and explored by Philip Hefner in his article "How Science Is a Resource and a Challenge for Religion" (2002). Indeed, ever since Copernicus and Galileo, on down through Newton, Darwin, Einstein, Bohr, Watson and Crick, and Margullis, it has been largely science that pushes the boundaries of knowledge and opens up new ways of seeing the universe, thereby showing others some of the more important work to be done in what Hefner calls "worldview construction or worldbuilding" (2002, 56). Consider, for example, the demand science has placed upon the arts, philosophy, and religion to tend, in their different ways, to the grand epic of evolution, what Loyal Rue calls "Everybody's Story" in his book bearing that title (2000). The poet, philosopher, and theologian are being challenged to give this new narrative an aesthetic, an ethics, and a meaning that partakes, in some sense, of transcendence.

14. Even the seemingly unfiltered stream-of-consciousness technique found in the fiction of such writers as James Joyce, William Faulkner, and Virginia Woolf is an edited (i.e., reduced) version of reality. A totally nonreduced reality is an overwhelming reality that can be captured by neither science nor art.

15. An interesting paradox: even as science seeks its definite, literal answers, it produces or forces new metaphors upon us or makes old metaphors come alive—that is, reveals them *as* metaphors. I'm thinking of how relativity theory made us see the metaphoric nature of our earlier conception of gravity as a force, replacing that conception with one of gravity as curved space-time. And look at what the computer has done to our metaphors about the brain and the mind.

16. There are, to be sure, theologians who accept and work with the metaphoric nature of religious language and the ambiguities such language entails. Nonetheless, theologians working in this vein do not revel in metaphor, as the poet does, so much as they are forced into it by the problems that arise from a literal reading of scripture in this post-Enlightenment era. Important works include Mary Gerhart and Allen Russell's *Metaphoric Process: The Creation of Scientific and Religious Understanding* (1984), Earl MacCormac's *Metaphor and Myth in Science and Religion* (1976), and Janet Martin Soskice's *Metaphor and Religious Language* (1985). Of particular interest is Sallie McFague's *Metaphorical Theology: Models of God in Religious Language* (1982), in which we find this provocative passage: "the parables as metaphors and the life of Jesus as a metaphor of God provide characteristics for theology: a theology guided by them is open-ended, tentative, indirect, tensive, iconoclastic, transformative. . . . In such a theology no finite thought, product, or creature can be identified with God, and this includes Jesus of Nazareth, who as parable of God both 'is and is not' God" (p. 19).

17. See Midgley 1985, 122–31, for an analysis of Dawkins's metaphor that reveals where and how it breaks down.

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