AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
150 YEARS • 1848-1998

BEAUTY, CHARM, AND STRANGENESS: SCIENCE AS METAPHOR

ILLUSTRATION: ALLAN M. BURCH

JOHN BANVILLE *has worked in journalism since 1969, and served as literary editor of* The Irish Times *since 1988. His numerous literary works, touching on both artistic and scientific subjects, have won him many prizes internationally. His latest novel is* The Untouchable *(Knopf, 1997).*

I wish to advance a thesis which, were they to take note of it, the academies would decry as scandalous. My thesis is that modern science, particularly physics, is being forced, under pressure of its own advances, to acknowledge that the truths it offers are true not in an absolute but in a poetic sense, that its laws are contingent, that its facts are a kind of metaphor. Of course, art and science are fundamentally different in their methods, and in their ends. The doing of science involves a level of rigor unattainable to art. A scientific hypothesis can be proven—or, perhaps more importantly, *dis*proven—but a poem, a picture, or a piece of music, cannot. Yet in their *origins* art and science are remarkably similar. It was a scientist, Niels Bohr, who declared that a great truth is a statement whose opposite is also a great truth. Oscar Wilde would have agreed.

Since the Enlightenment, the chasm between art and science has yawned ever wider with each new stage in the campaign to subdue nature to man's will. The human race cannot abide nature's indifference, and uses the physical sciences to attempt to wring from it a word of acknowledgment. Yet what we today think of as science is for the most part not science at all, but *applied* science, that is, technology. The machinery of modern science is so elaborate, and the building of it requires so much ingenuity—requires, indeed, so much *science*—that we naturally confuse the thinking with the doing. The great particle accelerator at CERN, for example, is for us the very image of modern science: a vast and inconceivably expensive machine built to perform minute and unimaginably complex operations whose results can be interpreted only by a handful of physicists. But we are willing to pay the cost of building these machines, are willing to allow the physicists their arcane rules and specialized language, because we believe that they are getting their hands into the very bowels, or, rather, the very synapses, of nature. And at some point, we believe, they will bring forth news of another advance, another boiled-down version of the world's variousness, another $E = mc^2$, only bigger and better. Perhaps this time they may even discover the final equation, the Grand Theory of Everything. Then, as Stephen Hawking puts it, "we shall all, philosophers, scientists, and just ordinary people [I am struck by that distinction, by the way], be able to take part in the discussion of the question of why it is that we and the universe exist. If we find the answer to that, it would be the ultimate triumph of human reason—for then we would know the mind of God."

Such foolhardy talk, from such an eminent source, misleads us into the notion that the aim of science is to find the "meaning" of the world. That there must be a meaning seems certain, otherwise how is it that there is such a thing as progress? Science keeps uncovering more and more secrets, keeps getting closer and closer to...well, to *something*, in the same way that computations in the infinitesimal calculus keep approaching nearer and nearer to infinity without ever getting there. Progress must be progress *toward* something, surely, some final end to the quest for knowledge? But to my mind the world has no meaning. It simply *is*. Leibnitz's thrilling question, "Why is there something rather than nothing?" is significant not because an answer to it is possible, but because out of the blind, boiling chaos that is the world, a species should have emerged that is capable of posing such a question.

Science and art are different ways of looking at the same thing, namely, the world. Let us take the case of Goethe. In his role as amateur scientist, he was vehemently opposed to Newton's mechanistic model of reality. He was mistaken—that is to say, his science was bad science, although his scientific writings are not bad philosophy, and still less are they bad poetry. Goethe demanded that science should always hold to the human scale. He opposed the use of the microscope, since he believed that what cannot be seen with the naked eye should not be seen, and that what is hidden from us is hidden for a purpose. In this, Goethe was a scandal among scientists, whose first, firm, and necessary principle is that if something *can* be done, then it *should* be done. Yet his furious denial of Newton was more than merely the bloodshot jealousy of one great mind drawing a bead on another. Goethe's theory of light is wrong insofar as the

The author is at *The Irish Times*, Post Office Box 74, 10-16 D'Olier Street, Dublin 2, Ireland.

*Wallace Stevens, *Collected Poetry and Prose* (Library of America, 1997), p329.
†*Rilke Poems* (Knopf, 1996), p. 201 (stanza 2, lines 15 to 19).

science of optics is concerned, yet in the expression of his theory Goethe achieves a pitch of poetic intensity that is as persuasive, in its way, as anything Newton did. But persuasive at what level?

There is a world beyond politics, says the poet Wallace Stevens, and we might adapt that to say that there is a world beyond science, or, at least, there is a world beyond *the current state* of science. At the end of the 19th century professors of physics in the great European universities were steering students away from the discipline because they believed that there was very little of interest left to be discovered about the nature of physical reality. Then came Einstein. As we approach the end of the 20th century, we are still guilty of hubris, as evidenced by Stephen Hawking's statements quoted above. Probably a Unified Field Theory will be achieved, and will seem for a time, perhaps even as long as the period between Newton's *Principia* and Einstein's first paper on the theory of relativity, to explain everything; then a Heisenberg or a Gödel will come forward and point to a loose end which, when pulled, will unravel the entire structure.

This is a truth that both clearsighted artists and scientists—that is, those not blinded by hubris, or a cramped imagination, or both—have always acknowledged: There is no end to the venture. The difference between the two, however, is that while the artist acknowledges that in art there is nothing new to be said, only new ways of saying the old things, new combinations of old materials—a process, paradoxically, that *makes* a new thing, namely, the work of art—science seems always to be pressing on into hitherto uncharted territory. Yet the fact is, science is not *making* this new landscape, but *discovering* it. Einstein remarked more than once how strange it is that reality, as we know it, keeps proving itself amenable to the rules of man-made science. It certainly is strange; indeed, so strange, that perhaps it should make us a little suspicious. More than one philosopher has conjectured that our thought extends only as far as our capacity to express it. So too it is possible that what we consider reality is only that stratum of the world that we have the faculties to comprehend. For instance, I am convinced that quantum theory flouts commonsense logic only because commonsense logic has not yet been sufficiently expanded.

"AT THE LEVEL THAT CONCERNS US, THE LEVEL OF METAPHOR, ART AND SCIENCE ARE BLITHELY INUTILE—AT THIS LEVEL, FOR INSTANCE, THE THEORY OF RELATIVITY HAS NOTHING TO DO WITH THE ATOMIC BOMB."

I am not arguing that art is greater than science, more universal in its concerns, and wiser in its sad recognition of the limits of human knowledge. What I am proposing is that despite the profound differences between them, at an essential level art and science are so nearly alike as to be indistinguishable. The only meaningful distinction I can see between the two is that science has a practical extension into technology, and art does not. But this is a distinction only in terms of utility. At the level that concerns me, the level of *metaphor*, art and science are both blithely inutile—at this level, for instance, the theory of relativity has nothing to do with the atomic bomb.

The critic Frank Kermode has argued, persuasively, I believe, that one of art's greatest attractions is that it offers "the sense of an ending." The sense of completeness that is projected by the work of art is to be found nowhere else in our lives. We cannot remember our birth, and we shall not know our death; in between is the ramshackle circus of our days and doings. But in a poem, a picture, or a sonata, the curve is completed. This is the triumph of form. It is a deception, but one that we desire, and require.

The trick that art performs is to transform the ordinary into the extraordinary and back again in the twinkling of a metaphor. Here is Wallace Stevens again, in lines from his poem *Notes Toward a Supreme Fiction* (1942):

> You must become an ignorant man again
>
> And see the sun again with an ignorant eye
>
> And see it clearly in the idea of it.*

This is the project that all artists are embarked upon: to subject mundane reality to such intense, passionate, and unblinking scrutiny that it becomes transformed into something rich and strange while yet remaining solidly, stolidly, itself. Is the project of pure science any different? When Johannes Kepler recognized that the planets move in elliptical orbits and not in perfect circles, as received wisdom had for millennia held they must do, he added infinitely to the richness of man's life and thought. When Copernicus posited the horrifying notion that not the Earth but the sun is the center of our world, he literally put man in his place, and he did it for the sake of neither good nor ill, but for the sake of demonstrating *how things are*. When, probably early in the next millennium, quantum theory gives up its secrets, we shall see the world again with a new, ignorant eye—not as a blizzard of atoms, not as a speck whirling in an unimaginable immensity of darkness, not even as that blue-and-white marble photographed by the first moon travelers, the beauty of which took our breath away—as our ordinary and always known home, which is the world that art and science alike, even in their most seemingly transcendental modes, are concerned with. In the 1970s, when quantum theory began employing such terms as "beauty," "charm," and "strangeness" to signify the various properties of quarks, a friend turned to me and said: "You know, they're waiting for you to give them the words." I saw what he meant, but he was not quite right: Science does not need art to supply its metaphors. Art and science are alike in their quest to reveal the world. Rainer Maria Rilke spoke for both the artist and the scientist when he said:†

> Are we, perhaps, *here* just for saying: House, Bridge, Fountain, Gate, Jug, Fruit tree, Window,—possibly: Pillar, Tower?...but for *saying*, remember, oh, for such saying as never the things themselves hoped so intensely to be.

ILLUSTRATION: TERESE WINSLOW