"Marks the arrival of an important new thinker, who finds in the science and the arts wonder and beauty, and with equal confidence says wise and fresh things about both."

—Los Angeles Times Book Review
For Sarah and Ariella

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Coda

To say that we should drop the idea of truth as out there waiting to be discovered is not to say that we have discovered that, out there, there is no truth.

— Richard Rorty

In 1959, C. P. Snow famously declared that our two cultures — art and science — suffered from a "mutual incomprehension." As a result, Snow said, our knowledge had become a collection of lonely fiefdoms, each with its own habits and vocabularies. "Literary intellectuals" analyzed T. S. Eliot and Hamlet, while scientists studied the elementary particles of the universe. "Their attitudes are so different," wrote Snow, "that they can't find much common ground."

Snow's solution to this epistemic schism was the formation of a "third culture." He hoped that this new culture would close the "communications gap" between scientists and artists. Each side would benefit from an understanding of the other, as poets contemplated Einstein and physicists read Coleridge. Our fictions and our facts would feed off each other. Furthermore, this third culture would rein in the extravagances of both cultures at their extremes.

Snow turned out to be prophetic, at least in part. The third culture is now a genuine cultural movement. However, while this new third culture borrows Snow's phrase, it strays from his project. Instead of referring to a dialogue between artists and scientists — a
shared cultural space, so to speak — the third culture of today refers to scientists who communicate directly with the general public. They are translating their truths for the masses.

On the one hand, this is an important and necessary development. Many of the scientists that make up our current third culture have greatly increased the public's understanding of the scientific avant-garde. From Richard Dawkins to Brian Greene, from Steven Pinker to E. O. Wilson, these scientists do important scientific research and write in elegant prose. Because of their work, black holes, memes, and selfish genes are now part of our cultural lexicon.

Look deeper, however, and it becomes clear that this third culture has serious limitations. For one thing, it has failed to bridge the divide between our two existing cultures. There is still no dialogue of equals. Scientists and artists continue to describe the world in incommensurate languages.

Furthermore, the views promulgated by these scientific thinkers often take a one-dimensional view of the scientific enterprise and its relationship to the humanities. In E. O. Wilson's *Consilience* — a book that is often considered a manifesto for the third culture movement — Wilson argues that the humanities should be "rationalized," their "lack of empiricism" corrected by reductionist science. "The central idea of the consilience world view," Wilson writes, "is that all tangible phenomena, from the birth of stars to the workings of social institutions, are based on material processes that are ultimately reducible, however long and tortuous the sequences, to the laws of physics."

Wilson's ideology is technically true but, in the end, rather meaningless. No serious person denies the reality of gravity or the achievements of reductionism. What Wilson forgets, however, is that not every question is best answered in terms of quantum mechanics. When some things are broken apart, they are just broken. What the artists in this book reveal is that there are many different ways of describing reality, each of which is capable of generating truth. Physics is useful for describing quarks and galaxies, neuroscience is
useful for describing the brain, and art is useful for describing our actual experience. While these levels are obviously interconnected, they are also autonomous: art is not reducible to physics. (As Robert Frost wrote, “Poetry is what gets lost in translation.”) This is what our third culture should be about. It should be a celebration of pluralism.

Unfortunately, many of the luminaries of our current third culture are extremely antagonistic toward everything that isn’t scientific. They argue that art is a symptom of our biology, and that anything that isn’t experimental is just entertainment. Even worse, our third culture indulges in this attitude without always understanding the art it attempts to encompass. Steven Pinker’s book The Blank Slate: The New Sciences of Human Nature is a perfect example of this habit.

Pinker sets out to demolish the old intellectual belief in three false constructs: the Blank Slate (the belief that the mind is shaped primarily by its environment), the Noble Savage (the belief that people are naturally good but are ruined by society), and the Ghost in the Machine (the belief that there is a nonbiological entity underlying consciousness). The artists and humanists who promulgate these romantic myths are, of course, the archenemies of the rational evolutionary psychologists and neuroscientists that Pinker defends.

“The giveaway may be found,” Pinker writes, “in a now famous statement from Virginia Woolf: ‘On or about December 1910, human nature changed.’ For Pinker, Woolf embodies “the philosophy of modernism that would dominate the elite arts and criticism for much of the twentieth century, and whose denial of human nature was carried over with a vengeance to postmodernism.” Woolf was wrong, Pinker says, because “human nature did not change in 1910, or in any year thereafter.”

Pinker has misunderstood Woolf. She was being ironic. The quote comes from an essay entitled “Character in Fiction,” in which she criticizes earlier novelists precisely because they ignored the inner workings of the mind. Woolf wanted to write novels that reflected
human nature. She understood, like Pinker, that certain elements of consciousness were constant and universal. Every mind was naturally fragmented, and yet every self emerged from its fragments in the same way. It is this psychological process that Woolf wanted to translate into a new literary form.

But if Pinker is wrong to thoughtlessly attack Virginia Woolf (seeing an enemy when he should see an ally), he is right to admonish what he calls “the priests of postmodernism.” Too often, postmodernism — that most inexplicable of -isms — indulges in cheap disavowals of science and the scientific method. There is no truth, postmodernists say, only differing descriptions, all of which are equally invalid. Obviously, this idea very quickly exhausts itself. No truth is perfect, but that doesn’t mean all truths are equally imperfect. We will always need some way to distinguish among our claims.

Thus, in our current culture, we have two epistemological extremes reflexively attacking the other. Postmodernists have ignorantly written off science as nothing but another text, and many scientists have written off the humanities as hopelessly false. Instead of constructing a useful dialogue, our third culture has only inflamed this sad phenomenon.

Before she began writing *Mrs. Dalloway*, Virginia Woolf wrote that in her new novel the “psychology should be done very realistically.” She wanted this book to capture the mind in its actual state, to express the tumultuous process at the center of our existence. For too long, Woolf believed, fiction had indulged in a simplified view of consciousness. She was determined to make things complicated.

The artistic exploration of the mind did not end with Virginia Woolf. In 2005, the British novelist Ian McEwan gave *Mrs. Dalloway* — a novel set on a single day in the life of an upper-class Londoner — a scientific update. His novel *Saturday* reworks the narrative structure of Woolf (which was itself a reworking of *Ulysses*), but this time from the perspective of a neurosurgeon. As a result, the psychology is done very realistically. Like *Mrs. Dalloway, Saturday*
day is shadowed by war and madness, and includes oblique references to planes in flight and the prime minister. The ordinary moments of life — from grocery shopping to games of squash — are shown to contain all of life.

Saturday begins before dawn. The protagonist, Dr. Henry Perowne, finds himself awake, although “it’s not clear to him when exactly he became conscious, nor does it seem relevant.” All he knows is that his eyes are open, and that he exists, a palpable, if immaterial, presence: “It’s as if, standing there in the darkness, he’s materialized out of nothing.”

Of course, being a neurosurgeon, Henry knows better. He is on intimate terms with the cortex. It is “a kind of homeland to him.” He believes that the mind is the brain, and that the brain is just a myelinated mass of fissures and folds. McEwan, who spent more than two years following around a neurosurgeon during the writing of the book, delights in the odd consonances of our anatomy. He insists on showing us the sheer strangeness of our source.

But McEwan simultaneously complicates the materialist world his character inhabits. Though Henry disdains philosophy and is bored by fiction, he is constantly lost in metaphysical reveries. As he picks up fish for dinner, Henry wonders “what the chances are, of this particular fish, from that shoal, ending up in the pages, no, on this page of this copy of the Daily Mirror? Something just short of infinity to one. Similarly, the grains of sand on a beach, arranged just so. The random ordering of the world, the unimaginable odds against any particular condition.” And yet, despite the odds, our reality holds itself together: the fish is there, wrapped in newspaper in the plastic bag. Existence is a miracle.

It is also a precarious miracle. Woolf showed us this with Septimus, whose madness served to highlight the fragility of sanity. McEwan chooses Baxter, a man suffering from Huntington’s disease, to produce a parallel effect. Baxter’s disease, thinks the neurosurgeon, “is biological determinism in its purest form. The misfortune lies within a single gene, in an excessive repeat of a single sequence — CAG.” There is no escape from this minor misprint.
But McEwan doesn’t make the logical mistake of believing that such a deterministic relationship is true of life in general. Henry knows that the real gift of our matter is to let us be more than matter. While operating on an exposed brain, Henry ruminates on the mystery of consciousness. He knows that even if science “solves” the brain, “the wonder will remain. That mere wet stuff can make this bright inward cinema of thought, of sight and sound and touch bound into a vivid illusion of an instantaneous present, with a self, another brightly wrought illusion, hovering like a ghost at its center. Could it ever be explained, how matter becomes conscious?”

Saturday does not answer the question. Instead, the novel strives to remind us, again and again, that the question has no answer. We will never know how the mind turns the water of our cells into the wine of consciousness. Even Baxter, a man defined by his tragic genetic flaw, is ultimately altered by a poem. When Henry’s daughter begins reciting Matthew Arnold’s “Dover Beach,” a poem about the melancholy of materialism, Baxter is transfixed. The words “touched off a yearning he could barely begin to define.” The plot of Saturday hinges on this chance event, on a mind being moved by nothing more real than rhyming words. Poetry sways matter. Could anything be less likely?

McEwan ends Saturday the way he began it: in the dark, in the present tense, with Henry in bed. It has been a long day. As Henry is drifting off to sleep, his last thoughts are not about the brain, or surgery, or materialism. All of that seems far away. Instead, Henry’s thoughts return to the only reality we will ever know: our experience. The feeling of consciousness. The feeling of feeling. “There’s always this, is one of his remaining thoughts. And then: there’s only this.”

McEwan’s work is a potent demonstration that even in this age of dizzying scientific detail, the artist remains a necessary voice. Through the medium of fiction, McEwan explores the limits of science while doing justice to its utility and eloquence. Though he never doubts our existence as a property of matter — this is why the surgeon can heal our wounds — McEwan captures the paradox of
being a mind aware of itself. While each self is a brain, it is a brain that contemplates its own beginnings.

*Saturday* is a rare cultural commodity, and not only because of McEwan’s artistry. It symbolizes, perhaps, the birth of a new fourth culture, one that seeks to discover relationships between the humanities and the sciences. This fourth culture, much closer in concept to Snow’s original definition (and embodied by works like *Saturday*), will ignore arbitrary intellectual boundaries, seeking instead to blur the lines that separate. It will freely transplant knowledge between the sciences and the humanities, and will focus on connecting the reductionist fact to our actual experience. It will take a pragmatic view of the truth, and it will judge truth not by its origins but in terms of its usefulness. What does this novel or experiment or poem or protein teach us about ourselves? How does it help us to understand who we are? What long-standing problem has it solved?

If we are open-minded in our answers to these questions, we will discover that the poem can be just as true and useful as the acronym. And while science will always be our primary method of investigating the universe, it is naïve to think that science can solve everything by itself, or that everything can even be solved. One of the ironies of modern science is that some of its most profound discoveries — like Heisenberg’s uncertainty principle,* or the emergent nature of consciousness — are actually about the limits of science. As Vladimir Nabokov, the novelist and lepidopterist, once put it, “The greater one’s science, the deeper the sense of mystery.”

We now know enough to know that we will never know everything. This is why we need art: it teaches us to how live with mystery. Only the artist can explore the ineffable without offering us an answer, for sometimes there is no answer. John Keats called this romantic impulse “negative capability.” He said that certain poets, like

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* This principle of quantum physics states that one can know either the position of a particle or its momentum (mass times velocity), but not both variables simultaneously. In other words, we can’t know everything about anything.
Shakespeare, had “the ability to remain in uncertainties, mysteries, doubts, without any irritable reaching after fact and reason.” Keats realized that just because something can’t be solved, or reduced into the laws of physics, doesn’t mean it isn’t real. When we venture beyond the edge of our knowledge, all we have is art.

But before we can get a fourth culture, our two existing cultures must modify their habits. First of all, the humanities must sincerely engage with the sciences. Henry James defined the writer as someone on whom nothing is lost; artists must heed his call and not ignore science’s inspiring descriptions of reality. Every humanist should read Nature.

At the same time, the sciences must recognize that their truths are not the only truths. No knowledge has a monopoly on knowledge. That simple idea will be the starting premise of any fourth culture. As Karl Popper, an eminent defender of science, wrote, “It is imperative that we give up the idea of ultimate sources of knowledge, and admit that all knowledge is human; that it is mixed with our errors, our prejudices, our dreams, and our hopes; that all we can do is to grope for truth even though it is beyond our reach. There is no authority beyond the reach of criticism.”

I hope that this book has shown how art and science might be re-integrated into an expansive critical sphere. Both art and science can be useful, and both can be true. In our own time, art is a necessary counterbalance to the glories and excesses of scientific reductionism, especially as they are applied to human experience. This is the artist’s purpose: to keep our reality, with all its frailties and question marks, on the agenda. The world is large, as Whitman once remarked. It contains multitudes.