

March 4, 2017 – GELERNTER

For a weekend's thought provoking post, we have [Conor Friedersdorf's Atlantic Monthly interview with David Gelernter](#). The interview breaks for five days while Gelernter provides 20 thoughts.

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The U.S. and our allies have escaped nuclear, chemical, and bio attacks not because of the humane ideals of our enemies, but because we devote huge energy and effort to defense, and to our own mass-destruction weapons. Of course terrorists would love to murder huge numbers of westerners, and chemical weapons and perhaps some kinds of bio-weapons are easier to acquire and handle than nuclear weapons; and terrorists don't have hostage states and populations like a Stalin or Mao. But we have to assume that the terrorists have been trying this sort of attack since at least October 2001.

What's amazing isn't that they nearly always fail but that occasionally, on a small but tragic scale, they succeed. If you think about it, they have men willing to die for the cause but so do we—every American infantryman, every front-line soldier of the U.S. and our allies has put his life on the line; and our police, FBI and their allies do it routinely, too. We don't call them suicide fighters, we call them brave, patriotic, big-hearted Americans—or British, French, Israelis—but that doesn't change the facts.

And our soldiers are about 1,000 years further along in technology, much better-trained and equipped, and fighting for their homes and families, and freedom, which are better causes than medieval tyranny, the annihilation of Jews and Christians, and the enslavement of women—not the most inspiring ideas to fight and die for. ...

Here's Gelernter's 1st Thought;

Letting toxic partisanship heal. Everyone knows that we live in politically superheated times; partisanship feels more bitter and more personal than it ever has in my lifetime.

There are many reasons, but here is one: we all know that faith in the Judeo-Christian religions is dramatically weaker than it used to be. But human beings are religious animals, and most will find an alternative if the conventional choices are gone.

The readiest replacement nowadays for lost traditional religion is political ideology. But a citizen with faith in a political position, instead of rational belief, is a potential disaster for democracy. A religious believer can rarely be argued out of his faith in any ordinary conversational give-and-take. His personality is more likely to be wrapped up with his religion than with any mere political program. When a person's religion is attacked, he's more likely to take it personally and dislike (or even hate) the attacker than he is in the case of mere political attacks or arguments. Thus, the collapse of traditional religion within important parts of the population is one cause of our increasingly poisoned politics. Yet it doesn't have to be this way.

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And the 4th;

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As a result American were not paragons; but they had a place to start. Today many or most children in the intellectual or left-wing part of the nation are no longer reared as Christians or Jews. What ethical laws are they taught? Many on the left say "none, and it doesn't matter"—a recipe for one of the riskiest experiments in history.

The left, and my colleagues in the intelligentsia, need to come to terms with this issue. Rear your children to be atheists or agnostics—fine. But turning them loose on the world with no concept of right and wrong is unacceptable. ...

They've nothing to do with today's topic, but some of the 'toons are laugh out loud funny.

The Atlantic

['There's Enough Time to Change Everything'](#)

The polymath computer scientist David Gelernter's wide-ranging ideas about American life.

by Conor Friedersdorf

Last month, David Gelernter, the pioneering Yale University computer scientist, met with Donald Trump to discuss the possibility of joining the White House staff. An [article](#) about the meeting in

The Washington Post was headlined, "David Gelernter, fiercely anti-intellectual computer scientist, is being eyed for Trump's science adviser."

It is hard to imagine a more misleading treatment.

By one [common definition](#), anti-intellectualism is "hostility towards and mistrust of intellect, intellectuals, and intellectual pursuits, usually expressed as the derision of education, philosophy, literature, art, and science, as impractical and contemptible."

Here is the exchange that I had with Gelernter when I reached out to ask if he would be interested in discussing the substance of his views on science, politics and culture.

Conor Friedersdorf: The Founding era had as significant a scientist and inventor as Benjamin Franklin playing major parts in the revolution and experiment in self-government.

David Gelernter: I think the lesson of Franklin is not that a science advisor can tell you all sorts of things about government and diplomacy and human nature, but that thoughtful people are almost never defined by a pre-existing intellectual shoe-box. The best scientists aren't the dedicated drudges who have no other interests. The best take after Newton, Einstein and tens of thousands of lesser lights in their devotion to science *and other things too*. As a scientist handing out advice on the study of science, something I do as a college teacher, one of my main messages is that you can't be an educated human being on the basis of science alone; another main message is that, sometimes, you can't even be a scientist or technologist on the basis of science alone.

If I were loosely gathering topics of study into categories, I might call them arts, religion, scholarship, and science. As important as scholarship and science are, arts and religion are more important. Those were my main goals (my wife's, too) in educating our two boys, who are now both in their 20s. Arts and religion define, in a sense, a single spectrum rather than two topics. And this spectrum is where you find mankind's deepest attempts to figure out what's going on in the universe. A student who doesn't know the slow movement of Schubert's B-flat major op post sonata, or the story of David and Absalom, needs to go back to school and learn better.

The best scientists are often the ones who are plainest about their non-scientific interests. Feynman's intro physics books are the best of all physics intros in part because he talks freely about beauty: Here's a beautiful theorem. Here's a beautiful fact. My own small contributions to software were guided at every step by my search for beautiful design. More important, as I argue in my recent book on the spectrum of consciousness: who knows most about the human mind? Today it's John Coetzee, Philip Roth, Cynthia Ozick. That's why the book turns to novelists and poets at least as often as to neurobiologists and psychologists. I've had far more sustained, intense reaction to my one novel (1939) than to anything else I've published.

The short stories I've published over the years in *Commentary* have been read by maybe six people each; but the reaction from readers of those stories, in seriousness, intelligence, and depth, swamps the reaction to any science, tech, or political piece I've published.

Friedersdorf: One of the few newspaper columns that has stuck with me for years is Charles Krauthammer's [meditation](#) on Fermi's Paradox and what he calls "the high probability that advanced civilizations destroy themselves." This is a fear Baby Boomers associate with nuclear weapons. How do those products of the World War II era compare to other advances in technology that stoke existential worries? I am thinking of the people who worry about AI risk, or

warn that we're on the cusp of greatly expanding the number of people who can engineer a low-cost bio-weapon, or perhaps something entirely beyond my knowledge. The pessimist in me worries that advances in science and technology are always outpacing our ability or inclination to guard against their destructive potential. Is there something beyond nuclear-weapons policy that presidents should be doing to lessen the chance of humanity destroying itself?

Gelernter: Charles Krauthammer runs to pessimism, and I think he has this wrong—in fact backwards. The striking thing is that Stalin had the bomb and Mao had the bomb and neither ever used it. If both of those mass-murdering thug-tyrants were able to restrain themselves, it's not too surprising that their successors did too. You worry that "advances in science and technology are always outpacing our ability or inclination to guard against them," but it seems to me that this is exactly what *hasn't* happened.

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I find it amazing that there's so little discussion and analysis of where Mideast terrorism came from. When I was a child, Israel faced mortal danger every day, but Israel-hating terrorists didn't care much about the West in general. What happened? We know exactly what. Jimmy Carter let the Shah fall and let Khomeini replace him. It was one of the stupidest moves in modern history; it's caused unspeakable suffering in Iran and throughout the Middle East. What have we learned?

To lessen the chances of mankind destroying itself, I'd say we ought to do what we did in the Cold War: stand up for the things we believe and try to encourage them everywhere on earth, without fighting wars ourselves. (Anyway, that was our goal.) Our cowardly refusal to arm the Ukraine, the reluctance we showed in helping the Kurds, are exactly what we shouldn't be doing to maintain peace. To have peace, we ought to make sure that basically evil men are scared of basically good ones. That's been U.S. policy since 1945, basically, for all presidents; I say, keep on down this road, helping make the world a little safer and freer every time in every way we can.

Friedersdorf: If our domestic policy were informed by a similar lodestar—to stand up for what is basically good, to oppose what is basically evil, and to have the wisdom to know the difference

(and when neither good nor evil are implicated), how should we approach the most controversial intersections of science and policy?

I am thinking of questions like how much today's humans owe to future generations; if or when it is permissible to do research on stem cells from human embryos or to edit the human genome; what restrictions, if any, there ought to be on abortion or euthanasia; whether factory farms, or zoos, are wrong, etc. I don't mean to imply that these matters are all alike, or the most pertinent, but how you might guide policymakers who approach you in the course of trying to figure out what's best.

Gelernter: Frankly, I think that guiding citizens (insofar as I'm able to guide anyone) is far more important than advising policymakers. I've published a series of pieces over the years on this sort of question in the Frankfurter *Allgemeine Zeitung* (they translate them), which have led in turn to contributions to German anthologies on these topics, occasional lectures in Germany, etc. I've never found a place to publish such things in English, not for a handful of academics but for the educated public.

That being said, I'm not quite sure I understand the question.

Does it ask how I'd make a decision, or what decisions I've actually made? I make my own decisions from inside the modern-orthodox Jewish world; I try to read relevant Talmudic and halakhic and responsa literature. The rabbis, my rabbis, are my moral guides. But it's often the case that they haven't dealt quite with the right question, or I disagree (Jewish theology is a literature of constant disagreement; nor of course do I present my views as any sort of rabbinic position—considered becoming a rabbi long & hard, but didn't). In any case, I then turn on my brain and do my best to figure out the question. I'm too old to foist off the final responsibility on anyone but myself. So that's how I make these decisions. (There are philosophers who influence me, but as authors more than arbiters. Nietzsche and Wittgenstein have always enchanted me, more for the way they embrace art than for their doctrines. Wittgenstein would sit in the nave of Ely, not far from Cambridge, and admire it. Something I love to do, though he had a lot more opportunity.)

As to my answers, I've written & argued in Germany that (for example) computers & social nets ought to be treated like bars or strip joints: not acceptable for children. (At least we ought to *consider* treating them that way.) I don't like the idea of legal restrictions. But I might urge that we get computers out of schools until our children are able to read & write half decently—at least as decently as they used to during the middle two-thirds of the 20th Century. These are local decisions. But a science advisor's most important role is facing the public, not the president. A science advisor has to convince Americans that they're out of their minds to turn their backs on science. It is foolish, dangerous, and a waste of a beautiful opportunity.

AI presents tremendously serious moral problems which we leave to Kurzweil and friends. But in practical terms, there's no way on earth I could get a piece from a very different viewpoint before a mass audience.

The ideological narrowness of mainstream commercial magazines is one of the deep, deep frustrations of my life. We have a thriving conservative intelligentsia in this country; it includes many (in fact most) of the smartest people I've ever met. (Think about Norman Podhoretz, George Will, Bill Bennett, Donald Kagan—radically different sorts of thinker, all four strikingly brilliant. There are a few dozen more even at this exalted level.) It's a pleasure and a high honor to be part of America's conservative culture. But the Left hears nothing we say: nothing. *Nothing*. Most have shrugged this off; only a few of us care. Because I teach at Yale and, more

important, because I belong to the art world & have since birth, I can't help caring—and sometimes being outraged, sometimes just grief-stricken. What a damned mess we've made of intellectual life in this absurdly wealthy, lucky, blessed nation.

Friedersdorf : What's something you've wanted to get before a mainstream American audience? I'm especially eager to discuss anything that lends insight into your original thinking. Let's talk about whatever it is that you want to talk about.

Gelernter: This was the most fascinating invitation *by far* I've ever got ("an opportunity to put any viewpoint you'd like...")—yes, *more than the White House Chanukah parties!* More than my chance to ride in my second cousin's Corvette Stingray when I was 10! I don't want to bury you—I want something clearly expressed and organized, and concise.

[5 days elapsed, before I heard from Gelernter again.]

Gelernter: I've attached 20 ideas.

I'm sorry to list so many; but the chance you've given me is unique... I've profited enormously, and I appreciate it... Every assertion is merely my own opinion. Lots of people will disagree, but it's boring to read "in my opinion... in my opinion..." I've only tried to sketch out what I'm pondering & working on right now, as briefly as I can.

Even at that, I've gone far too long.

1.

Letting toxic partisanship heal. Everyone knows that we live in politically superheated times; partisanship feels more bitter and more personal than it ever has in my lifetime.

There are many reasons, but here is one: we all know that faith in the Judeo-Christian religions is dramatically weaker than it used to be. But human beings are religious animals, and most will find an alternative if the conventional choices are gone.

The readiest replacement nowadays for lost traditional religion is political ideology. But a citizen with faith in a political position, instead of rational belief, is a potential disaster for democracy. A religious believer can rarely be argued out of his faith in any ordinary conversational give-and-take. His personality is more likely to be wrapped up with his religion than with any mere political program. When a person's religion is attacked, he's more likely to take it personally and dislike (or even hate) the attacker than he is in the case of mere political attacks or arguments. Thus, the collapse of traditional religion within important parts of the population is one cause of our increasingly poisoned politics. Yet it doesn't have to be this way.

Turn back to the generation after the Second World War. The collapse of religion is well underway, but there is another alternate religion at hand: art.

Think of the extraordinary blaze-up of art in America in the postwar years, especially the 1950s and first half of the '60s: painting above all; choreography in New York (Balanchine, Robbins, the American Ballet Theater, the Joffrey and other regional companies); serious music, led by Bernstein's Young Peoples Concerts broadcast nationwide by CBS; intense interest in new American novelists; Frost; the Americanized Auden, Eliot and Delmore Schwartz; the great quartet of European masters as seen from the US: Picasso and Matisse, Giacometti and Chagall; the European film as an art form (Swedish, Italian and French—Hitchcock's *Birds*, for

that matter, opened in the early '60s at MOMA); in the architecture of the Americans Wright and Kahn and Eero Saarinen, and the Europeans Mies and Corbu and Gropius; in the design of the Eames studio, in the museum show as an event, in drama and the Actor's Studio; art-books, magazines, posters, high-fidelity audio, Lincoln Center, the Dick van Dyke show; a situation comedy with frequent episodes about the theater, galleries, art films--and on and on.

An astonishing era.

Among much else, it helped politics go down easier. (Only a little easier; but every bit helped.)

Other things did too, of course; and art, as always, was its own reward. But we miss something if we don't see how the religion of art took pressure off politics.

Nowadays it's mostly gone. But it doesn't have to be. Art itself is the reason to bring art back to center stage. But some of the merely incidental benefits might be enormous.

2.

Beauty is objective.

Take any civilization, ask for its artistic masterpieces; today, they are almost guaranteed to be valuable all over the world. There's almost nothing less subjective than the sense of beauty.

3.

Yale is building two new "colleges" or dormitories, modeled on Oxford and Cambridge colleges. The buildings are gothic—but copied not from the originals but from early-20th-century Yale gothic, mainly by James Gamble Rogers (an eminent architect who deserves to be studied alongside Pope and White and Lutyens, and will be someday).

Students love the Rogers colleges, and I like the university noticing the fact. They love quads.

But if Yale had turned on its brain, it could have had quads and something exciting and new, instead of something that tries so hard to be boring and old. Yale has mostly had enormous success over the years when it was willing to take new architecture seriously.

Take a chance, dammit.

Quads are good; quads are necessary. But why not build a college with four separate quads stacked up like a pile of book, each half-overlapping the one beneath? Each quad except the topmost has partly sun, then runs underneath the next-higher quad, into the shade. Students are guaranteed to make up new sports played on all four levels simultaneously. Lit up at a night, the four quads make the most fascinating party-space. Performances (music, plays, movies) are set up on the outside half of the bottom quad, and observed from higher quads and from all over the college.

Or, imagine a fjord sort of building with four fairly steep, severe outer walls. There's a dramatic slit in each exterior wall, and four pathways lead (windingly) to the heads of four separate routes around the hidden central quad—one for walking, one for running, one for swimming and a fourth for rowing (in the winter, skating). The central quad is almost filled by a large glass cube with a carousel inside. The glass walls keep a fair amount of sound enclosed, so that the carousel can play its carousel music—children and parents from the neighborhood can be

admitted (through an underground passage) during several hours most afternoons. Take a chance!

4.

It used to be that nearly all American children were reared as Christians or Jews. In the process they were given comprehensive ethical views, centering on the Ten Commandments and the "golden rule," and God's requirements as spelled out by the prophet Micah: "Only to do justice, and love mercy, and walk humbly with your God."

As a result American were not paragons; but they had a place to start. Today many or most children in the intellectual or left-wing part of the nation are no longer reared as Christians or Jews. What ethical laws are they taught? Many on the left say "none, and it doesn't matter"—a recipe for one of the riskiest experiments in history.

The left, and my colleagues in the intelligentsia, need to come to terms with this issue. Rear your children to be atheists or agnostics—fine. But turning them loose on the world with no concept of right and wrong is unacceptable. You might well say that Jewish and Christian ethical teaching managed to accomplish remarkably little; but if you believe that, and propose to teach your children even less than the bare bones that proved (you say) so inadequate, then your irresponsibility is obvious. Choose the ethical code you like, but choose something and make sure they know it.

5.

Long ago, I wrote a novel (also a history) about the 1939 NY World's Fair. My parents had been there; I'd been at the 1964 Fair as a boy. At the time (mid '90s) I believed the party line: it would be crazy to have a new world's fair. I was wrong. A modern nation can't operate unless the science world and the public are on speaking terms.

The public must pay the bills, and tolerate the long-term planning, that substantial science and technology projects require.

The sharpest, smartest young people must be excited about science. More than ever, every prospective science student has excellent reasons to do something else—go into law or business and be richer, into government and wield power, or into medicine, to be incomparably richer and to be treated with respect and admiration nearly everywhere. Only deep excitement can overcome obstacles like those. No world's fair can do the job all by itself, but we're crazy to sacrifice any tool we can bring to bear.

At a time when the population is threatening to fall apart into countless spiky crystals that have nothing to do with or say to one another, a world's fair helps bring populations together and gives everyone something to think about aside from how much they dislike everyone else. Of course a new one would lose a ton of money; but we've never needed a change of topic and a stiff dose of intellectual excitement more than today. You can't measure the value of what we'd gain, but it would be gigantic.

6.

Our cultural revolution, roughly 1945-1970, created modern America—created the nation and the world we live in. It happened because of a strange circumstance: Two large social changes (separate though related) happened at almost the same time and their effects overlapped. As a

result two tidal waves, which would each have produced major changes, came together and overturned everything.

The effect, loosely and broadly speaking, was to move the nation decidedly to the left. But no conspiracy created it. In fact, the left itself doesn't even begin to understand; has never analyzed it. But we must all understand this event, unquestionably the most important in American history since the end of the Second World War. Of course Civil Rights were important. Feminism was important. But those two changes happened the way they did because of the Cultural Revolution.

Two big waves flowing in the same direction:

First, the major American colleges, run heretofore by WASPs, opened their doors, after the Second World War, to all sorts of people—first, Jews. A decade later, blacks and women. Jews were admitted as students, then faculty members, finally bosses—deans and presidents. Naturally, big changes resulted. College faculties were left-leaning anyway, but a significant Jewish contingent made them even more so.

Second, a growing belief that college, like high school, was good for everyone—and the "professionalization" of all sorts of fields where a BA used to be plenty: the rise of business schools, the growing importance of education schools and of journalism schools were three of the most important aspects of this big change. The transformation of journalism from a battered-hat group of rough-speaking, hard-drinking, widely-admired "ordinary guys" who were thought to be mostly conservatives to penetrating, opinionated intellectuals who are mainly liberal is a major story in itself.

The unbigoted-colleges revolution, which pushed colleges to the left and helped detach them from their old WASP bases, together with the professionalization and college-for-everyone revolution, which increased colleges' reach and influence, were post-war revolutions that coincided, swamping American culture. The result was a 1970s America vastly different from the 1940s version, dominated by academic ideas. Thus "political correctness," e.g., is an issue not only in academic promotions but in naming Navy warships (!). The new version had good and bad aspects, but whether you're pleased, horrified, or neutral, there's no way to miss the huge importance of these events. But most historians have missed them.

Most seem intent on ignoring the Cultural Revolution—or tying it to a strange concoction of Vietnam, rock music, drugs, birth-control, the Civil Rights movement and so on. Yet if Vietnam or rock had never existed, if Civil Rights had been fought out in the 1930s or had only grown serious in 1975, a Cultural Revolution would still have transformed this nation during the post-World War II generation.

7.

Where does a writer's stuff appear?

A small, distinguished quarterly has asked me to write a piece explaining the more-or-less inevitable end of the colleges (which I wrote about in the *WSJ* a few weeks ago), and what will replace them. I'm grateful to them for asking, and will probably say yes. In a different world, I'd be writing the piece for a commercial magazine, and a general audience would actually read it. I'm a professional writer; I wrote a weekly culture-and-politics column for the *New York Post* in the '90s and the *LA Times* in the '00s. I'd rather write for a wider audience. But no commercial mag will touch me. One pays a price for one's political beliefs. (Yet the price, in this society, is

so trivial compared to what men have paid in living memory, the price they pay today in Islamic states, Marxist utopias and all kinds of tyrannies, that it is truly stupid, truly infantile to complain.)

8.

Artificial Intelligence is going nowhere until we have mastered Artificial Emotion. AI will continue to solve particular, set problems brilliantly, as it has been doing with slowly-increasing prowess since the 1950s, but AI software won't show a glimmer of originality or creativity, which are essential to the very idea of thought, until it can simulate emotion as accurately as it does other mental phenomena.

We think with emotions as well as ideas.

But psychology and personal bias has led philosophers of mind starting with Descartes, and psychologists, neurobiologists & AI researchers, to demote emotions to second-class status. Our first successful humanoid robot—the first robot that is clearly on the road to a human-like imitation mind—won't happen until we know how to imitate human emotions, and how to integrate them completely into artificial thought. Of course, such robots will feel nothing; we have no way to make a computer or any machine feel, and we probably never will. But we will learn to build artificial minds that work as if they can feel—and can see and hear and think and imagine too.

What makes emotion crucial?

We're capable of assembling two basic kinds of mental sequence, but we tend to ignore one of them. The logical sequence is well-known—we work our ways from some problem or starting point to a solution, explanation, plan of action. This is reasoning, broadly speaking. We assemble ideas using the rules of informal logic. But we also assemble sequences of feelings—sensations and emotions. (Usually such sequences assemble themselves: we enter some new environment and sensations arrive, observations occur to us, and often we respond emotionally.) Logical ideas tend to be stepping-stones to our mental destination. Feelings, on the other hand, tend to be "translucent"—we can overlay them and see through a whole stack of them, although each element adds some color or special effect to the ensemble. We tend to bring such feelings to bear not one-by-one, stepping-stone-wise, but all at once.

Assembling a sequence or a stack of feelings tends to yield one particular, highly-specific feeling—incorporating aspects of many different emotions and sensations. We tend to label memories with particular, specific emotions; some memories consist entirely of a stack of feelings. How do we decide quickly (using emotion, not analysis or reasoning) that we like some applicant and want to hire him, dislike someone else, like or dislike a book that we've barely started, or are fascinated by a sight or a room or house or painting that we've only just glanced at? These abilities suggest to many psychologists and philosophers that emotions are a "parallel mind," alongside the analytical, reasonable mind. But how does the parallel mind work?

How do emotions yield judgments so quickly? Judgments we're often at a loss to explain, except post facto, but that are often right?

Say we meet someone, start a book, wander into a forest path, look at a building. In this new "environment," our sensations, observations and emotions pile up. Suppose we now examine these feelings all at once, as if we were gazing through a stack of translucent images. If we use this highly-specific, specialized, multi-element feeling as a memory cue, we tend to recall episodes associated with roughly the same set of sensations and emotions. When we pull out

of memory a recollection associated with the same sort of feelings we're experiencing now... it's natural to apply the outcome or conclusion or analysis we arrived at then. And that's (in briefest outline) how emotions work as a "parallel mind," how they lead us to fast conclusions we can't necessarily explain--but they feel right. It all depends not on a step-by-step logical sequence but on a step-by-step emotional one.

A similar mechanism allows the mind to link together far apart, radically-different memories, which share something deep although they seem to share little or nothing, yielding a brand-new analogy, which in turns yields a mental "restructuring" or a new way to look at things, which in turn yields an original invention or viewpoint. That's how one important type of creativity works—or at least, how it starts.

9.

AI is one of the most important technologies in history, and we're going about it wrong. To do it right, we need information about the mind. The people who know the mind best aren't neurobiologists, they're novelists & poets. Science must learn from the arts.

A scientist who know only science is in no position to do science.

10.

That's why my recent *Tides of Mind* has far more quotes from Shakespeare & Wordsworth & Jane Austen, and Coetzee and Roth and Cynthia Ozick, than from any scientist or psychologist.

Tides of Mind is a sort of commentary on Coetzee's *Life & Times of Michael K*. I can only understand Michael K. himself as an almost implausibly-perfect example of what I mean by "low-spectrum thinking." I argue for a "spectrum of consciousness" running from concentrated, rational, emotionally-controlled, vigorous thought (when energy is high) to diffuse thought, saturated with emotion and recollections, that leads into sleep. Upper-spectrum thought is abstract, full of language and even numbers; lower-spectrum thought is concrete, full of sensation and emotion.

One way to describe the spectrum is as a continuum from doing to being: the mind is capable of doing-- acting, planning, noticing and solving problems; deciding on goals and concocting plans. This is the aspect of mind we usually focus on. But the mind is also capable of passively experiencing some particular state. As we move from the focused, logical, reasonable, analytical, planning-and-solving mind towards the diffuse, emotional, reminiscing, sitting-back-and-watching mind, and even farther "down spectrum," into the dreaming mind, which shuts out external stimuli and responds to a hallucinated, emotion-saturated, hot-house reality... we're moving from a mind whose main business is acting to one whose main business is being.

Ordinarily, we each drift through the spectrum every day, from a relatively up-spectrum point towards the bottom and sleep. But it's also clear that different personalities have different biases—different spectrum points that are most natural and comfortable, different home bases to which they repeatedly return. Michael K shows us what a low-spectrum personality is like. "There seemed nothing to do but live. He sat so still that it would not have startled him if birds had flown down and perched on his shoulders."

This is being, not doing.

"I have never seen anyone as asleep as you," a friend tells him.

"I am like a woman whose children have left the house, he thought; all that remains is to tidy up and listen to the silence." This is being, feeling, observing, versus talking and thinking and doing. "As summer slanted to an end, he was learning to love idleness.... As a yielding up of himself to time, to a time flowing slowly like oil from horizon to horizon over the face of the world... 'I am not clever with words,' he said, nothing more."

Words and language are the central abstractions of human life. Abstraction is up-spectrum; but when we think visually, emotionally, narratively, we are thinking concretely—down-spectrum. Michael's uneasiness in using language is the main reason why nearly everyone regards him as a simpleton. There is much more to be said about this reading of Michael K—what we learn about the book, and the spectrum.

11.

The Ambassadors is Henry James's finest novel, and ranks alongside *Emma* as one of the two finest in English. Everyone notices the symmetry of the two-section, twelve-chapter plan.

But critics don't seem to notice the center of the symmetry.

The Ambassadors is about Paris. Paris is unusual in having an exact psychological and approximate physical center—Notre Dame and the parvis out front, where there's a milestone embedded in the pavement from which distances throughout France are measured.

The church itself stands towards the middle of the island in the middle of the river in the middle of the city. And James has arranged for Notre Dame, the center of Paris, to be the exact center of his book about Paris too.

It is the center of the episode on which the plot hinges.

Strether, the hero, comes to the church on the first page of the first chapter of part II. He enters a mere respectful outsider, an admirer but no intimate of the church, the city or the heroine. Inside he sees (without recognizing) Marie de Vionnet in the distance, from the back. She is lost in meditation or prayer. Moreover "there are no altars for him" in the great Catholic church—either because he is a New England puritan or just a New England skeptic. But he leaves with Mme. de Vionnet on a new basis of close friendship. And now there is an altar for him in Paris. She is the altar.

Although the story ends in a kind of disillusionment, Strether is transformed by his religious experience. *The Ambassadors* remains the perfect study of the woman-worship that is so important to James; that appears at the center of each of his last two novels also.

And it's important in earlier James too, perhaps most strikingly in *The Awkward Age*—an underrated, first-order masterpiece with a wholly-undeserved reputation for difficulty. It includes James's most dazzling, most breathtakingly beautiful set pieces—the subtle, wordy, moody, moving conversations among a small unchanging group on which he thrives. It is about the worship of a woman that outlives her death to be handed on like a precious sacred vessel, frail yet almost intact, to her granddaughter. This act of handing-on is the novel—as critics can't seem to see.

It's impossible not to wonder where this theme has gone. Have men stopped worshipping women?

Hardly.

During feminism's heyday feminist leaders made clear that they didn't choose to be worshiped. But it was never up to them. Such emotions are part of a man's life, not a woman's.

If we take (say) the novels of Roth and of Coetzee as representing the last several generations of great novels in English, the one instance of woman-worship that comes to mind in all their novels is startling: the magistrate's love for the unnamed barbarian girl in *Waiting for the Barbarians*. He loves her not for her perfection but exactly for her imposed imperfection, for the wounds and the suffering visited on her by the secret police.

(The lack of interest in woman-worship as a central theme seems to hold for such relatively young novelists as Sean O'Reilly, Patrick Flanery, Anthony Schneider, Robert Seethaler and Jenny Erpenbeck too.) We seem to have lost something essential, a matter of life and death.

12.

John Brockman believes I invented the term "Cloud"; I'm not sure. But we did build the first cloud, in the course of building a network-programming system called Linda, when I was a grad student at SUNY Stony Brook and an assistant prof at Yale in the 1980s.

My book *Mirror Worlds* ('91) was "one of the most influential books in computer science" (Tech Review, 7/07) and directly inspired the creation of the Java net-programming language (according to Bill Joy, once head scientist at Sun Microsystems); generally said to have "foreseen" the World Wide Web (Reuters, 3/20/01, and others).

Lifestreams, which we built in the 1990s (it was Eric Freeman's dissertation project), was the world's first social network (in the modern, online sense). The first blog on the internet ("Women in Computing") ran on top of our first Lifestreams system at Yale, in 1996.

Since then I've tried to push Lifestreams into the limelight, where it belonged (this Wednesday I met with three undergrads who are beginning yet another in the long series of Lifestreams implementations); but in recent years I've worked mainly on AI and philosophy of mind, which yielded the book *Tides of Mind* (Norton '16: "A new paradigm for the study of human consciousness," Nick Romeo, *Chicago Tribune*); I am working now on "let me build you a robot," about emotion in robots and AI and the mind generally.

And also a novel, set in the early years of the 1960s. My novel *1939* did better by far than any other of my books. But I'm not sure how I'll manage to get the new one published.

13.

How you'll shop. Someone will make a lot of money some day (soon, I think) by using software in a fairly dense, fairly typical suburb to organize an "orbiting supermarket."

You buy a small fleet of trucks and distribute your wares over the fleet. Then you send them out to cruise. (They could easily be electric.) When we need something, we hang out a digital flag—need a loaf of bread, or "a loaf of vitamin-enhanced 50-slice Wonder Bread," or whatever;

we choose from dazzling high-resolution menus, so we can buy exotic produce we can't even name. When a fleet's truck is in your area, software checks whether you've got flags out, and whether your flags correspond to something onboard. The robotized little warehouse behind the driver, together with ordinary sat-nav, make the drop-off quick. If one of your flags is getting old (45 minutes, say, and you still haven't gotten your milk), software routes an appropriate truck to your front door whether or not it was in your area.

The plan seems to save customers time at the expense of added truck-use and road-use. What happens in fact is much like a series of raster-scans executed by vans over the "screen" of your neighborhood. Vans rarely go out of their way or retrace steps. Flying drones might eventually be cheaper. (But how do we quantify the value of low-skills jobs and a friendly face? Customers will come to know all the drivers.... And when package-delivery services and the post office coordinate services with the orbiting supermarkets, we'll have an impressively efficient system.)

14.

How you'll get from the suburbs to downtown and back. To get into Manhattan, I'd start out in my own car and hang out a digital flag with my exact destination. At some point along the highway, software tells me: "pull over & park in #57 in the roadside parking lot." I do so & stay put in my car--and within 5 minutes, a van picks me up and I'm on my way, straight to a destination drop-off in the city. When traffic is light, the rendezvous happens close to the city; when it's heavy, it happens much further out—and bigger vans do the carrying. This sort of "mass transportation" would be more & not less convenient than driving; would also be more predictable and flexible. (In the van I'd put on my headphones & disappear into my own world.)

The New York Times is outraged. *We should be getting the public onto the trains, at gunpoint if necessary!*

But even left-wing Connecticut would rather drive—not for love of driving but because, for most of us, trains are grossly inefficient, an insultingly ludicrous waste of time.

(1) I drive to the station—then park, get a ticket, shoehorn myself into the schedule—waste time waiting, or count on missing my train sometimes; (2) take the train; (3) get into some other transit system to reach my destination, (4) get back in, to return to the station, (5) train, and (6) drive home—usually through the local rush-hour. Unless you happen to live near a station, it's infuriatingly wasteful of the thing that matters most: your life.

Transportation in the eastern corridor is a disgrace. It must change. Why not change it using the networks we've got instead of new networks, merely adding software and—admittedly—a huge fleet of vans, buses and drivers? But simulate the thing carefully first—which should have started decades ago; then try it in a small test.... Or will we do nothing until the local economy literally starts to fall apart? That will happen, because we each have only so many hours to throw away....

15.

The next Web. (The stream-based cybersphere.) The Cybersphere isn't a Web; instead it's trillions of streams trickling down some immense mountainside. Each stream is a time-organized "feed" (like the AP feed, or a Twitter stream, or a Facebook wall). Each stream has a broad theme—the stream of the European paintings department at the Met, NY, or the official stream of the NY Mets, of Simon & Schuster, Ferrari, the XYZ hospital pathology dept, the pizza place on the corner, the association for Hiberno-Saxon mss, Fox News, C-SPAN, England, Wells, St.

Cuthbert in Wells. Most streams belong to persons: My stream is a chronological list of every document I create (text, videos, spreadsheets, photo-albums). Each stream-element is marked with allowed readers. I mark nearly all my elements "private." Elements I'll share with the world—my website, in effect—I mark "public." Or an element might be for "family," "project Zep," "Ozick readers of CT," etc.

This is essentially the whole structure of the new web (the worldbeam)—and of every user's private operating system; one system for all his computers, phone, car-computers, audio equipment and so on.

All streams have a future as well as a past.

If I have a meeting at 2PM tomorrow, I add a note to the future of my lifestream at 2PM tomorrow. I can search and browse the whole stream, past, present and future. Every stream flows from the future towards the present, from the present into the past, at the speed of time. I build my computing world by mixing into my own stream any other streams that are interesting: maybe streams belonging to my family-members and close colleagues and best friends. Maybe streams for local schools. Maybe streams for stores where I shop; news streams of all sorts; streams for organizations I care about.

Everything I'm interested in comes to me, and flows right past. I might notice something interesting as it passes by, or might look for it by searching and browsing. If built right, this is the only operating system or web browser anyone ever needs.

16.

Something important we haven't noticed: recursive structure is a fundamental part of sophisticated architecture, especially of gothic and of the parade of styles--mainly renaissance, baroque and neo-classical—that occupied the centuries down to the 20th (or in some cases, down till today). Recursive structure means that a structure is repeated within itself: An octagonal spire, for example, is decorated with small spires, identical to the large one, at the base of the four angled faces of the octagon.

The curve of a large church's apse is repeated in the curves of the scooped-out chapels running along the face of the apse. Art historians have noticed this important fact, naturally.

But "recursive structure" is a term from computer science; there's no comparable term in art or architectural history—and as a result of separating science and art, every historian who writes about the phenomenon makes up his own terminology, and the generality of the technique, the big picture, remains hidden. What a shame!—we could understand everything from the delicate structure of a masonry edging in a late medieval English chantry chapel to the whole east end of Salisbury Cathedral, or Michelangelo's giant orders, as instances of the same deep phenomenon. But we don't. A wall separates computing from the arts. Another wall, more impregnable, separates conservative intellectuals from the mainstream. I published a piece about this phenomenon (with many examples and good photos) in the *Weekly Standard's* books-and-art section. But I've yet to find a single art historian, or anyone with an interest in medieval art or architectural history, who ever saw it.

17.

We don't understand great medieval churches properly.

The extent to which western churches are based on a pilgrimage to Jerusalem is implicit in parts of the literature, but doesn't seem to have been studied thoroughly, especially in the way that a Christian's progression from the west-end to the sacred east-end recreates the pilgrimage in miniature—in the sense that the Christian's steps trace an easterly path which is a literal part of a pilgrimage to Jerusalem. Thus the font at which Christian life begins is usually at or near the west end. (Southern cathedrals such as Florence's, with the baptistery as a separate building west of the main church, underline the start of the pilgrimage.) A pilgrim heads eastward through the nave and arrives at the crossing; moving into the choir, he is usually approaching the high altar, east of the choir. A saint's shrine, in England especially, was apt to be east of the high altar (thus the Confessor's shrine at Westminster Abbey, Becket's former shrine at Canterbury, and many, many other cases).

The east end of the church is a re-creation of the Celestial Jerusalem—of Paradise, of the goal of the pilgrimage. This is true of the traditional French apse or chevet, concave to enclose the pilgrim—but also of the great eastern window at Lincoln (for example) or the glass wall at the east end of York or Gloucester. The English tradition of siting a lady chapel in the easternmost position—east of the altar, east of the shrine, as in Salisbury or Winchester or Exeter or Wells, and in some parish or former abbey churches (such as Abbey Dore)—underlines the pilgrimage theme. At Wells, for example, the great east window hovers above the altar. This is the main source of light from the east, the light of Paradise towards which a Christian life leads.

But beneath the great east window, light enters from a distance, from the beautiful reticulated windows of the octagonal lady chapel. Just as a choir within the west façades of Wells and Salisbury, singing through hidden sound-holes, welcomes pilgrims and processions into church on feasts such as Easter, the light of the easternmost windows sneaking in beneath the great east window, beyond the altar, calls pilgrims east, to the lady chapel and the celestial Jerusalem and Paradise.

18.

Who is history's greatest composer? (I encourage my students to ask this sort of wildly unpopular question because it sharpens one's critical understanding, and forces one to make choices.)

The composer is Franz Schubert; he died at 31, and none of his three competitors had finished masterpieces to compare with his at 31. His three opus posthumous sonatas are among the deepest achievements in art. The slow movements of the last two might be the most beautiful in all of music—in competition only with Mozart's Requiem and the last movement of Beethoven's op 111 sonata. And what if Schubert's competitors had each died at 31? Beethoven had finished his stupendous C minor piano concerto, op. 37, and several perfect piano sonatas; but his great work was yet to come.

Bach had finished Herz und Mund und Tat und Leben, one of his finest cantatas and his single biggest hit (it includes "Jesus Joy of man's desiring"); but his greatest music all came later.

Mozart is the toughest competitor, because he finished Figaro at 30—Figaro, greatest of his operas, greatest of all operas, the best answer in music (better even than Don Giovanni) to the hardest of all musical problems--how to come to an end. But listen carefully once more to the three sonatas and Schubert wins. (Which doesn't change the underlying truth, that Beethoven's Missa Solemnis, his op 110 and 111 sonatas, his string quartet in C# minor and the Gross Fuge are the greatest music of all.)

19.

My own paintings are inspired by the great NY abstract expressionists of my youth (especially de Kooning) and a couple of Francophones (Matisse and Giacometti, who was born in Italian Switzerland but lived in Paris)—and by medieval architecture (especially the decorative patterns invented by masons and carpenters in the late English gothic of the 14th through 16th centuries) and the great Insular Gospel Books, especially Lindisfarne and Kells—probably the two greatest artworks we have. Nearly all of my paintings include texts, usually in Hebrew.

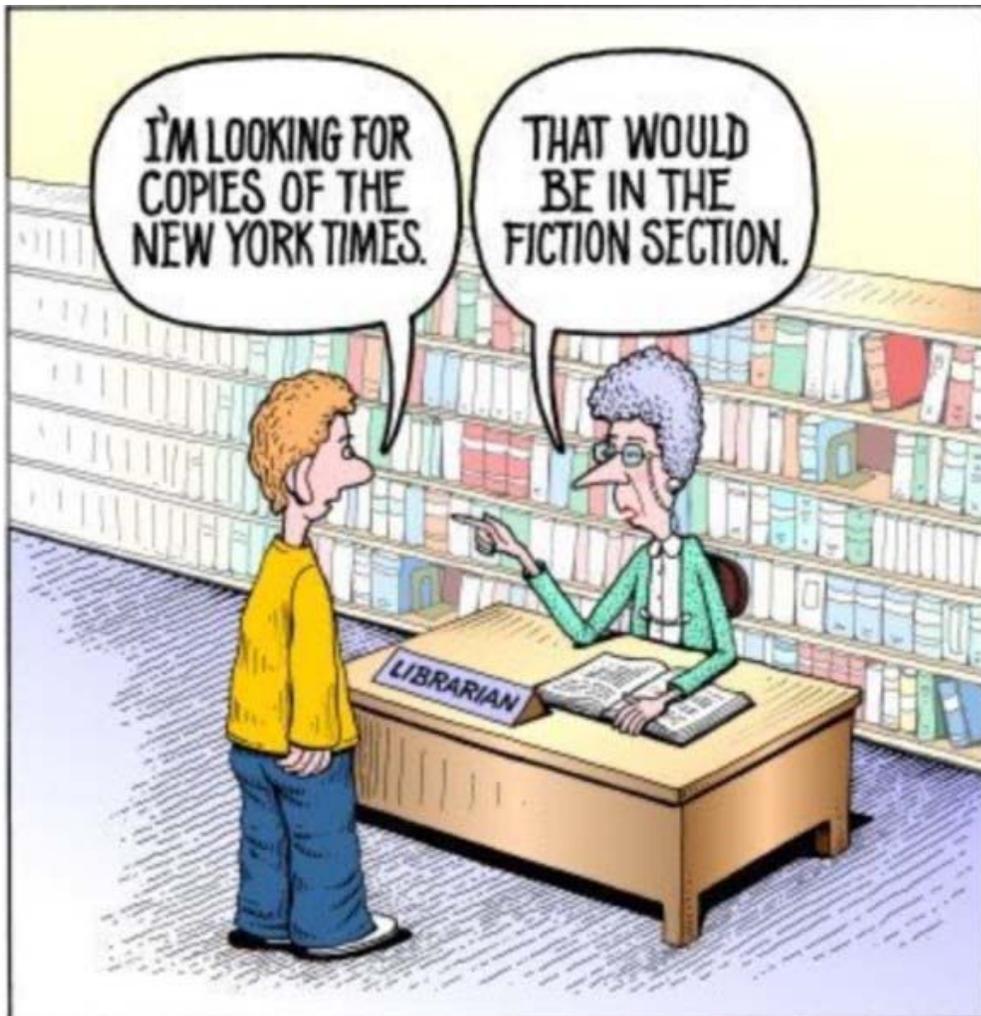
Each one is a setting of a text in the same way, broadly speaking, that Schubert sets a text in a lied. But there are some portraits also. Only orthodox Jews and Israelis can read the texts; orthodox Jews have no great love of painting, and the Israeli art world is fiercely secular. What does an artist do when he's stuck (by his own choice entirely!) in a hole no one cares about? Should he shrug it off and get on with his work, or does an artist's work include proselytizing for his own vision? In my case, that includes the deeply visual character of Judaism—and the visual character of much of thought.

20.

The extraordinary graphic power of new computers ought to have set up a blizzard of new thoughts and new work on images and the mind, teaching images, reading images, expressing ourselves in images. That it hasn't, that it's set up nothing, is one of the surest ways to see that western culture is almost dead—is surviving on royalty checks from heroes of the past.

But there's still more than enough time to change everything.







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