

The *Heart*
of the **Mind**

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Introduction

This book is called *The Heart of the Mind*, not only because those words are found in the text but because in our educational culture of the heartless (objective) mind, the paradoxical phrase disrupts the false dichotomy between the mind and the heart that has misguided our pedagogical thinking. At the highest levels of intellect, there is no dichotomy between the heart and the mind. The two are one. School children, however, are often subjected to cold, cognitive lives, to endless pages of sober, declarative sentences.

The philosopher Friedrich Nietzsche once wrote that he wanted to escape from “the dust of the scholars.” He meant, in part, that much scholarship is heartless, cognitive without being affective, and that a mind must be passionate. We must not study things without caring about them. In educating gifted children, we want no dusty scholarship, and we desire no artificial separation between the cognitive and the affective aspects of intellect.

It is not a cold, cognitive regard that fuels the highest levels of intellect. No one ever won a Nobel Prize after a course of indifference to the subject of discovery.

At the forefront of every great discipline, the world’s finest thinkers live, not in a state of sedate and arid erudition, but rather in passionate and fervent exploration. They are transfixed by the thrill of neutron stars, or battle strategies, or subatomic particles, or polyphony, or sonnets. They are face to face with their knowledge, and it is this thrill of bringing great academics alive, of snatching intellectual joy from the pallid jaws of tedium, that is behind the essays in this book.

Some of the essays are a bit scholarly, but I hope not too many. They are as likely to be satires or to project a voice that I wish I could really speak. Some of them are supportive of popular ideas, and some of them will ripple the equanimity of a reader or two. Thoreau said that his equanimity was rippled but not ruffled; I'd like these essays to do both—both for readers and for myself.

Chapter Four

Give Me Rigor, or Give Me Mortis

In my freshman year at college, the text for our English class was the compendious, ponderous tome *The Norton Anthology of English Literature*, in two thick volumes. Of onionskin-thin paper. Fifteen hundred pages. Each. As the Christmas season approached through the falling snow, our professor announced that part of the semester exam would be fifty two-line quotations from the 1,500 pages of Volume One of the *Norton*, and for each quotation, we would have to provide the author, the title of the work, the context of the two lines in the work, and an explanation of the significance of the lines.

“Do you mean two lines from anything we have read?” one student asked.

“That, Mr. Trotman, is what I mean.”

“But we have read hundreds and hundreds of poems and essays,” said another.

“Precisely,” said the professor.

“We have read everything in the book!” cried another.

“Yes,” quoth the professor.

The tingle of terror crept up our necks as an abyss of impossibility opened up before our dilating pupils.

How could we possibly prepare ourselves for such a vast exam? How could we begin to spit out the butt ends of our days and ways?

I mean, I love poetry and literature, but this was absurd. How could I internalize more than a thousand pages of poetry so completely that I could identify any two lines and give author, title, context, and significance?

Well, there were three weeks until the exam, and there was only one thing to do.

Read.

I read. I read at night, and I read in the afternoon. I read in the early morning hours. I read at the student union between classes. I read during lunch. Every few days, my friend Bob and I would meet at KennyBurger at the edge of town and quiz each other on two-line quotes as we fortified our spirits with extremely fast food.

“One Kenny, two fries,” the voice would call over the loudspeaker.

“Dance, there, upon the shore,” Bob would say.

“Two dogs, one shake,” the speaker would announce. “Yeats,” I replied, “‘To a Child, Dancing in the Wind,’—it’s the first line and shows the despair of the narrator as contrasted with the blind insouciance of the child.”

We would quiz each other for two hours, then go our separate ways to study for two more days before meeting again for another quiz session.

We both studied hundreds of hours for our English exam, and we both got A’s.

In the process, I learned something.

Of course, I learned something about English poetry. Even today, when I hear lines from John Donne, or Sir Thomas Wyatt the Elder, or Thomas Hardy, I know them at once; they are a part of me now, and became so as I revolved them in my mind, walking through the Virginia

snow under the bleak twigs overhead, struggling to push my understanding forward.

And in the process, I learned something.

I learned myself. I learned that I am not who I thought I was, a lesser being incapable of mastering such a breadth and depth of beautiful poetry; rather, I am a human being, one of the great race of mortals who produced this poetry, and it is in my large nature to comprehend and internalize literature. Trapped in a corner by the demands of the exam, I had no one to turn to but myself and a book. A very thiiiiiiiick book.

And in the process, I learned something.

I learned that in teaching my own students, I could make the most rigorous demands on them, and that was a beautiful gift. For not until you have done something do you truly know that you can.

Our expectations of the students we teach must be set high.

Imagine a vertical continuum of challenge. The challenge at the bottom is zero; every student can do everything asked already, and no new learning or mental effort is required. Much of American education falls into this category; research consistently shows, for example, that bright students can answer eighty percent of final exam math questions before taking the course.

The challenge level in the middle of the vertical continuum is minimal. Students already understand most of what is required, and the few details that are new do not provide enough growth to generate excitement. Students come home every day and answer “Nothing” to you-know-what question.

Higher on the vertical challenge continuum, we find a level of genuine difficulty. There is some real demand, some interesting complexity, a bit of abstraction, and a dash of depth. Here and there the minds light up and begin to read and learn, feeling that at last their time is not being wasted. Still, no deep growth is required; students do this work with equanimity, feeling that though more interesting, it is well within their ability.

Even higher on the continuum, there is a level of stringent, severe difficulty that makes strong demands of students through advanced levels of reading, abstraction, complexity, and pace but that nevertheless remains within the realm of familiar terrain. Students here are doing more complex and elaborate varieties of things they have already done. They are learning more, faster, with more mastery and discipline, but no change is required in the way they think of themselves.

Above this, high up on the challenge continuum, there is a thin, almost unnoticeable band. It represents a level of rigor so challenging that, beyond requiring students to study difficult content, it requires them to reconsider themselves. At this level a small amount of fear creeps in. Rapid breathing ensues. The thrill factor jumps. Students not only do not know the material at all; they are not sure if they are in the right place. They are not in Kansas anymore. Moses-like, they are intellectual strangers in a strange land. To answer the demands of the assignment, they must not only learn what is new; they must *be* what is new.

Master teaching for gifted children involves positioning the learning demands right at this seam, forcing students not only to learn but to molt, to crack off the crusty shells of exoconcepts and get bigger. The unthreatening hard study in the level below is insufficiently rigorous because it builds their knowledge without developing their selves,

and the really threatening impossibility in the level above is inappropriate because it will bruise them with failure, but between the difficult and the impossible is the rigorous.

What strikes and disappoints me about much of what passes as educational material in our society is its commonplace quality; even the most challenging materials and assignments circumambulate through the familiar, leading students through smaller and smaller branches of the same old paths. Students learn new things without having to change their minds. Students graduating from high school are just more encyclopedic versions of themselves in the fifth grade.

When my professor put fifty two-line quotes from 1,500 pages of literature on our semester exam, we thought he was doing something wrong. In angry incredulity, we thought it was unfair, absurd, and impossible. But decades later I love that literature, and I love the experience that showed me, forever, that I am smarter than I realized. Having mastered the fifty-quote challenge, I soon felt able to face far greater challenges because I was armed with new self-knowledge, born of a rigor that first daunted me and that forced me to confront the specious assumptions, callow complacencies, and demons of doubt that lurked unknown at the back of my brain.

Giving students material that they can master without struggle is not the path to strength. On the contrary.

Give me rigor, or give me *mortis*.

Chapter Thirty-Two

Hayrides and Antimatter Universes

Recently I found myself on a hayride with sixth-grade gifted kids. It was a pleasant Indiana night, and three hay wagons bumped along, pulled by tractors whose small headlights lit the spooky way as we wound through woods, over fields, and through streams. We could see the eyes of bullfrogs reflecting back at us, and a great tree trunk loomed out of the darkness, perfectly suggesting the shape of a suffering human form trapped inside.

There were probably twenty kids in the hay wagon, and they talked excitedly among themselves. From time to time I would forget myself and engage them in some sort of banter and then retreat back into the grown-up shadows where I belonged. It was their time.

The tractors pattered, and the kids chattered and giggled, and I tried to ignore my bruising tailbone as the night sky unwound itself overhead. Up there was Cygnus, and there was the Milky Way. Jupiter blazed over on the horizon, with its pinpoint moons lending an extra sparkle. Our own moon was reddish orange and was engaging the local trees in a contest of wills. High overhead, Cassiopeia was pointing at the great square, and between them the Andromeda galaxy suggested a dim glow. It, I told the students, is the most distant object that can be seen by the naked eye. I had a good time teaching them how to find it and explaining the nineteenth century's great Island Universe debate, in which most scientists claimed that the glow-thing must be only a close-by nebula because if it was made of stars, it would have to be so far away that it would be impossible, since

even the greatest telescopes of the time could not resolve individual stars in Andromeda. The great truth is that the thinker who got it right was the philosopher Immanuel Kant, who deduced that it was not a nebula but some vast, distant second universe beyond our universe. An island universe. Today we know it as our sister galaxy and the closest major spiral galaxy to ourselves. It is quite worth finding with a pair of binoculars in the winter sky.

The kids thought that stuff was cool.

“Have you seen *Alien Resurrection*?” I heard one little girl ask. She seemed too little to have seen the film, but I soon learned that she had seen all of the *Alien* films, many times. Suddenly she erupted in a host of film questions, asking us all whether we had seen what may have been every film ever made. Somehow, I had not seen most of the ones she mentioned.

Another little guy had a laser pointer, and as we chugged along in the darkness, he performed astounding feats of laser prowess. One moment he was red dotting the far end of a recently mowed field. Then he was pointing the laser at the tops of the trees, to the certain astonishment of the squirrels. Then he was shining it across a field of high grasses, creating planes of red dots as he moved the pointer quickly from right to left.

I told them that they should not point the laser pointer at anyone’s face because the reflective properties of the human eye will bounce back the laser in an amplified form, burning their hands. They looked at me with tolerance. You can’t fool them, and I in particular can’t fool them. Most of them enjoy saying that the science teacher’s jokes are better than mine. This is funnier to them than it is to me.

At one point I asked, *If you point the laser up into the sky, how far will the light go in five seconds?* A million miles,

one answered absentmindedly. I should have known that they would know the speed of light.

Then someone started talking about the coolness of Fresnel lenses.

And then one of the kids started talking about antimatter universes and what would happen if an antimatter something collided with a matter something else.

I bumped along in the hay, listening, my head aswirl with cognitive dissonance. Most of the things these kids were discussing so happily I never learned about until I was in my thirties, and then I learned about them in graduate-level philosophy of science courses.

Eventually, we putt-putted back to the base, where hot dogs and cold drinks were waiting. Parents crowded around, wanting to know if the kids had a good time. They had, and I had, but I carried with me from that fun a strange sense of what gifted education means, and what it means today.

It isn't just that in their sixth-grade classes these kids are doing things that most kids don't study for several more years. It isn't just that they are studying algebra I or II instead of arithmetic, or that they are reading *Romeo and Juliet* now instead of three years from now. It isn't just that they have already studied the interior of the atom and the parts of the cell or that some of them have long-established intellectual hobbies, such as collecting Civil War facts.

It isn't just that some of them are already completely comfortable with academic material at a depth and detail level that is approached by few high school students or even adults.

It isn't just that their strange combination of child-voice fun and sesquipedalian diction tweaks your sense of reality

and makes you look at the kids again to see if they are putting you on.

I mean, those are all neat things that show aspects of giftedness and make you more determined than ever to provide them with a differentiated education.

Those are all neat things, but listening to the kids on the hayride made me think additional things that have additional implications about gifted education now and in the future.

What struck me, what surprised my expectations and made me think again about who gifted kids are and what gifted education must be, was the fluent awareness that the kids had of the new ideas of their time. To me, antimatter universes are wow phenomena; to these kids, antimatter is something they have grown up with. They don't remember when they didn't know about antimatter.

Antimatter is based on the idea of antiparticles, which were first predicted by British physicist Paul Dirac in the 1930s. In 1932 the U.S. physicist Carl Anderson verified Dirac's prediction when he observed a particle that had the mass of an electron but had a positive charge instead of a negative charge. It soon became clear that every subatomic particle could be matched by a corresponding antiparticle. High-energy particle accelerators in the 1950s began creating antiprotons and antineutrons, and experiments revealed that antimatter cannot coexist with matter; the opposites annihilate each other. Today, antideuterons have been created, and entire antiatoms have been created for extremely brief periods. Astronomers find that little antimatter exists naturally in space, but jokes about antimatter enliven scientific conversations, and on the hayride, I found myself wondering if an antiscandal in Washington would be useful in annihilating the scandals that so often plague our government and airwaves.

As technology continues to increase in sophistication, so do the children who master it. Mass media not only saturates the kids with armies of gooney characters and cartoon warriors; it also imports the terms of the time, such as *antimatter*. Today's gifted kids will need to be educated not just to master the academic world of a decade ago, or two, or three; they will need to be educated to master the academic world of a decade from now.

In a way, this presents problems.

As an educator, I believe in the classics of literature and in the classic fields of academe. I want every bright child to read *The Iliad* and *The Odyssey*. I want them all to read *To Kill a Mockingbird* and *The Great Gatsby* and *The War of the Worlds*. I want them all to read *Tom Sawyer*. I want the kids to know their world geography, and I don't think it is a waste of time to memorize world capitals and facts about rivers and mountains. I want them to know all about Napoleon and Simón Bolívar and Thomas Jefferson and Queen Elizabeth. I want them to know the story of the Armada, and how Alexander captured Darius's mother, and how Junípero Serra made missions in the West.

I do not think that ancient history is becoming less relevant through time. On the contrary, the purifying lens of time makes ancient history more important than ever, and I want kids to know the story of the Macedonian genius Alexander and his father Philip II, about how the young boy tamed the great horse Bucephalus, about how his teacher was none other than Aristotle, about how Alexander took *The Iliad* with him on campaign against the Persians, about how Alexander allowed the peoples he conquered to keep their own religions and customs, about how he married Roxana, the daughter of a warring chieftain.

I want gifted kids to know that there is truth in stories, both fictional and nonfictional.

I do not believe the ridiculous and shallow platitude that education can focus on process because knowledge is becoming outmoded before it can even be published. Plato will never become outmoded, if our species survives for millions of years, and Plato is just an obvious symbol for vast fields of academic phenomena that will never, either, become outmoded.

I want gifted kids to read *Walden*, and Geronimo's autobiography, and Benjamin Franklin's account of trying to perfect himself. I want them to read *The Narrative of Frederick Douglass*. I want them to study the Periodic Table. I want them to be swept away by Mozart's Clarinet Concerto. I want them all to know about Van Gogh's paintings, and bleeding ear, and friendship with Gauguin. I want them to read *Don Quixote*. I want them to know about the dinosaurs, and keep collections of trilobites, and be able to date the Cambrian Era at 575 million years ago. I want the kids to know about Catherine the Great, about Bach, about Georgia O'Keefe, about Martin Luther King, Jr., and about William Butler Yeats's Irish poetry.

I want them to read *War and Peace*.

There, you can see how far gone I am. I want them to read *War and Peace*. How many people think everyone should read *War and Peace*? I never had a student read it who did not love it. And it is such a wonderful, beyond wonderful book that it feels like bitter tragedy for any good soul not to have been to it.

The bottom line of all this is that I still retain an abiding belief in a traditional liberal arts education.

And yet in the past several decades, humanity has transformed itself into a vast, moving edge of discovery. We are pushing rapidly out into space, down into the sea, in into the subatomic weird place. We are developing genetic miracles and connecting the world into an electronic uniplace.

As much as I still want gifted kids to have a massive foundation of traditional liberal arts, I do not want them facing backward. I want them to take the great knowledge of the past and use it to face forward. With the best of a liberal arts education and the best of current education at their disposal, they can actively participate in the powerful quests of our times: curing cancer, exploring space, equalizing opportunities for women, extending the human lifespan, delivering a new communications revolution, predicting natural disasters, bringing justice to all segments of society, stabilizing the economy, lowering divorce and murder rates, ending poverty in America and elsewhere, bringing a new era of effective education to the entire world.

Sixth-grade kids who know what antimatter is will be able to help with these problems, someday, when they are grown up and we are grown old. They will take human knowledge to places that today have no names, that have not, today, been thought of by anyone. They will teach us undreamed-of facts about our universe, our past, and our potential. They will cure, and heal, and solve, and move out into new frontiers of discovery that do not now exist.

They will do all these things, providing that we now do the right thing and give them a differentiated education, teaching them things that they do not yet know, rather than forcing them to waste their educational lives reviewing things they knew long ago.