

uncomfortable truths and great social and political failures is sometimes called prophecy. Like the Hebrew prophets, he exposed wrongdoing that it was in no one's interest to expose, cutting through careful strategizing for political ends and the self-serving denial of reality that presses us, always, to be satisfied too quickly.

Inwardness, Depth, and the Study of Nature

Our thought bursts through the ramparts of the sky, and is not content to know what has been revealed.

—SENECA, *ON LEISURE*, TRANS. JOHN W. BASORE

Our new examples have made more vivid the notion of inwardness and what withdrawal from the world looks like. An inner world can be found in an office or a prison cell; it can treat as its object mathematics, or God's word, or the history of one's own people. However, by broadening our reach, we have exacerbated the difficulty of determining the object of contemplation. These human situations may resemble one another in certain ways, but what could be said in general about what these various readers and thinkings are thinking *about*? Mary contemplates the Bible, whereas Einstein studies the mathematical structures of nature; Weil, geometric objects; Gramsci, literature and politics; and Malcolm X, history, philosophy, and religion. What do these activities have in common with one another? And yet the sort of intellectual activity we are interested in does not seem directed at simply anything: sitting on the couch while restlessly flipping channels does not seem to fit the mold. Something about the inwardness and the complexity of these activities suggests *depth* rather than surface.

The theologian and philosopher Saint Augustine writes of the escape that the intellect enables from the private and the ephemeral to the concrete and the permanent:

What then are we doing when we diligently strive to be wise? Do we not seek, with as much energy as we can command, to gather our whole soul somehow to that which we attain by the mind, to station ourselves and become wholly entrenched there, so that we may no longer rejoice in our own private goods, which are bound up with ephemeral things, but instead cast aside all attachment to times and places and apprehend that which is always one and the same?²⁷

For Augustine, our customary life is lived at the surface of things. We seek beautiful or pleasant experiences, or honor in the approval of groups. Intellectual endeavors take us inward to the depths.

Consider the self-awareness induced by a powerful argument on a subject one cares deeply about, the sometimes sudden disorientation that results when one realizes that one might be wrong. In particularly difficult moments, such awareness might reach to the emptiness at our core, where we see the vast scope of the arbitrary objects that could hold our convictions, our senses, or our desires. Or consider the work of a great novelist. In the novel, the most humdrum features of everyday life are connected with one another and made grand, showing the depths and heights of a particular human community, making contact with the reader's own experience, with centuries of history, with anything whatsoever—animals, chemicals, vegetables, or distant galactic objects. These are two examples of the depth that the intellect can open, but there are more.

Augustine finds infinite riches in the self-examination he conducts in his autobiographical *Confessions*. In a childish prank he

sees the sin of Adam, and in childhood play he discerns the human enchantment with ambition and with pleasing others. His own sexual compulsions and desires for renown suggest the outlines of social life and how it goes wrong. He is most of all fascinated with the capacities of the human mind:

Great is the power of memory, exceedingly great, O my God, a spreading limitless room within me. Who can reach its uttermost depth? Yet it is a faculty of soul and belongs to my nature. In fact I cannot totally grasp all that I am. Thus the mind is not large enough to contain itself: but where can that part of it be that does not contain itself? . . .

As this question struck me, I was overcome with wonder and almost stupor. Here are men going afar to marvel at the heights of mountains, the mighty waves of the sea, the long courses of great rivers, the vastness of the ocean, the movements of the stars, yet leaving themselves unnoticed and not seeing it as marvelous that when I spoke of all these things, I did not see them with my eyes, yet I could not have spoken of them unless these mountains and waves and rivers and stars which I have seen, and the ocean of which I have heard, had been inwardly present to my sight; in my memory, and yet with the same vast spaces between them as if I saw them outside of me.²⁸

The natural world in its vastness can be remembered, imagined, brought to mind; and yet there is more in Augustine's inner self even than that. The nature of happiness, God himself, the source and origins of everything—all are approached for him in the inner depths of the human person.

Again, the book Augustine writes, the *Confessions*, has itself been a limitless source of discovery; it has been read for more than a thousand years and still draws in those who seek to get

to the bottom of things. Readers may use their negative reactions to the book to figure something out, or follow Augustine part of the way and take a detour elsewhere, or follow him all the way and trace out his path further than he did; or a reader may spend a lifetime, as many have spent their lifetimes, simply trying to understand Augustine himself, for his own sake.

Anyone tempted to doubt the incomprehensible depth and vastness that the intellect opens to us might spend some time looking at the work of amateur students of nature. Natural beings, after all, are concrete, external, rooted in material reality. They ought to be simpler and more tractable than the vagaries of the human heart, the infinity of a personal creator-god, or the toothy jaws of an existential question.

William Herschel and his sister Caroline, the eighteenth century's prodigies of amateur astronomy, are fine witnesses to the depths available in nature.²⁹ At the age of twenty-eight, while working as an organist and music teacher and living in Bath, England, William developed an obsession with looking at the sky. He gazed for hours at the stars and the moon at night in the Beaufort Square garden. He began to read voraciously about astronomical calculation and speculation, and to build telescopes. After five years of following these pursuits, he brought his sister over from Germany to assist him with housekeeping and with his growing astronomical enterprises. Caroline's growth had been stunted and her face scarred from childhood illnesses. She had suffered abuse and neglect at the hands of her mother and eldest brother, and had pursued what learning she could against their wishes. She took to astronomy like a fish to water.

Together, William and Caroline built a larger, more powerful and more precise telescope than any previously known in England, including at the royal observatories. Building it took untold days and hours of painstaking, nonstop polishing of metal

mirrors. One polishing session took sixteen uninterrupted hours, and Caroline had to put food in William's mouth while he was working. It was with this telescope that William discovered the planet Uranus in 1781; they built later the smaller, roving telescope with which Caroline found her vocation as a highly accomplished comet hunter.

Both William and Caroline eventually memorized the night sky, able to navigate the stars and planets without charts and to identify hitherto unknown and unseen objects. William imagined, as few had before, the depths of the universe, seeing past what the ancients saw as a sphere of fixed stars to what he envisaged as a vast realm of illuminated emptiness. The Milky Way, even as late as the eighteenth century, was thought of as a flattish surface, as it appears to the eye. It was William who imagined that we see it from the side, that its circular shape is obscured by our perspective, and that it stretches outward into a universe whose depth had not been guessed.

Roughly contemporary with the Herschels, the German romantic poet Goethe was preoccupied from his late twenties with several natural phenomena.³⁰ His first interest was in geology and minerals, culminating in an essay on granite. He studied microscopic organisms and later clouds, atmospheric mists, and the weather, as well as conducting an extensive inquiry into the nature of light and color. His journal from his trip to Italy at the age of thirty-seven shows all of these interests, containing entries on the strata of rock, unusual minerals, mists gathering at mountain tops, and his newest fascination, plants.

In Italy he visited botanical gardens and observed wild trees and agricultural practices, collecting samples and interesting cases. Writing after a visit to the botanical garden in Padua, he speculated that all plants originated in one type of plant. Over the course of his two-year sojourn in Italy, he found evidence for

a somewhat more modest theory: that the foundational organ of the annual plant was the leaf, a thesis he defended in his 1790 essay *The Metamorphosis of Plants*.³¹ His interest is what is called in botany “morphology,” the origin and nature of plant parts and forms.

Goethe observed the growth and development of a variety of types of annual plant. He noticed that the most outward petals of flowers were leaves, or sometimes partly leaves. He saw that the calyx, the seat of the blossom, was a collection of tiny stem leaves. The petal, which had once been a leaf, contracts into the sex organs—anther, style, and stigma—and these too often turn back into petals. The leaves, first to originate from the seed, originate seeds themselves, as is most obvious in the seed-laden leaves of the fern. The eyes on the stem from which smaller stems emerge are analogous to seeds: an entire plant can emerge from them. Goethe explains the whole of plant growth and reproduction as a series of changes to the leaf: expansion, contraction, coalescence, division, and forward and backward transformations from seed to node to leaf and back again. Each part of the plant is also in some sense a plant; and yet each plant is a single harmonious whole.

In his journal from the travels in Italy, he describes his discovery of the principle of the annual plant:

While walking in the garden in the Public Gardens of Palermo, it came to me in a flash that in the organ of the plant which we are accustomed to call the *leaf* lies the true Proteus who can hide and reveal himself in all vegetal forms. From first to last, the plant is nothing but leaf, which is so inseparable from the future germ that one cannot think of one without the other.³²

Goethe recounted his theory of plants in his first encounter with the poet Friedrich Schiller, and Schiller exclaimed, “That is not

an observation, that is an idea!”³³ But Goethe himself thought that much of reality lurked past the surfaces immediately visible to the eye. As he put it:

When we try to recognize the idea inherent in a phenomenon we are confused by the fact that it frequently—even normally—contradicts our senses. The Copernican system is based on an idea that was hard to grasp; even now it contradicts our senses every day. We merely echo something we neither see nor understand. The metamorphosis of plants contradicts our senses this way.³⁴

If the earth’s movement around the sun is so invisible to us (we still say, as Goethe points out, that the sun rises and sets), we ought to expect reality in many cases to be invisible, available only to those cognitive powers that go past sensory perception.

And yet the *Metamorphosis* is clearly a product of a highly disciplined, almost unimaginably careful, use of the eyes. Early on his Italian journey, he says: “It is the same with familiar plants as with other familiar objects: in the end we cease to think about them at all. But what is seeing without thinking?”³⁵ We think of seeing as simple contact with reality. But when we see objects repeatedly, to the point of familiarity, they become invisible; the use of the mind, beyond the eyes alone, is required to see them for what they are.

Despite the intense attention that must have generated it, this phase of Goethe’s botanical research was a fraction of his life: it was only four years from the beginning of his trip to Italy to the publication of his essay. Even his journals from Italy are crowded with nonbotanical concerns. His botany and his scientific interests in general are scarcely mentioned by his modern biographers, earning a passing sentence or two in the thousands of pages dedicated to his writings and doings.

The eighteenth century was perhaps the golden age of amateur inquiry into nature, and its accomplishments now seem inaccessible, but the depths of natural experience are nearer than we think. Consider John Baker, the author of the phenomenal 1967 study *The Peregrine*. Baker was an office worker in Essex who followed peregrine falcons across his county, on bicycle and on foot, for ten years.³⁶ The work must have been physically demanding for a short-sighted man who suffered from rheumatoid arthritis. Nonetheless, Baker learned, according to his own description, the prey of the peregrines and their flight patterns, the intricacies of their killing style, and how to assuage their fear of human beings. He condensed the massive journals that he had written over a decade into a single, slim volume, fictionalized as if a man were tracking a peregrine every day for a single six-month migratory season.

The intensity of Baker's engagement with peregrines shows itself in carefully wrought sentences that evoke at once the beauty and horror of the natural world.³⁷ Baker seeks to capture the bloodiness of nature as it is, without putting it in human terms; but, of course, no other terms are available to him. His only recourse is the discomfort of incompatible human meanings. On one page, he exposes the violence in a peaceful, pastoral backyard scene: "Consider the cold-eyed thrush, that springy carnivore of lawns, worm-stabber, smasher of snails. We should not sentimentalize his song, nor forget the killing that sustains it."³⁸ Further on, he lulls us into the peace that the outdoors and its wildlife invoke, only to startle the reader with the realization that the scene is murderous:

The tide was rising in the estuary; sleeping waders crowded the saltings; plover were restless. I expected the hawk to drop from the sky, but he came low from inland. He was a skimming

black crescent, cutting across the saltings, sending up a cloud of dunlin dense as a swarm of bees. He drove up between them, black shark in shoals of silver fish, threshing and plunging. With a sudden stab down he was clear of the swirl and was chasing a solitary dunlin up the sky. The dunlin seemed to come slowly back to the hawk. It passed into his dark outline, and did not reappear. There was no brutality, no violence. The hawk's foot reached out, and gripped, and squeezed, and clenched the dunlin's heart as effortlessly as a man's finger extinguishing an insect. Languidly, easily, the hawk glided down to an elm on the island to plume and eat his prey.³⁹

Baker reports, on principle, his own emotions and reactions as carefully as each swoop of the bird on the wing. "The eye becomes insatiable for hawks," he writes. "It clicks toward them with an ecstatic fury, just as the hawk's eye swings and dilates to the luring food shapes of gulls and pigeons."⁴⁰ He means no mere metaphor by this: the peregrine's interest in its prey is mimicked by his own interest in the predator-bird. As the book progresses, he seems more and more to be turning into a peregrine himself: "A day of blood; of sun, snow, and blood. Blood-red! What a useless adjective that is. Nothing is as beautifully, richly red as flowing blood on snow. It is strange that the eye can love what mind and body hate."⁴¹ Baker's attempt to understand the bird on its own terms, to get inside the world of the peregrine, ends with his own identification with the falcon's predation, his adoption of what he sees as the bird's love of killing.

The critic George Steiner writes of how we are answerable or responsible for what we take in or understand. He argues that it is appropriate in responding to any work of art or any form of human culture to take it personally, to invest oneself in it.⁴² To read and inquire as a free adult is to take on the awesome

responsibility of allowing oneself to be changed. If the change were certain to be positive, no risk would be involved, and the freedom to think would not mean nearly as much as it does. Baker is an “answerable” reader of birds in Steiner’s sense: he takes them into his being, becomes one with them as far as that is possible. He has staked his life on his inquiry into birds, albeit in a far different way than Malcolm X staked his life on his conversions, or than Khaled Al-Asaad did on archaeological study.

Ten years to look at a bird; three years to see the moving essence of the annual plant; twenty to soak in the whole night sky. It is obvious that the study of nature, too, can be a form of leisure. The Herschels worked for years without contact with a single professional astronomer, without anyone so much as knowing what they were doing, much less recognizing it, encouraging it, or supporting it. Goethe, by contrast, was embedded in a community of like-minded intellectuals, famous and celebrated. Yet there remains a freedom to his inquiries that modern-day professionals must envy. Baker worked without a publisher’s advance or an academic department, supported in his work with birds only by his wife, driven by fascination, alienation, and moral fury. The students of nature may seem to be out in the world, but they have turned out to be as withdrawn and as leisured as any bookworm or imprisoned mathematician.

The Escape to Truth

If the natural world exposes depths as rich or richer than the human realm, it too must be a proper object of intellectual contemplation. Herschel, Goethe, and Baker contemplated certain beings: stars, plants, birds. But it is also traditional to see inquiry into nature as a search for truth.