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INTRODUCTION

An Enchanted World

CHARLES DARWIN did not call himself a scientist. When he was young, it was not possible. The word *scientist* was not invented until 1833, when Darwin reached his twenties. Before then, people who studied the natural world were known as *naturalists* and *natural philosophers*. Darwin's shipmates on HMS *Beagle* thought of him as the ship's philosopher. They called him Philos. The nickname did not imply that Darwin was a lofty thinker, prone to idle reveries or flights of fancy. At the time, natural philosophy was a surprisingly active, physical pursuit.

When the word "scientist" replaced "natural philosopher," the shift marked a change in the way people thought about studying the natural world. It was more than mere semantics. In the decades before "scientist" was coined, there was no clear separation between the arts and the sciences; after *scientist* was proposed as a parallel to *artist*, these realms began to divide. Until then, Romantic poets and philosophers (who were often one and the same) tended to think of pursuits that we would now call artistic (writing poems, sketching landscapes, making botanical drawings) as empirical investigations into the natural world. At the same time, their idea of philosophy was often very close to what we now think of as natural science. Natural philosophers conducted experiments. They collected specimens of animals, plants, and minerals and exchanged them with others. They anatomized, classified, and dissected. Breaking rocks open, pulling flowers apart, cutting frogs into pieces—philosophers were people who got their hands dirty.

In *Frankenstein*, her 1818 novel about a deranged natural philosopher, Mary Shelley described philosophers as men "whose hands seem only made to dabble in dirt, and their eyes to pore over the microscope or crucible."[1] Although the fictional Victor Frankenstein would become the prototype for mad scientists in thousands of subsequent novels and films, Shelley never described him as a scientist. At the time, years before the word existed, such crucible-wielding, microscope-peering, dirty-handed dabblers were known instead as philosophers.

Decades after the word "scientist" was coined, Charles Darwin and Victor Frankenstein would come to stand for two sides of the nineteenth-century scientist in the popular imagination. The fictional Frankenstein would represent the horrifying danger of interfering with the natural order of things, while Darwin's systematic, secular approach to the natural world would be associated with the dry logic of disenchantment. On the one hand, supernatural horror. On the other, a wholly rationalist world so drained of emotional or spiritual significance that it inspired another type of horror. Scientists would become disturbing cultural figures either way, whether they were too close to magic or too far removed from it.

Both extremes point toward a second remarkable shift that happened around the same time. Just as natural philosophers were transformed into scientists, natural magic was banished from serious conversation. In the course of the nineteenth century, scientific objectivity replaced more subjective emotional approaches to the natural world. Science distanced itself from wonder. The German sociologist Max Weber would describe this process as the "disenchanting of the world."[2] As Weber defined it, the central principle of disenchantment was that "there are no mysterious incalculable forces intervening in our lives, but instead all things, in theory, can be *mastered* through *calculation*."[3] Weber held that modern thinkers had replaced the old sense of mystery with a surprisingly unsubstantiated belief in the principle that humans could—theoretically—have mastery over every aspect of nature.

Charles Darwin's approach to the natural world was unquestionably secular and systematic. He was not a mad scientist like Victor Frankenstein, much less an evil wizard. His attitude was closer to the

"rationalization and intellectualization" Max Weber would later describe.[4] However, it would be wrongheaded to imagine him as a great disenchanter who wanted to master the universe. Mastery was alien to him. Darwin challenged human supremacy and stressed kinship among living beings. The humility of his works shocked some of his contemporaries. Throughout his life Darwin remained fascinated and energized by the mysteries of the natural world. He never lost his sense of enchantment. In fact, the scholar George Levine has argued that Darwin is best understood as a secular enchanter.[5]

Though Darwin witnessed—and even participated in—the separation of science from philosophy and poetry, he regretted the divide. In his *Autobiography*, Darwin recalled, "Up to the age of thirty, or beyond it, poetry of many kinds, such as the works of Milton, Gray, Byron, Wordsworth, Coleridge, and Shelley, gave me great pleasure, and even as a schoolboy I took intense delight in Shakespeare, especially in the historical plays."[6] But in 1839, his thirtieth year, Darwin published his first book, *The Voyage of the Beagle*, an account of his five-year journey around the world as a naturalist. In honor of his work, Darwin was made a Fellow of the Royal Society. After he was inducted into the highest echelon of science, he narrowed his scope and renounced other pursuits.

In later years, he would come to feel that his turn away from poetry was a "curious and lamentable loss."[7] In a letter to the botanist Joseph Hooker, written when he was nearly 60, Darwin remarked, "I am a withered leaf for every subject except Science."[8]

Darwin was not as much of a withered leaf as he feared or as others imagined. Yet to his chagrin, *Darwin* became a shorthand way of referring to a version of materialism that saw the word as wholly disenchanted, meaningless, and dispiriting. Darwin's own view was richer. *On the Origin of Species* celebrated the grandeur of the natural world, with its "endless forms most beautiful and most wonderful."[9] That sense of aesthetic appreciation and open-ended wonder imbued all his works—including the books on corals, barnacles, and worms. In *The Descent of Man* (1874), Darwin concluded that "appreciation of the beautiful" shaped sexual selection for many species.[10] In Darwin's

thought, beauty was central. He believed that evolution hinged on aesthetics. The impact of his work, however, was beyond his control. Darwin would watch helplessly as poetry, beauty, and magic drained away from science.

The story of how science and religion became opposed to each other during the nineteenth century has often been told. In many accounts, Charles Darwin plays the role of the great Victorian scientist whose work opened the floodgates of secularization. In these pages, however, I will unfold a different narrative. Darwin will begin as an aspiring natural philosopher, born in an age when "poets were philosophers, and philosophers poets" (as Darwin's biographer Janet Browne describes it).[11] Together, poetry and philosophy played the role that science plays today, and magic had a place in serious thought. During Darwin's lifetime, science—and scientists—would come to be imagined in opposition to poetry, philosophy, and magic as well as religion, but Darwin would remain skeptical of the hardening boundaries between science and other ways of understanding the natural world. My account will explore how magic invisibly persisted for Darwin and his closest intellectual kin, infusing their sense of nineteenth-century science with infinite possibility.

We will begin in the years before magic seemed to disappear—the years when poetry and natural philosophy were inseparable. To gain a sense of the approaches to nature that nourished Darwin's thinking, we will consider the poet-philosophers who shaped his world (his grandfather Erasmus Darwin and the circle of Romantics and radicals that included Samuel Taylor Coleridge and Mary Shelley). But although Charles Darwin's Romantic roots reached deep, he was no Romantic. By 1859, when he published *On the Origin of Species*, the world of his grandfathers had vanished. In his own time, when poetry was often separated from science, the poet who best captured the relationships between science, religion, and magic was Emily Dickinson.

Born in Amherst, Massachusetts, where girls were expected to study the natural sciences, Dickinson was extraordinarily well positioned to respond to Darwin's ideas. After studying at Mount Holyoke, Dickinson moved back to Amherst and lived in her family home on the edge of the

Amherst College campus. She and her family were among the intellectual and cultural elite of the United States. Her father was a U.S. congressman. The family was instrumental in establishing Amherst College.

Dickinson was 29 years old when *On the Origin of Species* was published. She was an accomplished poet, but she usually kept her writing private. One of the few people who had the chance to read her poetry was her mentor, Thomas Wentworth Higginson, who shared Dickinson's knowledge of—and interest in—the natural world. This common interest bonded them together. In one early letter to him, she proclaimed, "I know the butterfly, and the lizard, and the orchis. Are not those your countrymen?"[12] She knew that Higginson was as interested in natural science as he was in poetry.

When Dickinson started writing to him, Higginson was one of the most prominent literary Darwinians in the United States. He frequently quoted Darwin. His 1860 lecture at the Concord Lyceum a few weeks after *On the Origin of Species* was published used quotations from Darwin's newest book to argue against slavery.[13] He framed his 1862 essay on the "Life of Birds" with a quotation from *The Voyage of the Beagle*: "'We do not steadily bear in mind,' says Darwin, with a noble scientific humility, 'how profoundly ignorant we are of the condition of existence of every animal.'"[14] Although it was somewhat unusual to cite Darwin in the mid-nineteenth century, what is most striking about this mention is that Higginson praised him for "noble scientific humility." He understood that Darwin did not pretend to be a master of nature. Few others were as admiring or as perceptive.

Higginson would eventually provide the closest personal link between Darwin and Dickinson. They had other social connections, but Higginson was the strongest tie. He was one of the only friends invited to visit Dickinson at home in Western Massachusetts in the poet's later years. He was also acquainted with Darwin and visited him twice in Kent. On his second visit, in 1878, Higginson would stay overnight at Darwin's home.

The social ties between Darwin and Dickinson are not particularly surprising. In cultural terms, nineteenth-century Massachusetts was

practically a British colony. Britain and New England were closely connected at the time, though everything in New England tended to be on a smaller scale. New England's yeoman farmers were very different from Britain's aristocratic landowners, but the differences between the emerging professional classes were much less significant. Darwin and Dickinson were born into similar social echelons. Darwin's father was a doctor; Dickinson's was a lawyer. They both moved in highly educated, socially progressive circles. While Dickinson's family had been instrumental in the founding of Amherst College, Darwin's family patronized a wide variety of institutions (Darwin's grandfathers were both *Lunar Men*, founders of the Lunar Society of Birmingham. Ten members of the Darwin-Wedgwood clan were Fellows of the Royal Society). Darwin's fortune came partly from the industrial pottery established by his Wedgwood grandfather and partly from his family investments in railroad companies and other ventures. Dickinson's Norcross grandfather was a canny investor who left substantial property to the poet's mother. Her father was an enthusiastic proponent of the railroad and the telegraph who made significant investments to bring the new technologies to Amherst. Thus, Darwin and Dickinson were heirs of industrialization, fortunate scions of nineteenth-century capitalism.

They were both wealthy enough to be able to avoid the usual obligations. Darwin did not need to find a paying job; Dickinson did not need to marry. Instead, both could stay home and spend their time focused diligently on observing the natural world and writing about it. Their financial independence allowed them to concentrate full time on writing. Darwin cared deeply about literature; he was a writer as well as a naturalist. Dickinson's interest in nature was equally profound; she was a naturalist as well as a poet.

Darwin sailed around the world but never visited North America. After he returned from his great voyage and established himself in the village of Downe, he became somewhat reclusive. Dickinson never left the United States. In her twenties she traveled south along the Eastern Seaboard to Washington, DC, but as she grew older she stayed closer and closer to home. From the 1850s to the 1880s, Darwin and Dickinson lived surprisingly similar lives in similar places.

The connections between Darwin and Dickinson went much deeper than their overlapping friendships and their similar circumstances. Caught in the middle of the great disenchantment that Weber would document, both Darwin and Dickinson grappled with the massive cultural changes wrought by modern science. Over their careers, each would wrestle with the implications of dividing the study of nature from philosophy and poetry. Was it possible that the material world was entirely separate from any higher ideals? Was the universe random—neither good nor bad but somehow outside of ethics? Was the cosmos meaningless? Through their influential works, both addressed these questions. They advanced scientific ways of thinking while continuing to insist that the natural world was rich with mystery.

Today, Dickinson and Darwin are remembered very differently, most obviously in relation to gender and nationality. We tend to picture Dickinson as a feminine character: a young lady in a white dress in her bedroom in Massachusetts, her days spent writing or picking wildflowers at the edge of her family's hayfield, far from the center of the British Empire. In contrast, we imagine Darwin sailing around the world aboard HMS *Beagle* or striding across London with a wild Victorian beard.

Of course, the differences between these two figures go deeper than their popular images. During her lifetime, Dickinson was not a public figure. Although she wrote thousands of poems, she published only ten. In contrast, Darwin was a celebrity who published more than a dozen books and played many public roles. Dickinson never married. Darwin and his wife, Emma, had ten children, seven of whom survived to adulthood. While Darwin was a Fellow of the Royal Society, Dickinson wondered if the pine tree outside her window was a "'Fellow of the Royal' Infinity."[15]

The professionalization of science in the mid-nineteenth century had unexpected consequences for both figures. Darwin had set out to be a naturalist and natural philosopher—a well-rounded man of science—before British universities offered degrees in the natural sciences. His formal education focused on the classics, and he trained to be a clergyman. Later in his career, he would embrace the developing

scientific method, but he mourned—and never entirely relinquished—a deeply Romantic love of nature. His work helped the sciences to become culturally central, yet a year before he died, he complained, "My mind seems to have become a kind of machine for grinding general laws out of large collections of facts."[16]

Dickinson was born in 1830, during a brief window of time when people in Massachusetts thought the physical sciences were the most appropriate topic for girls to study. Indeed, one of the reasons for coining the word "scientist" was to make room for the accomplished women who could not readily be described as men of science. The historian Kim Tolley has documented that in the United States in the first decades of the nineteenth century "female higher schools placed a greater emphasis on scientific subjects than did similar, contemporary institutions for males."[17] Dickinson's formal education included botany, geology, astronomy, and chemistry. She wrote most of her poems after Darwin published *On the Origin of Species* in 1859. Yet although Dickinson found ways to breathe natural magic back into scientific thought, few readers were able to recognize the science in her poetry. In 1890, when the first edition of her poems was published, it was almost impossible for readers to see that this very private Massachusetts woman could have been a profound philosophical, theological, and scientific thinker as well as a major poet. By the time readers caught on to her importance as a poet, poetry had come to be viewed as largely irrelevant to science.

Many of Dickinson's readers have overlooked her scientific acuity and her conviction that poetry and magic were valid and useful approaches to nature. Her beloved sister-in-law, Susan Gilbert Dickinson, did not make that mistake. After Dickinson's death, Susan described her as a "magician." According to Susan, Dickinson's magic was not supernatural but a new, modern version of natural magic. She was "quick as the electric spark in her intuitions and analyses," Susan wrote. Her conservatory bloomed with "rare flowers," and she "knew her subtle chemistries." Though her imagination was shaped by her study of botany, physiology, geology, and astronomy, Dickinson rejected the approach to the scientific method that Darwin described as "grinding

general laws out of large collections of facts."[18] Instead, Susan reported, Dickinson thought life was "all aglow."[19] Dickinson never allowed her close and careful observation of the natural world to diminish her sense of enchantment.

Dickinson was not alone in her effort to resist disenchantment. In *The Myth of Disenchantment*, the historian of religion Jason Ā. Josephson Storm explains that "for all the polemical attacks against superstition and magic, disenchanting efforts were only sporadically enforced. . . . Notions of magic and spirits keep resurfacing as redemptive possibilities."[20] Many nineteenth-century thinkers regretted the retreat of magical thinking. The pragmatist philosopher William James described it as "a very sad loss" "for certain poetic constitutions" "that the naturalistic superstition, the worship of the God of nature simply taken as such, should have begun to loosen its hold upon the educated mind."[21] Without enchantment, James worried, life would not be worth living. In his view, disenchantment was not absolute or inevitable. It was not even desirable.[22] Even so, by the end of the nineteenth century, universities and schools were full of dogmatic adherents of disenchantment. Gradually, the way that educated people in Europe, Britain, and America looked at the world changed.

As higher education grew hostile to magic, the ideas of earlier scholars became somewhat embarrassing. University libraries and museums reorganized, deemphasizing works by figures like Isaac Newton and Cotton Mather that focused on such topics as alchemy and witchcraft. Magic was so discredited among scholars that its terms became unfamiliar, even for historians. Everything from alchemy to Zoroastrianism was labeled *superstition*.

The new hostility to superstition was a by-product of secularization. The growing consensus among educated people was that scientific approaches had more validity than both religion and magic. As religion and science came into conflict, schools and universities separated religion from science and moved explicitly theological thought into specialized divinity schools. No one knew quite what to do with magical thought. Although the shift in the credibility accorded to different

approaches was dramatic, the more radical change was that magic, religion, and science came to be viewed as not only separated from but even opposed to one another.

If natural philosophy and its bygone companions natural history and natural theology seem strange to twenty-first-century readers, natural magic might seem almost unimaginable. During Charles Darwin's and Emily Dickinson's childhood years, however, "magic" was not necessarily dismissed as superstition or associated with the supernatural. The study of nature embraced many overlapping approaches. Collecting and classifying objects was called natural history. Deducing general laws was the work of natural philosophers. The search for God—the Christian God—in the natural world was the purview of natural theology. Along similar lines, mysterious natural forces and transformations—changes related to life and death, electricity and magnetism, the formation of crystals and gases—had long been understood as natural magic.

As early as 1496, the Renaissance humanist Giovanni Pico della Mirandola had argued that natural magic "when well-researched" was "nothing more than the final realization of natural philosophy."[23] For hundreds of years afterwards, natural magic and natural philosophy were interchangeable. In 1605, Francis Bacon explained that natural magic was characterized by "good and fruitful inventions and experiments."[24] When the English translation of Giambattista della Porta's book *Natural Magick* was published in 1658, its title page promised "all the riches and delights of the natural sciences."[25]

For early modern thinkers, "natural magic" was an attempt to understand and explain the hidden properties of things. For the most part, these thinkers tended to use *occult* to describe mysterious or invisible phenomena—such as the phenomena we know today as gravity, electromagnetism, and thermodynamics. In later years, "occult" began to imply intentional secrecy on the part of the practitioner. The association of the occult with supernatural rituals came even later. Even after the occult and the supernatural became entwined with each other, natural

magic was imagined in opposition to the supernatural: by the early nineteenth century, it encompassed the work of chemists, horticulturalists, animal breeders and trainers, and medical practitioners (from midwives to mesmerists).

Magic was not the only English word whose meaning shifted over time. *Science* changed meaning as well. When Francis Bacon and his contemporaries used the word "science," they meant to describe any coherent body of knowledge, what an English speaker of the twenty-first century might describe as an academic discipline. For Bacon the sciences included grammar, logic, and rhetoric as well as arithmetic, geometry, music, and astronomy—the trivium and quadrivium of medieval universities.

When Darwin and Dickinson were young, science and magic were still closely associated. Popular demonstrations of new technologies and scientific discoveries were often framed as displays of natural magic. Although many people found the advances in physics and chemistry mysterious, few saw them as diabolical. In fact, it was the other way around: increasingly, witches, demons, and evil spirits were dismissed as hoaxes or delusions.

Emily Dickinson was born in 1830, just as modern science emerged from disparate strands of natural history, natural theology, natural philosophy, and natural magic. In Britain, one turning point, when "science" became more like science as we know it today, can be pinpointed in 1831, when the British Association for the Advancement of Science (BAAS) was launched. The men who started the BAAS hoped their new organization would become a more professional alternative to the clubby Royal Society, which was full of aristocratic amateurs.

The founders of the BAAS, John Herschel, Charles Babbage, and David Brewster, all published influential books on scientific method around this time. In 1830, Herschel published *Preliminary Discourse on Natural Philosophy*, which described the experimental methods of natural philosophy as rooted in alchemy and natural magic.

His colleagues urged their contemporaries to turn away from the old ways. Babbage's *Reflections on the Decline of Science in England and Some of Its Causes* (1830) argued for the professionalization and intellectual

division of labor. Meanwhile, Brewster hoped to demystify science completely. His book *Letters on Natural Magic* (1832) carefully separated science from magic. In Brewster's mind, mystery and magic were the enemies of the modern scientific methods that the BAAS wanted to promote. Brewster emphatically rejected the old notion of equivalency between physical science and natural magic and starkly distinguished natural philosophy from natural magic.

According to Brewster, the central distinction between natural philosophy and natural magic lay in how knowledge was used. Natural philosophers shared their knowledge widely for the good of all humanity, while practitioners of natural magic tried to keep scientific knowledge hidden (or occult) so that science and technology could be used to manipulate the credulous. Brewster explained, "The subject of Natural Magic is one of great extent as well as of deep interest. In its widest range, it embraces the history of the governments and the superstitions of ancient times, – of means by which they maintained their influence over the human mind, – of the assistance which they derived from the arts and the sciences, and from a knowledge of the powers and phenomena of nature."[26]

Brewster defined natural magic as science in the service of tyranny. As he put it, "The prince, the priest, and the sage, were leagued in a dark conspiracy to deceive and enslave their species."[27] Brewster wanted to fight against the "dark conspiracy" by explaining the science behind marvels and illusions.

The new emphasis on making ideas public brought new opportunities and new pressures. One strange side effect of the shift toward a scientific method that required publication was that the privacy long accorded to amateurs and independent scholars was practically demonized—keeping ideas private came to be seen as somewhat occult, while marvels and wonders were greeted with new skepticism. Brewster's *Letters on Natural Magic* embraced this cultural shift. As he put it, "The science of chemistry has from its infancy been preeminently the science of wonders. In her laboratory the alchemist and the magician have revelled uncontrolled, and from her treasures was forged the sceptre which was so long and so fatally wielded over

human reason."[28] In Brewster's mind, any "science of wonders" was dubious, even dangerous.

Interest in scientific explanations of magic tricks extended from Edinburgh and London to Dickinson's hometown. In 1834, in Amherst, Massachusetts, an anonymous author published *Ventriloquism Explained: And Juggler's Tricks, or Legerdemain Exposed: With Remarks on Vulgar Superstitions. In a Series of Letters to an Instructor*. Dickinson's neighbor Edward Hitchcock, presumably the "instructor" mentioned in the title, wrote the preface.[29] Like Brewster, the Amherst author tried to explain magical effects by revealing the trickery and deception behind them. At the same time, despite the author's claim that the book was intended to compel "wandering jugglers to live by honest labor rather than by infamous deception,"[30] *Ventriloquism Explained* aimed to profit from the popularity of the magic shows and magicians it purported to debunk.

At times these works seemed to be attempts to popularize scientific principles by piggybacking on interest in the paranormal. Sometimes they even functioned as instruction manuals. In *Natural Magic*, Brewster offered detailed diagrams of magic lanterns and other illusion-producing devices. Similarly, *Ventriloquism Explained* gave careful instructions on how to produce a variety of vocal effects and ended by encouraging pupils "to try experiments, in hours of amusement, with their vocal organs" while cautioning them against carrying "these imitations so far as to diminish their own self-respect."[31]

Something about these attitudes toward magic was inherently contradictory. On the one hand, magic was fraudulent, if not diabolical. On the other, it was entertaining, even fascinating. Books about magic sold very well—often better than works of natural philosophy or science. According to Janet Browne, popular displays of scientific materials in Britain fell "indiscriminately into a miscellaneous spectrum of stage shows, art exhibitions, pageants, theatres, circuses, painted panoramic displays, fireworks, magic lanterns, freak shows, funfairs, and the crammed glass cases of civic museums."[32] The author of *Ventriloquism Explained* remarked, "I can give no better epithet than *mountebank* or *juggler*, to those penny-seeking idlers who impose upon the public by

their petty tricks of legerdemain,"[33] declaring, "Lectures on scientific subjects have done much good throughout our country, but the dark deeds of mountebanks cannot be too severely reprobated."[34] Paradoxically, readers would not necessarily have purchased a volume of scientific lectures by the anonymous author. The "dark deeds of mountebanks" were the draw—they made the book attractive to readers. But how dark were such deeds? Were they diabolical, or were they just unscientific? The book described "a painful uncertainty in the minds of many as to the various phenomena of Legerdemain."[35] Such uncertainty was not painful to everyone, but there is no question that the boundaries between science and magic were often unclear.

Darwin's and Dickinson's understanding of magic grew from these tangled roots. For them, science and magic—and disenchantment and enchantment—were intertwined. Jason Ā. Josephson Storm describes the early nineteenth-century conception of the relationship between enchantment and disenchantment as a "Romantic Spiral" in which the effect of disenchantment is to create more powerful enchantments. As he puts it, "*Magic had to be eliminated so that we could make it real*."[36]

Shortly after Darwin and Dickinson died, *The Golden Bough* by J. G. Frazer argued against circular accounts of history. Frazer thought that history moved in steps, like a staircase. He claimed that as societies developed, belief systems progressed in distinct, separate stages from magic to religion to science. Frazer's influential account made it hard to imagine magic, religion, and science coexisting. More recently, many scholars have pushed back against *The Golden Bough*. Twenty-first-century approaches to the history of magic tend to stress the coexistence of many ways of understanding the world and continuity across centuries. Unlike the scholars of the late nineteenth and early twentieth centuries, current scholars avoid belittling magical thought.[37]

I am interested in natural magic because I understand it as a way of thinking about nature that is interactive and participatory. When viewed from a magical perspective, the world appears to be alive with relationships. Other ways of thinking—those that we imagine as nonmagical or even antimagical—render the world as either a hierarchy ordained by a superior being or a random grouping of unrelated material objects.

The twenty-first-century archaeologist Chris Gosden's definition of magic harks back to the old tradition of natural magic: "Magic sees spirits in the land, considers how people and animals are related, and tries to understand transformations around birth and death."[38] This explanation has three parts. First, there is the attempt to see the generally unseen "spirits in the land." Next, there is a sense that "people and animals are related." Finally, there is a focus on how birth and death do transformative work in the world. Gosden claims that magic and modern science resonate with each other, not only because of their intertwined history but also because of their shared interest in unseen forces, complex interconnections, and transformative change. As he puts it, "The forces defined by science find echoes in magic's insistence that spirits animate the world."[39] In *Magic: A History*, Gosden argues that magic, science, and religion continue to coexist and that magical thinking persists in the twenty-first century.

In addition to these historians, scholars in other fields—philosophers, physicists, and biologists for the most part—have reengaged with the concepts of natural magic in recent years. These figures do not see enchantment as confined to the past. In *A Thousand Plateaus*, the philosophers Gilles Deleuze and Felix Guittari turned toward botany, describing the tangled relationships between human and nonhuman beings in terms of rhizomes, the buried network of root systems that form underground, invisible connections between different plants. In *The Enchantment of Modern Life* and *Vibrant Matter*, the philosopher Jane Bennett has celebrated enchantment and worked to reanimate the early nineteenth-century concept of vitalism. In *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*, the physicist Karen Barad has argued that matter has agency. Donna Haraway, the biologist turned feminist philosopher, started with simians and cyborgs, then focused on the companionship between human and nonhuman animals. Most recently, in *Staying with the Trouble*, Haraway has turned her attention to the mysterious transformations that take place deep in the compost pile. These scholars and others have pushed back against nineteenth- and twentieth-century discourses of disenchantment, but they do not usually describe their approaches as

magical. Even critics of disenchantment are somewhat wary of mentioning magic.

Magic continues to have a place in the popular imagination. However, although many people enjoy fantastical works of fiction about witchcraft and wizardry, few educated people like to admit that they believe in magic. Even fewer would be able to separate the idea of magic from the supernatural. In fact, the concept of magic generally goes unexamined. For most, it works as a metaphor. Some religious believers take the idea more seriously. Evangelical Christians tend to see magic as supernatural and anti-Christian. In contrast, Wiccans and other modern pagans make magical rituals cornerstones of their religious practice. These groups have very different views, but Wiccans and Evangelicals are both drawn to supernatural phenomena. They are often skeptical of science and scientific approaches to understanding the world, and they do not tend to express as much interest in natural magic—magic entwined with natural science—as they do in supernatural magic.

Darwin and Dickinson both saw nature as enchanted, but their magical way of knowing—their interest in natural magic rather than supernatural magic—can be hard to access in the contemporary world. To imagine enchantment as an epistemology—an approach to understanding the world—we need to turn our focus away from magical practices such as rituals and incantations. At the same time, if we want to focus on natural magic as Darwin and Dickinson understood it, we need to imagine a kind of enchantment that is not necessarily supernatural. Jane Bennett is helpful here. She describes enchantment as a feeling that "the marvelous vitality of bodies human and nonhuman" can inspire "deep attachment" and "a mood of fullness, plenitude, or liveliness."[40] Darwin and Dickinson described such experiences as moments of "wonder."

Darwin never lost his sense of wonder or his conviction that all kinds of beings were mysteriously entangled. His endless experiments with plants and animals were always framed in terms of learning about connections. He was a conscientious specific naturalist who tried to learn as much as he could about particular species, but he was not limited to finding the dividing lines between species. Darwin was always more interested in the mystery of mysteries at the heart of interspecies

relationships. He tried to persuade his readers of their kinship with seaweeds, coral reefs, and barnacles; mammoths, mastodons, and elephants; dogs, finches, and primates; beetles, orchids, and earthworms. Darwin's great project was to show how the hardest things that individuals face—war, famine, struggle, even death—can give rise to new forms of beauty and new kinds of love.

A few of Darwin's contemporaries saw that Darwinian science could create new forms of enchantment as it built new connections and delved down into the mysterious roots of the great green tree of life and death. Dickinson was not the only person (nor even the only poet) to explore the magical possibilities of Darwinian science. But she was among the greatest of them. Her poetry sings with the strange green magic of Darwinian science. By putting Emily Dickinson and Charles Darwin on the page together, I hope to open a window into a time before thinkers worked in atomized disciplinary silos, a time when scientists, philosophers, theologians, poets, and political activists were in constant conversation. Their lives and works invite us home to an enchanted world.

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Notes: Page numbers in *italics* indicate figures. ED indicates Emily Dickinson, and CD indicates Charles Darwin. *On the Origin of Species* and Darwin's other works are in the entry "Darwin, Charles, works." Likewise, the poems of Dickinson are in the entry "Dickinson, Emily, poems."