

Magic in Science, Science in Magic

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Introduction

Imagine you have travelled many hundreds or thousands of years into the past. There, you meet your ancestor, Bernie. You and Bernie start getting to know each other, so you decide to show Bernie something on your phone, because let's be real, you would hardly travel anywhere in the farther reaches of time or space without your precious phone. Now Bernie inquires about this phone. You tell Bernie that this device has a number of functions. It can let you talk to someone miles away, record videos or pictures, predict the weather, or basically plan your whole life out. Bernie would then proceed to either worship you, call you a prophet or a witch, or send you to some equivalent of a place like an asylum, depending on who you're imagining Bernie to be.

Or maybe Bernie decides to travel through the same portal you did to step into the present. Bernie sees metal carriages carrying people on land, or metal birds soaring overhead, carrying hundreds of people through the sky. Bernie finds out that doctors can peer inside the body without cutting it open, then replace failing hearts with new ones. To you, this is just science. To Bernie, this would most definitely not be science. It would be sorcery. And now you're taking Bernie to the hospital because Bernie's mind might just have short-circuited.

We are accustomed to drawing a sharp line between **magic and science**. Magic, we are told, is irrational, mystical, unreal. Science, by contrast, is rational, measurable, explainable. One belongs to the imagination; the other to the laboratory, or more so, our reality. But this binary is misleading. For much of history, what we now call science was once considered magic. And even today, the language of science is saturated with talk of *miracles*, *wonders*, and *mysteries*.

My own curiosity about this tension comes from standing between two very different worlds. As a fantasy writer, I have long been drawn to the extraordinary, to the imaginative worlds of spells, transformations, and mythic journeys. As someone working in IT, I deal daily with systems that are equally as magical: data transmitted invisibly across continents, algorithms predicting behavior, networks automating decisions. For me, the world of science and magic is not separated by a fixed line. Both writing and technology have taught me to see that the extraordinary is never far away: sometimes in the page of a story, sometimes in the glow of a screen.

This essay also comes out of reading and listening widely to contemporary voices that grapple with the same question. Among them, Deepak Chopra stands out for his constant insistence that reality itself is an expansion of consciousness, and that what we perceive as the material world is inseparable from our awareness of it altogether. Works like *You Are the Universe* (2017), co-authored with physicist Menas Kafatos, present the provocative claim that

consciousness is not a by-product of matter but its foundation. Chopra has often been controversial, but he is also one of the few voices who frame science itself as a modern form of enchantment, suggesting that the latest discoveries in cosmology and quantum physics bring us closer to the sense of wonder once attributed to magic. And that is the point I will be carrying forward here as well.

It was after engaging with Chopra's work, alongside other scholars of science, religion, and philosophy, that I began to imagine this essay. My aim is not to collapse science into spirituality, nor to defend magic as superstition, but to explore how science and magic might be seen as companions on a continuum of wonder and explanation. When science explains something, it does not kill the magical; it transforms it, relocating our awe into new domains. The story of science is, in many ways, the story of magic reborn.

Redefining Magic

When most people hear the word magic, they picture stage tricks, spellbooks, or midnight rituals by firelight. Magic is often cast as something opposed to reason: illusion, superstition, or fantasy. But if we step away from the stereotype, we can see that *magic* has always meant something deeper and more human.

For me, this realization grew out of living in two parallel worlds. On one side, my work immerses me in technologies that would have been unimaginable just a century ago: clouds that hold endless information, algorithms that seem to know our choices before we make them, networks that make distance vanish in an instant. These are everyday tools in my profession, yet if I placed them in a novel, they could easily pass for sorcery. On the other side, the writer in me is devoted to fantasy, a genre that celebrates transformation, awe, and the bending of reality. Holding these worlds together has taught me that "magic" is less about tricks and more about how humans frame the extraordinary.

Through this lens, magic can be redefined in three ways: as the unexplained, the extraordinary, and the transformative.

The Unexplained

Magic has always lived at the frontier of knowledge. Before meteorology, lightning was Zeus's weapon. Before germ theory, disease was a curse. When no clear mechanism could be identified, people named the phenomenon "magic", not as an endpoint, but as a placeholder for the unknown (Maia, 2017). In this sense, magic is not an illusion; it is our first vocabulary for mystery, for the unknown.

The Extraordinary

Magic also names the moments that overwhelm ordinary perception. Eclipses turning day into night, the aurora painting the sky, a desert bursting into bloom after rain; these events are "magical" not because they resist explanation, but because they exceed expectation. Even in

modern science, scholars like Jason Josephson-Storm (2017) remind us that wonder and enchantment remain essential, whether we find them in a ritual or in a telescope.

The Transformative

Finally, magic is the name we give to radical change. Alchemists sought to transmute one metal into another; today, chemists transmute petroleum into plastics or create entirely new materials all the time. Traditional healers sought balance through herbs, rituals, and spiritual practice; modern medicine pursues the same goal through surgical precision and biomedical innovation. Transformation has always been at the core of magic, with symbols and rituals carrying as much meaning in their time as chemical reactions or surgical techniques do today. As Arthur C. Clarke (1973) famously wrote, “Any sufficiently advanced technology is indistinguishable from magic.”

Seen this way, the line between science and magic becomes porous. In fact, scientists themselves often reach for magical language: the “magic of DNA” unraveling life’s code, the “miracle drug” that saves lives, the “wonder of the stars” that compels us to look upward (Kuhn, 2019). Einstein, too, captured this continuum when he wrote that “the most beautiful thing we can experience is the mysterious. It is the source of all true art and all science” (Einstein, 1931/2006).

Historical Shifts: from Magic to Science

Many legends and cultural practices, once described in terms of supernatural forces or mythical unknowns, can now be understood through scientific explanation. Events that seemed miraculous — eclipses, earthquakes, plagues — were woven into myth and religion as signs of divine presence. Over time, astronomy, geology, and medicine revealed the mechanisms behind them. Even rules and taboos preserved in religious or cultural traditions often carried practical wisdom that science later confirmed. Dietary restrictions, seasonal rituals, or practices of hygiene may have been framed in spiritual language but were effective at preventing disease or sustaining ecological balance. What appeared to be magical decrees can now be seen as early forms of empirical observation encoded in culture.

History offers countless examples of practices once regarded as *magic* that later became the foundations of science. What we now recognize as rational disciplines often began as attempts to harness forces that seemed mysterious, even divine. Yet when the mystery was explained, the sense of awe did not vanish; it simply shifted.

Alchemy → Chemistry

Alchemists once sought the philosopher’s stone, the elixir of life, and the transmutation of lead into gold. These pursuits were often dismissed as mystical or fantastical, yet they gave rise to techniques of experimentation, distillation, and observation. Modern chemistry, with its ability to synthesize medicines, plastics, and new materials, carries forward the same dream of

transformation. As Lawrence Principe (2013) shows, the “magical” goals of alchemy seeded the empirical practices that now define the laboratory.

Astrology → Astronomy

For much of history, the stars were read as signs of fate. Astrology bound human lives to celestial movements, weaving myth with observation. Over time, careful measurement transformed astrology’s observational core into astronomy, revealing the cosmos as a vast, dynamic system. Yet astronomy has never lost its sense of wonder. Black holes, exoplanets, and galaxies billions of light-years away magnify the awe once reserved for omens. As Jason Josephson-Storm (2017) argues, disenchantment is never complete; the cosmos continues to enchant, even when described in the language of physics rather than prophecy.

Healing Rituals → Medicine

In many cultures, illness was once seen as a curse or imbalance, and healing involved ritual, herbal knowledge, and communal care. Today, medicine uses empirical methods and advanced technologies: MRI machines that see inside the body, organ transplants that extend life, and genetic therapies that reshape inherited conditions. To earlier generations, these would have been miracles. Even in modern language, groundbreaking treatments are often hailed as “medical miracles” (DeForest, 2021).

Far from erasing enchantment, scientific explanation relocates it. Alchemy’s dream of transformation lives on in chemistry; astrology’s reverence for the stars persists in astronomy; ritual’s pursuit of healing continues in medicine. Each shift is less a replacement than a translation, proof that human beings have always sought wonder in different tongues. The laboratory, the observatory, the hospital, each is a modern temple where the same awe is practiced under new names. Science, then, is not the death of magic, but its reincarnation, carrying forward the same desire to pierce the veil of mystery.

Science Adding Magic

If history shows that science often begins where magic once stood, modern science demonstrates that explanation itself can generate new forms of wonder. The more knowledge expands, the more uncanny and wondrous the world becomes, often in ways that rival the wildest myths.

Quantum Mechanics

In the early 20th century, physicists discovered that at the subatomic level, reality behaves in ways so counterintuitive that even Einstein resisted calling them complete. Particles can exist in multiple states at once (superposition), become instantaneously linked across vast distances (entanglement), and blur the line between probability and reality (Heisenberg, 1927/2007). As Niels Bohr observed, “Anyone who is not shocked by quantum theory has not understood it”

(Pais, 1991). Richard Feynman echoed the same sentiment decades later: “I think I can safely say that nobody understands quantum mechanics” (Feynman, 1965/2011). What could sound more magical than matter being both wave and particle, or an electron “tunneling” through barriers as though phasing through walls?

Cosmology

The cosmos deepens enchantment as science progresses. Black holes bend space-time, dark matter outweighs visible matter yet remains invisible, and cosmologists seriously entertain multiverse theories (Greene, 2011). Each of these discoveries, grounded in equations and observation, reads like myth written in mathematics. The scale of cosmology suggests that reality is stranger and vaster than any premodern cosmology dared to imagine.

Complexity and Chaos

Chaos theory and complexity science reveal that unpredictability and order are inseparable. Weather systems, ecosystems, and economies display patterns that emerge spontaneously yet resist precise prediction (Gleick, 1987). The “butterfly effect,” where the smallest disturbance can ripple into massive change, captures the same uncanny logic once attributed to spells or omens.

Consciousness and Reality

Some thinkers go further by suggesting that consciousness itself is the foundation of reality. Deepak Chopra, in *You Are the Universe* (2017), co-authored with physicist Menas Kafatos, argues that matter, time, and space arise from consciousness rather than the other way around. He writes that “consciousness, rather than being an epiphenomenon of matter, is actually the source of matter.” This position remains controversial within scientific circles, especially in relation to Chopra’s earlier ideas of “quantum healing,” yet it powerfully illustrates how scientific concepts can be reimagined to highlight mystery rather than dispel it. Chopra’s work represents an effort to restore enchantment by showing that science and spirituality converge in consciousness, turning the universe itself into a site of wonder.

Coding as Modern Magic

Even in the realm of technology, the language of magic persists. As Samuel Arbesman wrote in *The Atlantic*, “When people say that coding is magic, they mean that coders can transform the world, as though with incantations and spells” (Arbesman, 2016). A string of symbols typed into a machine can alter economies, shape human relationships, or create entire virtual worlds. This is not metaphorical sorcery, it is the everyday work of programming.

Taken together, these insights reveal that science does not strip the world of magic; it multiplies it. Quantum entanglement, black holes, chaotic systems, the primacy of consciousness, and the incantations of code all push the boundaries of imagination as much as any myth ever did. What once belonged to myth now belongs to method, and the awe survives the translation.

Enchantment Or Disenchantment?

Not all thinkers agree that science preserves or relocates magic. For many, the rise of modern science marked the end of enchantment. Max Weber, in his 1919 lecture *Science as a Vocation*, described modernity as an *Entzauberung der Welt* — a “disenchantment of the world” in which rationalization strips away mystery and renders reality calculable, predictable, and controllable (Weber, 2004). What had once been alive with spirits, myths, and unseen forces became flattened into systems of measurement.

This perspective has remained influential. Philosopher Charles Taylor (2007) argued that secular modernity confines us to an “immanent frame” in which transcendence feels closed off, leaving a cultural longing for enchantment that science cannot supply. Jacques Ellul (1964) critiqued technological society for reducing human experience to mechanized processes and metrics. From these perspectives, science does not reframe magic, it eradicates it, leaving behind a world of mechanisms without mystery.

The tension is sharpened by debates around figures such as Deepak Chopra, whose claims about consciousness and quantum physics have been criticized by scientists for stretching metaphors beyond empirical limits (Pigliucci, 2010). Critics see such interpretations as evidence that the desire for enchantment can lead to confusion or even pseudoscience when it borrows too freely from scientific language.

Yet enchantment persists despite these warnings. At the very smallest scales, quantum mechanics defies common logic; at the largest scales, cosmology reveals infinities, singularities, and universes beyond comprehension. Even in medicine and technology, society continues to speak of “miracle cures” and “medical marvels.” As Carl Sagan (1995) argued, science itself is “not only compatible with spirituality; it is a profound source of spirituality.”

If we could step back in time and explain these discoveries to our ancestors, maybe Bernie, which would seem more magical? Zeus hurling thunderbolts, or meteorology predicting lightning storms with satellites in orbit? A sorcerer chanting spells, or a programmer typing symbols that move money, messages, and machines across the globe?

The deeper pattern that emerges is that science and magic are not strict opposites but different modes of accessing wonder. Both serve as ways of naming humanity’s encounters with the extraordinary and expanding the boundaries of imagination.

Bronisław Malinowski (1948), in his anthropological studies, observed that magic offered a practical way of coping with uncertainty, providing rituals that made the unpredictable feel navigable. Magic does not aim to eliminate the unknown; it seeks to work with it, shaping awe into narrative and symbol.

Science approaches the unknown differently: through observation, experimentation, and theory. Yet even here, its task is not to strip away mystery entirely but to frame it in ways that can be

explored. Karl Popper (1959) emphasized that science does not establish final truths but instead pushes the limits of what can be tested, always open to revision. Its humility before the unknown resembles the magician's recognition of forces beyond control, even if the language differs.

In practice, both magic and science invite humanity to imagine more than what is immediately visible. Magic does this through myth and symbol; science does it by revealing that reality itself is stranger than expected. Max Weber (1919/2004) famously spoke of modernity as a process of *disenchantment*, in which rationalization drained the world of wonder. Yet as Jason Josephson-Storm (2017) argues, enchantment has never truly disappeared. It persists within science itself, in the awe of technology, in the marvels of medicine, and in the mysteries of quantum physics.

Perhaps disenchantment is not inherent to science but arises from how it is interpreted. When explanation is treated as reduction, as stripping away mystery, wonder recedes. But when explanation is treated as revelation, as uncovering new layers of reality, science expands rather than diminishes the magical.

Seen this way, science and magic are not enemies but partners. One cloaks wonder in narrative, the other in mathematics, but both remind us that the world exceeds our grasp. What matters is not the opposition between them, but the recognition that wonder, however named, remains essential to the human experience.

Conclusion

Magic and science have long been cast as adversaries: one bound to superstition, the other to reason. But the boundary between them has never been as rigid as this dichotomy suggests. Both are ways of naming humanity's encounter with the extraordinary. Both are modes of expanding imagination beyond the ordinary. And both remind us that explanation does not exhaust wonder, it reshapes it.

Every historical shift shows this continuity. Alchemy gave way to chemistry, yet the dream of transformation endured. Astrology yielded to astronomy, yet the cosmos remained a source of awe. Rituals gave way to medicine, yet healing is still spoken of in terms of miracles. At the cutting edge of physics, cosmology, and consciousness studies, science now produces mysteries as uncanny as any myth: particles entangled across galaxies, black holes bending time, universes multiplying beyond sight. Even in technology, coding itself has been described as the closest thing we have to magic; words and symbols that summon worlds into being.

For me, this is where the worlds I inhabit converge. As a writer, I build stories steeped in wonder; as someone working in IT, I engage daily with systems that would once have been called sorcery. Both experiences convince me that the real opposition is not between magic and science but between indifference and wonder.

Magic and science, then, are not enemies but travelers on the same road. One speaks in stories, the other in equations, yet both testify to the inexhaustible strangeness of existence,

and both invite us to keep our eyes open. As Einstein observed, “He to whom this emotion [of the mysterious] is a stranger ... is as good as dead: his eyes are closed” (Einstein, 1931/2006).

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