ONE

EIGHT WONDERS OF LIFE

An Awe Movement Begins

> ***The strange thing about life is that though the nature of it must have been apparent to every one for hundreds of years, no one has left any adequate account of it. The streets of London have their map; but our passions are uncharted.***
>
> • VIRGINIA WOOLF

The last time the word "awe" hit me with the force of personal epiphany, I was twenty-seven years old. I was in Paul Ekman's living room, having just interviewed for a fellowship in his lab to study emotion. Ekman is well-known for his study of facial expression, and a founding figure in the new science of emotion. At the conclusion of his querying, we moved to the deck off his home in the San Francisco hills. We were embraced by a view of the city. Thick fog moved through the streets toward the Bay Bridge and eventually across the bay to Berkeley.

Stretching for conversation, I asked Paul what a young scholar might study. His answer was one word:

Awe.

At that time—1988—we knew very little scientifically about emotions: what they are, how they influence our minds and bodies, and why we experience them in the first place.

Psychological science was firmly entrenched in a "cognitive revolution." Within this framework, every human experience, from moral condemnation to prejudice against people of color, originates in how our minds, like computer programs, process units of information in passionless ways. What was missing from this understanding of human nature was emotion. Passion. Gut feeling. What Scottish philosopher David Hume famously called the "master of reason," and Nobel Prize winner Daniel Kahneman, in *Thinking, Fast and Slow*, termed "System 1" thinking.

Emotions have long been viewed as "lower" and animalistic, disruptive of lofty reason, which is often considered humanity's highest achievement. Emotions, so fleeting and subjective, others observed, cannot be measured in the lab. Our passions were still very much uncharted some seventy years after Virginia Woolf's musing.

Ekman, though, would soon publish a paper—now the most widely cited in the field—that would push the scientific pendulum firmly toward emotion. In this essay, a field guide really, he detailed the *what* of emotions: They are brief feeling states accompanied by distinct thoughts, expressions, and physiology. Emotions are fleeting, shorter-lived than moods, like feeling blue, and emo-

tional disorders, such as depression. He outlined *how* emotions work: they shift our thought and action to enable us to adapt to our present circumstances. To approach the *why* of emotions, Ekman took a cue from Charles Darwin: Emotions enable us to accomplish "fundamental life tasks," such as fleeing peril, avoiding toxins, and finding nutritious food. Emotions are central to our individual survival and our evolution as a species.

A young science had a field guide, and scholars promptly went exploring. First, scientists mapped anger, disgust, fear, sadness, surprise, and joy, the emotions whose facial expressions Ekman had documented in the hills of New Guinea in the early 1960s. Next to appear in the lab were the self-conscious emotions—embarrassment, shame, and guilt. Studies charted how these states arise when we make social mistakes, and how blushes, head bows, awkward appeasing smiles, and apologies restore our standing in the eyes of others. Sensing that there is more to the mind, brain, and body than negative emotions, and more to the delights of life than "joy," young scientists then turned to studies of states like amusement, gratitude, love, and pride. My own lab got into the act with studies of laughter, gratitude, love, desire, and sympathy.

An emotion revolution in reaction to the cognitive revolution was underway, moving psychological science beyond its dry and cool cognitivist account of the mind and inattention to the body. Neuroscientists were mapping "the emotional brain." Studies alerted those interested in the secrets of love to the finding that marriages dissolve when partners express contempt to one another. Our culture wars over abortion, race, class, and climate crises could be traced back to gut feelings about the moral issues of our times. For faring well in life, emotion scientists determined that we are

better served by cultivating our "emotional intelligence," or EQ, than our IQ. Today we are still in the midst of "an age of emotion" in science, one that shapes every corner of our lives.

One emotion, though, would not get the call for this revolution, an emotion that is the provenance of so much that is human—music, art, religion, science, politics, and transformative insights about life. That would be awe. The reasons are in part methodological. Awe seems to resist precise definition and measurement, the bedrock of science. In fact, how would a scientist study awe in a lab? How could scientists lead people to feel it on cue and measure its near-ineffable qualities, or document how awe transforms our lives, if, indeed, it does?

There were theoretical barriers as well. As the science of emotion got off the ground, it did so in a theoretical zeitgeist that held that emotions are about *self*-preservation, oriented toward minimizing peril and advancing competitive gains for the *individual.* Awe, by contrast, seems to orient us to devote ourselves to things outside of our individual selves. To sacrifice and serve. To sense that the boundaries between our individual selves and others readily dissolve, that our true nature is collective. These qualities did not fit neatly within the hyperindividualistic, materialistic, survival-of-the-selfish-genes view of human nature so prominent at the time.

One cannot help but suspect that personal hesitations were at play as well. When people talk about experiences of awe, they often mention things like finding their soul, or discovering what is sacred, or being moved by spirit—phenomena that many believe to be beyond measurement and the scientific view of human nature.

Emotion science had a field guide, though, a road map for charting the what, how, and why of awe. What awe needed first was a definition, the place where all good scientific stories begin. What is awe?

Defining Awe

With emotion science turning its attention to the varieties of positive emotion, in 2003 my longtime collaborator at New York University Jonathan Haidt and I worked to articulate a definition of awe. At the time, there were only a few scientific articles on awe (but thousands on fear). There were no definitions of awe to speak of.

So we immersed ourselves in the writings of mystics about their encounters with the Divine. We read treatments of the holy, the sublime, the supernatural, the sacred, and "peak experiences" that people might describe with words like "flow," "joy," "bliss," or even "enlightenment." We considered political theorists like Max Weber and their speculations about the passions of mobs whipped up by demagogues. We read anthropologists' accounts of awe in dance, music, art, and religion in faraway, remote cultures. Drawing upon these veins of scholarship, we defined awe as follows:

> Awe is the feeling of being in the presence of something vast that transcends your current understanding of the world.

Vastness can be physical—for example, when you stand next to a 350-foot-tall tree or hear a singer's voice or electric guitar fill the space of an arena. Vastness can be temporal, as when a laugh

or scent transports you back in time to the sounds or aromas of your childhood. Vastness can be semantic, or about ideas, most notably when an epiphany integrates scattered beliefs and unknowns into a coherent thesis about the world.

Vastness can be challenging, unsettling, and destabilizing. In evoking awe, it reveals that our current knowledge is not up to the task of making sense of what we have encountered. And so, in awe, we go in search of new forms of understanding.

Awe is about our relation to the vast mysteries of life.

What about the innumerable variations in awe? How awe changes from one culture to another, or from one period in history to another? Or from one person to another? Or even one moment in your life to another?

The content of what is vast varies dramatically across cultures and the contexts of our lives. In some places it is high-altitude mountains, and in others flat never-ending plains with storms approaching. For infants it is the immense warmth provided by parents, and when we die, the enormous expanse of our lives. During some historical periods it is the violence humans are capable of, and during other times protests in the streets against the machines and institutions that perpetrate violence. The varieties of vastness are myriad, giving rise to shifts in the meaning of awe.

"Flavoring themes," Jon and I reasoned, also account for variations in awe. By flavoring themes, we meant context-specific ways in which we ascribe meaning to vast mysteries. For example, you shall learn that extraordinary virtue and ability can lead us to feel awe. Conceptions of virtue and ability vary dramatically according to context: whether, for example, we find ourselves in combat or at a meditation retreat, whether we are part of a hip-hop

performance or a chess club, whether we live in a region of religious dogma or one governed by the rules of Wall Street. How we conceptualize virtue and ability within our local culture gives rise to variations in awe.

Another flavoring theme that shapes the experience of awe is supernatural belief systems—beliefs, for example, about ghosts, spirits, extraordinary experiences, gods, the Divine, heaven, and hell. These beliefs imbue experiences of awe with culturally specific meanings. For example, for many people across history, experiences of awe in encounters with mountains, storms, winds, the sun, and the moon have been flavored with local stories and beliefs about the Divine. For others, those same mountains, storms, winds, the sun, and the moon stir a different kind of awe, one more grounded in a sense of what is sacred about nature but lacking the sense of the Divine.

Perhaps most pervasively, perceived threat also flavors experiences of awe, and can layer fear, uncertainty, alienation, and terror into our experience of the emotion. Perceptions of threat explain why people in certain cultures—such as the Japanese or Chinese—feel more fear blended with awe when around inspiring people than people from less hierarchical cultures do. Why psychedelic experiences with LSD, MDMA, or ayahuasca inspire pure awe for some and are flooded with terror for others. Why encounters with the Divine are filled with fear in some cultures, whereas in other cultures that lack ideas about a judgmental God they are defined by bliss and love. Why dying is oceanic and awe-filled for some and horrifying for others. And why cultural symbols like the American flag can move some to tears and chills, and others to shudder in the sense of threat and alienation.

In awe we encounter the vast mysteries of life, with flavoring themes like conceptions of virtue, supernatural beliefs, and perceived threat giving rise to near-infinite variations.

Eight Wonders of Life

Emotions are like stories. They are dramas that structure our day, like scenes in a novel, movie, or play. Emotions unfold in actions between people, enabling us, for example, to comfort someone in need, show devotion to a loved one, redress injustice, or belong to a community. Having defined awe, our answer to the question "What is awe?" needs next to move to people's own stories of the emotion.

When William James, a founding figure in psychology, went in search of understanding mystical awe at the turn of the twentieth century—an exploration we will consider later—he did not have people rate their feelings with numbers. He did not do experiments. He did not measure physiological reactions or sensations, which had long fascinated him. Instead, he gathered stories: First-person narratives, utterly personal, about encounters with the Divine. Religious conversions. Spiritual epiphanies. Visions of heaven and hell. And in discerning the patterns in these stories, he uncovered the heart of religion: that it is about mystical awe, an ineffable emotional experience of being in relation to what we consider divine.

Guided by this approach, Professor Yang Bai, a longtime collaborator of mine, and I gathered stories of awe from people in twenty-six countries. We cast our net broadly because of the scientific concern about "WEIRD" samples: those composed

disproportionately of people who are Western, Educated, Individualist, Rich, and Democratic. Our participants were anything but WEIRD. Participants included adherents to all major religions—many forms of Christianity, Hinduism, Buddhism, Islam, and Judaism—as well as denizens of more secular cultures (e.g., Holland). Our participants varied in terms of their wealth and education. They lived within democratic and authoritarian political systems. They held egalitarian and patriarchal views of gender. They ranged in their cultural values from the more collectivist (e.g., China, Mexico) to the more individualistic (e.g., the United States).

In our study, people were provided with the definition of awe you have considered: "Being in the presence of something vast and mysterious that transcends your current understanding of the world." And then they wrote their story of awe. Speakers of twenty languages at UC Berkeley translated the 2,600 narratives. We were surprised to learn that these rich narratives from around the world could be classified into a taxonomy of awe, the eight wonders of life.

What most commonly led people around the world to feel awe? Nature? Spiritual practice? Listening to music? In fact, it was *other people's courage, kindness, strength, or overcoming.* Around the world, we are most likely to feel awe when moved by *moral beauty*, the first wonder of life in our taxonomy. Exceptional physical beauty, from faces to landscapes, has long been a fascination of the arts and sciences, and moves us to feelings of infatuation, affection, and, on occasion, desire. Exceptional virtue, character, and ability—moral beauty—operate according to a different aesthetic, one marked by a purity and goodness of intention and action, and moves us to awe. One kind of moral beauty is the courage that

others show when encountering suffering, as in this story from the United Kingdom:

> The way my daughter dealt with the stillbirth of her son. I was with her at the hospital when he was delivered and her strength in dealing with this left me in awe. My little girl grew up overnight and exhibited awesome strength and bravery during this difficult time.

The courage required in combat is another time-honored source of awe. This is a stirring theme found in Greek and Roman myths, gripping scenes in films like *Saving Private Ryan*, and war stories veterans tell, as in this story from South Africa:

> I was in the Angolan war. One of our soldiers got shot. An officer risked his life and fears to drag the soldier to safety. In the process the officer was wounded but continued saving the soldier's life. I came out of hiding and secured the area for enough time in order for the officer to drag the soldier to safety.

Horrific acts also occasioned awe, but much less commonly, and most typically in epiphanies found in art, as in this example from Sweden:

> The first time I saw *Schindler's List* back in 2011. The music and the performance of the main actor were insanely powerful. And the grim truth of human nature. All I wanted to do, and all I did the next few hours, was cry.

Human atrocities captivate our imagination, but are more aptly deemed the provenance of *horror*, a different state than awe. And art, we shall see, so often provides a space in our imagination for contemplating human horrors, giving rise to aesthetic experiences of awe.

A second wonder of life is *collective effervescence*, a term introduced by French sociologist Émile Durkheim in his analysis of the emotional core of religion. His phrase speaks to the qualities of such experiences: we feel like we are buzzing and crackling with some life force that merges people into a collective self, a tribe, an oceanic "we." Across the twenty-six cultures, people told stories of collective effervescence at weddings, christenings, quinceañeras, bar and bat mitzvahs, graduations, sports celebrations, funerals, family reunions, and political rallies, as in this one from Russia:

> At the parade of victory, the city and entire country were with me. There was a procession called "Immortal Regiment" with portraits of soldier participants of the war. I felt pride for my country and people.

A third wonder of life should not surprise. It is *nature.* Often what inspired natural awe was a cataclysmic event—earthquakes, thunderstorms, lightning, wildfires, gale-force winds, and tsunamis, or for one participant from China, watching a flood rip through her village. Many mentioned night skies, whose patterns of stars and illumination were an inspiration of Greek, Roman, and Mesoamerican imaginings of the gods. Many worry today about how the dimming of the night sky in this era of light pollution is harming our capacity to wonder. Experiences in mountains, looking at canyons, walking among large trees, running through vast sand dunes,

and first encounters with the ocean brought people awe, as in this example from Mexico:

> The first time I saw the ocean. I was still only a child, listening to the waves and wind, feeling the breeze.

Common to experiences of natural awe is the sense that plants and animals are conscious and aware, an idea found in many Indigenous traditions and attracting scientific attention today. In this story of wild awe translated from Russian, notice how the participant remarks upon the awareness of trees, which seem to be looking at something alongside them:

> Five years ago, collecting mushrooms in the forest, I bumped into an uncommon hole in the ground. Around it all the trees stood in a circle as if gazing into the hole.

Music offered up a fourth wonder of life, transporting people to new dimensions of symbolic meaning in experiences at concerts, listening quietly to a piece of music, chanting in a religious ceremony, or simply singing with others. In this story from Switzerland, the individual feels connected to something larger than the self, a defining theme of awe:

> It was at around Christmas several years ago. I was away on a trip to different monasteries in west Switzerland with fellow students. We were in a Dominican monastery. It was snowing outside and it was freezing cold. The Romanesque church was only dimly lit and you could hear Gregorian songs—the acoustics were unparalleled. A feeling of reverence for

> something bigger and at the same time a feeling of comfort came over me.

Musical awe often arose in response to favorite rock groups, virtuosos, and, perhaps most poignantly, children, as in this story from Ireland:

> When my seven-year-old daughter went in front of a couple hundred people and played the tin whistle with such determination and I was in awe of her courage to do that. She got an applause after her performance. We were attending her communion in the local church with her brothers and extended family. I felt nervous for her before her performance but was in awe at the way she did her performance so well and the way she handled herself at such a young age. I gave her a big hug and kiss after and told her she was great.

So much for booming electric guitars; give me a tin whistle any day.

Visual design proved to be a fifth wonder of life. Buildings, terracotta warriors in China, dams, and paintings appeared in stories of awe from around the world. So too did more surprising kinds of visual design, as in this example from South Africa:

> I went to a customer factory for a machine inspection on a pharmaceutical sorting line. The machine's capabilities were astounding—mind-blowing. I was in complete awe with the functionality, speed, and design of the machine. This happened roughly one year ago inside my customer's factory and I was with my colleague (designer of the machine).

In his book *The Doors of Perception*, Aldous Huxley suggested that the visual design of jewels opens our minds to the mystic's way of perceiving the world. The awe we feel in relation to visual design allows us to locate ourselves within cultural systems that we may be part of. You may feel this in relation to Haussmann's grand boulevards in Paris, a Mayan pyramid, the graffiti of Barcelona, and for some, a machine that sorts pills.

Stories of *spiritual* and *religious* awe were a sixth wonder of life. These weren't as common as you might imagine, given our perennial search for nirvana, satori, bliss, or samadhi. Some experiences of mystical awe were classic conversion stories like that of Saint Paul on the road to Damascus or the Buddha under the bodhi tree, as in this example from Singapore:

> When the Holy Spirit of God came upon me at a Life in the Spirit Seminar organized by the Catholic church. It was so powerful I could not stand and instantly collapsed but I was conscious of my surroundings and as my eyes were closed I could only see a very bright white light. Before the event I felt that the world had rejected me, that no one cared. When the event happened, I immediately felt lifted but most important of all I felt loved.

Other stories like this one from Canada mix mystical awe with sexual desire, a timeless blending of the sacred and the profane.

> I met a man at our local farmers market who opened my eyes about meditation and the power of one's body and emotions. With one touch of my shoulders he was able to see through me (in a sense). His presence and knowledge let me want to

> learn more. . . . Therefore I started to take meditation classes with him on a weekly basis. I learned so much about my body, mind, and spirit.

We shall see how often the sensations that arise during mystical awe, and all encounters with the wonders of life, involve touch, feeling embraced, a warm presence, and an awareness of being seen—clues, perhaps, to the deep origins of the emotion.

Stories of *life and death*, the seventh wonder of life, were common around the world. We are awestruck by how, in an instant, life comes out of the womb. And on the other end of the life-death cycle, when a person makes the transition from being a breathing physical being to some other form of existence, as I observed that night in watching Rolf die. Here is a cycle-of-life narrative from Indonesia, revealing how in grief our minds turn to ideas about the ways the departed remains with us:

> That time around six years ago at the Sardjito hospital in Yogyakarta, me along with my father and other siblings waited for my mother who was sick, she had been hospitalized for one week and hadn't regained consciousness. That time we were waiting until Mother met her maker, we were extremely heartbroken and sad at that time, however we realized that we shouldn't drown in too much sorrow. Our future is still long. It was only after Mom left us that we realized how important is a mother and a wife, that now all of us have grown to appreciate and love our wives who are the mothers of our children.

This story leads us to *epiphanies*—when we suddenly understand essential truths about life—which were the eighth wonder

of life. Around the world, people were awestruck by philosophical insights, scientific discoveries, metaphysical ideas, personal realizations, mathematical equations, and sudden disclosures (such as a wife leaving her husband for his best friend) that transform life in an instant. In each instance, the epiphany united facts, beliefs, values, intuitions, and images into a new system of understanding. Here is an epiphany from Japan that delighted me, because I had found awe in my childhood in art and natural history museums and later in Darwin's theory of evolution:

> Just before I was twelve, I saw a science museum exhibit and understood the evolution of biology. I realized that human beings are undoubtedly only one species of many creatures (not particularly advantageous compared to other creatures).

We can find awe, then, in eight wonders of life: moral beauty, collective effervescence, nature, music, visual design, spirituality and religion, life and death, and epiphany. If you are offended that your favorite form of the sublime did not make this periodic table of awe, the Eight Wonders of Life Club, perhaps you'll find solace in this: our "other" category encompassed 5 percent of the responses worldwide. This category included stories about incredible flavors, video games, overwhelming sensations (for example, of color or sound), and first experiences of sex.

It also merits considering what was *not* mentioned in stories of awe from around the world. Money didn't figure into awe, except in a couple of instances in which people had been cheated out of life savings. No one mentioned their laptop, Facebook, Apple Watch, or smartphone. Nor did anyone mention consumer purchases, like their new Nikes, Tesla, Gucci bag, or Montblanc pen.

Awe occurs in a realm separate from the mundane world of materialism, money, acquisition, and status signaling—a realm beyond the profane that many call the sacred.

A Space of Its Own

The etymology of the word "awe" traces back eight hundred years to the middle English "ege" and Old Norse "agi," both of which refer to fear, dread, horror, and terror. The legacy of this etymology is deep. If I asked you now to answer our current question—*What is awe?*—you might define it in terms related to fear. Remember, though, that when "ege" and "agi" emerged in the spoken word some eight centuries ago, it was a time of plagues, famines, public torture, religious inquisition, war, and short life expectancy; what was vast and mysterious was violence and death.

When we use the word "awe" today, are we describing an experience similar to fear, or a variant of feeling threatened and seeking to flee?

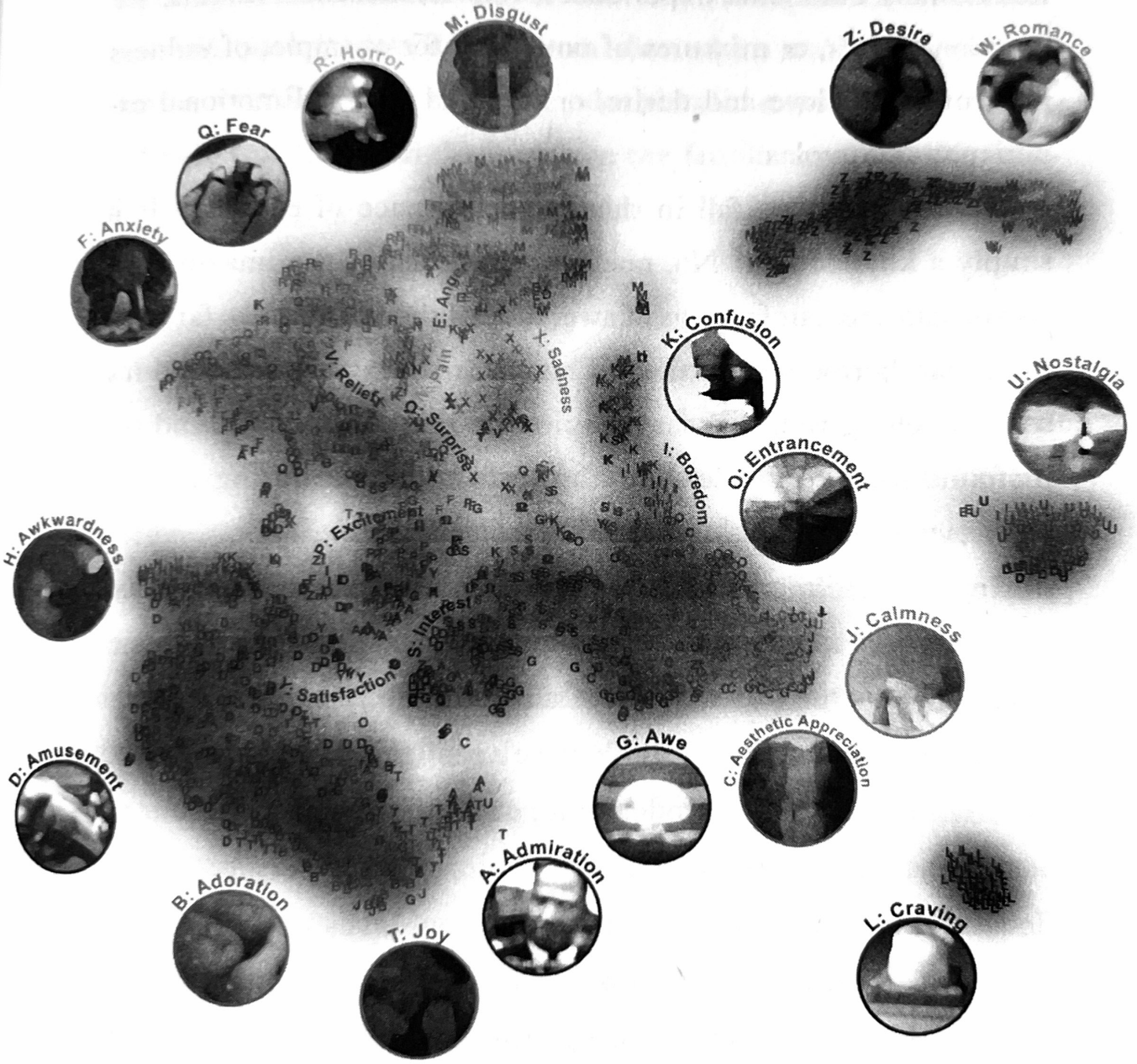
Another question is this: Do our experiences of awe differ from our feelings of beauty? We feel beauty in response to all manner of things that can bring us awe, from skies to music to vibrant neighborhoods in cities. Is awe just a more intense feeling of beauty?

Up until recently, the science of emotion had no answers to these questions. The study of emotional experience had largely focused on those six states Paul Ekman had studied in the 1960s, eliciting emotions like fear and disgust with images of horrifying, repulsive things—spiders, snarling dogs, bloody gore, feces—and, for sensory pleasure or joy, photos of chocolate cakes, tropical

beaches, beautiful faces, and bucolic nature scenes. No study had sought to inspire awe in its participants. Had it done so, it still would have failed to capture that experience, since the most widely used emotional experience questionnaire, which measures these positive states—*active, interested, proud, excited, strong, inspired, alert, enthusiastic, determined, attentive*—makes no mention of awe or beauty (or amusement, love, desire, or compassion, for that matter). The experience of awe was uncharted.

To map the experience of awe, I was fortunate to carry out the following study with my computationally minded collaborator Alan Cowen, a math prodigy well versed in new quantitative approaches to mapping the structures of human experience. Alan first scoured the internet, locating 2,100 emotionally rich GIFs, or two-to-three-second videos. The GIFs our participants viewed extended far beyond the images and videos relied on in the past to elicit Ekman's six emotions, to include things like dog pratfalls, awkward social encounters, a moving speech by Martin Luther King Jr., delicious-looking food, couples kissing, scary images of hairy spiders, terrifying car crashes, rotting food, weird and transfixing geometric patterns, beautiful landscapes, baby and puppy faces, amusing mishaps of cats, parents hugging infants, dramatic storm clouds, and so on. After viewing each GIF, our participants rated their experience on more than fifty emotional terms, including, most germane to our present interests, awe, fear, horror, and beauty.

One day Alan dropped by my office with a data visualization of his results, which I present on the following page. What in the world are we looking at? That's what I first asked Alan. After detailing the new statistical analyses he derived to produce such an image, he explained that each letter refers to a GIF in our study, and each GIF is placed spatially in terms of which emotion it


M: Disgust
R: Horror
Z: Desire
W: Romance
Q: Fear
F: Anxiety
E: Anger
X: Sadness
V: Relief
Q: Surprise
K: Confusion
U: Nostalgia
I: Boredom
O: Entrancement
H: Awkwardness
P: Excitement
S: Interest
J: Calmness
L: Satisfaction
D: Amusement
G: Awe
C: Aesthetic Appreciation
A: Admiration
B: Adoration
T: Joy
L: Craving

predominantly evoked. The overall distribution of emotions is called a semantic space. The streets of London have their maps, and so too do our emotional experiences.

You will notice right away how rich our emotional experience is; in this study, people felt twenty-seven distinct kinds of emotions. Many emotional experiences, this visualization reveals, are emotion blends, or mixtures of emotions, for example, of sadness and confusion, love and desire, or awe and horror. Emotional experience is complex.

Where does awe fall in this semantic space of emotion? Is it simply a kind of fear? No, not by any stretch of the imagination. As you can see, our feelings of awe, toward the bottom, are far away from fear, horror, and anxiety. This in part is what astonished me so in watching Rolf die: that despite the horrors of cancer and the profound losses in his leaving, the vastness of his passing and the mysteries it unearthed in my mind left me in awe.

Instead, feelings of awe are located near admiration, interest, and aesthetic appreciation, or feelings of beauty. Awe feels intrinsically good. Our experiences of awe, though, clearly differ from feelings of beauty. The GIFs evocative of the feelings of beauty were familiar, easier to understand, and more fitting with our expectations about our visual world—images of oceans, forests, flowers, and sunsets. The awe-inspiring GIFs were vast and mysterious—an endless river of cyclists in a road race; an undulating, spiraling swarm of birds; the time-lapsed changes of a star-filled sky in the desert; a video of flying through the Alps as seen through a bird's-eye camera; a trippy immersion in Van Gogh's *Starry Night.*

In subsequent mapping studies with similar methodologies, Alan and I documented other ways in which awe is distinct from

fear, horror, and feelings of beauty (for relevant emotion maps, go to alancowen.com). The sounds we use to express awe with our voices sound different from our vocalizations of fear (and closer to vocalizations of emotions we experience when learning new things, like interest and realization). Our facial expressions of awe are easily differentiated from those of fear. The music and visual art that leads us to feel awe differs from that which evokes horror and beauty. Our experiences of awe take place in a space of their own, far away from fear and distinct from the familiar and pleasing feelings of beauty.

Everyday Awe

With stories from around the world and maps of emotional experience, we have begun to chart the what of awe. Perhaps, though, you have reservations. When we recall stories of awe—the core methodology of the twenty-six-culture study—we likely call to mind more extreme, once-in-a-lifetime experiences—saving a stranger's life, being one of the millions at the festival of Guadalupe in Mexico City, visiting the Grand Canyon, watching a mother die. Artistic portrayals of what brings us awe—GIFs, music, paintings in our awe-mapping studies—are stylized and idealized representations. Neither method captures what awe is like in our daily lives—if there is even such a thing.

In search of everyday awe, Yang Bai, University of Michigan professor Amie Gordon, and I carried out several studies in different countries with a method known as the daily diary approach. This method brings into the lab the very human tendency to write and journal about our emotions, to translate feelings into words. In

one study, people in China and the United States wrote about daily experiences of awe—if they occurred—each night for two weeks. Here is a story from China, which speaks once again to the power of museums to bring us awe:

> In the national museum, I saw the exhibition of bronze wares in Shang dynasty, the exhibition of Picasso's art works, and the exhibition of statues of Mao Zedong. . . . I was blown away by the delicate statues, the refined shapes of the hands, the structures of males' and females' nudes of Picasso's art works, and the story, revealed by bronze wares, of the female warrior Fu Hao. I was in awe.

Fu Hao was a female general who fought to preserve the Shang dynasty some three thousand years ago—moral courage from Chinese history. And this study participant is not alone in appreciating the marvels of the hand: the sculptor Rodin saw hands as spiritual parts of our body, and in his sculpture *The Cathedral*, two right hands point upward, creating a mysterious sense of light and space one would find in a forest or cathedral.

A Berkeley student felt awe in learning about the causal processes of chemistry, that fundamental, invisible layer of life underlying visible reality:

> I was at work in the lab and was taught a new process that I had no experience with until today. The effects of very subtle changes in temperature on the outcome of the process was awesome in the literal sense. The actual tool that was used for the process was also awesome.

Another found awe in thinking about the vastness of big data:

> It was in my sociology class about social media. I was awe-struck and humbled by the vastness of data and the power it exerts over each and every one of our lives, whether we choose to ignore it or not. Social media and technology amass so much data about our lives that is hard to comprehend—to the point where our every heartbeat can be timestamped.

The results from these daily diary studies dovetailed with what we learned from our twenty-six-culture study: In our daily lives, we most frequently feel awe in encounters with moral beauty, and secondarily in nature and in experiences with music, art, and film. Rarer were everyday awe experiences of the spiritual variety (although had we done the study at a religious college, this no doubt would have been different). We also confirmed, as in our mapping studies, that most moments of awe—about three-quarters—feel good, and only one-quarter are flavored with threat.

Culture shaped awe in profound ways. Students in Beijing more commonly found awe in moral beauty—inspiring teachers or grandparents and virtuosic performances of musicians. For the U.S. students, it was nature. And here is a cultural difference that left us shaking our heads: the individual self was twenty times more likely to be the source of awe in the United States than in China. U.S. students could not help but feel awe at getting an A in a tough class, receiving a competitive fellowship, telling a hilarious joke, or, for those true narcissists, posting a new photo on Tinder.

Sometimes the most important finding in a scientific study is a

simple observation, free of any hypothesis or pitting of theoretical perspectives against one another. And this was true in our daily diary research: people experience awe two to three times a week. That's once every couple of days. They did so in finding the extraordinary in the ordinary: a friend's generosity to a homeless person in the streets; the scent of a flower; looking at a leafy tree's play of light and shadow on a sidewalk; hearing a song that transported them back to a first love; bingeing *Game of Thrones* with friends.

Everyday awe.

Great thinkers, from Walt Whitman to Rachel Carson to Zen master Shunryu Suzuki, remind us to become aware of how much of life can bring us awe. It is a deep conviction in many Indigenous philosophies from around the world that so much of the life that surrounds us is sacred. Our daily diary findings suggest that these great minds and cultures were onto something: the wonders of life are so often nearby.

Transcendent States in 1,372 Slides

With stories of awe from around the world, twenty-first-century emotion-mapping techniques, and hearing people's reports of everyday awe, we can now offer an answer to the question "What is awe?" Awe begins in encounters with the eight wonders of life. The experience of awe unfolds in a space of its own, one that feels good and differs from feelings of fear, horror, and beauty. Our everyday lives offer so many occasions for awe.

As Rolf's colon cancer reduced his body from a broad-shouldered

210 pounds to a frail, starving 145, the future of his life was increasingly clear. And so I sought to look to the past, to distill the story of our brotherhood.

On my second-to-last visit with Rolf, about ten days before he passed, we took in 1,372 photos from the fifteen years our family had been together before our parents divorced. They were mostly black-and-white slides tucked away in small, yellowing cardboard boxes. They hadn't been looked at for years. They dated from 1963—our shared baby years in Mexico—to 1978, our last days as an intact family in England.

Rolf, my mom, and I looked over the photos, proceeding year by year. From the early 1960s: photos of us held aloft in our young parents' arms as babies, cheeks pressing into cheeks, adult hands cupping fuzzy heads. Slides from the late 1960s chronicled our Laurel Canyon years and wandering summer vacations in our blue Volkswagen bus. Peering out of tents in the Rockies, surrounded by aspens. Climbing down rocky, wild coastal cliffs off Highway 1 near Mendocino, California. At art shows of my dad's. Late '60s music festivals and renaissance fairs and Fourth of July communal celebrations in the mountains. Long-haired collective effervescence everywhere.

The 1970s brought a move to the foothills of Northern California, a new VW bus, and a Huck Finn–like freedom of early adolescence on our five acres with a pond. Shooting hoops on the basketball court my dad had built in a star-thistly pasture. Inner tubing and rafting down rivers. A bicentennial trip across the United States in 1976—vast plains of cornfields out the windows of the bus, my brother and I spoofing and mugging at Monticello.

And then our last year as an intact family, on our way to

England, where our parents would part ways. Rolf and I at revered sites—the Alhambra, the Louvre, and Notre Dame—as teens, sneering and mocking, and on occasion solemn and moved.

As we looked at the slides, Rolf drifted in and out, and with an inviting finger asked for more. Before finally falling into a deep sleep, he observed: "We had fun."

Fun, like awe, is one of several *self-transcendent* states, a space of emotions that transport us out of our self-focused, threat-oriented, and status quo mindset to a realm where we connect to something larger than the self. *Joy*, the feeling of being free, for the moment, of worldly concerns, is part of this space, as is *ecstasy* (or *bliss*), when we sense ourself to dissolve completely (in awe we remain aware, although faintly, of our selves). And fun, the *mirth* and lighthearted delight we feel when imagining alternative perspectives upon our mundane lives we so often take too seriously.

Gratitude is part of this transcendent realm of feeling, the reverence we feel for the gifts of life. I felt it acutely that day amid waves of sadness and anxiety, surveying those 1,372 slides. My parents had allowed my brother and me to wander, locating us in a world of wonders. Rolf and I had lived a brotherhood of awe.

Knowing now a bit more about the what of awe, where we find it, how it feels, and how it is part of a broader space of transcendent states, it is time to turn to how awe works. How does awe transform our minds, our sense of self, and our way of being in the world?

TWO

AWE INSIDE OUT

How Awe Transforms Our Relation to the World

The most beautiful experience we can have is the mysterious. It is the fundamental emotion which stands at the cradle of true art and science.

• ALBERT EINSTEIN

A sense of wonder so indestructible it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strengths.

• RACHEL CARSON

On a bustling day in 2010, I was working in my office when I received a call from Pete Docter, whose film *Up* had just won an Academy Award. He was calling to ask if I would talk with his team about his next film. The main characters, he continued, would be five emotions inside the mind of Riley, an eleven-year-old girl. The film was tentatively titled *Inside Out.*

On my visits to Pixar's campus, Pete would take me to a sequestered room where he and his cocreator, Ronnie del Carmen, passed the hours drawing storyboards for *Inside Out* (a typical film is based on 70,000 to 120,000 storyboards). I had prepared for questions of a technical nature: What does the face look like during envy? What color best conveys disgust? Instead, we tackled questions about *how* emotions work. How does feeling shape thought? How do emotions guide our actions?

Like great novels and films so often do, *Inside Out* dramatizes two central insights about how emotions work. The first is this: emotions transform how we perceive the world—the "inside" of *Inside Out.* For example, studies find that if you are feeling fear, you will perceive more uncertainty in your romantic partnership, think it more likely you will die from a weird disease or terrorist attack, remember more readily harrowing moments from your teens, and detect more quickly an image of a spider on a computer screen. During fear, our mind is attuned to danger. Each emotion is a lens through which we see the world.

The "out" of *Inside Out* refers to how emotions animate action. In the film, it is the five emotions that move Riley to action. As eighteen-month-old Riley dodges an electrical outlet, Bill Hader's voice of Fear narrates the action. When Riley plays hockey with sharpened elbow ferocity, Lewis Black's Anger moves her forceful actions forward on the ice. Emotions are much more than fleeting states in the mind; they involve sequences of actions between individuals as they negotiate social relationships.

Let's turn to the Inside Out of awe: How does awe transform how we see the world? And what actions do experiences of awe lead us to take upon encountering the vast mysteries of the eight wonders of life?

Something Larger Than the Self

Our experiences of awe seem ineffable, beyond words. But you might have noticed an irony at play: awe's ineffability hasn't stopped people from telling stories of awe in journaling, writing poems, singing, composing music, dancing, and turning to visual art and design to make sense of the sublime. In our narration of experiences of awe in these symbolic traditions, a clear motif emerges: our individual self gives way to the boundary-dissolving sense of being part of something much larger.

For hundreds of years, awe has been a central character in spiritual journaling, in which people write—to this day—about their encounters with the Divine. Fourteenth-century mystic Julian of Norwich had sixteen visions of Jesus's compassionate love. These stories of awe became *Revelations of Divine Love*, one of the first books written by a woman in the English language, and influential in shifting Christian theology toward an emphasis on a compassionate, love-based faith. Julian of Norwich used the phrase "I am nothing" throughout to express her feelings of awe in relation to Christ's love.

Some of the most influential passages in nature writing in the global West, those of Wordsworth, Emerson, Thoreau, and Carson, portray the self as dissolving during experiences of natural awe. This dissolving of the self would transform early feminist Margaret Fuller, a central force in American transcendentalism, an editor at the influential magazine *The Dial*, and author of the bestselling treatise *Woman in the Nineteenth Century*, all remarkable achievements during a deeply sexist time. At the age of twenty-one, Fuller had an experience of awe that began in the pews of a

church and then continued outdoors under "sad clouds" and a cold blue sky:

> I saw there was no self; that selfishness was all folly, and the result of circumstance; that it was only because I thought self real that I suffered; that I had only to live in the idea of the all; and all was mine.

Awe freed Fuller of the very gendered self of the early nineteenth century to go in search of "the all," a life of expanding freedom and empowerment.

The vanishing self, or "ego death," is also at the heart of psychedelic experiences. In a story of awe, modern author Michael Pollan choked down a piece of a magic mushroom containing psilocybin, and then lay down with eyeshades on, listening to music. He saw his self, represented as a sheaf of papers, disappear::

> a sheaf of little papers, no bigger than Post-its, and they were being scattered to the wind . . .

Pollan perceives his self to expand in ways fitting for a food writer married to a painter:

> I looked and saw myself out there again, but this time spread over the landscape like paint, or butter, thinly coating a wide expanse of the world with a substance I recognized as me.

The personal always imbues the transcendent.

What exactly vanishes during awe? Aldous Huxley called it "the interfering neurotic who, in waking hours, tries to run the

show" in making sense of what disappeared during his experiences with mescaline. This is a pretty good approximation of how psychological science makes sense of the *default self.* This self, one of many that makes up who you are, is focused on how you are distinct from others, independent, in control, and oriented toward competitive advantage. It has been amplified by the rise of individualism and materialism, and no doubt was less prominent during other time periods (e.g., in Indigenous cultures thousands of years ago). Today, this default self keeps you on track in achieving your goals and urges you to rise in the ranks in the world, all essential to your survival and thriving.

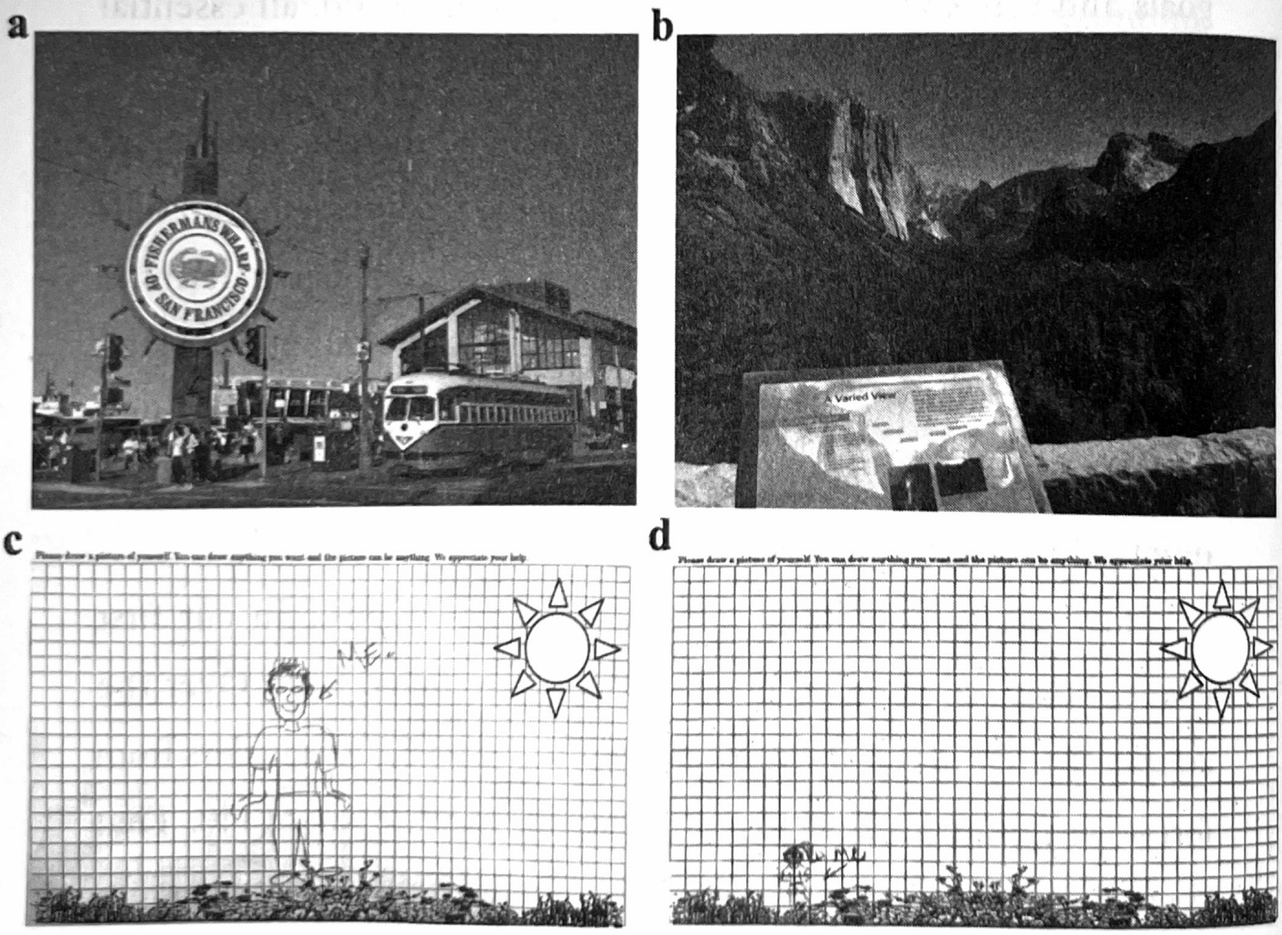
When our default self reigns too strongly, though, and we are too focused on ourselves, anxiety, rumination, depression, and self-criticism can overtake us. An overactive default self can undermine the collaborative efforts and goodwill of our communities. Many of today's social ills arise out of an overactive default self, augmented by self-obsessed digital technologies. Awe, it would seem, quiets this urgent voice of the default self.

How would one study the vanishing self of awe? In our first effort, Yang Bai camped out in Yosemite National Park. Over the course of a few days, she approached more than 1,100 travelers from forty-two countries at a lookout at the side of State Route 140. That lookout offers an expansive view of Yosemite Valley, a natural wonder that led Teddy Roosevelt to observe:

> It was like lying in a great solemn cathedral, far vaster and more beautiful than any built by the hand of man.

As a measure of their sense of self, participants were asked to draw themselves on a sheet of graph paper, and write "me" next

to their drawing. In a control condition, travelers were asked to do the same thing at Fisherman's Wharf in San Francisco, a place more evocative of light-hearted, carefree joy. Other research has found that simple measures—the size of the drawn self and how large you write "me"—are pretty good measures of how self-focused the individual is. Below are randomly selected drawings from this study: to the left is one from Fisherman's Wharf, and to the right, a drawn self in Yosemite eight squares from the left.



Simply being in a context of awe leads to a "small self." We can quiet that nagging voice of the interfering neurotic simply by locating ourselves in contexts of more awe.

In related work with Yang Bai, we found that the "small self" effect of awe arises in all eight wonders of life, and not just vast

nature. Finding awe in encounters with moral beauty, for example, or music, or when struck by big ideas, quiets the voice of that interfering and nagging neurotic. We also found that awe leads to a vanishing self when this elusive construct is measured by other means, like simple self-report measures (e.g., "I feel small"; "my personal concerns are insignificant").

What about other core convictions of the default self, of being distinct, independent, in control, and seeking to prevail over others? To explore how awe expands our sense of self from feeling independent to feeling part of something larger, Arizona State University professor Michelle Shiota and I carried out the following study. We took college students to a paleontology museum and had them stand facing an awe-inspiring model of a *T. rex* skeleton. In the control condition, participants stood in the same location but looked down a fluorescent-lit hallway. Participants then filled in this sentence stem twenty times: "I AM _____". People in the control condition defined themselves in terms of distinct traits and preferences, in the spirit of individualism and its privileging of distinctness over common humanity. People feeling awe named qualities they shared with others—being a college student, belonging to a dance society, being human, being part of the category of all sentient beings.

Another pillar of the default self is that we are in control of our lives. This conviction in agency and freedom has many benefits but can blind us to a complementary truth: that our lives are shaped by vast forces, like the family, class background, historical period, or culture we happen to be born into. To test whether awe opens our minds to the vast forces that shape our lives, University of Toronto collaborator Jennifer Stellar and I took college students up to the observation deck of the Campanile tower on the UC

Berkeley campus, opened in 1914. It is 220 feet in the air and provides students with an expansive view of the Bay Area: its bay, bridges, cities, arteries of roads, and fog-laced, ever-changing skies. When eighteenth-century Europeans floated above the ground at about this height in the first hot-air balloons, one early balloonist perceived "the earth as a giant organism, mysteriously patterned and unfolding, like a living creature." Many astronauts experience a scaled-up version of this sensation, known as the overview effect, when looking at Earth from out in space. Here is astronaut Ed Gibson in 1964 offering his own story of awe from space:

> You see how diminutive your life and concerns are compared to other things in the universe. . . . The result is that you enjoy the life that is before you. . . . It allows you to have inner peace.

In our study, participants enjoying an expansive view also reported a greater sense of humility, and that the direction of their lives depended on many interacting forces beyond their own agency.

Awe's vanishing self has even been charted in our brains. The focus in this work has been the default mode network, or DMN, regions of the cortex that are engaged when we process information from an egocentric point of view. In a nuanced study from Japan, one group of participants watched videos of awe-inducing nature (footage of mountains, ravines, skies, and animals from BBC's *Planet Earth*). Other participants viewed more threat-filled awe videos of tornadoes, volcanoes, lightning, and violent storms. Both led to reduced activation in the DMN. This finding would suggest that when we experience awe, regions of the brain that are associated with the excesses of the ego, including self-criticism, anxiety, and even depression, quiet down.

The positive form of awe, though, led to increased connections between the DMN and a region of the brain (the cingulate cortex) involved in our sense of reward. Threat-based awe led to increased connections between the DMN and the amygdala, which activates fight-or-flight physiology—more evidence of the flavoring of awe by threat. It is worth noting now that sources of mystical awe—meditation, prayer, and psilocybin—also reduce activation in the DMN. The same is likely true of other wonders of life.

As our default self vanishes, other studies have shown, awe shifts us from a competitive, dog-eat-dog mindset to perceive that we are part of networks of more interdependent, collaborating individuals. We sense that we are part of a chapter in the history of a family, a community, a culture. An ecosystem. For Walt Whitman, this transformation of the self felt like a song:

I celebrate myself, and sing myself,
And what I assume you shall assume,
For every atom belonging to me as good belongs to you.

Feeling part of something much larger than the self is music to our ears. This transformation of the self brought about by awe is a powerful antidote to the isolation and loneliness that is epidemic today.

Wonder

In *The Age of Wonder*, Richard Holmes details how awe transformed science during the eighteenth and first half of the nineteenth centuries. One example of this transformative power of awe is the

scientist William Herschel, who as a young man was awestruck by how the moon hovered in the sky, surrounding him in its light, during his nighttime walks. He would be moved by awe to build the largest telescope in the world and painstakingly map, with his sister Caroline, the movements of stars and comets in the sky. Their discoveries put to rest the "fixed stars" thesis, that a two-dimensional pattern of a couple thousand stars revolved around Earth in unchanging ways. Instead, they opened the world's eyes to a near-infinite, ever-changing, three-dimensional space of billions of stars. This epiphany led the philosopher John Bonnycastle to this story of awe:

> Astronomy has enlarged the sphere of our conceptions, and opened to us a universe without bounds, where the human imagination is lost. Surrounded by infinite space, and swallowed up in an immensity of being, man seems but as a drop of water in the ocean, mixed and confounded with the general mass. But from this situation, perplexing as it is, he endeavors to extricate himself; and by looking abroad into Nature, employs the powers she has bestowed upon him in investigating her works.

Like so many stories of awe, Bonnycastle's about the vast mysteries of space reveals the emotion's unfolding pattern. It begins with vastness—"universe without bounds"—and mystery—"human imagination is lost." What follows is the vanishing of the self—"drop of water"—and the sense of being related to something larger—"immensity of being." And as the default self fades, the mind opens to intellectual questioning and searching that awe inspires ("investigating her works"). Or wonder.

AWE INSIDE OUT

Wonder, the mental state of openness, questioning, curiosity, and embracing mystery, arises out of experiences of awe. In our studies, people who find more everyday awe show evidence of living with wonder. They are more open to new ideas. To what is unknown. To what language can't describe. To the absurd. To seeking new knowledge. To experience itself, for example of sound, or color, or bodily sensation, or the directions thought might take during dreams or meditation. To the strengths and virtues of other people. It should not surprise that people who feel even five minutes a day of everyday awe are more curious about art, music, poetry, new scientific discoveries, philosophy, and questions about life and death. They feel more comfortable with mysteries, with that which cannot be explained.

A stereotype of awe is that it leaves us dumbfounded and dazed, ready to subordinate reason to dogma, disinformation, blind faith, a local guru or trendy influencer. The scientific evidence suggests otherwise. In the state of wonder that awe produces, our thought is more rigorous and energized. As one historical example, Isaac Newton and René Descartes were both awestruck by rainbows. In wonder, they asked: How is it that rainbows form when the sun's light refracts through water molecules? What is the precise angle that produces this effect? What does this say about light and our experience of color? This wonder over rainbows led these two scholars to some of their best work on mathematics, the physics of light, color theory, and sensation and perception.

Laboratory studies have captured how awe leads to more rigorous thought. In one such study, after being led to experience awe by recalling a time of looking out at an expansive view, college

students were more discerning between what is a strong argument, grounded in robust scientific evidence, and a weak argument, based on a single individual's opinions.

With our thinking energized by awe, we place vast mysteries within more complex systems of understanding. We perceive natural phenomena like tide pools, pollinating bees, or ecosystems gathering around a "mother tree" as the result of intricate interacting *systems* of causal forces. We see human affairs as the result of complex webs of cause-and-effect relations in history that transcend an individual's intentions. When thinking about our own lives, we become more aware of how vast forces—our family, our neighborhood, a generous coach or teacher, a fateful encounter with a wise elder, the good health we may enjoy—shape the courses our lives take. In awe, our minds open in wonder to the systems of life and our small part in them.

Saintly Tendencies

In moments of awe, then, we shift from the sense that we are solely in charge of our own fate and striving against others to feeling we are part of a community, sharing essential qualities, interdependent and collaborating. Awe expands what philosopher Peter Singer calls the circle of care, the network of people we feel kindness toward. William James called the actions that give rise to the circle of care the "saintly tendencies" of mystical awe—to sacrifice, share, put aside self-interest in favor of the interests of others. Our studies find that these "saintly tendencies" arise in encounters with all eight wonders of life.

In one study on this theme, longtime collaborator and professor

at UC Irvine Paul Piff and I led one group of participants to feel awe by watching BBC's *Planet Earth*. Other participants watched the hilarious antics of dogs, bears, cats, monkeys, and apes in their natural habitats in the British comedic nature show *Walk on the Wild Side*. When given points that would determine a chance to win money and asked to share with a stranger, people feeling awe gave more. In fact, they gave more than half their points to a stranger.

Awe empowers sacrifice, and inspires us to give that most precious of resources, time. Memphis University professor Jia Wei Zhang and I brought people to a lab where they were surrounded by either awe-inspiring plants or less-inspiring ones. As participants were leaving the lab, we asked if they would fold origami cranes to be sent to victims of the 2011 tsunami in Japan. Being surrounded with awe-inspiring plants led people to volunteer more time. The last pillar of the default self—striving for competitive advantage, registered in a stinginess toward giving away possessions and time—crumbles during awe.

Awe awakens the better angels of our nature.

The Sequel

Perhaps there will be a sequel to *Inside Out*. And who knows, perhaps Awe will be a character in Riley's mind, transforming her sense of self, opening her to wonder, and inclining her to saintly tendencies after encounters with the wonders of life. In the sequel, Riley could be older, perhaps a college student, and moved by Awe to youthful encounters with moral beauty, dancing at parties, outdoor concerts, and late-night conversations about the meaning of life, all so very fitting for a young adult.

And if I had my druthers, in this sequel Riley would be a budding neuroscientist. If so, there could be a scene in which she presents to her lab a video called "Waterfall Display," which is narrated by her hero, Jane Goodall. In the video, a solitary chimpanzee approaches a roaring waterfall. He piloerects (fluffs up his fur). He moves in swaying, rhythmic motions, swinging from one branch to another near the rushing river. He pushes large rocks into the river. At the end of this "dance" he sits quietly, absorbed in the flow of water. Jane Goodall observes that chimpanzees do the waterfall dance near waterfalls and roaring rivers, as well as during heavy rainstorms and sudden winds. She then speculates:

> I can't help feeling that this waterfall display, or dance, is perhaps triggered by feelings of awe, wonder, that we feel. . . . So why wouldn't they also have feelings of some kind of spirituality, which is really being amazed at things outside yourself?

At the short video's conclusion, Riley would pose questions to her lab. Is the chimpanzee's piloerection the same as our chills? What do those chills mean, anyway? Do chimpanzees have spiritual feelings? Why do we feel awe?