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Creepy, Fearless, and Devious

THE ANIMAL WITH A HIGH COEFFICIENT OF WEIRDNESS

SPIDERS ARE POSSIBLY the most valuable creatures in our agricultural ecosystem. We cohabit the planet with these ubiquitous creatures in real life, depending on them to protect our food supply by keeping insects in check. They also do much cultural work for us, looming large in our belief systems and our myths, our nursery rhymes and our songs, our paintings and poetry, and our virtual worlds and electronic entertainments. And yet we do not have a word for capturing our attachment to these creatures, only a term for expressing revulsion at the sight of black widows, brown recluse spiders, or horror of horrors, tarantulas. And Hollywood has eagerly amplified the horror, turning "arachnophobia" into a household term. "Arachnophilia" is a word that you will not yet find in a dictionary. And if you try "arachnophile" on the website for the *Oxford English Dictionary*, you will be asked, "Did you mean arachnophobe?"

Spiders are the planet's predators in chief. They scamper, stalk, trap, chase, and hunt. Some cast nets, while others lurk in burrows or hunt with bolas, weighted threads thrown to

entangle the legs of prey. The global spider population does its part in controlling insects, consuming between 400 million and 800 million tons of them each year. By way of comparison, humans consume about 400 million tons of meat and fish.[1] So numerous, ubiquitous, and gluttonous are these small creatures that it would take just a year for spiders to consume every human on the planet, if that happened to be their sole available source of nourishment and if they had an appetite for human flesh. They may labor on a small individual scale, but they are also wildly effective as a collective, and for that reason alone, they loom mysteriously large in our imaginations.

There are somewhere between forty and fifty thousand known species of spiders (depending on who is counting and when). Arachnids are found everywhere on the planet, save for Antarctica. They take up residence in climates with extreme temperatures, settling comfortably in places that even humans shun, making themselves at home in Death Valley (the driest national park in the US) or in Iran's hyperarid Lut Desert, as well as in the most frigid and inhospitable regions of Siberia and Greenland. They can survive on Mt. Everest by feeding on prey blown up from lower regions. They flourish in underground caves, living in pitch-dark habitats and sometimes going for months without eating.

What is the superpower of spiders? Clearly, it is the ability to spin silk, something that enables them to stay at home, trap prey, and build egg sacs from the comfort of their web nests but also to travel vast distances by releasing silk strands into the air. Spinning silk explains spiders' evolutionary success, enabling them to survive anywhere from the dark corners of our bedrooms to the depths of a wooded wilderness.[2] We have already seen that Charles Darwin discovered, to his astonishment, how spiders can balloon their way onto ships at sea. They are nature's

risk-takers—adventurous, adaptable, and seemingly carefree—and they are also oddly loners—reclusive creatures who would roll up their sleeves, if they had them, as they engage in the hard work of survival and reproduction.

Spiders have been around for longer than humans, possibly dating back 200 million years. We have visual evidence, in the form of a spider web preserved in amber, that they have resided on the planet for at least 140 million years.[3] Two amateur fossil-hunting brothers, Jamie and Jonathan Hiscocks, came upon that piece of amber on a beach in the south of England. Researchers at the University of Oxford examined the find and confirmed the presence of spider web threads about a millimeter long, forming the circular pattern of a web.

All spiders belong to the arthropod group. Unlike vertebrates, with skeletons inside their bodies, arthropods have a rigid exoskeleton. The dominant group on the planet, both in the number of species as well as in their biomass, the group also includes horseshoe crabs, scorpions, and mites. The average acre of land on the planet is populated by about one million spiders. You may not know it, but most of the time you are never more than a few feet away from a spider. Observe a spider, and you will see that it moves fast, but it can also come to a grinding halt, play dead, and then sprint in the opposite direction.

A small number of other organisms aside from spiders produce silk, including silk moths and silkworms, but none do so with silk glands and spinnerets. The spider's silk glands manufacture silk, and that liquid silk goes to the spinnerets, which function as taps for extruding the threads used to form webs. Spider silk may be thirty times thinner than human hair, but it has a tensile strength greater than steel. Experts put its strength at the level of fused quartz, a transparent substance used in deep-diving vessels like the bathysphere as well as in the windows of

spacecraft including the space shuttle. Fishermen in the South Pacific Islands use threads from the golden silk orb weaver to make their fishing nets. Textile manufacturers have been trying for decades to unlock the secrets built into spider silk, a substance so elastic that it can stretch out to several times its original length.

Scientists, engineers, biochemists, and medical researchers have all sought to solve the mysteries built into the amino acid chains of spider silk. By studying the silk-producing glands and web-building techniques of spiders, they have developed new ways to create textiles for use in making everything from parachutes to bulletproof vests. A firm by the name of Spintex Engineering (now defunct) claimed to have cracked the spider's genetic code and tried unsuccessfully to develop a process that mimics a spider's ability to spin fiber from a liquid.[4] And biomimicry, the process of learning from nature and replicating its practices rather than exploiting its assets, has been hailed as the path forward by Stella McCartney and other fashion designers committed to green chemistry practices.

The ingenious engineering of spider webs makes them things of beauty, particularly when they catch just the right light in outdoor spaces. In a flash, the colorless miraculously turns colorful. Orb webs are not just pleasing to the eye but also cheerful reminders that nature's art can still exceed what humans can fashion. With a body consisting of an anterior cephalothorax and a posterior abdomen, along with strong muscles, anywhere from one to eight eyes, and four pairs of legs, the spider is a marvel of evolutionary genius, and the webs it produces are nothing short of miracles of engineering. From the leaden dullness of what is often described as an unsightly body, a delicate, shimmering work of art materializes.

Spiders have challenged the ingenuity of taxonomists with the variety of webs they spin. Still, science has succeeded in identifying, naming, and classifying them in ways that Carl

Linnaeus would have applauded. The standard taxonomy features the orb, sheet, funnel, tangle, and tubular webs. Not all spiders catch their prey with webs, and some do not build webs at all, but almost half of spider species trap their food using a web, which, as noted, doubles as home.

The most familiar type of web is known as the orb web, and it resembles a bicycle wheel, with its spiral center from which "spokes" lead to the web's outer edges. These are the webs that become visible and ornamental with the morning dew or after a light rain. How do spiders construct orb webs? The best instructions come in E. B. White's *Charlotte's Web*, a work in which we discover how the barnyard orb weaver named Charlotte swings her spinnerets into position, attaches her thread to a point, and drops down to start the web. "As she dropped, her spinning tubes went into action, and she let out thread. At the bottom, she attached the thread." After that, she is guided by the mantra "Pay out line! Whoa! Attach! Ascend! Repeat!"[5]

More prosaic descriptions can be found in scientific studies, where we learn that the garden spider first forms a triangular or polygonal foundation from which it then makes the spokes or radii of the web, usually about thirty in number. The spokes, all almost exactly equidistant from the center, then form a kind of ladder for constructing a spiral scaffolding, from which lines are laid out connecting one spoke to the next. In this breathtaking engineering feat, the spider moves from spoke to spoke, tying, gluing, and twanging in concentric circles until the hub is reached. A long "telephone line" connects the hub with the spider's retreat.

In 2007, an enormous spider web measuring two hundred yards in length was found draped, eerily, like the shroud for some immense, alien creature that looked like it had suffered a crash landing, in the state of Texas. It covered the ground, wrapping itself around bushes and trees in Lake Tawakoni State

Park. Eager to investigate what seemed for all the world like a UFO suicide mission, reporters described it as the stuff of fairy tales until, upon closer inspection, mosquitoes were found swarming inside it. This is the trap set by sheet-weaving spiders, who construct their webs over herbage, sometimes in treetops, and snare their prey by slowing it down and tangling it up. One arachnologist described trying to escape a sheet web as attempting to run through thick snow while being pursued by someone on skis. Sheet webs are woven horizontally and may become so dense that they resemble a sheet hung out to dry or a silken hammock, hence the name.

The funnel web, as its name implies, is wide at the top, tapering down to the bottom where the spider lies in wait for its prey, often concealing itself in a burrow. The burrows of funnel-web spiders are usually found close to the ground, in moist habitats, under rocks and around rotting logs. Silk trip lines radiate out from the mouth of the burrow, ready to catch victims wandering in the vicinity. Some species of funnel-web spiders are among the most dangerous creatures on the planet, and their sharp fangs have been known to cut right through shoes.

Next in the zigzag from one spider habitat to the next comes the tangle web, found in attics, basements, and the dark corners of closets, staircases, and pantries. This is the web that looks like a mess and is often referred to as a cobweb. We gaze in awe at orb webs but find cobwebs mildly disgusting, even though the latter is a successful response to the limitations of the orb web. The black widow spider is one of its expert weavers, and its webs, while appearing uneven and tangled, have a disciplined architecture, with upper supporting threads, tangle threads in the middle, and vertical trap threads in the lower regions. The term "cobweb" is also often used to refer to an abandoned web that has fallen into disrepair.

And finally, there are tubular webs, found in cracks and crevices in the ground, in walls, or between bricks and planks of wood. The name comes from the web's shape, from which a half dozen or more silk threads radiate outward. When prey touches one of those threads, the spider bolts out, sinks its fangs into the unwary victim, and rushes back into its lair. The tube web spider is matriphagous, that is, the offspring devour the mother after hatching.

Spiders range in size, with the Samoan moss spider a mere .011 inches long to the foot-long Goliath birdeater found in South America, which feeds on bats, snakes, and mice more often than on the prey designated in its name. Only a small number in the thousands of spider species are dangerous to humans, among them the brown recluse spider and the Brazilian wandering spider. You are, however, twenty-five hundred times more likely to be killed by a human than by a spider.[6]

Spiders kill their prey in two ways, one by biting and injecting venom into their next meal and the second by swathing and wrapping it in silk. Here too the spider's observed behavior reveals it to be a master at enacting paradoxes, combining violent assault with suffocating tenderness.

Spider venoms are potent cocktails of neurotoxins designed to attack the nervous systems of prey or to damage their tissue. A complex mix of proteins, peptides, sugars, and other ingredients, they quickly immobilize or kill the insects on which spiders feed. But the venom of many spiders, while sometimes as strong or stronger than that of a rattlesnake, is rarely harmful to humans, leaving lesions on the skin rather than causing any kind of systemic harm.

Less deadly to humans than lightning, power mowers, and bathtubs, spiders are legendary in their power to arouse dread. A study documenting causes of death in the United States from

1979 to 1981 listed 1,135 deaths from lightning strikes, 591 from bee stings, 72 from snake bites, and 57 from alleged spider bites (insects may have been responsible for some of those deaths).[7] The Australian funnel-web spider has been responsible for 13 human deaths in all, in one rare case killing its victim within fifteen minutes. And yet, a 2005 limited streaming series, *Secret Smile*, ends with the heroine's father asserting that he does not want to relocate to Australia: "Too many funnel-web spiders in your dunnies [toilets]." The Brazilian wandering spider, also known as an armed spider or banana spider, is the second most deadly spider, hunting its prey at night while roaming the floors of rainforests. An antivenom to that spider's bite was discovered in 1981, making it less dangerous but no less feared. The six-eyed brown recluse spider, which can survive up to ten months without food or water, flourishes in tropical and subtropical regions, and its strong venom causes necrosis around the site of its bite and can also lead to severe systemic disorders.

Flip through the pages of any natural history of spiders, and most of us will find it challenging to avoid recoiling, cringing, or squirming. Spiders, like rats, are terror writ large. Scroll through a Google search of spiders, and before long you will come across the furry jumping spider, a creature straight out of a horror film. Consider the adjectives used most frequently to describe spiders, and you will quickly understand that they are not winning any animal popularity contests soon: aggressive, creepy, devious, efficient, fearless, hardy, hungry, intelligent, poisonous, solitary, stealthy, terrifying, and so on.

The walking mud spider, a master of deception, cleverly covers itself with soil and leaf litter to blend into its surroundings. The ogre-faced spider, with its grotesquely large posterior eyes, propels itself forward to catch its prey in a web stretched out across its front legs. Male mouse spiders queue up at the

entrance to a female's burrow at mating time. We fear and loathe these tiny creatures in part because their physical appearance and mating practices so strongly conflict with what we consider attractive and principled.

The human imagination is inventive, and our urban folklore includes many legends about tarantulas leaping out of yucca plants, stowaway spiders prowling around shipping containers preparing to invade new territory, and South American blush spiders skulking in toilets. Spiders are headline grabbers, and our fear of them is writ large in news stories about how they creep, crawl, sneak, or swarm: "Huge Spider Crawls into Car Garage as Owners Joke Insect Now 'Owns the Place,'" "Giant Spider with Nasty Bite Discovered Lurking inside Box of Organic Bananas," "It's Raining Spiders in Brazil," and "Spider Web Engulfs Texas Park Trail." Need clickbait? The trope of the "one-weird-spider" guarantees instant hits.

Spiders seem designed by nature to repel us, and we are more likely to take flight from them rather than fight them, even when perfectly capable of crushing the "monsters" or swatting them away. Since the number of spiders is legion and they seem to be ubiquitous, making themselves at home in almost every corner, indoors and out, they occupy a significant chunk of real estate in our minds as well, arousing fears magnified to the point of absurdity. In countries where they are relatively scarce, spiders are seen as more dangerous than in countries where their presence is normalized owing to their visibility.

Psychologists report that 3 to 6 percent of the world's population suffers from arachnophobia, defined as an irrational fear of spiders. That percentage feels spectacularly low. Many insist that the aversion to spiders is an evolutionary adaptation, a vestige of a moment in our development when spiders may have posed real threats to survival. But most naturalists and psychologists

explain our revulsion by referring to the mistaken belief held by our ancestors and passed on to us that spiders were agents of infection, responsible for decimating entire populations. In Europe, for example, it was not until the nineteenth century that rat-borne fleas were found responsible for spreading diseases like the Black Plague. Spiders still take the heat as sources of many, varied afflictions.

In 1897, the Canadian science writer and novelist Grant Allen declared that "for sheer ferocity and lust of blood, perhaps no creature on earth can equal that uncanny brute, the common garden spider. He is small but he is savage."[8] Emil Bogen, another expert on arachnids, waxed on, in the preface to a study of black widow spiders, about the "vicious character" of that species and how it is a "ferocious enemy of mankind," waging a form of "guerilla-warfare" on humans.[9] Many still swear by such inflated claims, unfounded and irrational.

All the beautiful theories about the evil spiders do constantly run up against a range of inconvenient facts. Spiders protect our food supply and prevent the spread of diseases, dining on pests like roaches, fleas, mosquitoes, flies, aphids, and moths. They serve as valuable prey in our ecosystems, with birds and other faunae depending on them as an important component of their diets. And the venom of spiders is now being used in medical research not just to develop antitoxins for harmful spider bites but also to develop safe painkillers and to treat strokes.

Spiders Are Good to Think With

Beyond the practical benefits of spiders to a human population dependent on agriculture for its survival, there is also a more intangible gift bestowed on us by the humble spider. Spiders are good to think with, and humans have found in their activities

models for reflecting on the processes ruling their own social worlds. The seeming detachment and concentration of arachnids inspire all kinds of analogies with what humans do. We use metaphors derived from the arachnid universe to describe, understand, and guide the production of textiles (spinning and weaving). We also draw on the activities of arachnids to capture the process of creating not just textiles but also texts (weaving words and spinning stories). Native American cultures and African cultures revered spiders as powerful mediators between the animal and human worlds, and their spider gods are master linguists who instruct humans in the art of naming and storytelling. We look to the web-building activities of spiders to talk about the structure and reach of social organizations as well as the electronic networks that connect us. And as noted, knowledge today is conceptualized as a digitized weblike structure—the World Wide Web—one that puts facts at our fingertips and connects us, for better and for worse, in social networks, economic communities, and political organizations.

Spiders may devote their lives to hunting and lying in wait for prey, but they also engage in practices that resonate with nearly universal cultural models for describing how song and story are produced. Drawing from their own bodies to produce luminous strands that build an attractive web of alluring intricacy, spiders model what it is to be an artist, in the idealized form that, for centuries, dominated our thinking about creativity. Reclusive, self-contained, but also often predatory—those were the signature traits of artists in the grand romantic style. We look back on them as, in some ways, sacred monsters but they are also creative master weavers. Poets and artists alike, as we shall see, have made the spider their chosen totem animal.

Spiders can be seen as kindred spirits to the great unwashed as well as to the oiled and anointed. Today we spin stories,

weave tangled webs, and design networks, relying on what spiders were doing long before Homo sapiens emerged 300,000 years ago in what today are African regions. Preachers and philosophers have looked to the spider for guidance about the great existential and theological mysteries of their time. Rather than peering into the jaws of lions, crocodiles, cheetahs, and other apex predators or gazing at the flight patterns of storks, nightingales, cardinals, and other avian beings, they have turned to the spider, hovering between the heavens and earth, for enlightenment about the workings of man and nature.

When the New England theologian Jonathan Edwards (1703–1758) tried to divine the ways of God, he turned to creatures that were both "despicable" and "wondrous," the spiders "from whose glistening webs so much of the wisdom of the Creator shines." Deep ambivalence emerges here from the recognition that even the abject has a certain sacred quality as the creation of a higher being.

In a letter to Judge Paul Dudley, a fellow of the Royal Society of London, Edwards described his desire to share knowledge about what he had discovered while observing "the wondrous and curious works" of spiders. Dazzled by the beauty of their webs, he was even more astonished by how spiders travel, sailing through the air entangled in the webs they have spun. An elaborate description of how spiders accomplish their flight is accompanied by a diagram revealing the precise movements required for liftoff. The clergyman clearly aspires to making a name for himself in the overseas showground of scientific discovery.

What conclusions does Edwards draw from his scientific observations? He discovers in all the carefully documented travels of spiders "the exuberant goodness of the Creator, who hath not only provided for all the necessities, but also for the pleasure and recreation of all sorts of creatures, even the insects [*sic*]." In the patterned movements of spiders and flies making their way

toward the sea and to their "destruction" as winds blow toward the east, Edwards saw the hand of God: "Notwithstanding their destruction by this means and the multitudes that are eaten by birds . . . they do not decrease and so by little and little come to nothing."[10] Carefree and creative, spiders are also suicidal, blindly moving with the wind toward their death but never toward extinction.

Why did the man who was to become the third president of Princeton University (he died after being inoculated by an experimental smallpox vaccine just a month after taking office) choose to observe the movements of spiders? That Edwards was not particularly enamored of those creatures becomes evident from a fiery sermon delivered in 1741, warning parishioners that God held them "over the pit of hell, much as one holds a spider or some loathsome insect over the fire."[11] But the spider's undeniable gift for creating magnificent forms of beauty, for defying the forces of gravity and taking flight, and, finally, for yielding to the forces of nature as it is swept into the ocean meant that the humble creature found favor in the eyes of a man who worked at the intersection of theology and science, forever seeking to reconcile the two. Spiders offered a magnificent, living example for contemplating the paradoxes found in nature, the eternal tangle of opposites, the tensions and fault lines in the stonework of our belief systems. Their ways and their habits served to challenge the human ability to make sense of God's creation.

"There Came a Big Spider": The Spiders of Childhood

"There is nothing either good or bad, but thinking makes it so." Arachnophobia offers a good test case for those debatable words spoken by Shakespeare's Hamlet. The Bard's own

skepticism about what seems like an instinctive revulsion to spiders becomes evident in the words of King Leontes when he ponders how we react to spiders, in this case when they may have released their venom into something you drink:

> There may be in the cup
> A spider steep'd, and one may drink, depart,
> And yet partake no venom, for his knowledge
> Is not infected: but if one present
> The abhorr'd ingredient to his eye, make known
> How he hath drunk, he cracks his gorge, his sides,
> With violent hefts. I have drunk,
> and seen the spider. (*The Winter's Tale*, III, i)

Arachnophobia may be in our DNA as part of the logic of evolution, but it is also instilled in us by the cultural scripts that dictate our conduct toward eight-legged creatures. Thinking them threatening makes them so.

The extent to which arachnophobia is built into the Anglophone culture of childhood and instilled in the young becomes evident from nursery rhymes. Only while researching spiders and writing about them did I begin to understand how profoundly the innocent pleasures of verses ranging from "Little Miss Muffet" to "The Itsy-Bitsy Spider" had stamped themselves in my mind, registering in ways that made them easy to revive, almost unconsciously, as an adult. The mosaic of remembrances, activated when around children, grandchildren, and in solitude, is a telling reminder that childhood chants and enchantments are more likely to be internalized than discarded, as material amusements like tops, dolls, and games often are, though they too imprint themselves on our minds in mysterious ways.

Spiders feature prominently in two popular rhymes and poems, still recited today even more than two centuries since

the time they were put in print. Who in the English-speaking world has not cowered at the thought of a spider after hearing about the interruption of Miss Muffet's meal of curds and whey (while also feeling perplexed about mysterious ingredients that sound less than appetizing)? First recorded in 1805 in *Songs for the Nursery*, an anthology compiled by Eliza Fenwick,[12] the verse runs as follows, with many regional variations:

Little Miss Muffet
Sat on a tuffet,
Eating her curds and whey.
There came a big spider
Who sat down beside her,
And frightened Miss Muffet away.[13]

It is possible though by no means certain that Little Miss Muffet was inspired by a Miss Patience Muffet, the stepchild of the English physician and naturalist Thomas Muffet (1553–1604), an eccentric with a deep interest in silkworms and an even deeper respect for spiders. "Good God, what great reason, judgment, art, what admirable wisdom and beauty she shows!" are words that appear with regard to the spider in his coauthored *Insectorum* of 1634.[14] It was no doubt his association with arthropods that led to the possible immortalization of his stepdaughter in verse that, contrary to his scientific views, painted the horrors of eight-legged creatures that appear out of nowhere.

Like the images for many simple stories and rhymes, the illustrations for "Little Miss Muffet" lead us into a dizzying hall of mirrors, a funhouse in which fears about spiders are magnified, miniaturized, or made to vanish. The proliferation of images for the rhyme, some in the form of paintings by eminent figures from the art world, is symptomatic of just how solidly

arachnophobia came to be rooted in the cultural imagination of the British and their empire.

The English artist John Everett Millais, one of the founders of the Pre-Raphaelite Brotherhood, and a man who also became one of the wealthiest artists of his time, turned the mysterious tuffet into a knoll and shows us an alarmed child gazing wide-eyed at an almost invisible intruder—the better to scare you (fig. 1). His 1884 picture of childhood innocence leaves the look of the invasive beast to the imagination of the viewer. Miss Muffet's wide-eyed terror becomes a proxy for the spider that appears to be anything but terrifying in that tiny web formed between two branches on the left side of the canvas.

Kate Greenaway, the English artist whose delicate, pastel illustrations for children's books modeled fashion for an entire generation, also took up the nursery rhyme. Her Little Miss Muffet of 1900 is fixated and fascinated by the small but horrifying intruder sitting on her stool as she dashes off, dish still in hand (fig. 2). The nimble girl, gracefully situated in a rural setting with green grass, white lambs, and fragrant blossoms, sees that spider, innocuous as it may be, as a blot on her utopian world.

Of all the artists working during the golden age of children's book illustration in the late nineteenth century up until World War I (when paper shortages put an end to a booming industry), Arthur Rackham is the only one to turn the seemingly innocuous rhymed verse into a Gothic tale of horror. Fueled by what in hindsight feels almost like prewar anxieties, Rackham's imagination turns the spider into a dark, hairy, massive creature in a 1913 illustration for a volume of Mother Goose's old nursery rhymes (fig. 3). His spider, almost human size, scuttles over on eight hairy legs to Miss Muffet, who is daintily raising a spoon to her lips. Mimicking good manners by tipping his hat in the

FIGURE 1. Sir John Everett Millais, *Little Miss Muffet*, 1884.

direction of Miss Muffet, the spider is, more than likely, up to no good. His intentions are betrayed by the menacing web in the limbs of the tree above the two figures. Will the girl become the spider's next meal? The polite suitor seems to be after more than the bowl of curds and whey.

Two years later, the American artist Frederick Richardson, a native Chicagoan who illustrated works by L. Frank Baum and

FIGURE 2. Kate Greenaway, *Little Miss Muffet*, 1900.

Hans Christian Andersen, fell under Miss Muffet's spell (fig. 4). He clearly knew something about how spider webs are constructed (he shows both spiral scaffolding and bridge lines) and gives us a terrified girl in flight from a spider that must have lowered itself down right over her head. Richardson seems to have borrowed from Rackham the importance of showing both spider and web in a surreal fashion, but he suspends Miss Muffet and her culinary accoutrements in an ocean of pink, without

FIGURE 3. Arthur Rackham, *Little Miss Muffet*, 1913.

anchoring all the pictorial elements in the green comforts of a natural landscape.

The spiders in these illustrations may not be as ferocious as the wolf who meets Little Red Riding Hood in the woods, and they may not be as duplicitous as the cannibalistic witch Hansel

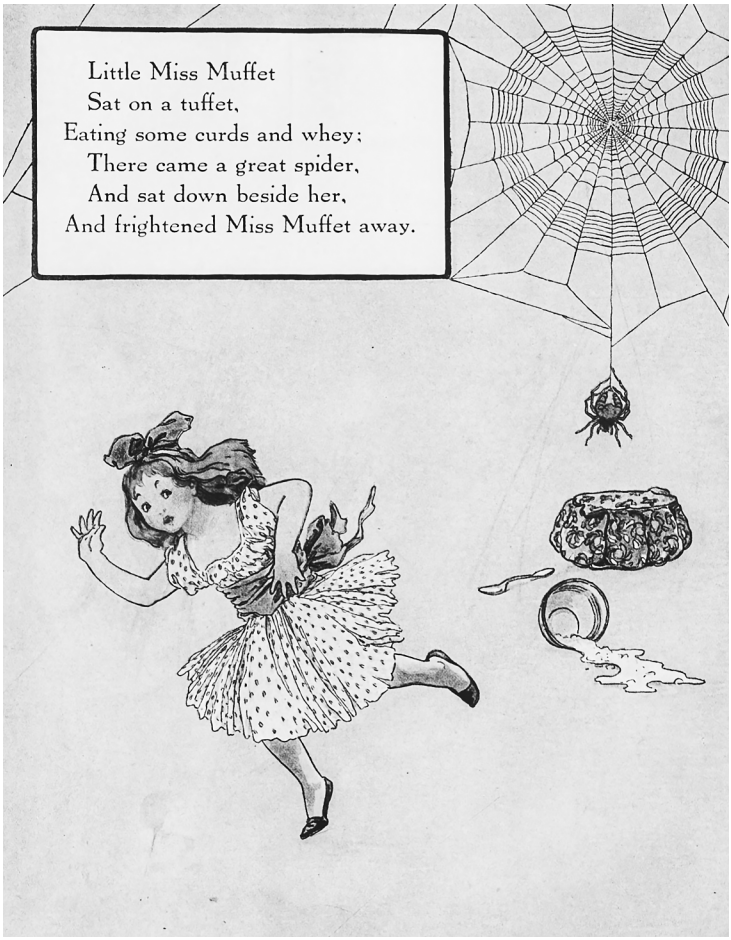

FIGURE 4. Frederick Richardson, *Little Miss Muffet*, 1915.

and Gretel encounter, but the images accompanying the nursery rhyme send a clear message about spiders as predators. You may be sitting quietly on your own, enjoying a nourishing breakfast dish, but who knows what might suddenly materialize beside you, not to mention the alarming web above your head.

In this case, the messaging seems gendered, with the girl always in petticoats, ribbons, and frills, sweet and innocent, and the spider turning into a distinctively male suitor over time.

On an annual basis, new picture books illustrating the nursery rhyme and riffing on it roll from the presses. Miss Muffet's fright becomes a source of endless delight, in part perhaps because the often tiny spider, less menacing than a wolf, a lion, or a bear, becomes a source of amusement rather than fright for the toddler set.

"Will you walk into my parlour?" is among the most quoted lines in British poetry. It comes from the 1829 "The Spider and the Fly," penned by Mary Howitt, who wrote over a hundred books for children, some with her husband in a team known as "William and Mary." The poem tells of a crafty spider who uses flattery to lure a fly into his home, where a web awaits, as well as a table set for dinner. Its final verse captures the moral of the fable, a message perhaps more relevant for adult readers than for the apostrophized "dear little children," who are less likely than grown-ups to fall prey to the seductions of flattery:

> And now, dear little children, who may this story read,
> To idle, silly, flattering words, I pray you ne'er give heed:
> Unto an evil counsellor, close heart, and ear, and eye,
> And take a lesson from this tale, of the Spider and
> the Fly.[15]

"The Spider and the Fly" gives us a gendered division of labor, with the fly an innocent female ("silly" and "foolish") and the sly male spider ("cunning" and "wily"). In early illustrations, vulnerable Little Miss Muffet encountered an ungendered spider, but whenever gendered by commentators or illustrators later in its history, it was always male. Men court and flatter but also scare and seduce, with the intention to harm—that is the

implicit lesson of the nursery rhyme and the rhymed fable. Like the classic tale of Little Red Riding Hood, this story too warns of what children today call "stranger danger" and pairs the unwary potential female victim with a predatory male beast.

The message in the nursery rhyme is taken up, elaborated, and deepened over a century later in the film *The Spider and the Fly* (1949), directed by Robert Hamer and made immediately after he released *Kind Hearts and Coronets*, a British black comedy about a viciously cruel and callous aristocrat. Set in Paris shortly before World War I, *The Spider and the Fly* follows the fortunes of the charismatic and cunning bank robber Philippe Lodocq, who charms, colludes with, and finally betrays his accomplice, the young Madeleine Saincaise. Madeleine herself is hardly innocent though, for, after World War I breaks out, she is arrested as a German spy. The film's message about a devious cad and his betrayal of a naïve victim mirrors what appears in the earlier poem.

There is one other item piece of children's folklore that comes to mind in this context, and it has a tenacious hold on our culture, a song still sung in the nursery today: "The Itsy-Bitsy Spider."[16] It tells of resilience and persistence in the face of daunting challenges. Whenever I hear it sung, I am reminded of the calming effects that tune had on my children and now on their children. Those effects may have nothing at all to do with the spider in the song, but still, the music has a mysterious way of quieting both colicky babies and tantrum-throwing toddlers, and the song continues to serve as an optimistic preschool anthem to persistence.

I am reminded by that song (with its percussive "again" of the final line) of the spiders that habitually settle down and spin in the space between the interior glass pane and storm window of my study, weaving elaborate webs as I sit at my desk reading, researching, and writing. One day, I recall, a leaf became lodged

in one of the webs, tearing it apart, and what did the spider do but rebuild? I had been overcome with sorrow at the sight of the badly damaged web, its delicate architecture unable to withstand the force of that small object, but then, to my astonishment, within hours the web had been repaired, or, more likely, rebuilt. There I was, demoralized and disheartened, gazing in disbelief at a tiny spider, evidently undaunted by the destruction of its abode and ready to make a fresh start.[17]

The song about the itsy-bitsy spider (for once an arachnid that is not threatening) also brings back memories of watching the ending of the film *Heartburn* (1986). When Rachel Samstat, a Manhattan food writer played by Meryl Streep, realizes that the father of her children has resumed his affair with a socialite, she turns her back on him and boards an Eastern Airlines jet with her children, leaving Washington, DC, for New York, for good. I recall watching that movie in theaters, with tears streaming from my eyes as I sensed the kind of courage and determination it took to leave a failed relationship and build a new life with two small children. Over the years, I sang that song many times (sometimes consciously, sometimes unintentionally) as a reminder of the need for persistence and determination. And, as a reminder too that, before long, the sun will come out and dry up all the rain. The simple nursery tune that we dismiss as child's play became a magical mantra for weathering personal storms.

Rehabilitating Spiders: Roald Dahl's *James and the Giant Peach*

The combination of sunny resilience and steely resolve we project onto spiders has turned them into cultural sentinels for us. Because our reverence for spiders manifests itself in entertainments that are considered juvenile rather than adult, we tend

not to have much faith in the symbolic significance of those particular songs. But once spiders take center stage in the magic of mythical theaters, as Spider Woman and Anansi both do, they become invested with a sacred seriousness absent from "childish" entertainments. In this context, it is worth recalling the theories set forth by the nineteenth-century German folklorist Hans Naumann, who argued that popular entertainments, in the sense of songs and stories circulating among what he called the "common" people and in the domestic sphere, are remnants of a past "high" culture. *Gesunkenes Kulturgut*, the phrase he used to designate the cultural capital that has trickled down from educated elite circles to the people, could then be seen in devolutionary terms, but it could also serve as a reminder that what moves in the comic, "low" mode (those nursery rhymes and childhood chants) was once part of a sacred belief system. All the more reason, then, to neither dismiss nor discredit the literary culture of childhood, which may, after all, tell us something about the childhood of culture.

It is worth looking at one volume designed for children that attempts to turn the tide against arachnophobia and to work against the conventional wisdom about spiders built into nursery rhymes. Itsy-bitsy spiders in the popular song are just that—creatures without the cultural heft required to provide a counterweight to all those monstrous spiders that assault Miss Muffet. It took a contrarian like Roald Dahl to recognize that the monsters children encounter in real life may in fact be human. In the animal world, Dahl discovered—long before we started worrying about climate change and the extinction of entire species—an antidote to cruelty and malice.

Roald Dahl's misanthropic ways are so out of favor today that his publisher recently hired sensitivity readers to revise his books. In the name of accessibility and inclusion, words like

"fat" and "ugly" were struck, no longer existing in the often rough Dahl lexicon. "The wonderful words of Roald Dahl can transport you to different worlds and introduce you to the most marvelous characters. This book was written many years ago, and so we regularly review the language to ensure that it can continue to be enjoyed by all today."[18] That's how the publisher, on the copyright page of the new editions, justified the edits.

In what now feels ironic, Dahl had once set himself the unusual task of working toward the goal of inclusion by rehabilitating creatures from the world of arachnids and insects. He may have been deeply misanthropic, but in his books, he befriended creatures that humans find repellent. In *James and the Giant Peach* (1961), his cast of outcasts includes a centipede, an earthworm, a silkworm, a spider, a glowworm, a grasshopper, and a ladybug. All are the companions of James Henry Trotter (the name is surely an inside joke about Henry James, the famous American author of *The Portrait of a Lady*), as he crosses the Atlantic in an outsized peach, making his way from a "queer ramshackle" house belonging to two despicable aunts living in the south of England to the Edenic precincts of Central Park in New York City.

When James enters the peach that will serve as his transatlantic vehicle, he encounters the seven creatures, all larger than they are in real life and "absolutely terrifying to behold." How does Miss Spider greet James? "I'm hungry!" she announces, staring hard at the boy. "Aren't you hungry?" she presses on, leaning forward until James finds himself backed up against a wall, "shivering with fright and much too terrified to answer."[19]

Miss Spider turns out to be a benevolent traveling companion, making a hammock bed ("a magnificent affair, and the stuff that it was made of shimmered like silk in the pale light") for each of the travelers, building a rope ladder to exit the peach,

and spinning the lines connecting the stem of the peach to seagulls that will rescue the travelers by lifting the peach out of the water. "I do nothing but good," Miss Spider complains. "All day long I catch flies and mosquitoes in my webs. I am a decent person" (91). And what thanks does she get? Why just the other day her father was flushed down the bathtub drain.

When the peach finally lands on the Empire State Building, there is panic all around, stirred up less by the appearance of a flying peach than by the travelers in it. Miss Spider emerges from the vehicle, and her head is described as "large black murderous-looking." "Is it the kind that eats fully grown men for breakfast?" the terrified Fire Chief asks (132). James calms the assembled officials down, reassuring them that Miss Spider is nothing but "nice" and that she had in fact never met Miss Muffet, and had she met her, she would never have frightened her away.

Dahl is militating against the revulsion reflex when it comes to spiders. The stereotyping of the spider as a malicious creature began with biblical condemnations, moved to a nursery rhyme, and, as we shall see, culminated in *The Sign of the Spider*, a volume that can be described as the supreme example of spider horror. It took a book written for children to restore the reputation of the spider as a "decent" creature that does no harm to the planet we share with it. It is telling that in recent literature written for children we find spiders celebrated and championed, above all for their work ethic and artistic genius, and of course for the environmental work they do for us. The taciturn spider in Eric Carle's *The Very Busy Spider* (1984) refuses the distractions of play to build what an owl describes as a "beautiful web" constructed during a "very busy day." And Bethany Barton's *I'm Trying to Love Spiders* (2015) focuses on "what spiders are good at," for example, eating seventy-five pounds of bugs every year.[20]

"Spiders Are Good to Hate People With"

Our innocent childhood rhymes help to explain arachnophobia, but there is still much to ponder in the dark ocean we are sailing to understand why we fear spiders. Why do they inflict on us what Primo Levi, the Italian writer who survived the Holocaust, described as a sense of revulsion-horror, even though the impulse is "unjustified"?[21] Why in the world would we ever want to undo the fine and fragile ecological threads that bind us to arachnids? Fear of spiders varies cross-culturally but it is one of the more common animal phobias. In Papua New Guinea and Cambodia, spiders can appear on the menu, in the form of an amuse-bouche or as the main course, though not everyone indulges. Random cases of (undocumented) arachnophagia fill the pages of books about spiders, and, oddly, "young ladies" seem to rank high among those who find spiders "delicious" and "will not leave off eating them."[22]

Of the many animal phobias that exist—ailurophobia (fear of cats), cynophobia (fear of dogs), ophidiophobia (fear of snakes)—arachnophobia is the only one that has become part of common parlance. A 2020 study published by the National Institute of Health revealed that spider and snake phobias rank highest among the many forms of zoophobia.[23] Are those innocent nursery rhymes symptom or cause of the high anxiety associated with spiders? What is it about spiders that makes them so hated?

According to a recent scientific study, the chelicerae, abdomen, hair, and legs are the spider body parts that inspire, in that order, the greatest fear.[24] The eyes, by contrast, are not seen as spooky, perhaps because they are in many cases barely visible, particularly in dim light. Horror films tend to enlarge those eyes, and the arachnid monster then stares us down in eerily unreadable ways.

While it is true that there is nothing particularly endearing about the physical appearance of a spider (no soulful eyes, no attractive pelt, no winning playfulness), the strength of our aversion to them remains mysterious. Is it because they are ubiquitous and at the same time masters of camouflage? Is it because they so often settle down in sunless spaces and dusty corners and come to be associated with things disgusting or unclean? Or that they hide in plain sight, taking us by surprise only when we look carefully at a wall, a ceiling, or a shower drain? Who has not at some time been ambushed by a spider appearing as if out of nowhere, furtively floating down a gossamer thread? Flies buzz to alert us to their presence; bees and wasps emit a humming sound; butterflies flutter into our field of vision with a burst of color. Spiders are almost like ghosts, materializing before our eyes in uncanny ways.

Perhaps we fear spider webs almost as much as we do the creatures that spin them. Who does not feel queasy when imagining that spider silk is drawn from what is stored in the spider's own body? And where do we find those webs? In attics, clinging to once treasured things, now abandoned, and left to molder in delicate white shrouds. Or we come upon them in basements, where they hang vertically from dark ceilings, growing into the cone of the dim light cast by a bulb. What a contrast to the wonder of an outdoor web, glistening in the morning dew or sparkling in the afternoon sunshine. That's when arachnophobia can execute an elegant flip, turning into arachnophilia.

Owls are wise, foxes are sly, sloths are lazy, cats are aloof, and dogs are faithful. Spiders by contrast have no single attribute assigned to them. We praise them for their patience, tenacity, industry, and determination, well aware that they build egg sacs with care and protect them with savage love. But we also harbor feelings of hostility as soon as our thoughts turn to their bite,

their venom, and their behavior. Spiders are antisocial and reclusive. Their webs may have a magical quality, but they are tainted by a drive associated with stealth and duplicity. Sir Walter Scott framed that association bluntly in his verse romance *Marmion*: "What a tangled web we weave, / When first we practice to deceive!"[25]

"Spiders are good to hate people with," the British psychoanalyst Adam Phillips once observed to a patient.[26] For him, phobias are also stories about "where the wild things are." Spiders, then, become a collecting point for all the fears we harbor about our own instincts and desires. Are we, too, reclusive and by extension misanthropic? Can we turn as cruel, aggressive, and murderous as the black widow, who devours her mate? Do we lure others into the treacherous webs we spin? Built into the logic of arachnophobia is a dialectic of purity and danger, a sense that we can be virtuous by dreading the object of fear even as we are perpetually drawn into its orbit because it can give us license to yield to forbidden desires.

That the noun "spider" is gendered feminine in nearly all languages does not bode well for women, who all too often must carry the symbolic baggage attached to arachnids. It does not help that the female in the order Araneae is often, though not always, more deadly than her male counterpart. That behavior may, of course, be motivated by altruistic instincts in both male and female spiders. Biologists long held that female spiders polish off their suitors after mating because of postcopulatory hunger, and a meal is readily available. However, a team of Chinese researchers at Hubei University discovered that the young born of females that had made a meal of their partners had a 48 percent chance of surviving versus only 12 percent for spiders born of females who had let their partners make a getaway. In other words, one can say that the spider dads engage in

altruistic behavior, laying down their lives for the good of their offspring. And the spider moms too are invested in the welfare of the next generation.[27] The findings of the Chinese scientists serve as a powerful reminder that our cultural understanding of behaviors observed in the animal world often has little to do with reality and that we apply them in gendered ways to the human world at our peril. Animals are good to think with, but we are only always in dialogue with other humans, never with the animals themselves. And, why, we might also ask, do we so often let ourselves be ensnared by fear rather than fact?

The folkloric inventions that stay with us in the form of rhymes and songs may be operating as a kind of residue of cultural belief systems, telling in their expressive simplicity. Clear gender lines emerge in that "innocent" form of folklore, with threatening male arachnids and resolute female spiders that anticipate what is to come in the world of high art from the nineteenth century onward, with its predatory male "spiders" and spiderlike females, treacherous femmes fatales who, tragically, become the equal of their male counterparts rather than running away in fright. What quickly becomes apparent is yet another way in which spiders personify paradox, aligning themselves now with men, now with women, and walking a fine line between what separates attackers from protectors, creators from destroyers.

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