

Human Gardens: Grotesque Love and Abject Terror in a World of Parasitic Infection

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Dedicated to Jonah Miller:
you've encysted in my heart
and I refuse treatment.

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Abstract

Several popular-science books explore how, even in the modern world, our bodies cling to our parasite-ridden evolutionary backgrounds. However, no academic or popular text has analyzed Western cultural attitudes towards parasites in terms of a larger aesthetic. To address this question, I wrote a nonfiction book that sought to accomplish the following: (1) Introduce the rhetorical aesthetics of the grotesque, the sublime, the uncanny, and the abject, with emphasis on the evolutionary grotesque, the usage of the latter three in speculative fiction, and my own personal connections to the same. (2) Articulate the current emotional relationship between people and parasites by examining the abjectified portrayal of parasitization in popular media. (3) Introduce the hygiene hypothesis and helminthic therapy in a manner accessible to the layman and explain the repercussions of the same. (4) Predict that future attitudes towards parasites will shift from the aesthetic of the abject to that of the grotesque, based on our more complex, emotionally ambiguous understanding of parasitic symbiosis.

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To My Host

What is it like, to live so completely
 for another?
swaddled in its swell, its subsidence
of the miles-distant heart
that tangles and thrives to blur
on the coaxing chemicals where *mine* becomes *ours*

the darkness, surely, would be complete—
my whole mass tossed
in the ocean wash, retreat, and sudden flood
of searing pepsin and brilliant muddy bile
like lines of flame that draw the heady, sucking sense
to where it spirals in the deep body's absolute night
sinks its mouth, burrows its fat dart
 comes to rest
in a different kind of work:

the tiny tongues of self seething away
from where I am pressed, blind and teeming, on every side
like a shapeless star lapped in that wet red darkness—pregnant, enveloped, rocked.

The Tangled Bank: Evolution and the Grotesque

Mr. Motley: “I believe this to be the fundamental dynamic. Transition. The point where one thing becomes another. It is what makes you, the city, the world, what they are.... The zone where the disparate become part of the whole. The hybrid zone.”

— China Miéville, Perdido Street Station (2000)

Near the end of the fifteenth century, the unfinished Domus Aurea (“Golden Palace”) complex of Emperor Nero was unearthed from beneath fifteen hundred years of accumulated fill, vegetation, and overbuilding. Renaissance artists and scholars were captivated by the fanciful new art form that filled its walls: strange, capering beings without description, whose bodies segued playfully and seamlessly from human to plant to animal. It defied the classical emphasis on “ideal” or “perfected” forms, which were static, eternal, and permitted no gaps or overlaps between categories of existence. Instead, the figures conveyed a sense of constant motion and transformation and existed at the boundaries between categories. Viewers could identify their component parts—the head of a man, the forelimbs of a wolf, the torso of a horse, the hindquarters narrowing into a curling vine—but had no word for the figure as a whole. Since the dank, dim rooms and corridors of the buried Domus Aurea had the feel of underground grottoes, this new form was called *grottesche*, or “grotto-esque.” This word and its associations with hybridity, uniqueness, vitality, taboo, and transformation evolved over the following centuries into our current aesthetic of the “grotesque.”

To be grotesque, a thing must both be conflicted in itself (i.e., exist at a conceptual boundary of some sort) and elicit conflicting feelings within the viewer. It is not necessarily a hybrid in the sense that it literally combines distinct physical parts of different organisms, like a Greek centaur or medieval demon. Frankenstein’s monster combines life and death in a single jarring form; the Hunchback of Notre Dame’s hideous appearance and enforced isolation places him at the edge of what is considered human. For the reader, both of these figures excite



Restored ceiling paintings from the Villa d'Este area of the Domus Aurea complex.
 Photographed by Adrian Pingstone at Tivoli, Italy in June 2007 (released to public domain).



The German Surrealist photographer Hans Bellmer (13 March 1902 – 23 February 1975) is best known for the series of life-sized, pubescent female dolls he produced in the mid-1930s. Though he was forced to flee to France in 1938 after the Nazi Party declared his work “degenerate,” he was welcomed by Paris’ art world.

simultaneous feelings of pity and revulsion. Sigmund Freud's theory of the uncanny describes a variant on the grotesque that creates intellectual uncertainty through repetition. It breaches the boundary between fantasy and reality, allowing repressed psychological material to take physical form in the real world—and though we are frightened at this breakdown in the accepted laws of the universe, we are strangely drawn to what are, essentially, our own secret selves. The dolls exhibited by Hans Bellmer in the mid-1930s also exist at the boundary between such essential binaries as life and death, animate and inanimate, human and inhuman, reality and imitation.

The viewer cannot resolve a grotesque object's multiple, often conflicting categories into a single entity that can be defined in the abstract—the grotesque is always unique and therefore indescribable. And yet s/he senses that there *is* some resolution, some higher category into which all the disparate elements can fit, lying just beyond his/her grasp:

Broadly and basically speaking, we apprehend the grotesque in the presence of an entity—an image, object, or experience—simultaneously justifying multiple and mutually exclusive interpretations which commonly stand in relation of high to low, human to subhuman, divine to human, normative to abnormal, with the unifying principle sensed but occluded and imperfectly perceived. (Harpham 14)

This dimly sensed commonality or logic behind a grotesque figure, as much as its original jangling combination of disparate parts, is what stimulates the viewer's conflict of emotion. The effect of the grotesque is often described as a war between humor and horror, where the viewer cannot decide whether to laugh or to feel disgust or fear. But a more general description would be a war between positive and negative emotions, or between attraction and repulsion. For example, Bellmer's dolls possess certain anatomical features appropriate to human females and are clothed and posed to suggest the same. These traits light up the part of the viewer's mind that

recognizes other humans and prompt him/her to reach out emotionally to the figures, identify and sympathize with them, perceive them as fellow human consciousnesses, search for evidence of their own opinions and emotions—perhaps even respond to their sexual cues with his/her own erotic interest. But the viewer keeps being brought up short by the abnormal, deficient configuration of those traits and the unambiguous “doll-ness” of their ball-jointed limbs. The human instinct to align our perception of ourselves with other human shapes is hijacked halfway through in the most horrible way possible.

The grotesque throws into our faces everything for which we have no word—everything that has slipped between the cracks of the mental framework by which we make sense of the world. By blending categories that are perceived as mutually exclusive, the grotesque suspends the viewer in the cognitive void between classical (i.e., perfected) forms. The viewer can feel the gears of his/her mind grinding as it struggles to expand its old, inadequate systems into the new, more complete understanding of the world that can contain a particular grotesque object. For example, the male/female binary seems like an obvious truth until one realizes that male humans are more similar to female humans than they are to, say, male cats or male flowers. By lengthening the gap between sensation and comprehension, the grotesque gives us time to examine the path along which information travels in our mind, without our preconceived notions and clichéd “truths” rushing in to fill the void and hurry us along to a reassuringly pre-chewed conclusion. In other words, it exposes the limits, gaps, overlaps, and grey areas of our mental frameworks by drawing attention to them, stretching them out until they become visible, and giving us time to think about them. A fantastic example of this rhetorical function of the grotesque is Patricia Piccinini’s “We Are Family” installation (Venice 2003), which explores the implications of evolution and genetic engineering through the aesthetic of the grotesque.

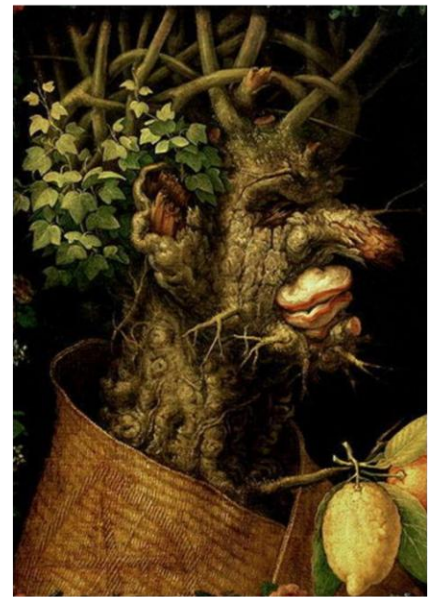


“The Young Family” (2002-2003) by Patricia Piccinini
silicone, acrylic, human hair, leather, timber
80.0 x 150.0 x 110.0 cm (irreg.)



“Leather Landscape” (2003) by Patricia Piccinini
silicone, acrylic, leather, human hair, clothing, timber
290.0 x 175.0 x 165.0 cm (irreg.)

Piccinini’s figures are new, incomprehensible forms caught perfectly between human and animal. And yet the viewer feels a hideous sense of homecoming, a bizarrely heartwarming recognition of our kinship through evolution from a common ancestor—of the fact that there is no solid scientific line between humans and other animals (or even between organisms from closely related species, for that matter). In this way, they tear down the most basic binary of all by breaching the line between the viewer and the outside world, or between Self and Other.



The Italian Mannerist painter Giuseppe Arcimboldo (1527 – 1593) was most famous for his composite portrait heads. Clockwise from left: “Water” (1566), “Earth” (1570) and “Winter” (1563).

This “evolutionary grotesque” has long been rich soil for artistic exploration. Giuseppe Arcimboldo, born in Milan in 1527, was an Italian painter famed for composing human portraits from animals, plants, and inanimate objects. Up close, the portrait “Water” (1566) seems like a lumpy mass of fish, crustaceans, and other sea creatures. As we move further away, the mass begins to resolve itself into a human face, until we see none of its marine components at all. At

the middle distance, however, both possibilities waver back and forth in our minds, so that we see first marine life and then a human and then marine life again. Neither label is adequate, so our perception is balanced uncomfortably on the unseen idea between them—the greater, fuller idea that would unite the categories and resolve the image in front of us, if only we could find it. But the painting’s title provides the vital clue “that, suggesting an abridged evolution, a common origin in the sea, accommodates all possibilities” (Harpham 14). Even if evolution as a scientific concept lay centuries in the future, many of Arcimboldo’s paintings drew similar attention to life’s common origins.

The exploration of evolution through the aesthetic of the grotesque only grew more explicit as Darwin’s theories became widely accepted. H.G. Wells’ The Island of Doctor Moreau, published in 1896, describes the shipwrecked Edward Prendick’s discovery of an island full of strange, bestial people, presided over by the coldly intellectual Doctor Moreau. Prendick at first believes that the “Beast-Folk” are captured humans that Moreau has tortured into a hideous, deranged state, but Moreau reveals that they are the products of his research to “uplift” animals into humans through plastic surgery, hypnosis, and inculcation of his pseudoreligious Law. Prendick lives on the island for almost two years, longing for his old civilized life among “true” humans even as he grows accustomed to the Beast-Folk. After a series of social upheavals on the island, the Beast-Folk begin reverting to their original forms and behaviors, and Prendick escapes on a boat that drifted onto the island’s shore. But when he returns to London, the very humans for whose company he longed inspire a frenzied terror of the grotesque:

I could not persuade myself that the men and women I met were not also another Beast

People, animals half wrought into the outward image of human souls, and that they would

presently begin to revert.... I feel as though the animal was surging up through them; that presently the degradation of the Islanders will be played over again on a larger scale.... [P]rowling women would mew after me; furtive, craving men glance jealously at me; weary, pale workers go coughing by me with tired eyes and eager paces, like wounded deer dripping blood.... Then I would turn aside into some chapel—and even there, such was my disturbance, it seemed that the preacher gibbered ‘Big Thinks,’ even as the Ape-Man had done; or into some library, and there the intent faces over the books seemed but patient creatures waiting for prey. Particularly nauseous were the blank, expressionless faces of people in trains and omnibuses; they seemed no more my fellow-creatures than dead bodies would be.... And even it seemed that I too was not a reasonable creature, but only an animal tormented with some strange disorder in its brain which sent it to wander alone, like a sheep stricken with gid. (244-45)

Tormented by his visions of the animal within each fellow human, the collapse of his illusions about humanity and civilization that held savage Nature at bay, Prendick moves to an isolated house in the country. He spends the rest of his days studying chemistry and astronomy, soothing his soul with the predictable motions of perfect bodies, governed by eternal physical laws.

Nearly a century later, the Lilith’s Brood trilogy by Octavia Butler—first published in 1989 as the Xenogenesis trilogy—emphasizes the evolutionary power of the grotesque to recombine, reinvent, and reinvigorate old concepts after it has deconstructed them. In a postapocalyptic future, Lilith Iyapo and other surviving humans are rescued by highly advanced extraterrestrials, known as the Oankali. The Oankali have a fundamental biological drive to seek out other species and share genetic material with them, such that the next generation of Oankali is a perfectly tuned mix of its two parent species. (The human/Oankali hybrid children look

mostly human, though some have small tentacles.) They also have three sexes: male, female, and *ooloi*, who have especially powerful genetic-engineering and neural-manipulation abilities. Instead of manufacturing mechanical devices, they merely alter existing organisms in order to breed biological vehicles, buildings, and even starships. Finally, their memory is both eidetic and hereditary, meaning that an individual Oankali of any age has perfect personal memories of all the species that the Oankali have merged with since they left their home planet.

There is a simultaneously touching and eerie scene in the first book, *Dawn*, where Lilith's assigned friend and tutor Nikanj (who was only recently born) tells her centuries-old stories of life on other planets, in other bodies: "Six divisions ago, on a white-sun water world, we lived in great shallow oceans.... We were many-bodied and spoke with body lights and color patterns among ourself and among ourselves" (63). Oankali, especially *ooloi*, can peer into a person's genetic structure as easily as a human peers through a microscope—except that said microscope has infinitely perfect magnification and allows for infinitely precise manual manipulation of what is being examined. Their instinctual drive for biological change, their retained genetic memory of all life that has gone before, and their ability to produce such sweeping changes to other species make them almost the embodiment of evolution itself. Their beneficial ability to meld with other organisms, emotionally and mentally as well as genetically, only adds another layer of grotesquerie by violating the Self/Other boundary that exists between individual people.

But the most striking examples of the evolutionary grotesque are those found in real nature. Here it is important to note that the grotesque can be created by compressing *time* as well as types or states of being: "[I]n order to achieve grotesqueness, it suffices to abridge an evolution,' to attach a creature to another phase of its own being, with the intervening temporal gap so great that it appears that species boundaries, and not mere time, has been overleaped"

(Harpham 11). A population's evolutionary path is punctuated by intermediate, unnamable forms that lie balanced between ancestor and descendant, seemingly "halfway" adapted, and by sister taxa that touch one another across their genetic gaps as gently as Goodall's chimpanzees touched their hands to hers. The human body is littered with the artifacts of our past animal existences: tailbones, goosebumps, ear muscles, nictating membranes, junk DNA, wisdom teeth, appendixes withered by our departure from strict herbivory to an omnivorous diet (Campbell and Reece 448-449). Our digestive tracts are a teeming metropolis of bacteria, some beneficial or even vital, a few harmful, most neutral. But even if we were to scrub our bodies inside and out with bleach (and somehow survive), we would still shelter tiny, essential aliens within our very cells.

The endosymbiotic theory of eukaryote evolution requires some explanation. A eukaryote cell is defined as one that contains a nucleus and certain other organelles, all enclosed within membranes (Campbell and Reece 8). One type of these organelles is the mitochondrion, which uses oxygen to efficiently convert glucose into chemical energy in the form of adenosine triphosphate, or ATP. Another type is the chloroplast, which uses sunlight to efficiently convert carbon dioxide into glucose (Campbell and Reece 109). For the most part, animals and fungi have only mitochondria, while plants have both mitochondria and chloroplasts. All three groups, in addition to several other kingdoms of life, belong to the domain Eukarya. (Bacteria and Archaea, which lack membrane-bound organelles and are therefore prokaryotic, are the other two domains of life.) While the majority of a cell's DNA is kept in its nucleus, chloroplasts and mitochondria both maintain most of their own separate genomes within the confines of their membranes. Furthermore, both mitochondria and chloroplasts possess bacteria-like internal structures and DNA arrangements (Campbell and Reece 524).

This and other overwhelming evidence has contributed to the formulation of the endosymbiotic theory (Campbell and Reece 523-524, 550-551). Roughly two billion years ago, after photosynthesis came into existence but before true multicellular organisms evolved, a large predatory prokaryote engulfed a smaller, oxygen-using prokaryote. But instead of being digested, the small prokaryote continued to live inside the large one, taking a portion of the food that the large one consumed and providing it with an abundance of chemical energy in return. When the large prokaryote divided, the small one divided with it, and their descendants maintained the mutually beneficial relationship while they diversified into more advanced unicellular organisms, colonies, and even multicellular organisms. The small prokaryotes eventually became mitochondria and their hosts became eukaryotes. Another endosymbiosis event happened later when primitive eukaryotes engulfed the cyanobacteria ancestors of chloroplasts, giving rise to photosynthetic eukaryotes.

Mitochondria are our most intimate partners. We literally could not live without them; other processes that produce chemical energy from glucose, such as the anaerobic glycolysis employed by many prokaryotes, are simply too inefficient to sustain a body made of so many large, complex cells. But our mitochondria keep their DNA separate from our own, reproduce on a different schedule—and with bacteria-like binary fission, no less, rather than the mitosis that a eukaryotic cell would use—and sometimes even respond to antibiotics like their bacterial ancestors (Campbell and Reece 524). To quote Bill Bryson's A Brief History of Nearly Everything: In biological and evolutionary terms, “they keep their bags packed” (144).

This patchwork coexistence of life extends even to the genetic level. It has long been known that a family of mechanisms known as “horizontal gene transfer” (HGT) allows bacteria to acquire and immediately use new genetic material. The three main types are conjugation (the

bacterial equivalent of mating), transformation (the uptake of “naked” DNA or RNA floating around in the environment), and transduction (in which a virus transports DNA from one bacterium to another). But as was recently discovered, HGT is not limited to bacteria.

Transduction and, to a lesser extent, transformation also facilitate constant traffic between the genetic pools of eukaryote species. In fact, the current genomes of eukaryotic cells may be the result of *genetic annealing*: the production of a new genome through the transfer of part of one organism’s genome to that of another (Campbell and Reece 525). The most current evidence suggests that HGT, as well as hybridization between different species, has shaped life from its very beginnings to the present day. In other words, a wide variety of organisms—including prokaryotes, unicellular eukaryotes, and even multicellular eukaryotes—have shared genes across phylogenetic boundaries that were once thought ironclad (Lawton). This means that the genetic history of any given species is confused by DNA from many different sources, rather than a single line whose path can be discovered by tracking only one gene. It seems that the Oankali, far from being alien, would feel at home on Earth. Since the publication of Lilith’s Brood, Darwin’s neatly branching tree of life has been reimagined as a snarled shrub populated by throwbacks, chimeras, jury-riggers, and even “vampires” that evolved specifically “to keep only the limited set of genes they need for their current environment, but retain nearly endless capacity to acquire new genes” from unrelated species (Slonczewski).

There is one last element of the grotesque to consider: a sense of “an atrocious and inappropriate vitality” (Harpham 6), an excess of birth and growth and decay and death, often occurring simultaneously. The literature of Rabelais and the folk art of medieval carnival celebrated the imperfect human body, which was not self-contained and sleek and perfect, but bulged, gaped open, overate, defecated, dripped mucus, bled, copulated, vomited, guffawed,

changed size and shape over time, and ultimately died. It reached out to the world and let the world enter it in return, stimulating lifegiving change for both entities. As modern biology understands us, our bodies are piled-upon composites of ancestral DNA, vestigial features, and silent agreements with hordes of beneficial bacteria. Our very cells are patchwork. We are, ourselves, grotesque—full of life in every sense.

In Darwin's stirring conclusion to The Origin of Species, he reflects upon the teeming interdependence and endless, vivacious innovation of life with the now-famed metaphor of the tangled bank:

It is interesting to contemplate a tangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent upon each other in so complex a manner, have all been produced by laws acting around us.... There is grandeur in this view of life...that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved. (429)

Every organism alive on Earth, argued Darwin, is part of a tangled bank, inseparable from its predators, competitors, and prey. What he didn't know was that every organism is also itself a tangled bank—an ecosystem populated with trillions of invisible but essential citizens, heaving with the movements of our own biology and our life-giving inner swarms.

So what do we, such seething cities, feel about that with which we overflow?

Abstract

the painting

writhes and squirms
go on touch it

globbed canvas, worming to one
and I do I do it I touch it
hot glue dried invisible and exuberant
over colored taffy swoops, I stroke the paint lines purring
crosswise under my fingers like chewed gum dried to stone under desks
jumping like the woman's voice in my ear and I know

without looking that porcupine quills sleek back from her skull, wrists, and elbows
trilling clattering as her body slants to snow-powder beat
again, juddering—no primary colors—
crying like a lyrebird with the black wounds inflicted in silence
enforced thrills me flows me shit I forgot to tie my shoe while I had the smallest moment

the digital serpent fractalizing overhead, its blared smashed-transistor scream
from white and static green to blue, an AI reaching for love—
can we not see the snake
without seeing the woman?

can we knock on the floor and let this huge room
tell you all about itself,

a bronze statue who stares at a tree and writes about woods
and also about Death
except you're also writing about woods
while Gaia ambles
while Raven laughs at sweet imaginary stench

while somehow past all you zombies still
I see the painting, that entangled bank of his
roots clothed with moss and leaf and inseparable, adoring stem
a-flit with roaches dragonflies ants pillbugs dear centipedes dear darkling beetles dear worms
struggling in the mouths of English blackbirds and warblers
heaving, teeming through the damp death-mulched earth under their pale talons
those beloved forms, those snarled unbreakable
elaborately constructed forms—that entangled bank
shows me its own one solid knotted body of life, twisted with itself
matted and pervaded with itself
at a loss with itself
convulsed and enraptured with itself
in screaming mad heartbroken skin-aching love with itself

and I
touch it.

Apologia Pro Vita: The Aesthetics of Speculative Fiction

“The sinister, the terrible never deceive: the state in which they leave us is always one of enlightenment. And only this condition of vicious insight allows us a full grasp of the world, all things considered, just as a frigid melancholy grants us full possession of ourselves. We may hide from horror only in the heart of horror.”

— Thomas Ligotti, *The Medusa* (1991)

The developed world’s attitudes towards parasites are difficult to pinpoint through explicit investigation. In the course of my research for this book, I found no one who outright asked, “How do we feel about parasites and why? What are the origins and the precise texture of our emotions?” Indeed, even if someone had, it is difficult for the conscious mind to find a rational grip on emotions—especially strong, slippery ones like fear. But if fiction reflects the collective unconscious of a culture, then literary analysis can function as dream interpretation on a societal scale. We can divine our relationship to parasites through the stories we tell about them. But to dissect these stories, which most often fall into the science fiction and horror genres, I must first establish a basic vocabulary of key literary-theory concepts: the sublime, the uncanny, and the abject.

Science fiction is often described as a way to examine humanity’s present by examining its future. This can certainly be true, often is true—and yet what I most enjoy about science fiction is its lovingly detailed portraits of the alien. I am utterly fascinated by the biology, psychology, and sociology of fictional, nonhuman species. (One of my most beloved books is Jeff Rovin’s The Transgalactic Guide to Solar System M-17, a mock travel guide outlining the various tourist attractions of each planet orbiting the eponymous star. It has no plot or characters—just two hundred and eighty-eight encyclopedic pages on the morphology, culture, and history of almost a dozen alien species and the overall environment of their home planets. I suspect that most people would find this book unbearably boring.) Even when the subjects of a

science fiction story are *Homo sapiens sapiens*, they have been altered. We, as modern readers, glimpse them across a vast chasm of technology and culture and the indefatigable march of time. They have changed and become something greater simply by virtue of survival. Even the very-Earthly protagonists of Bradbury's often-technophobic stories were still entranced, right along with their readers, by the unimaginable universe that they had pried open like a reluctant flower.

It is for this reason that my favorite human-centered science fiction tends not to be dystopic (though perhaps not outright utopic, as it is difficult to write interesting plots for a setting designed to lack conflict and suffering). Dystopias take a magnifying glass to the tragedies and follies of human nature that we already know: fear, anger, hatred, apathy, the lust for power. My favorite stories glow, however subtly, with the optimism and pure wonder of science fiction's Golden Age, the heartfelt belief that humanity will not go gentle into that good night but fly on and on into it, into the marvels of eternity, into splendor indescribable. That we will touch, in other words, something sublime.

Unlike the aesthetic of the beautiful, which "is connected with the form of the object," the aesthetic of the sublime is "found in a formless object, so far as in it or by occasion of it *boundlessness* is represented.... [T]he satisfaction in the sublime does not so much involve the positive pleasure as admiration or respect, which rather deserves to be called negative pleasure" (Kant 102). The sublime constitutes an entire category of stark, awe-inspiring experiences, ranging from the concrete (witnessing a volcanic eruption or a hurricane) to the abstract (contemplating God or the concept of infinity). Sublime entities cannot be resisted; they overwhelm our understanding and make us feel insignificant. Yet if we are safe from any real danger, these feelings are invigorating, even pleasurable. The fear provoked by sublime entities "raise[s] the energies of the soul above their accustomed height and discover[s] in us a faculty of

resistance of a quite different kind, which gives us courage to measure ourselves against the apparent almightiness of nature” (Kant 125). The sublimity of science fiction—its promise of an unbounded universe, just waiting to be explored, and the unknowable ways in which we will grow and change as a species—is one of my favorite aspects of the genre.

But I also love horror.

I am fond of it on principle, as a genre, even the kind found in formulaic slasher flicks, absurd B-movies, and the recent “torture porn” fad. That subspecies of horror unashamedly revels in excess: fountains of gore, extreme close-ups of gaping wounds, masked killers who slowly sit back up after being shot fifteen times, young women who scream for minutes on end, monsters slapped together seemingly at random from piles of spiny-furred cloth and rubbery tentacles and glycerin goo. It’s brazenly campy and has fun with its own ridiculousness, which means that I have fun with it, too. What it is not, however, is scary. The feelings it evokes cannot stand up to daylight; it jumps out and startles you, but it does not leave a lasting mark on your mind. More specifically, it does not make you *doubt* your own mind.

The best horror asserts this trademark “gleeful excessiveness” (Hurley 142) in more psychologically deliberate ways. This adroitness is the difference between Joyce Carol Oates and Dean Koontz, *The Amityville Horror* and *The Evil Dead*, *Jacob’s Ladder* and *Saw*, the *Silent Hill* and *Resident Evil* series, the first *Friday the 13th* and its later iterations. (Indeed, between most original horror movies and their remakes; subtlety is too often lost in special effects.) Sensory and emotional input must overwhelm the human capacity to comprehend, calmly analyze, sort and label everything into neat little boxes whose contents are then promptly forgotten. Every narrative element, from the most incidental scuff-marks and dusty corners of its setting to the ever-shifting emotions of its characters, works together to create what I can only describe as “a

sense of wrongness”—and then just keeps amplifying it, piling those signals on top of each other until they become a screeching dysphony. This buildup can be slow or fast, work towards a subtly creeping unease or a hysterical revulsion, primarily sensory or primarily emotional or an even mix. It can deal with both primal fears (such as death, pain, or abandonment) that endure through time and more specific sociopolitical fears that tend to lose relevance outside the culture from which they spawned (King 142). Even the feelings that good horror fiction evokes in me are living contradictions: beautiful despair, sweet pain, transcendent disgust. It is as if the sheer excess of terribleness wraps around the limits of human emotion to become a pleasurable aesthetic experience in its own right, its nuances as worth savoring as those of wine. Or perhaps the way that this experience exceeds, defies, downright explodes conventional reason in favor of intuitive truth is why I find horror so fascinating. Tertullian’s famous misquotation, *CREDO QUIA ABSURDUM*, applies well here: I believe because it is irrational.

Excess, with the way it overwhelms the human mind, is a vital element of horror fiction. But horror is also *reductive*. Like its cousin pornography, it is a literature of bodily sensation and response, felt not in the mind but in the twisting gut and prickling skin. It boils both its characters and its readers back down into frightened animals by boiling all choices down to fight or flight, all emotions down to varying degrees of adrenaline. I might love horror because I am fascinated with this state of mind—or lack thereof—which is not so much irrational as it is *arational*, not causing one to lose track of time as it is *timeless* to begin with. The favorite tropes and themes of horror are existentially haunting: Isolation. Uncertainty. Confusion. Helpless anger. The loss of control. The loss of direction, both physical and moral. The loss of hope. The loss of self. Horror pierces our thick skins like a starving worm and empties our hearts of all pretense; once we are thus pierced, thus emptied, we cannot help but see what we really are. The grotesque and the

sublime alike bring us just short of comprehension, then leave us hanging there until we can close the gap ourselves with a epiphanic leap. It is in this respect that, again, the lowest pits of horror fiction feel oddly similar to the highest vaults of science fiction's heavens. Humans, as individuals, are nothing. Irrelevant to the story. Humanity, as maddened beast or transcendent angel or both at once, is everything.

This uncanny feeling of “familiar alien-ness”—of seeing a world that I have never known, populated by the shades of things greater than I will ever know, yet still coming in shocked contact with something essentially human—is present in both horror and science fiction. In the previous chapter, I touched only briefly on this emotional effect as it related to the aesthetic of the grotesque. However, it is more prominent in the function of horror, whose importance and effectiveness as a genre lies in its liberation of buried anxieties (King 33, 41, 187, 323, 367). Freud's ground-breaking essay “The Uncanny” (published in 1919 as “*Das Unheimlich*”), which was the first to name and describe this effect, relies on his concepts of repression and the unconscious. He begins by exploring the many definitions of the German word *heimlich* (best translated as “homey”), which begin with “comfortably familiar” as its most common meaning but eventually reach “secret and unsettling.” The emotional quality of the word *heimlich* becomes more and more ambivalent until it coincides with that of *unheimlich*, or “uncanny,” its own opposite:

[T]he word *heimlich* is not unambiguous, but belongs to two sets of ideas, which, without being contradictory, are yet very different: on the one hand it means what is familiar and agreeable, and on the other, what is concealed.... [E]verything is *unheimlich* that ought to have remained secret and hidden but has come to light. (Freud 420)

Essentially, Freud's uncanny describes a moment when you feel déjà vu at something you've never encountered. To experience it is to feel simultaneously like a stranger coming across another person's deeply buried secret and like the person whose secret has been exposed. It evokes the world of dreams, where Nature's laws are bent in deference to the gravity of your psyche—skewed like bean seeds planted in upside-down flowerpots, whose roots writhe out into open air while their leaves unfold in soil. You move easily forward when the path should be impassable and get stuck when it should be clear. You recognize totally new things, while things you should know like the back of your hand have somehow grown extra dimensions when you weren't looking. And yet it all makes perfect sense to you within the boundaries of the dream. It is a world ruled by intuitive rather than rational logic.

However, the uncanny may be understood in a more general sense as an uncomfortable mixing of familiar and unfamiliar, known and unknown. A haunted house is uncanny because it is an inanimate object that has developed animate aspects: rattling windows, sourceless moans, threatening messages scrawled in blood, furniture that rearranges itself, and (above all) a malevolent force of will. It should not, *cannot* be alive—and yet it is, though wavering within an indescribable limbo of unlife that doesn't operate quite like any truly living organism.

Furthermore, as horror novelist Anne Rivers Siddons explains:

[A house] is an extension of ourselves; it tolls in answer to one of the most basic chords mankind will ever hear. My shelter. My earth. My second skin. Mine. So basic is it that the desecration of it, the corruption...by something alien takes on a peculiar and bone-deep horror and disgust. It is both frightening and...violating, like a sly, terrible burglar. A house askew is one of the not-rightest things in the world, and is terrible out of all proportion to its actual visitant... (qtd. in King 287)

What makes a haunted house so terrible is the fact that it was once ours—safe, familiar, reliable, and most of all, docile. Other examples of the uncanny include an android whose face falls just short of human or a young child who speaks and behaves like an adult. (The former entity is addressed in the concept of the *uncanny valley*, an interesting statistical dip in how people respond to humanoid figures. We tend to like creatures that look more human than otherwise—but only up to a point. Our reactions nosedive into revulsion at creatures that approach, yet fall just short of humanity: corpses, too-realistic mannequins, bad CGI, and so on.) What situates the uncanny squarely in the realm of the grotesque is the way it mixes categories that ought not to be mixed and dangles understanding just out of our grasp. We all have an intimate experience with how humans and houses are supposed to work, so when they suddenly start working differently, we are repulsed and terrified out of all proportion to the actual threat level of the object in question. Yet we are also strangely fascinated—it’s in our nature to explore unfamiliar things, after all, even as we are frightened by them.

The heart of the uncanny is the way it provokes *intellectual uncertainty*; it is forever “almost, but not quite.” For Freud, this uncertainty evoked the dream state because of the way psychological material existed in his conception of the unconscious. Every aspect of a dream is *alive*—animated, possessing intent, pregnant with meaning. If objects and events that recall our psyches begin to crop up in our day-to-day lives, it feels like our psychological material is leaking into the real world and influencing it to “wake up,” thus becoming like the living world of a dream. An uncanny event can be as simple as seeing the same number everywhere, over and over—on a license plate, a newspaper, a radio, a cloud—until we feel like the world is “trying to tell us something” about that number. (Such repetition, or “doubling,” is common in dreams and useful in dream interpretation as a way of calling our attention to important symbols.) But an

uncanny event can also be as complex as our repressed thoughts taking solid form and demanding our attention.

Though its author had no sociopolitical message in mind, Jack Finney's novel The Body Snatchers (1955)—and especially its Don Siegel movie adaptation (1956)—perfectly follows the contours of paranoia, which we have all trod at least once: “Something’s going on here and only I can see it. Television is being censored. All the phones are being monitored. Nobody else believes me—or are they part of the conspiracy themselves? But I know the Great Enemies are here, dammit, and they look *just like us*.” In it, the fictional town of Santa Mira, California, is invaded by alien seedpods that disintegrate sleeping humans and grow duplicates to replace them. (This story is the source of the popular expression “pod people.”) The duplicates are physically and mentally identical to the original victims, but they are emotionally “off” in a subtle way that only the victims’ loved ones can readily perceive. In Finney's original ending, the extraterrestrials responsible are discouraged by the surviving humans’ resistance and leave Earth to search for easier targets. Siegel’s film, however, ends with Santa Mira fully assimilated and already breeding more seedpods to deliver by truck to neighboring towns. The last human survivor can only run onto the nearest highway to escape, screaming to passing motorists, “They're here already! You're next! You're next!”

The uncanny works here on two levels: The way in which the broad psychological truths of paranoia are brought to life and the way in which the pod people themselves fall into the uncanny valley. *Invasion of the Body Snatchers* indulges both the negative and positive aspects of paranoid fantasy, following the primal pathways of our subconscious so precisely that we feel like we know this story already. It confirms all our secret, buried suspicions and lets our natural inclinations towards obsessive mistrust run wild, experienced vicariously through characters who

have been driven towards rightful, rational paranoia. And yet, at the same time, it's such a tremendous relief to believe in conspiracy. To think that something alien is at the center of all the world's problems, instead of a disorganized bunch of scared, misguided, stupid, selfish, lazy, *ordinary* humans. People just like us. Which means that the fault is nobody's but our own.

In a more specific sense, the “pod people” are uncanny even without observing their long-term effects on the bucolic suburbs of Santa Mira. They inherit the memories and physical appearances of their “originals,” right down to the last wart and nervous tic. But their eyes are blank, their emotions forced, their identities fabricated. They are perfect imitations of people—yet they are so profoundly *not people* that the comparison blows right by “absurd” and into “macabre.” They are, in every sense, dolls. Mannequins. The classic Freudian figure of uncanny doubling. The undead doppelgangers whose very existence is a mocking perversion of their originals and of all living creatures. Yet what could be a more perfect, revelatory mirror? And how could we as individuals, as members of a society, and as a species examine ourselves, if not through such mirrors?

Horror asks that question and more. Who hasn't paused on the way back from the bathroom in the middle of the night because they heard some creak or moan that couldn't possibly have been the wind? Who hasn't suspected, if only for an instant, that there was something waiting just beyond the weak lights of civilization? Who hasn't thought *I knew it would happen* when a terrible event has come to pass? Who hasn't wished ill on another person and then been eaten up with irrational remorse when something bad does happen? Nothing is more frightening than being told the truth—or at least being told that what you've always *imagined* is true. The uncanny throws all our suspicions, our phobias, our petty uglinesses and

guilty consciences and rawest, deepest emotions back into our faces. Nothing is a secret anymore, least of all from ourselves. And everything has consequences.

Lars von Trier's *Antichrist* (2009) is a movie about this upwelling of the irrational, about how the worst parts of the unconscious—both individual and collective—refuse to be ignored. In its opening scene, a couple's young son falls from an open window while they are otherwise occupied making love. The (unnamed) woman is incapacitated with grief; the (also unnamed) man, a therapist, takes her psychiatric care upon himself. She seems terrified of “Eden,” an isolated cabin in the woods where she stayed with their son while working on “Gynocide,” her thesis on the oppression and demonization of women—so he decides to take her back there to confront her fear. Over the course of their stay, her behavior becomes increasingly manic, violent, and sexual. The man experiences strange visions and the environment surrounding the cabin grows malevolently perverse. He discovers that, in the course of her thesis research, she came to believe that women are indeed inherently evil; he also discovers that she had been deliberately putting their son's shoes on the wrong feet, causing the bones to become deformed. Eventually, the woman assaults and immobilizes him, then sexually mutilates herself. (A flashback to their son's death shows the woman seeing his imminent peril, yet not alerting her husband. It is unclear whether this is actually what happened or whether her memory has been distorted by guilt.) He breaks free, strangles her to death, and limps back to the main road.

Over the course of *Antichrist*, the woman is swept away by the ancient vision of femaleness, especially female sexuality, as a force to be feared and loathed. Her Self has been swallowed by the archetype of the Witch: an amoral, selfish, uncontrollable creature with the power (supernatural or otherwise) to enact her desires. She believes that to be a woman is to be insane, stunted in rationality and virtue yet abundant in vice. But is she aspiring to fill that role,

to “be a real woman”—or giving in to it? Why does she hurt herself as well as others? Because she believes that she deserves to be both pleased *and* punished as befits a Witch? Because she periodically surfaces from an ocean of madness, becomes horrified at what she has done, and scrambles to make her penance before the tide overwhelms her again? Because the brutal, often contradictory demands of the archetype are too great a strain on her sense of Self—a strain which demonstrates the hideousness and fatal illogic of squeezing people into such archetypes? Or because she is embracing the cold, mad, absolute freedom of a Witch, however terrible it may be, because it is better than the smothered captivity of a “good girl?”

Where *The Body Snatchers* directly indulges its audience’s latent paranoia, *Antichrist* uses horror to illustrate the wider repercussions of an idea. But these two examples are merely opposing sides of the same uncanny coin. The implicit is rendered explicit; buried psychological material, whether emotion or information or attitude, comes to light. The uncanny can simply describe the way horror fiction brings our primal fears to life, but it can also serve much more profound revelations—shedding light on the ugly underbelly of ideas that it wouldn’t have otherwise occurred to us to inspect. To continue the example: *Antichrist* does not directly lecture the audience about how misogyny is bad. We have all heard that before, and merely stating an idea is not enough to embed it in the listener’s worldview. Instead, this film builds a *reductio ad absurdum* argument—or perhaps I should say, *reductio ad nauseam*—against misogyny by giving it a human face. The woman strove to embody all misogynistic stereotypes at the same time, which warps her into a dangerous, self-contradictory monster and ultimately tears her apart. The terrifying, revolting portrait of misogyny thus painted pierces past superficial comprehension and into our emotional memories. Similarly, horror fiction can both serve as a direct hotline to the fears of its audience and exploit those fears to make a larger point.

Like all fiction, works of enduring psychological horror are both unreal and realer than real, technically false and yet essentially true. They do not reflect the normal laws of physics, the normal dynamics of social groups, the normal day-to-day tick of mundane life. Such terrible things do not happen in our safe, sunlit, coherent reality; in the case of surreal and supernatural horror, such things literally cannot happen. But they resonate with our psyches. They make intuitive sense to us. We may even feel a strange shock of recognition. To use a Lovecraftian turn of phrase, such horror stories—their plot, their characters, the very fabric of their universe—have gone mad at the touch of something true, unbearably true, a dark, glassy-smooth foundation stone buried deep in the mud of our collective unconscious. And that touch is transmitted through their hearts to ours.

As fundamental categories of thought, both science fiction and horror show us the limits of our understanding, our intuition and comfort and downright *survivability*, but encourage us to grow beyond those limits. They fracture us so that we may heal into a stronger, wiser shape. Again, even though she speaks for horror alone, I must quote Anne Rivers Siddon:

[T]he supernatural...blasts and breaks relationships between people and their world and, in a way, between people and the very essences of themselves. And the blasting and breaking leaves them defenseless and alone, howling in terror before the thing that they have been forced to believe.... In a world where the very furniture of your life, the basic bones of your existence, turn terrible and strange, perhaps the only thing we're going to have to fall back on is whatever innate decency we can find deep within ourselves. In a way, I do not think this is a bad thing. (qtd. in King 288-290)

Both genres peel back our neat, polished, inoffensive skins to reveal the fundamentally grotesque human heart: the fragility and strength, the intelligence and stupidity, the greatness and pettiness,

the good and evil that coexists in all of us. Good horror fiction, or at least the works that most entrance me, is a compelling picture of what we *are*, while good science fiction shows us what we *might* encounter—the things we might become and the things we might meet that have nothing to do with us at all. In comparing *The Day the Earth Stood Still* with the B-movie classic *Earth vs. the Flying Saucers*, Stephen King comments:

Klaatu comes to extend the hand of friendship and brotherhood.... The saucerians of *Earth vs. the Flying Saucers* come only to conquer, the last armada of a dying planet, old and greedy, seeking not peace but plunder.... It is in the space between these two philosophies that the terror was seeded, I think. If there is a line of force between such neatly opposing ideas, then the terror almost certainly grew there. (King 2)

The former is “one of a select handful—the real science fiction movies,” a didactic but ultimately utopian story that promises a gloriously civilized future, if only we can shed the more barbaric aspects of our behavior. The latter is horror in sci-fi’s clothing; the aliens and their technology are just an excuse for people to get vaporized, flee in terror, fight back, and eventually triumph. In their contrast, they demonstrate the underlying double-sided appeal of speculative fiction. Both stories propose that there is Something Else in the universe. But is it beautiful, a transparent appeal to our “better natures,” as in *The Day the Earth Stood Still* and other works of “pure” science fiction? Or is it harmful and hideous, ultimately serving as a mirror to our less savory selves, as in *Earth vs. the Flying Saucers* and other works of horror?

Of course, horror and science fiction have a rich intersection, from Frankenstein’s blasphemous, tormented gothicism to H.P. Lovecraft’s tales of insanity provoked by inhuman entities to David Cronenberg’s surreally transgressive body horror. What better way to show the real terror inherent in the wide, uncaring universe than to populate that universe with things that

are nothing like us, yet tend to bring out the worst in us? But I tend to appreciate sci-fi horror as horror fiction rather than science fiction—that is, savoring its immediate revulsion and misery, not contemplating its vision of humanity’s future or taking an anthropological perspective on its alien cultures. Even stories of dystopia, which are usually categorized as pure science fiction, engage me as horror fiction. I am perversely fascinated by the anatomy of monsters—it makes no difference whether a particular monster is a creature of flesh and blood, a totalitarian oppressor-State (as in Orwell’s 1984), or a sociocultural system set up to amplify some inherent weakness of humanity itself (as in Huxley’s Brave New World).

But maybe I’m putting too much thought into a mere preference. Maybe I only overanalyze and overappreciate good horror because it’s so hard to find. Regardless, I know that every image or idea that really intrigues me (and every piece of fiction I have ever written) is, in some way, *awful*. In the most wonderful way possible. Whether horror is excessive or reductive or both at once, it has a way of magnifying the most trivial acts and thoughts, just as a fairytale peasant’s last loaf of bread is more meaningful than a prince’s whole treasure room when shared with a beggar woman. For a character in a horror story, to sit on a soft-carpeted floor and peacefully eat a box of stale crackers is an unimaginable luxury. One clichéd joke or snide comment reveals its speaker’s entire trembling soul in the very instant he tries to hide it. The warm hand of a stranger, when offered in the dark, is a sacred act of tenderness that brings tears to your eyes. Clinging to life, bloody and battered, is a triumph of the highest order. To emerge from a horror tale with one’s body, mind, and soul intact is to emerge from the belly of a monster—to be crushed, dissolved, yet reformed rather than consumed. Conversely, the smallest and largest failures alike carry the full catharsis of tragedy. The final struggle of death can be compared to one painful stumble in the slick, grimy darkness. The final surrender to madness is

equal to realizing that you've dropped your lost sister's hair-ribbon somewhere. All values of relative significance, whether positive or negative, waver and ultimately warp. Because each and every loss is one more pound of flesh sucked from your very bones. One more step towards the most prominent, primal state of horror: Abjection.

Abjection is the toothed mouth waiting at the bottom of the grotesque, the reduction of Self from which there is no return, the infinite and therefore final multiplication of excess. One may conceive of the abject as "the grotesque on steroids"—the bridge, or perhaps the grey area, between Self and Other. The literary theorist Julia Kristeva, who first codified the abject as an aesthetic rooted in the dark Freudian unconscious, describes it as the destructively undecidable:

When I am beset by abjection, the twisted braid of affects and thoughts I call by such a name does not have, properly speaking, is a definable *object*. The abject is not an object facing me, which I can name or imagine...[but] draws me toward the place where meaning collapses....disturbs identity, system, order. Abjection preserves...the immemorial violence with which a body becomes separated from another body in order to be.... The abject confronts us, on the one hand, with those fragile states where [humanity] strays on the territories of the *animal*.... The abject confronts us, on the other hand...with our earliest attempts to release the hold of *maternal* entity even before existing outside of her.... It is a violent, clumsy breaking away, with the constant risk of falling back under the sway of a power as securing as it is stifling. (Kristeva 1-13)

The playful hybridization of the grotesque is ramped up to such a degree that all individual components begin to dissolve into each other towards an indistinguishable slurry, until, at last, the Self diffuses irretrievably into the Other. Disease, death, and decay are all abject; so are the substances that were originally part of the body but then separated themselves from it, such as

blood, pus, saliva, vomit, and feces (Hurley 138). They are abject because they occupy the sickening, vertiginous space between identity and non-identity. They represent the dissolution of our own selves, a transformation from Self to Other, reminding us that this boundary we think of as so fundamental is more like cheesecloth than steel (Hurley 144). And yet the abject must be expelled if there is to be a Self/Other binary at all. In order for there to exist a definite “subject,” a *me*, there must exist a definite “object,” a *not-me*. The abject is merely what crosses over from one category to the next, tearing away a little piece of us as it goes.

An entity is abject rather than grotesque when it possesses the grotesque’s dissolution of boundaries, yet lacks its corresponding sense of recombination, birth, growth, or carnival laughter. As viewers, we feel a terrible pity towards such an entity; we want to put it out of its misery, but only if we don’t have to touch it. It is this pity, rather than humor or happiness, that forms the “positive” half of abjection’s attraction/repulsion dynamic. Physically, an abject entity may be trapped by its own rebellious flesh, such that what was once its bodily Self has become an incarcerating Other, or it may be unable to stop the boundaries between its Self and the rest of the world from breaking down. An image that combines both possibilities would be a creature incapacitated by sickness—too weak to move, unable to control the body that it once inhabited effortlessly, seeping mucus and feces and blood out into the world, infiltrated by the hungry forces of decay. To return to my earlier example of the Lilith’s Brood trilogy: In the third book, *Imago*, the first ooloi human-Oankali hybrid discovers that it loses control of its body’s form when away from its mates. It struggles for miles to return to its family, its physical mass and complexity rapidly “melting” away until it has devolved into a hand-sized, primitive slug. It eventually loses the ability to walk and breathe on land, forcing it to travel through water and try

to attract attention by writhing weakly, voiceless, on the riverbank. If its mother, Lilith, had not happened by, it would have dehydrated in the sun and died mere yards away from its home.

Like horror fiction, our evolutionary history reminds us of what we were and what we still are: Soft, mortal creatures who must die alone in some dark place, looking out in terrified despair at a world that seethes with strange, quiet sounds and glistening eyes. But the very mechanisms of evolution, like science fiction, remind us that life is capable of infinite change into unimaginable forms. Whether these forms are lovely or terrible or both, they hold a strange beauty for me, the fascination of the alien. They demonstrate humanity's potential for infinite power and grace; the lowest and highest places in the soul, the promise of encountering infinite magnificence and infinite squalor. It keeps us humble even as it reminds us that our limits can be exceeded beyond our wildest dreams.

This is where the grotesque comes in: To unite the abject and the sublime. Humans are not the center of the universe or even the pinnacle of life on Earth. We are merely one tiny fragment of a huge, teeming, amoral world that plans no future and promises no reward. And there is no physical or metaphysical barrier that separates us from the rest of this world—as we reach out to it, it reaches into us. Our bodies are riddled with irregular bulges and gaping, vulnerable orifices. Our digestive tracts play host to thousands of species of unicellular and multicellular parasites, most neutral, some beneficial, a few detrimental. From the moment we emerge into the world, we are devoured on all sides until only good, rich soil remains. We do not even have the solace of uniqueness. Every behavior and trait that we think of as distinctively “human” can be found in other animals; they laugh, make tools, mourn their dead, and pass

cultural traditions to their offspring. “Humanity” is not a special or exclusive state, but merely an extreme position on the spectrum of Earth’s biosphere.

We have no destiny. But such profound, existential uncertainty is the price of absolute freedom. We may have been given no purpose. But we can make our own purpose. Infinite causal lines of possibility unfurl from us with every moment like feathers spreading for flight. We can become anything—plagues, stewards, saviors, or something so new there are no words for it yet. Even as you read this, the future incubates inside you. If evolution is where horror and science fiction meet in humanity’s collective consciousness, then speculative literature is where the abject meets the sublime. And parasites are where horror meets science fiction in real life.

siren

he does not fall
far enough

until

the static-deadened streets, the ash-bruised sky,
the angles of his rusted skull
come in to meet him

until
the vast, yellow-god body

bulges shudders tears *splits*

black veins spread like tree roots
unfastening the flesh
and open the dumb pulp of diseased, toothless meat

until

he knows, as one knows in a dream
that rot-slick wound squirming with pus
that bruised red underside of heaven
already *gaping* for him
his thin, white terror like a deep-ached caress

unable to distinguish
between hating eating

and being
loved.

Nightmare Worms: The Modern Abjection of Parasites

“Nor is it to be thought, that man is either the oldest or the last of earth's masters, or that the common bulk of life and substance walks alone. The Old Ones were, the Old Ones are, and the Old Ones shall be. Not in the spaces we know, but between them. They walk serene and primal, undimensioned and to us unseen.... The wind gibbers with Their voices, and the earth mutters with Their consciousness. They bend the forest and crush the city, yet may not forest or city behold the hand that smites.”

— H.P. Lovecraft, Necronomicon

Parasites seem to hold a special place in the nightmares of humanity. In horror movie after horror novel after horror videogame, pus-covered worms and bristling insectoids violently burst from bodies and seize control of minds. The ravishment of an unsuspecting host from within is almost its own literary subgenre. As explored in the previous chapter, the idea that a person, place, or object is contaminated by some degenerative, malevolent entity is a variation on that fundamental force of horror: the uncanny. In *The Haunting of Hill House*, the paranormal researcher Dr. Montague opens his history of haunted houses with a reference to “the houses described in Leviticus as ‘leprous,’ *tsaraas*,” when asked what else one could call Hill House other than “haunted,” he reiterates, “Well—disturbed, perhaps. Leprous. Sick. Any of the popular euphemisms for insanity” (Jackson 70). Infection, insanity, and hauntedness are merely the three different faces of contamination, pertaining respectively to the body, the mind, and the soul. But does this mythic parasite phobia, which stretches across the Western world, actually make any emotional sense? Does it have any connection to the reality of our everyday lives? Or is there a more profound truth at work, a deeper horror that parasites merely call upon? To find out, we must delve into the anatomy of our fear through the way we portray parasites in media.

Stephen King describes all horror-story monsters as falling into three major categories: the Vampire, the Werewolf, and the Thing Without a Name (76). The Vampire represents a fearful outside influence, a corrupting force that destabilizes and tears apart our normal, civilized lives. The Werewolf taps into the fear that we are already corrupted and cannot escape our own

fatal ills. Finally, the Thing represents the human fear of the unrepresentable—that which cannot be pinned down, catalogued, understood, because it exists outside of our understanding. Parasites occupy both the Vampire and the Werewolf archetypes. They come from the outside world to invade us, but that invasion continues even after they have nestled inside of our bodies; they weaken and sicken us, they affect our minds. The fact that parasitic infection commands its own well-documented category of psychopathology, known as *delusional parasitosis* (Hinkle), speaks to the power that parasites hold over us as a culture.

On occasion, parasites can even step into the Thing archetype and take on spiritual significance as emissaries from another world, whether natural or supernatural, whose laws are strange and hostile. Some Biblical scholars think that the fiery serpents mentioned in the Old Testament, representative of either divine punishment or the dangers of desolate wilderness, may have been guinea worms, *Dracunculus medinensis* (Zimmer 1). Once a human host ingests larvae-infected copepods in his/her drinking water and the worms mature, the fertilized female—which can grow quite snakelike, up to a meter in length—migrates out to her host's skin and causes a hot, painful blister. When her host tries to soothe the afflicted limb by placing it in fresh water, she lays her eggs, beginning the guinea-worm life cycle anew (Roberts, Janovy, and Nadler 458-461). Most fascinating is the Biblical account of Numbers 21:4-9, in which God plagued the ungrateful Israelites with fiery serpents, then commanded Moses to create his own fiery serpent that would heal those who looked upon it. The “serpent of brass” that Moses constructed, a sacred symbol known as the Nehushtan, bears more than a passing similarity to the Rod of Asclepius, the serpent-entwined staff wielded by the ancient Greek god of medicine. In turn, this symbol may have emerged from one of the earliest medical treatments in history: removing a female guinea worm by slowly winding her around a stick (Zimmer 1).

This fear-inspiring power is not entirely misplaced—real-life parasites can be almost cartoonishly horrifying. The penultimate life-stage of *Ribeiroia ondatrae* forms cysts at the limb buds of metamorphosing tadpoles, resulting in adult frogs with deformed, absent, or multiplied legs (Johnson and Sutherland). The pillbug-like crustacean *Cymothoa exigua* consumes the tongue of a fish, then attaches itself to the remaining muscle stub as a replacement in order to snatch food from its host's meals (Brusca and Gilligan). The sinuous copepod *Ommatokoita elongata* blinds its shark host by attaching itself to the cornea (Benz et al). My personal favorite is *Echinococcus multilocularis*, a tapeworm that is harmless as an adult, but cripples its rodent hosts with multilocular hydatid cysts in its intermediate phase. A single cyst of this type contains multiple germative layers, each of which continually forms new baby tapeworms, and can bud off new cysts. One ingested tapeworm egg can become a cluster of endlessly expanding, endlessly multiplying cysts that literally crush the rodent's organs from the inside—making it easy prey for the carnivores that host the adult *E. multilocularis* tapeworm (Roberts, Janovy, and Nadler 339). Hydatid cysts can only be removed with exceptionally careful surgery; rupturing the cyst releases a fluid that triggers severe anaphylactic shock in the host. They are the real-life counterparts of *Alien*'s facehugger, which tightened its tail around John Hurt's neck when threatened and leaked caustic blood when cut.

But how many of the truly terrible parasites are most people in the developed world actually, realistically familiar with? To ask another way: How many of the parasites that we are familiar with cause symptoms anything like the horrors of fictional parasites? Human tapeworms, pinworms, hookworms, and whipworms are downright innocuous. Trichinosis, caused by the nematode *Trichinella spiralis*, inflames muscle tissue with painful cysts and

eventually kills—but the United States FDA so stringently regulates and tests pork that, on average, fewer than 25 cases have been reported annually since 1997 (“Trichinellosis”):

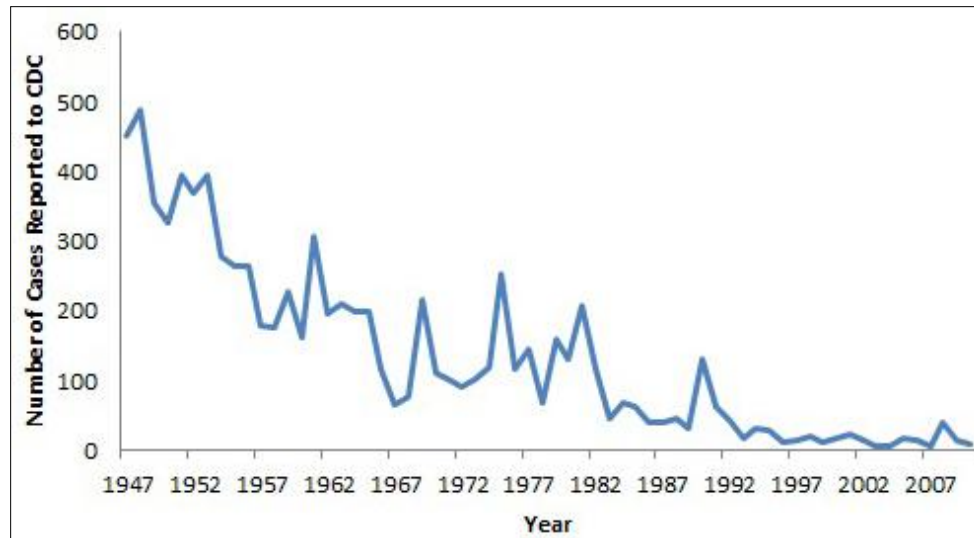


Figure 1: Annual reported cases of trichinosis (*Trichinella spiralis* infection) in the United States. Due to strict FDA pork testing and pig-farming regulations, what was once a fairly prevalent problem has become rare enough that few Americans are familiar with its effects. Source: Centers for Disease Control and Prevention (CDC).

Yet people continue to produce and consume stories of hysterical, overwhelming, parasite-centric horror. As a culture, our fear of parasites is out of proportion to anything we encounter in our everyday lives—which tells us that this fear has nothing to do with the parasites themselves. Such horror stories merely use parasites to probe and poke at a much deeper, more profound psychological weak spot: The fear of abjection.

Parasites in themselves are remarkably abject figures. Without a host, a “stolen body,” they fail to grow and soon die; in a sense, they have no body of their own. Extracted and laid out, they are pathetically pale and flabby-looking, almost fetal, the very image of the “degenerate” life-form denounced from the age of Darwin onward. They are cast off, alienated, helpless to sustain or defend themselves, vulnerable to the outside world. One’s pity for them is only outweighed by one’s disgust. Yet they are also hyper-embodied. Their revoltingly soft, fleshy

masses are so small, but cause us such great pain and disruption—their mouths gaping, their appetites unending, their fecundity fantastic. Their bodies, bloated to extraordinary proportions, are constantly exploding into thousands upon thousands more of themselves, a flood of offspring that bloats our own bodies and encroaches upon our sense of Self. Many parasite species actually influence the minds of their intermediate hosts in order to further their life cycle.

Leucochloridium paradoxum, *Euhaplorchis californiensis*, and *Polymorphus paradoxus* alter the behavior of snails, killifish, and amphipods respectively to make them more conspicuous to the predators that serve as their final hosts (Roberts, Janovy, and Nadler 222; Laffety and Morris; Maynard, DeMartini, and Wright). *Dicrocoelium dendriticum* doesn't even need the lure of tasty prey; it merely forces ants to cling to the tops of grass blades at the time of day when cows and sheep most like to graze, causing the infected ants to be slurped up by accident (Manga-González et al). Parasites are themselves abject, but they are also agents of abjection—their existence threatens the sanctity of our bodies and minds by revealing how penetrable we are. As a result, they do a remarkable job of stimulating our two-headed fear of *the abject* and of *abjection*.

The rapid physical, mental, or moral deterioration of parasitized hosts is so common that most fictional parasites can be characterized by their effects on the inner versus the outer Self. John Carpenter's film *The Thing* (1982), based on John W. Campbell's novella "Who Goes There?" (1938), portrays a voracious alien predator that assimilates the body, memories, and mannerisms of its prey. The alien parasites in *Invasion of the Body Snatchers* (1956), as well as similar works like Robert Heinlein's novel *The Puppet Masters* (1951) and Robert Rodriguez's film *The Faculty* (1998), also leave nothing left of their hosts. The primary focus of these stories, however, is the struggle to identify who is still human inside and who is just masquerading, not the physical violence of parasitization. Contrast David Cronenberg's film *Shivers* (1975), whose

scientist villain creates a parasite that spreads through sexual contact and causes its host to experience uncontrollable lust. Though his intent was to diminish humanity's "over-rational" tendencies by bringing people back in touch with their fleshly instincts, the effect is more of a moral apocalypse than a mental one—and their bodies aren't touched at all. The minds of parasite-based zombies, such as those from the *Half-Life*, *Halo*, and *Resident Evil* videogame series, are almost always severely degraded by their separation from humanity. But it's almost a toss-up whether they collapse into shambling fragility or bloom into bizarre, nightmarish behemoths. (In fact, the most human-looking zombies are typically the weakest, while those that have strayed furthest from humanity are typically the strongest.) I will further characterize our cultural perceptions of parasites with two "keystone" examples: Ridley Scott's film *Alien* (1979), which exemplifies the tangible, physical facet of parasitism horror, and the *Animorphs* series of young-adult novels by K.A. Applegate, which exemplifies the intangible, mental/moral facet.

The horror of *Alien* is rooted in the violence of the body as a grotesque entity. The xenomorph tore through all of its life stages with the same dark zeal. It leapt onto the first living creature it sensed, reproduced through brutal rape, birthed itself (from a human male, no less) in a fatal shower of blood and tattered flesh, and attacked the *Nostromo*'s remaining crew with a fervor that seemed equal parts hunger and rage. Each of its successive forms is a deeper, more disturbing image of un-categorizable life, especially un-genderable sexuality. Its silicon-based skin is as hard and reticulated as that of a machine, yet it constantly drools saliva and sweats glistening slime. Everything about it is embroiled in continuous excess and rebellion. The mature xenomorph, in particular, literally cannot be contained; its physical power is as unstoppable and all-consuming as its instinct. A single mouth is not enough—it must have two. Even its blood is violent and hungry, corroding everything it touches. The xenomorph may be grotesque itself, but

abjection follows close on its heels. It forms our cultural image of what parasites do to the human body: tear it to shreds in a fury of reproduction and consumption.

Animorphs, in contrast, places the grotesque in opposition to the abject. The horror of this series is rooted in psychological trauma that combines the slowly mounting stress of war with the immediate, visceral fear of extraterrestrial infestation. The series' main enemies were the Yeerks—a conquering species of giant, blind slugs that took over their hosts by burrowing into the ear canal to gain full control of their hosts' memories and motor functions. The only weapon that the six young protagonists had to stop the Yeerk invasion of Earth was their capacity to “morph,” or physically transform into different organisms. In this series, the grotesque was neither inherently good nor inherently evil, but merely a tool for the furthering of good or evil goals. The children often described morphing as revolting to watch and (painlessly) disturbing to undergo, with its random flow of facial features and loud *crack* of self-rearranging bones and joints. However, there was no true horror in morphing. True horror was reserved for abjection, for the moment when Self became Other with nothing to replace it:

[B]ehind the Animorphs' struggle for survival lies a deeply primitive fear that the loss of bodily control may betoken a loss of something more fundamental – a loss of self and a complete surrender to a-human forces. One reason for being afraid of the Yeerks is that they have no body.... A Yeerk who has taken over [a] body...is called a “Controller”, which denotes the dominating idea communicated in the series that mastery of your body equals power. By the same token, to lose control of your own body...represents a frighteningly disempowering loss of self. (Lassén-Seger 106)

These two complementary fictional depictions emphasize the thorough violence with which parasites destroy the body, mind, and soul. They are both abject and abjectifying; they are

pieces of the Other that move into and breach the Self, which we are accustomed to thinking of as solid and inviolable, forcibly reconceptualizing us from perfected classical statues (“being”) into composite, mutable creatures (“becoming”). Parasites invade, ravage, and ultimately pervert the host’s body or mind. They demonstrate how easily the outside world can force its way inside, and in doing so, they demonstrate that there was never any such thing as “outside” or “inside” in the first place—only a sea of heterogeneous matter, surrounding one small, egocentric, yet highly permeable clump of organic compounds whose terrified struggles to elevate itself are ultimately in vain. The Self is dragged kicking and screaming into the Other.

Parasites give us plenty of reasons to be afraid of them. However, a fear that is rational in object may be excessive in degree. An illustrative contrast can be found between parasite phobia and snake phobia, both of which are common and deeply rooted in many human cultures. While snakes have the potential to be extremely dangerous, snakes don’t psychologically taint the places and people with which they are associated. We are not disgusted by snakebite victims; we do not perceive them as contaminated by “snakiness” or feel that their snakebites are outward signs of their inferiority. Additionally, it is common knowledge that snakes are a diverse group containing not only highly venomous, but mildly venomous and non-venomous species. If someone felt the same, undiscerning fear regarding all snakes or became uncomfortably anxious just from seeing a photograph of a snake, we would tell them to seek treatment for their psychological disorder. Yet most people untrained in medicine react to parasitic infection as a calamity. For an example, let us turn to pinworms (*Enterobius vermicularis*).

Pinworms are common even in affluent communities, unlike most other parasites, and are not associated with any particular gender, race, or culture. They are so successfully cosmopolitan that they are almost a defining characteristic of the human species. Yet millions of American and

Western European parents panic every year upon discovering that their young children are infected with these small, inoffensive roundworms, which must reach unimaginable densities before they trouble their hosts with anything more than itchy posteriors. Even after pediatricians reassure parents that pinworm infections are a common childhood ailment, no more dangerous or indicative of neglect than chicken pox, they can sometimes be so upset that they require counseling (Roberts, Janovy, and Nadler 425-426).

This overwhelming tangle of emotions is rooted partly in ignorance. If people who cannot distinguish between snake species are forced to say, “Better safe than sorry!” and assume that all snakes are dangerous, the problem is compounded for parasites. Media and popular education focus on dangerous species and overlook innocuous ones, for reasons of either public safety or entertainment. But there is more to the story than that. When confronted with parasites, we don’t feel startled or uneasy, as we would if a snake slithered across our path. We feel a disgust so intense that it becomes horror. Parasites carry a psychological weight out of all proportion to their actual medical risks. They are associated with not only poverty, filth, and “otherness,” but outright physical and mental deliquescence—i.e., abjection.

In fiction, symbiotic life-forms tend to be either all good or all bad. (Though not always in the physical and mental/moral senses at the same time; for example, the alien symbiotes from *Spider-Man* grant great strength and resilience, but also dominate their hosts’ minds and turn them violently evil.) They are either horrific, predatory bodysnatchers or benevolent mutualists. Occasionally, they are innocuous commensalists. They are very rarely ambiguous, providing both significant benefits and significant drawbacks. The most famous works of fiction that involve parasites are either unadulterated horror or “science fiction horror,” a subgenre which uses the trappings of science fiction to create fear.

But what if our relationship with parasites could be less like the worlds of *Alien* and *Animorphs* and more like the world of the *Stargate* series? The Goa'uld, who serve as the main villains of *Stargate SG-1*, have weak, fishlike bodies that could be described as abject. However, their villainy is centered in their actions as amoral tyrants, not in their parasitism per se, and the act of parasitizing a host is not portrayed in an excessively gory or traumatic way. (Contrast *Animorphs*, in which the Yeerks' parasitism is always both harrowing and portrayed as their main evil trait. Their biological nature as parasites, rather than their choice as a culture to adopt parasitism as a philosophy, is what is portrayed as horrifying and wrong.) Other symbiotes of the same species as the Goa'uld include the Jafa and the Tok'ra, who are mutualists and parasites that leave their hosts free will, respectively. The Tok'ra are still parasites; they still physically inhabit their hosts and drain their resources. But they are not that all-consuming, all-degrading maw that parasites are typically portrayed as. What if our view of parasites could change from the limiting absolute of the abject to the more complex, constructive ambiguity of the grotesque? Recent advances in biology and medicine may push us in that direction.

A Puzzle of Flesh

this is the lagging edge, the sewn fragments
 wispings telomere-tails
this is the oxygen broken off
on the shore of the first green sea
shearing, shearing to the lethal confusion

 that someday will find itself sliding
 round endless nuclear loops
helpless and yelling, white-eyed
while we take our time with things

watch the sun set smoked past Io, distant Gliese

and those short sweet lyrics of helix (only ever
three letters long) will quicken, jaggen
into genetic ultrapunk

because your shoulders itch
where there should be wings—the color of your eyes
for just two hundred dollars more

because your taffy legs twine, pull, fan and float
cradled by the weight, sleeked coins interlocking
 no in, no out, no curve or angle
but the smooth new body
sexless that remembers the sea

because your belly remembers
what movement comes slick and pale out of the skin,
the soft luminous bark, the secret indentations
of rough, steaming earth
that insects hunt at night

because
 our faces, my loves, our faces
 shall be unknowable to themselves

An Infested Future: The Hygiene Hypothesis and Helminthic Therapy

Mr. Motley: “You’re still not looking the right way.... You still see *this* [grotesque body]...as pathology. You’re still interested in what *was* and how it went *wrong*. *This is not error or absence or mutancy: this is image and essence....* This is totality.... [And p]art of you understands without recourse to words, even if your higher mind asks questions in a format which renders an answer impossible.”

— China Miéville, Perdido Street Station (115)

Calling someone a “parasite” is never complimentary. The word describes an organism that drains the life of another, a host whose natural state is clean and whose contaminated state is always poorer for it. But a more ambiguous term like “gadfly” would be more appropriate to the role of parasites in modern life—something needed in small numbers to keep the larger organism functioning at its best.

Modern humans tend to conceive of a deformed, diseased, parasitized, injured, or otherwise less-than-optimal organism as abnormal, a departure from its Platonic ideal, almost fallen from grace (to thoroughly mix my metaphors). Yet while describing someone as “dirty” has long been used to Other that person—to not only degrade them, but to distance oneself from them by placing them in a separate, inferior sociocultural category, such as “low-class” or “foreign”—our standards for cleanliness and our hysteria surrounding contamination have never been higher. The life enjoyed by the citizens of developed nations is a completely novel state of existence in terms of *recorded* history, let alone our evolutionary history. For an example of just how much of an aberration this squeaky-clean, undiseased world is, let us turn to Napoleon’s doomed march on Russia.

In June of 1812, Napoleon Bonaparte left France with roughly half a million troops—a force known as the Grande Armée—in an attempt to invade Russia through Poland. One month later, when Moscow still lay almost five hundred kilometers to the east, he had already lost eighty thousand soldiers to typhus and dysentery. (Typhus, whose many colloquial names at the

time included “war fever,” is caused by a bacterium, *Rickettsia prowazekii*. However, it is transmitted by the human body louse when its infected feces are rubbed or scratched into the skin or mucus membranes. “Dysentery” is the catchall name for intestinal inflammation that causes fever, bloody diarrhea, and abdominal pain; it is a symptom of several viruses, bacteria, and protozoans.) During this march, the Grande Armée suffered virtually all of its losses during this march in summer and autumn—long before they had seen one of Russia’s famously brutal winters, or even more than a few skirmishes with Russian forces. The Grande Armée ultimately limped back to France in June 1813 with less than forty thousand troops. In other words, Napoleon lost around nine out of every ten of his men. And as many as 220,000 of those lost—or *four* out of every ten of his men—may have died solely from disease (Dunn 212, Peterson).

The biologist and popular-science journalist Rob Dunn asserts that, “[b]y some estimates, World War II was the first war in which more soldiers died in combat than of ectoparasite-transmitted diseases” (212). Even in 1946, an estimated one in six Americans suffered from trichinosis, which constituted “a truly astounding proportion for a supposedly modern and hygienic society” (Zuk 216). We have only recently slipped the leash of our ancient plagues. The profound, often devastating effects of parasites and pathogens have shaped our lives and our behavior. Our all-out war against them made sense—that is, until recently. Compare 1946 with 2007, a year in which *less than one percent* of American commercial pigs were found to be infected with trichinosis. Though over a third of the world’s population still harbors parasites, cases are primarily confined to developing nations, especially in tropical and subtropical regions (Zuk 217). Life expectancy in the United States was forty years in 1850, inched up to forty-eight by 1900, then leapt to sixty by 1930 and leapt again to almost eighty by today (Gumpert).

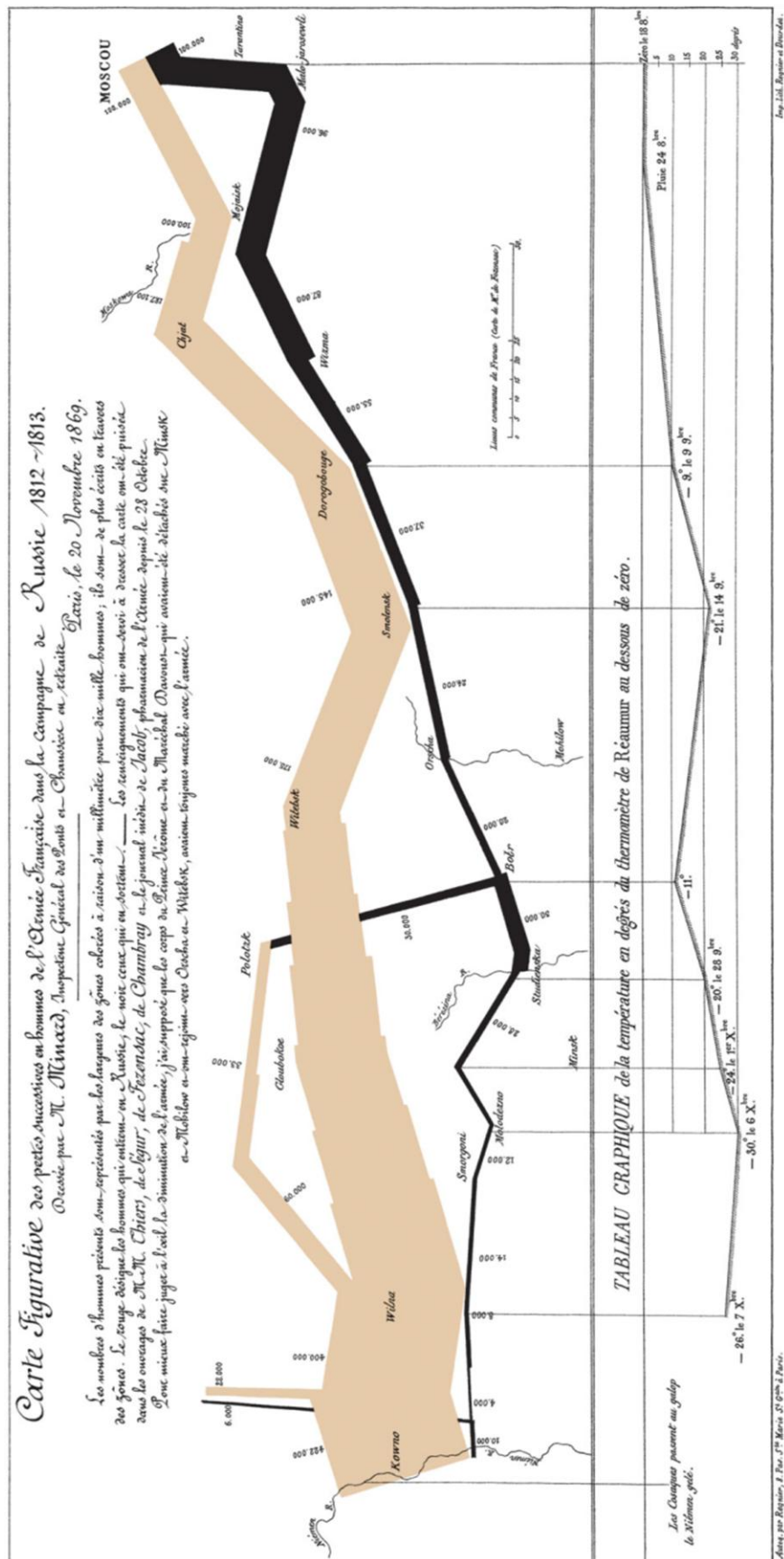


Figure 1: Charles Minard's famous graph (1869) of the number of men remaining in Napoleon's 1812 Russian campaign army, their geographic locations through time, and the temperatures encountered along their return path. The brown path is the number of men entering Russia and the black path is the number of men leaving, originally with a scale of one millimeter for every ten thousand men. Temperatures are in degrees below freezing on the Réaumur scale.

But as our cities and bowels were stripped of wriggling worms, a new, bodiless breed of enemy began to rise. During the 1930s and 1940s, when nearly half of all children in the United States had some sort of parasite (Dunn 22), Crohn's disease—an inflammatory bowel disease in which the immune system attacks the gastrointestinal tract—was “so rare that it was mostly undetected” (Dunn 19). But as parasite infection rates plummeted, strange new autoimmune disorders emerged and grew in prevalence: asthma, allergies, Crohn's disease and inflammatory bowel syndrome (IBS), rheumatoid arthritis, lupus, and multiple sclerosis. (Some theories even suggest that there may be an autoimmune component to schizophrenia and autism.) And they emerged in precisely the nations that spent the most on health care and public health:

In Olmstead County, Minnesota, the number of cases of Crohn's was ten times higher in 1980 than in 1940. The incidence of the disease has also risen precipitously in...nearly all of the other places in the developed world for which the data are good. Today, roughly 600,000 people have Crohn's disease in the United States—accounting for some unnoted cases, about one in every 500 people. Similar proportions of people in much of Europe, Australia, and the more developed countries in Asia are also affected. (Dunn 19)

Today, when worms are all but a thing of the past in the developed world, projections of life expectancy—and, one might argue, quality of life—have begun to plateau or decline (Olshansky et al). In an even more damning observation, autoimmune disorders are starting to gain ground among wealthy, urban, and white-collar populations in India and China, even as their worms disappear in the face of swift modernization (Dunn 19).

But the reverse is also true, even within developed nations. Blue-collar workers, people who live in rural areas, and other demographics regularly “in intimate contact with the soil” (as my father is fond of saying) are both more likely to have worms and less likely to have Crohn's

disease. People with siblings, especially older siblings, are also less likely to have asthma and allergies than only children, regardless of where they actually grew up. The same is true of people born into a household with pets. But while soot, pesticide, and other forms of pollution may exacerbate autoimmune disorders in a person who already has them (especially asthma and allergies), they are not the initial cause. Asthma and allergies are virtually absent in developing regions, even those with high pollution and pesticide use. The sharp increase in the prevalence of autoimmune disorders—from almost nonexistent before World War Two to downright common today, less than a century later—rules out genetic change as a cause. While diet is important in controlling these diseases, the diets of affected individuals across cultures have little or nothing in common; furthermore, the diets within cultures have not changed rapidly or uniformly enough to keep up with the change in autoimmune disorder prevalence. In short, the only factors seem to be exposure to unhygienic conditions (Kemp and Björkstén; Liu and Murphy).

Of course, science is never absolute. The best you can do is to be fairly confident that you found a correlation between one property and another, not *completely* confident that you demonstrated that one property *causes* another. But the correlations were strong enough to make more than a few health-care workers speculate on the relationship between dirt and autoimmune disease. In 1989, medical researcher Dr. Erika von Mutius began comparing the incidence of allergies and asthma in the recently-reunified East and West Germanies. Despite West Germany's superior air quality, health care, and general standard of living, it turned out to have more respiratory problems than East Germany (von Mutius et al. 1994). She was not alone in her surprise; several other scientists had noticed similarly “backwards” patterns of autoimmune disease elsewhere. Attempting to explain the strange results, they collaborated to propose a new concept of the human body: the hygiene hypothesis.

Modern medicine is rooted in the germ theory of disease, which formulates new hypotheses about sickness “based on the idea that we get sick when new species invade our bodies” (Dunn 22). The germ theory implicitly assumes a “classical” view of the human body—a pure, sterile temple that any intruder could only defile and damage. In contrast, the hygiene hypothesis (a term coined by Dr. David P. Strachan in 1989) predicts that the recent rise in autoimmune disorders has been caused by taking invaders *away*. It formulates a grotesque view of the human body, as an ecosystem that evolved in the context of a germ-filled natural world. And just like a wetland or rainforest, the human body can be thrown out of whack by taking away any of its inhabitants or severing any of its interspecies relationships—even the ones that we, in our romanticization of nature, conceive of as “bad.”

Think of what happens to a caribou herd when the nearby wolf packs are eliminated. The caribou that would normally be eaten by wolves aren’t invulnerable to other killers, and in the meantime, they transmit disease to their herdmates and eat up food that could have gone into the mouths of other caribou. The herd as a whole is strained and ultimately forced into ill health by its excess population. However, while more than twenty years of biomedical research has accumulated in support of the hygiene hypothesis (Braun-Fahrlander et al.; Eggesbo et al.; Liu and Murphy; van den Biggelaar et al.; von Mutius et al. 2000), the precise mechanism behind it remains vague. The three best-supported ideas can be thought of as the “peacekeeper” effect, the “checks-and-balances” effect, and the “signal boost” effect. Interestingly enough, they all involve multicellular parasites.

The peacekeeper effect involves the chemicals produced by parasitized host bodies that prevent the immune system from attacking entrenched worms. As a side effect, these chemicals calm the immune system to the point where it leaves the body’s own tissues alone. The answer to

the obvious question “Why rein in the immune system at all?” has to do with the fact that our bodies have limited energy and must manage it carefully. While parasites by definition live at the expense of their host, most species that parasitize humans do very little damage unless the host is burdened with too many at once. For instance, a single hookworm (*Necator americanus*) consumes a mere one one-hundredth of a milliliter of blood per day. The energy cost of fighting these worms forever, all guns blazing, would therefore be much greater than calling a truce and letting them have their tiny share of energy (Dunn 43). Of course, this effect only works well with innocuous parasite species; the human body doesn’t hold back when faced with more dangerous invaders, such as the giant roundworm *Ascaris lumbricoides* or the dysentery-causing protozoan *Giardia lamblia*.

The checks-and-balances effect involves the way in which the components of our immune systems interact with each other. One of the primary players in the human immune system is a variety of white blood cell known as a T cell, whose many types include killer T cells and helper T cells. In turn, the helper T cells are divided into Th-1 cells (responsible for bacteria and viruses) and Th-2 cells (responsible for parasitic worms and other multicellular invaders). While each subtype of helper T cell is equipped with its own set of hormones used to regulate swelling, mucus production, and other inflammatory responses, these hormones still interact with each other in order to keep the immune system as a whole on keel. For reasons unknown, a lack of Th-1 stimulation increases the Th-2 response, resulting in high mucus production and the contraction of muscles in the airways—symptoms that should be familiar to any asthma or allergy sufferer. In contrast, Th-2 responses in individuals with adequately stimulated Th-1 systems “are regulated by repeated cycles of infection and inflammation, with the inflammation countered by natural antiallergic reactions” (Zuk 47). The Th-2 system still reacts to harmless

invaders like pollen, dust, and dander, but it doesn't spiral out of control, let alone develop into a chronic disorder. So a high level of Th-1 cells, stimulated by the presence of parasites, seems to somehow forestall "overkill" Th-2 responses—or perhaps constantly damp down all Th-2 responses (Elliott, Summers, and Weinstock; Horner and Raz; Mohamadzadeh et al).

The signal boost effect involves the immunosuppressant chemicals that parasitic worms produce to mimic the host body's own "All clear!" signals. Since, in nature, we were virtually always infected with parasites, it's possible that our bodies "assumed" we would always be marinating in low levels of these chemicals and beefed up our immune strength to compensate (Dunn 43). In other words, our bodies took parasites for granted and evolved around them, like a desert plant evolves around its harsh conditions to the point where it can survive nowhere else. It's true that all organisms need water (and can deal with a surplus better than a deficit), but watering a cactus as frequently as you would water a hydrangea would only end in disaster. Spic-and-span bowels just aren't what we're used to in terms of our natural history; suddenly undulled by worm hormones, our immune systems don't know their own strength. This theory is less supported by scientific evidence than the others, but still not implausible, and it could easily constitute one of many factors rather than a monolithic cause.

Whatever the precise mechanism, however, it's clear "that our immune systems appear to have evolved in such a way as to function 'normally' only when worms are present" (Dunn 43). This parasite-centric update of the hygiene hypothesis began in 1995, when Dr. Joel Weinstock, then a medical researcher at the University of Iowa, realized that Crohn's disease was becoming common among the same populations in which intestinal parasites were becoming rare. More importantly, a lack of "intimate contact with the soil"—and the consequent lack of worms—was

one of the few things that Crohn's patients in India, China, and the United States had in common (Dunn 21). So what if, he thought, we reintroduced those worms into their natural habitats?

In a series of increasingly large, rigorous studies from 1998 to 2005, Weinstock and his colleagues fed pig whipworm eggs (*Trichuris suis*) to patients suffering from severe autoimmune bowel disorders. Though their conditions had been unresponsive to traditional therapies, the vast majority of subjects in each trial reported that they felt better within a few months after infection (Summers et al). This treatment, known as "helminthic therapy," has already found medical and commercial success despite not yet being approved by the United States FDA. Autoimmune Therapies, founded in 2007 as the world's first helminthic therapy practice, successfully treated almost a hundred autoimmune patients by 2011 (Dunn 54). Its founder, Jasper Lawrence, uses descendants of the hookworms that he deliberately picked up in Cameroon in an attempt to control his debilitating asthma. There are currently four main helminthic-therapy providers in the world: Autoimmune Therapies (United Kingdom, formerly Mexico), Instituto de Terapias Alternativas Autoinmunes (Mexico), Ovamed (Germany), and Worm Therapy (Mexico). All patients must go back to be reinoculated—Rob Dunn invents the word "rewilded"—every few months, most likely because the worms die, but possibly because the body acclimates to them.

The mounting evidence in favor of the hygiene hypothesis and of helminthic therapy stands to revolutionize our cultural relationship with parasites. The world we have just stepped into is even stranger than that of *Stargate SG-1*'s Goa'uld and Tok'ra. To find a more fitting example—one that addresses not only the parasite's relative lack of violence, but its effects on a self-destructive deficiency of the host—we must turn again to the *Animorphs* series. There is one species, known as "Taxxons," that can be found in a grotesquely functional relationship with the Yeerks. The pale, wormlike, glistening body of a Taxxon bears more than a passing resemblance

to that of its Yeerk master. But its face is dominated by a toothy maw ringed with small, red compound eyes—and its mind is dominated by undiscerning, insatiable hunger. Because Yeerk control alleviates the torment of that hunger, Taxxons are often willing hosts, despite everything they lose in becoming Controllers. The presence of the parasite is vital, even restful. They are a perfect image of what parasites are to us on Earth. The Yeerk is no mutualist; it demands sacrifice, from which its host benefits only incidentally. But the Taxxon still benefits. As do we.

Parasites have shaped a staggering range of animal physiology and behavior. They are not merely an annoyance, or some minor maw into which the weakest individuals fall, but a major driving force of evolution. With an entire pasture to wander in, why do horses cluster beside each other? To share their tails, so that they can better keep off the biting flies and mosquitoes. With the potential for a huge number of cloned daughters, why do so many species forego the one-hundred-percent genetic returns of asexual reproduction—let alone divide into two separate sexes, one of which cannot become pregnant? To recombine their genes each generation, reset the immunoprotein “locks” on their cells, and keep up in the eternal arms race between parasite and host (Hakoyama and Iwasa; Lively; Otto and Nuismer). Why do males grow showy antlers and bright plumage, waste their time and energy in elaborate mating displays, or risk injury in combat with one another? To provide unfakeable signals that they can either stave off parasites or tolerate their effects (Hamilton and Poulin; McLennan and Brooks; Moore and Wilson; Moller, Christie, and Lux; Roberts, Buchanan, and Evans).

Parasites are also not unnatural drains on wholesome, honest organisms or symptoms of environmental disorder. All organisms have so closely co-evolved with their parasites, just as they co-evolved with their climate or their food supply, that the diversity and abundance of

parasites in an area can be used to deduce that of their hosts. Widespread, low-to-moderate parasitism is more “natural” (and more indicative of a healthy ecosystem) than any sterile human notion of purity. Parasites are ubiquitous, exquisitely adapted to life within their hosts and transmission between them; it is only within the last century of human history that we have achieved the medical and sanitation standards necessary to relegate parasites to a rare, deeply stigmatized horror. In nature, a population with an extremely low average parasite load indicates not health, but an environment so poor that its inhabitants cannot support parasites.

Our old conception of the world was that all foreign bodies—everything that was biologically Other—were bad. We coveted the long, tooth decay-free, seemingly idyllic lives of the germless guinea pigs bred by James Reyniers during the 1950s (Dunn 72-74). We scrubbed with caustic chemicals and purged with antibiotics, dreaming of utopian habitrails built from stainless steel and the triumph of science. Since then, we have learned that we need an army of mutualist and commensal bacteria to help us digest our food efficiently (Dunn 79-80), produce vitamins (Rukhmi, Bhat, and Deshmukh), and limit the proliferation of less-innocuous microbes (Croswell et al). Our new conception is that some foreign bodies are good for us, some are neutral, and some are bad. As recently as ten years ago, you would be hard-pressed to find an ad for a “probiotic” product on television; today, there are entire phalanxes of yogurts, supplements, and other consumables being sold on the strength of how many creepies they’re crawling with. Our understanding of bacterial infection and our symbiotic relationships with bacteria have become more complex, shifting from the aesthetic of the abject into that of the grotesque. But our view of symbiosis and our definition of “health” are still incomplete and oversimplified. We see organisms as bad or good or neutral, black or white or grey, when in reality they possess distinct bad, good, and neutral facets that nevertheless cannot be separated from each other. It is

by the very act of sucking our blood and clogging our flesh that parasites keep our immune systems sane.

There is no such thing as a “good parasite”—only more-harmful and less-harmful parasites, since harm is inherent in the very definition of a parasite. Yet parasites are no more “evil” or “degenerate” than a tornado, a drought, or a volcano, and far more dear to us. Over the vast majority of our evolutionary history, the average human carried a light-to-medium load of many parasite species throughout life (Zuk 53), and the defenses we’d evolved to combat them persist long into our super-hygienic modern century. Heredity and natural selection have braided our bodies together, for better or for worse, until death do us part. We must understand that we need parasites even if they are all “bad,” even if their positive effects are incidental, because the human body is an ecosystem and not a machine. Our relationship exists outside of good and evil.

Thus, our future conception of the world will be that we need even the *harmful* Others because we evolved with them. Parasites are the horror fiction of the natural world; our bodies need them, just as our minds need simulated evils in order to relieve the emotional tension surrounding the real world’s evils (King 14, 33, 187, 323, 335-336). We can’t allow the terrible things in our lives—in ourselves as well as the world that surrounds us—free reign. But we need to give them their pound of flesh every once in a while, a little slack on their leash, or risk a sudden rampage for which we are utterly unprepared. A psychically or physically sterile life is not only impossible, but unhealthy. The “clean,” the “correct,” the “original” body is not only unimportant, but nonexistent. And when we realize not only the impracticality, but the horror of a parasite-free life, our grotesque understanding of the natural world will be complete.

Highway Between Boulder and Longmont

the roadside rears strawy-blue chicory
with knobbled green-grey stems
 (which open all locks),
the shockingly purple straw-blooms of thistle—who would have ever
 expected it among the thorns? among the white
and pink-swirled bindweed flowers
sprawling the wide highway median
curling their lips over themselves before the sigh, when they throw themselves
 all in one direction
to the sneeze

red-winged blackbirds hunched by ponds
 sudden in the knee-high yellow grass
by only the coarse foxtails marking water, the long grass
with cornsilk-pale tufts bowing like knights' horses
 all in one direction

fields dappled, dark, yellow-green
foaming with white and tawny seedheads
individual stalks and blades
 pricking up here there out into sharpness
then whole oceans of soft silver bending purple-red
in the wind that bends the oak and aspen and lodgepole alike
that hurls the blue-backed swallow
 after the cottonwood fluff, the robin after the robin

the car after the truck after the sun
 all in one direction

Epilogue

The snail in my watchglass is a physid—its bulbous sable shell only pinch-twists into its spiraled point at the last possible moment, unlike a lymnaeid, whose spire is much longer and stouter. The snail's soft, dark body retracted into this shell the moment I picked it up with my forceps; it now lies still and headless, waiting for the danger to pass. Three more physids and a lymnaeid ooze slowly around the confines of a much smaller glass. They are waiting for me.

Compared to my own species, the snail in my watchglass is an ancient. Its forebears glided sedately through Earth's waters more than a billion years before my primate ancestors dared stand on two legs. In the space of my single, diligently-managed reproductive lifespan, my snail might have spawned dozens of generations, each offspring an unwitting soldier in a bitter arms race of evolutionary modification between itself and its parasites.

My ancestors were Germanic farmers and Scottish seafarers who survived wave after wave of biological attack, from the Black Death in the old country to Spanish flu and polio in the New World. But if I were transplanted into the snail's environment, I wouldn't last a week. As a lone daughter of caring hominids with access to modern healthcare, the odds of my survival were bolstered by disinfectants, antibiotics, and a battery of childhood immunizations. Those defenses would normally have been hard-won by several million years of selective evolutionary pressure; a snail would pass them on to its progeny as an integral part of their genetic heritage, but I cannot naturally provide them to my future children.

Lisette, my research team leader, hands me a hickory-handled claw hammer and instructs, "First, just tap him gently to break the shell. Then put the pieces off to the side."

I tap as gently as I can, barely letting the hammer fall onto the snail's body. The shell cracks off into four big shards and innumerable smaller fragments; I can see that the snail's color

comes from its dark-mottled body rather than its shell, which is like an intricately dotted, translucent film of amber. The newly naked snail shrinks back so fiercely that its body humps up out of the largest fissure in its shell. It relaxes slightly when I drip deionized water around it—not to moisten its flesh in the dry Colorado air, but to float the dissection. I pick off every fragment of shell that I can grip in my forceps and nudge them all to the edge of the watchglass.

“Now pull him out straight and check his entire body,” Lisette says. “Then tear him open and look through his organs. If you think you see anything, put it in here—” (She chooses another tiny watchglass.) “—and I’ll look at it under the compound microscope.”

I focus the dissecting microscope on the snail’s tightly coiled body. The nearly-transparent tentacles on its front end have already begun to reach out again, hesitantly, but vanish the moment I begin to nip and poke with my clumsy, needle-sharp forceps. I grip the thick mantle just behind its head and attempt to unwind its tail, which contains the rich yellow and iridescent green gonads. This tissue is a prime feeding ground for sporocysts and redia, the asexually reproducing stages of digenean parasites, since it is stuffed with nutrients but nonessential to the snail’s survival—digeneans can devour everything in sight without endangering themselves in the process. (Indeed, the castrated host has more resources than ever to devote to the parasites, now that it is no longer frittering its energies away on reproduction.) The forceps slice easily through the flesh of its mantle and I have to keep moving, hunting for fresh tissue to grip, as the tail fights to keep its coiled shape.

At last the snail is laid out as straight as it will stay. I turn the watchglass, looking for the best angle, then pinch the forceps shut, bring its twin tips close to the snail’s head, and stab. I miss—the forceps only wound it, too far off to one side, and it shrinks back. I try again and miss again, this time to the other side of the head. I try twice more, each time wounding it closer to the

center, then attempt to take its head between the tips of my forceps and squeeze. The snail lies still after that; it does not flinch when I prod its mantle.

We had collected our snails on a typical modern farm in the plains of eastern Colorado, from a small pond nestled between a rusting sheet-metal shed filled with powerful agricultural equipment and a pristine field of soybeans. The crop was thriving under the careful administration of inorganic fertilizers, herbicides, and pesticides, traces of which leached into the pond with each summer rain. An unmistakable rainbow-ribbon of oil floated on the edge of the water closest to the shed. A shift in the species and number of aquatic plants several yards inside the circumference of the pond marked its annual low point, where the pond's fauna would be forced to move during the year's driest months. What effect would these ecological cataclysms, played out in miniature in the tiny biosphere of the pond, have on the snails or their parasites? Would the parasites numbers dwindle? Or would the snails, stressed beyond their capacity to compensate, be overrun?

From the stories my mother and grandmother tell, our family has experienced its own forced migrations and external upheavals. One grandfather was born just inside the territorial waters of the United States, on a ship carrying his parents as they fled anti-Semitic German laws. Other ancestors survived the Civil War, fought in the Philippines, and served in two world wars. Sitting at my dissecting microscope on a bright summer day, I am the product of generations of survival stories and the promise of my family's genetic future. My ancient friend lying in the watchglass is not so fortunate.

I pinch off the snail's tail at the point where its dark brown body turns green-and-gold. The gonads tear open easily along their length, spilling forth a dense yellowish sand—and a flood of hundreds, if not thousands of frantically thrashing cercaria. They look very much like

human spermatozoa, alternately contracting into a motion-blurred ball and relaxing so I can see their elongated “heads” and dark, wishbone-shaped guts. Dozens of plump, wormlike redia soon writhe sluggishly out of the wound, each one “pregnant” with eight or nine new cercaria visible through its transparent flesh.

I glance back at the rest of the snail. Now that I know what I’m looking for, I can see through the thin tissues of its body, to the shadows of more and yet more redia packed within. They are immobile or moving very slowly, but they spill forth and writhe just like the others when I tear open the snail, almost shredding it in my clumsy efforts at thoroughness. I am not very good at visual estimations, but at least a quarter of this snail’s body mass must be composed of parasite tissue. It is almost more worm now than snail.

“Hey, Lisette?” I ask. She glances up from her computer. “Come look at this.”

“Is it a good one?” she says, already getting up.

I scoot aside. “Uh-huh. There’s lots of digeneans in here.”

She sits down at the dissecting microscope, twiddles the fine-focus knob, and makes a long, pleased noise. “Oh, yeah. They look like echinostomes...could you pipette some of that and make a slide?” She shifts one seat over to the compound microscope. While I slurp up a fraction of a milliliter of the teeming water in my watchglass, she remarks, “I feel bad, doing dissections, but I don’t feel *quite* as bad killing snails with high parasite loads—they’re already evolutionarily dead. Since they can’t reproduce anymore.”

I grunt rather than nod, since I’m trying (and failing) not to blow air bubbles onto the slide along with the infested water sample. “Not like killing a bright young snail, with its whole life ahead of it...”

She snorts. I add a cover slip and pass her the slide. After a moment, she says, “Yep, echinostomes. Come look. They’ve got sort of a crown of spines at their anterior end, that’s what they’re named after—*echino-stome*, ‘spiny mouth’—and the characteristic dark gut.” She looks back into the compound microscope. “And you can see the perambulatory buds on the redia! Aww...so cute.” She gets up to find Valerie, her Ph.D. advisor (and, not coincidentally, my thesis advisor).

I take her seat and look. I have to admit, they actually are kind of cute—like the stubby, featureless paws of a teddy bear, placed seemingly at random along the length of the redia’s cercaria-bloated body. But I can’t see much else, least of all the rapidly-moving cercariae’s spiny rings, which Lisette apparently saw right away and used to unambiguously identify them. When Valerie and Lisette emerge from the lab’s private office, I give up looking and move to the other side of the table, next to the dissecting scope.

Valerie sits down at the scope and almost immediately comments, “Oh, look at them all! Adorable.” As she and Lisette coo over the parasites and come to an agreement on their taxonomy, something in the watchglass catches my eye. And I am half-awed, half-horrified by what I see there of life.

Back in the pond, this snail had been burrowed into by one or more roving miracidia, swollen with unceasingly multiplying redia until its flesh was merely a translucent casing for their own, gnawed into a genetic zombie more parasite than snail, and pierced again from within by a thousand escaping cercaria. Then it was abducted from its home and subjected to the crude, vicious care of my forceps. But the snail—or rather, the largest remaining scrap of the snail’s body—is still moving.

Life does not compartmentalize into sterile, independent bodies. Life, like a morning glory trellising to the sky, scaffolds itself upon life—its predecessors and its symbiotic cohorts, its enemies and its allies—until none can be separated from the whole. But evolution is also the process by which the present is continuously redefined by the absent, the culled, the unfortunate. I am here because a billion of my ancestors' siblings were not. I am here because my flesh has cultivated itself around the promise of death: The platelets that start binding my red blood cells into a sticky plaster within seconds of an injury. The muscle tissue that must be etched away by lactic acid to grow back in a configuration that can better bear the strain of my life's labors. The neurons that preserve precious energy by withering away from disuse. The immune system whose agents prowl my bloodstream for disease, trigger inflammation, instruct hopelessly overrun cells to commit suicide, and turn rogue if left idle by a too-hygienic world. The gametes that allow the information that built my body to outlive me. Death is what fuels that slowly spiraling bloom of diversity from which the snail's and the echinostomes' and my own genetic line arose. And though my physid will eventually succumb—has already succumbed—to this eternal arms race of parasite and host, its species' next generation will reap the spoils of victory.

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