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## INTRODUCTION

# In the Trenches of Sleep

I can hear little clicks inside my dream.  
Night drips its silver tap  
down the back. At 4 A.M. I wake. Thinking

—ANNE CARSON<sup>1</sup>

### HEIDI'S DREAM

Season thirty-eight, episode one of the PBS series *Nature*, “Octopus: Making Contact,”<sup>2</sup> promised viewers a rare journey into the inner lives of octopuses, billed as “the closest we may get to meeting an alien.” The star of the one-hour documentary is Heidi, a female day octopus (*Octopus cyanea*) who lives with the narrator, David Scheel, a biologist at Alaska Pacific University. Unlike most captive octopuses, Heidi lives neither in an aquarium nor in a laboratory, but in Scheel’s private residence in Anchorage—a charming mix of roommate, companion animal, and research assistant.

“Octopus: Making Contact” tells a tale of octopuses not as “stupid creatures,” which is how the Greek philosopher Aristotle described them in 355 BCE, but as intelligent and naturally curious beings who have unique personalities,

recognize others of the same species, and solve complex problems. From start to finish, octopuses are presented as conscious agents who know when they are being observed and who, more importantly, do not hesitate to observe in return. “When you look at them,” says Scheel, “you feel like they’re looking back. That’s not an illusion. They *are* looking back.”

Near the end of the documentary, as Heidi is shown sleeping in her tank, Scheel reports: “Last night, I witnessed something I’ve never seen recorded before.” What follows is a breathtaking one-minute-long shot. In it, Heidi is at first peacefully restful, but after a few seconds her skin lights up, displaying a sequence of dramatic, multicolored patterns, each one more mesmerizing than the last. The “something” Scheel is referring to may be an *octopus dream*.

His voice then walks the viewer through each of Heidi’s arresting displays, noting, “you could almost just narrate the body changes and narrate the dream.”

#### DISPLAY 1

Heidi changes from a smooth and consistent alabaster white to a flashing yellow with blotches of mandarin orange. “So here she’s asleep, she sees a crab, and her color starts to change a little bit.”

#### DISPLAY 2

From these splendid shades of yellow and orange, Heidi changes to a dark and piercing purple, a purple so deep that for a fraction of a second, we cannot tell where her

body ends and the dark blue background begins. “Octopuses will do that when they leave the bottom,” usually after a successful kill, Scheel explains.

DISPLAY 3

Heidi then changes into a series of light grays and yellows, except this time the colors are crisscrossed by a disordered topology of ridges and spiky horns, the textured byproduct of the contractions of the papillae on her skin. “This is a camouflage, like she’s just subdued a crab and she’s just going to sit there and eat it, and she doesn’t want anyone to notice her.”<sup>3</sup>

The camera then turns to Scheel himself, who says with noticeable elation: “This really is fascinating [. . .] If she’s dreaming, *that’s* the dream.”

Heidi became a viral sensation overnight. Within days, thousands of people shared the video of her dream on social media, and major news outlets rushed to cover the story. Viewers were simultaneously fascinated and stupefied. Her sleep displays were stunning, a veritable kaleidoscope of flesh. But what did they mean? And beneath this procession of color and texture, what was Heidi herself thinking or feeling? As Elizabeth Preston put it in the *New York Times*, “[A]n octopus is almost nothing like a person. So how much can anyone really say with accuracy about what Heidi was doing?”

Pan out and the bigger question becomes: What goes on in the minds of nonhuman animals when they sleep, or, as

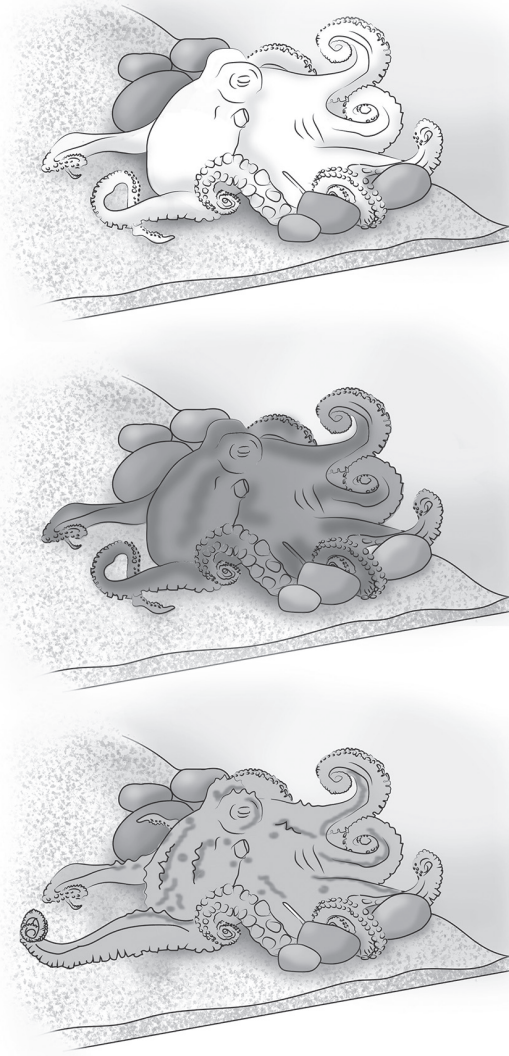


FIGURE 1. Heidi displays three separate chromatic patterns in a row while asleep, probably on account of experiencing a dream in which she is hunting and eating prey.

the poet Anne Carson says, when “night drips its silver tap”? Do they experience those penetrating nightly visions that humans do, which Shakespeare described as “the children of an idle brain”? Or do their minds simply plummet into a psychic void in which no conscious experience takes root? Can other animals—not just octopuses, but parrots, lizards, elephants, owls, zebras, fish, marmosets, dogs, and so on—truly dream? If so, what does this tell us about who these creatures are and how they dwell in this world? And if not, does this mean that dreaming may be the cognitive Rubicon that separates us from the other animals? Are humans “the dreaming animal,” as the Spanish philosopher George Santayana believed?<sup>4</sup>

This book is about these questions.

#### ANIMAL INTERIORITY

Even though humans have been fascinated by the possible dreamworlds of other animals for millennia,<sup>5</sup> the first modern scientific publication devoted to animal dreaming appeared in 2020. In an article published in the *Journal of Comparative Neurology* under the title “Do All Mammals Dream?,” the biologists Paul Manger and Jerome Siegel express doubt that only humans experience dream sequences during sleep, and they wonder whether dreaming—that curious mental happening that the sociologist Eugene Halton describes as “the mind’s nightly ritual of inner icons”<sup>6</sup>—may be a universal feature of mammalian life, something we share

with all other species whose young feed from the mother's mammary glands. I will come back to this mammalocentric hypothesis in chapter 1, but for now I want to emphasize that this article stands out within the field of animal sleep research as a genuine anomaly: the only publication in a scientific journal to use the terms "dream" and "dreaming" explicitly in connection to animals other than *Homo sapiens*.<sup>7</sup>

To be clear, this is not the only publication to shed light on what goes on inside the minds and bodies of animals during sleep. Far from it. Over the last century, biologists, psychologists, and neuroscientists have made significant strides in cracking the code of animal sleep, giving us a fuller picture of the imperatives of animal experience across the great sleep-wake divide. Nevertheless, these same experts have historically shied away from describing their findings using the language of dreams. Instead, they have opted for more phenomenologically ambivalent terms, such as "oneiric behavior"<sup>8</sup> and "mental replay,"<sup>9</sup> that allow them to talk at great length about the mechanics of animal sleep—the biological processes that regulate it, the physiological changes that prompt it, the neurochemical changes it occasions, and so on—without needing to take a stance on whether any of the animals under study actually experience anything subjectively at any point during the cycle of sleep. Because of their intrinsic agnosticism, these terms end up blotting out some of the most philosophically stimulating questions raised by the possibility of animal dreaming, especially questions concerning consciousness, intentionality, and subjectivity.

In this book, I build on contemporary animal sleep research to show that what scientists refer to as “oneiric behaviors” and “mental replay” in sleeping animals should be interpreted as the result of internally generated dream sequences that animals experience—even if only momentarily—as their very reality. Rejecting this phenomenological interpretation, I argue, would require holding two conflicting beliefs at once: first, that many animals display the same patterns of motor and neural activity during sleep that are widely accepted as indices of dreaming in humans; and second, that while this bustle is going on inside them, these same animals sense, feel, and think nothing. It would almost require believing that the minds of animals magically disappear into the ether the moment animals drift off into sleep; that, immediately upon entering the kingdom of Hypnos, a gaping abyss opens up beneath them and swallows them whole. While this position is not necessarily illogical, a close reading of the empirical data reveals it to be untenable. Even if scientists are reluctant to talk about the dreams of animals (say, for reasons of scientific humility), their findings point in precisely that direction.

My concern is that, aside from betraying a problematic double standard,<sup>10</sup> this reluctance to talk about animal dreaming feeds a larger cultural prejudice that rationalizes our appalling treatment of animals. In a seminal article on animal consciousness, the father of cognitive ethology, Donald Griffin, called this prejudice “mentophobia”—the fear of viewing animals as creatures with minds of their own.<sup>11</sup> This



fear leads us to see animals as food to be consumed, reservoirs of labor power to be exploited, resources to be used, and specimens to be cultured and dissected—as anything, that is, except creatures who live, feel, and think on their own terms. While mentophobia affects all areas of social life, Griffin recognized that it exerts an exceptionally strong pressure on the scientific community, a pressure that is most conspicuously on display whenever scientists resist attributing complex mental states to the animals they study even when there is ample support for it. It is because of mentophobia that most of us continue to see animals, in the now infamous words of the philosopher Normal Malcolm, as “thoughtless brutes”; that is, as creatures who eat, sleep, and die, but who never develop a meaningful cognitive, emotional, or existential bond with the world.<sup>12</sup> Once animals are pigeonholed into this category, their fate is sealed. There are simply too many things one cannot expect from a thoughtless brute.

One of them is the capacity to dream.<sup>13</sup>

And yet: watching the displays of Alaska’s most famous cephalopod feels very much like witnessing the collision of two subjective realities—one human, one not. It is almost as if Heidi’s flamboyant metamorphoses bring within the reach of our human, all-too-human senses that alluring yet inscrutable realm of reality from which every human observer has been barred from time immemorial: the inner world of another animal. Perhaps a phenomenology of animal dreaming can explain why. If, while watching Heidi’s displays, we feel that we are coming face-to-face with another subjective

reality that is recognizable and alien at once, this may be because the band of colors marching rhythmically on the surface of her skin bespeaks a dream, a dream that—much like the dreams of the myriad other animals we will encounter throughout this book—is itself an irrefutable sign that *there exist, alongside ours, endless other worlds—utterly “Other,” inhuman worlds. Enigmatic, foreign, hidden animal worlds.*

Worlds without human contours.

Worlds with nonhuman centers.

#### AN INTEGRATIVE APPROACH

There are experts who worry that attributing dreams to animals anthropomorphizes them by projecting a uniquely human ability onto them. In their view, animal researchers should stick to what the philosopher of science Peter Winch calls “external descriptions” of behavior, leaving considerations of animal interiority to their colleagues from across the quad: the philosophers.<sup>14</sup> In defense of this division of intellectual labor, they offer a host of arguments. Sometimes, they invoke the authority of “Morgan’s canon,” which says we must opt for the simplest possible explanation of animal behavior.<sup>15</sup> Sometimes, they appeal to the philosophical “problem of other minds,” which maintains that we cannot say that animals have an interior life because we lack direct access to their first-person experience of the world.<sup>16</sup> At other times, however, they hint at the problem of language. In the

absence of a shared language, they say, we cannot make empirically meaningful claims about how, when, or why—or even whether—other animals dream, let alone about the nature, structure, and quality of their putative dream experiences. What are dreams, after all, if not unobservable mental happenings whose existence we can infer only on the basis of subjective verbal reports—reports that animals cannot provide?

However appealing, this view relies on the conceit that the scientific study of dreams depends solely or mostly on the compilation, analysis, and interpretation of dream reports. Surely, dream scientists have learned, and continue to learn, a great deal from the verbal reports of human dreamers about what our minds and bodies do when we go “offline.” But the bulk of dream research since the 1980s has not been exclusively (or even primarily) based on the analysis of linguistic reports. It has been based on the investigation of the neural and behavioral correlates of dream experiences, which is to the say, the brain activity and bodily behaviors that correspond with the subjective experience of dreaming. A brief survey of contemporary human dream research reveals a vast, interdisciplinary, and rapidly evolving field in which experts concentrate on spotting the neural signatures (e.g., ponto-geniculo-occipital, or “PGO,” waves)<sup>17</sup> and behavioral markers (e.g., rapid eye movements or “REMs”) of human dream phenomenology.<sup>18</sup>

While our inability to speak with other animals certainly limits what we can know about their dream experiences, it does not prevent us from making meaningful and empirically



FIGURE 2. While linguistic reports remain a valuable tool in dream science, much contemporary dream research relies on the use of electroencephalography (EEG), functional magnetic resonance imaging (fMRI), and positron emission tomography (PET) to isolate the neural circuits involved in dreaming. Here, a woman wears an EEG headset in preparation for a study.

educated claims about their capacity to dream, or even from ruminating about the possible implications of this capacity for ongoing scholarly debates about animal consciousness, animal emotion, and animal ethics.<sup>19</sup> Indeed, throughout this book I use an *integrative method* to advance several such claims. In essence, this method involves:

1. surveying the empirical literature on animal sleep for findings that might point to dream experiences in other animals; and,

2. interpreting these findings through a philosophical lens that combines conceptual tools and resources from such fields as phenomenology, the philosophy of consciousness, and the philosophy of animal cognition.

Using this method, I can take the empirical data seriously while asking vital philosophical questions about what this data means. For, as we shall see, its meaning *is* up for grabs.<sup>20</sup>

#### THE BOOK—STRUCTURE AND AIMS

People who interact with animals as part of their everyday life—animal lovers, farmers, veterinarians, animal activists, and so on—may be tickled by the thought that someone would write an entire book about something that strikes them as obvious: that we share the ability to dream with many other critters. But holding this belief is one thing; defending it on scientific grounds is another; and teasing apart its philosophical implications is yet another. In the chapters that follow, I do all three.<sup>21</sup>

In chapter 1, “The Science of Animal Dreams,” I turn to animal sleep research to catalog evidence that animals run “reality simulations” during key phases of their sleep cycles. Even taking certain methodological and conceptual limitations into account, the preponderance of this evidence supports the conclusion that humans are not the only dreamers on earth.

In chapter 2, “Animal Dreams and Consciousness,” I consider the philosophical significance of the evidence laid out in chapter 1. Here, I introduce the “SAM” model of consciousness, which distinguishes three types of self-awareness: “S” for subjective (being at the center of a phenomenal field of experience), “A” for affective (experiencing events as emotionally shaded), and “M” for metaconscious (having the ability to reflect upon one’s own mental life). Guided by phenomenological theories of dreaming, I assert that all animals who dream are necessarily *subjectively conscious*, that most (if not all) are also *affectively conscious*, and that a select few may be *metaconscious* as well.

In chapter 3, “A Zoology of the Imagination,” I take the discussion of animal consciousness to a higher level by accentuating the imaginative character of dreams. Given that dreams hinge on the generation of sensory (visual, tactile, auditory, and so on) imagery, creatures who dream must possess what the philosopher of mind Jonathan Ichikawa calls “imaginative capacities,” such as creativity, fantasy, and make-believe. I explore how these capacities congeal in dreams while presenting dreams as part of a larger spectrum of imagination that includes, inter alia, hallucinations, day-dreams, and mind-wanderings.

In chapter 4, “The Value of Animal Consciousness,” I tackle the ethical dimension. Do the dreams of animals matter from an ethical standpoint? Under most ethical frameworks, the answer to that would be yes, as consciousness is thought to determine which entities have moral status

and which do not. Here, I use the philosopher Ned Block's famous theory of consciousness as a jumping-off point for articulating a novel account of why dreams are pregnant with what I call "moral force." On this account, dreams are morally significant because they reveal animals to be both carriers and sources of moral value, which is to say, beings who matter and *for whom* things matter.

The book closes with a short epilogue, "Animal Subjects, World Builders," in which I offer some final thoughts about the subjectivity of other animals and about what binds us to and cleaves us from them. It is in this tension between sameness and difference, between conjunction and disjunction, that the heart of this book lies. If inhabited correctly, I argue, this tension can open up contemporary debates about animal minds and animal experience and make us question some of our more disturbing assumptions about our nonhuman comrades, so that we can begin the task of collectively learning to see animals truly anew—no longer as the evolutionarily, cognitively, metaphysically, or even spiritually impoverished versions of us that we have historically taken them to be, but as the fully realized, inviolable, sacred versions of themselves that they already are and always have been.

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