

Stumbling through Life by Design & Accident

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[The Social Leap: The New Evolutionary Science of Who We Are, Where We Come From, and What Makes Us Happy](#) by William von Hippel [Harper Wave, 9780062740397]

In the compelling popular science tradition of *Sapiens* and *Guns, Germs, and Steel*, a groundbreaking and eye-opening exploration that applies evolutionary science to provide a new perspective on human psychology, revealing how major challenges from our past have shaped some of the most fundamental aspects of our being.

The most fundamental aspects of our lives—from leadership and innovation to aggression and happiness—were permanently altered by the "social leap" our ancestors made from the rainforest to the savannah. Their struggle to survive on the open grasslands required a shift from individualism to a new form of collectivism, which forever altered the way our mind works. It changed the way we fight and our proclivity to make peace, it changed the way we lead and the way we follow, it made us innovative but not inventive, it created a new kind of social intelligence, and it led to new sources of life satisfaction.

In [The Social Leap](#), William von Hippel lays out this revolutionary hypothesis, tracing human development through three critical evolutionary inflection points to explain how events in our distant past shape our lives today. From the mundane, such as why we exaggerate, to the surprising, such as why we believe our own lies and why fame and fortune are as likely to bring misery as happiness, the implications are far reaching and extraordinary.

Blending anthropology, biology, history, and psychology with evolutionary science, [The Social Leap](#) is a fresh and provocative look at our species that provides new clues about who we are, what

makes us happy, and how to use this knowledge to improve our lives.

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Excerpt: How Do We Know What Our Distant Ancestors Thought and Did?

Our deep past is called prehistory for a reason; there are no written records from the time period. Scientists have found an extraordinary number of fossils and other bits of evidence from our distant past, but sometimes these pieces of the past are open to multiple interpretations. Additionally, because strategies and behaviors don't fossilize, it's difficult to know exactly how our ancestors solved many of the problems they faced on their way to becoming human. Despite these challenges, evolutionary scientists have done a remarkable job extracting information from small clues, and their brilliant ideas and hard work have enabled me to tell this relatively complete story.

So how do we know what we know? To answer this question, let's consider three different approaches to the study of our evolutionary history: (1) how lice DNA indicate when we invented clothing; (2) how church records reveal the importance of grandmothers; and (3) how ancient teeth suggest what our ancestors did to avoid inbreeding.

How Do We Know When We Invented Clothing?

Humans have the distinct pleasure of being the host to three different species of lice: head lice, pubic lice, and body lice. The story of how we came to provide these revolting little parasites with a home that is also a meal is an intricate one, and it begins with the head lice my children brought home from day care. The ancestors of human head lice infested primates about twenty-five million years ago, which is around the time apes and Old World monkeys (i.e., monkeys from Africa and Asia) went their separate ways.

When our more immediate ancestors split from the ancestors of chimpanzees six or seven million years ago, the lice that accompanied us could roam anywhere on our bodies, as our ancestors were still a hairy lot. These ancient body lice were the only species that plagued us at the time, but a few million years later we caught a new species of lice, apparently from gorillas. I'm not sure how our ancestors managed that one, but I'd like to think they were just living in close proximity to gorillas, maybe sharing the same bed on occasion to stay warm. Whatever the cause, about three million years ago we began hosting two distinct species of lice.

As we continued down our evolutionary pathway, we eventually lost our thick body hair (and our habit of consorting with gorillas). Our newfound hairlessness posed a problem for both our species of lice, as they depend on a forest of hair to deposit their eggs. The end result was that we forced these two species of lice to become specialists. The lice that had accompanied us for the longest retreated to the northernmost part of our body and became head specialists. The lice we caught from gorillas moved to our equatorial region and became crotch specialists.

This détente between our two lice species remained in place for about a million years, until just seventy thousand years ago, when a third species of louse appeared on the scene, an offshoot of the lice on our heads. These new lice evolved to live on our body, but just like the lice from which they originated, they couldn't lay their eggs on our (now-hairless) skin, as the eggs would have fallen

to the ground and died. Rather, these new lice required clothing to deposit their eggs. For this reason, the evolution of body lice provides pretty good evidence that we started wearing clothing by at least seventy thousand years ago.

Of course, the tricky questions are why did we bother with clothes, and why then? Our ancestors had been hairless for over a million years at that point, and most of them still lived in the warm climate of Africa—but not all of them. As we will see, just prior to the advent of body lice, *Homo sapiens* had begun migrating out of Africa. Perhaps this migration to colder climates led to the invention of clothing. Or perhaps clothing was invented much earlier and was intended to shield us from sun as well as cold. Alternatively, perhaps our ancestors were just seeking to ornament themselves or differentiate themselves from others. Whatever the reason, from that point forward at least some of our ancestors must have worn clothing most of the time, or our body lice would have died out.

The evolutionary story of body lice provides great evidence regarding the invention of clothing, but how do we know the details of this time line? And how do we know we got our pubic lice from ancestral gorillas three million years ago? To answer such questions, scientists have relied on molecular clocks, which are timing procedures based on DNA mutation rates. Once two species diverge, they start to build up random mutations in their DNA. These mutations are no longer shared between the two species, and hence are unique to each. Because we know the average pace of mutation on different strands of DNA, we can count the unique mutations on strands of DNA that are shared by both species to assess when the two species went their separate ways.

For example, if a particular strand of DNA in a particular species mutates at an average rate of once every twenty generations, and if we find an average of fifty distinct mutations on this DNA in each of two previously related species, we know that they have been separated for about a thousand generations. When we count backward in this way, we eventually get to the parent species that is genetically closest to the two offspring species.

By studying mutation counts in the DNA of body lice and head lice (which are closely related to each other but not to pubic lice), we have pretty good evidence that our ancestors stopped running around naked at least seventy thousand years ago. Using this same procedure, we also have pretty good evidence that our pubic lice have been separated from gorilla lice for about three million years.

How Do We Know If Grandmothers are Important?

The Lutheran Church has maintained meticulous records of all births, marriages, and deaths in Finland since the eighteenth century. Mirikka Landenperä of the University of Turku and her colleagues took advantage of this excellent source of data to plot the life course of more than five hundred women and their children and grandchildren from five different farming and fishing communities in Finland between 1702 and 1823.

By carefully combing through these records, Landenperä and her colleagues discovered several important facts about grandparents. Perhaps most remarkably, they found that for every ten years a grandmother lived beyond the age of fifty, she gained two extra living grandchildren. This effect emerged most clearly in families in which grandparents lived in the same village as their grandchildren, and seemed to be a function of three factors:

1. A living grandmother in the same village enabled daughters to start having their own children earlier (at an average age of 25.5 versus 28).
2. A living grandmother also shortened the interval between births, as daughters of living grandmothers had children every 29.5 months, but daughters of deceased grandmothers had children every 32 months.
3. A living grandmother who was under the age of 60 (and thus more likely to be energetic and helpful) increased survival rates of grandchildren by 12 percent. This increased survival rate manifested itself only post-weaning, as children who were still being breast-fed survived at similar

rates whether their grandmother was alive or not.

During this period in Finland (and everywhere else), illnesses and injuries took nearly half of the children before they reached adulthood, so these positive effects of grandmothers on survival and reproduction were keenly felt.

How Do We Know What Our Ancestors Did to Avoid Inbreeding?

Animals that live in small groups gain numerous advantages from group living, but they face a problem of how to avoid inbreeding. Without knowledge of their family tree, animals that are born into small groups and then mate with members of that group risk mating with close relatives.

There are several potential costs to mating with close relatives, but the most notable one is that dangerous genes are more likely to find a match when you mate inside the family. For example, I carry a gene for Tay-Sachs disease, which fortunately for me is recessive (meaning that unless you get the Tay-Sachs gene from both parents, you suffer no consequences). When both parents carry the Tay-Sachs gene, there is a 25 percent chance that each of their children will get two Tay-Sachs genes and suffer from the disease. Most Tay-Sachs victims show signs of the disease by six months of age, at which point they begin to lose their sight and hearing, then their ability to swallow, and eventually their ability to move, and soon afterward they die.

The gene for Tay-Sachs is rare (fewer than one out of every two hundred people carry it in the general population), so there is almost no risk that carriers like me will have a child who has Tay-Sachs because there is almost no chance that they'll happen to fall in love with a fellow Tay-Sachs carrier. But if I were to have children with members of my family, such as my siblings or cousins, there would be a much greater likelihood that my partner carried the same Tay-Sachs gene I do, and a much greater likelihood that our children would suffer from this horrible disease.

The most common way that animals who live in small groups solve this potential inbreeding problem is by having either males or females leave

the group in which they were born when they reach adolescence. By leaving their group behind and joining a new one, animals dramatically reduce the likelihood of mating with someone who is a close relative. It's important to keep in mind, however, that animals have no idea why they leave their group. Rather, those animals who developed a wanderlust and migrated to a new group were more likely to avoid these inbreeding problems. As a consequence, the tendency to change groups spread through the species via the enhanced reproductive success of animals who inherited the tendency to wander off when they reached sexual maturity.

Chimpanzees solve this inbreeding problem by having the females find new groups when they reach maturity. In contrast, hunter-gatherer humans are more flexible and varied in their solutions (more on this issue in chapter 3). Researchers wondered whether our distant ancestors were similar to chimps in this regard or more similar to us. But how do you piece together that sort of information when all you have are random bits of fossils, with nothing else that survived to tell the tale of how our ancestors lived?

Scientists cracked this particular nut by measuring strontium levels in our ancestors' teeth. Strontium is a metal that is absorbed into the body in a manner similar to calcium, and hence it can be found primarily in our bones and teeth. There are four different forms of strontium, and the ratio of these different forms varies with the local geology. Some locations have strontium that is very common in one form, relatively common in another, and rare in the remaining two; and other locations have different patterns.

Because strontium is incorporated into the teeth during growth and development, ancient teeth can be analyzed to assess the ratio of different forms of strontium. If the strontium ratio found in ancient teeth matches the ratio found in the local bedrock, whoever owned the teeth almost assuredly grew up in the region where their teeth were found. In contrast, if the ratio differs from the local bedrock, the owner of the teeth almost assuredly moved to that region after childhood.

When Sandi Copeland of the Max Planck Institute for Evolutionary Anthropology and her colleagues analyzed the strontium ratios from the teeth of various *Australopithecus africanus* (our ancestors from a few million years ago; more on them in chapters 1 and 2), she found that the larger teeth matched the local geology but the smaller teeth did not. Because males are typically larger than females, and hence have larger teeth, these data suggest that female Australopithecines probably left the groups in which they were born, and thus avoided inbreeding, just like chimpanzees.

As you can tell from these three lines of research, scientists use a variety of approaches to study our past. Sometimes the data give us a lot of confidence in our conclusions, such as when we see that grandmothers living in the same town are associated with reduced childhood mortality. Other times the data allow educated guesses, such as when we infer that smaller teeth are female and thus females likely left their birth groups when they reached maturity. Still other times the data only provide constraints on our theorizing, such as when the emergence of body lice gives us the latest date by which we must have invented clothing but doesn't provide clear evidence about what the earliest date might be—perhaps lice took their sweet time in adapting to the newfound opportunities of clothing.

It's important to remember in this regard that any individual study is just a small piece of the puzzle; it's the combination of thousands of studies that provides us with the overall picture. When the studies all point in the same direction, we can be pretty sure we understand what's going on. When they contradict one another or have multiple interpretations, we have more work to do. Unsurprisingly, as we go further back in time, the evidence becomes thinner and more ambiguous, and we are forced to rely increasingly on conjecture. Be that as it may, I have tried to tell our story without the endless caveats that make academic writing tedious and difficult to read. So please keep in mind that this book represents my best effort to explain who we are and how we got here, based on the incomplete, complicated, and sometimes contradictory data that exist. For readers interested in learning more, I've included a

reference section at the end of the book that is separated by chapter.

Nature versus Nurture?

I have one last point I'd like to make before diving into the book, which concerns the role of nature and nurture in our psychological makeup. Some people are offended by evolutionary approaches to human behavior, criticizing evolutionary psychology for what they perceive as its implications. Such people often believe that if genes influence the contents of our minds, those aspects of our minds that are subject to genetic influence are impervious to environmental or social influences and are outside personal control. I want to clarify that nothing could be further from the truth. By way of example, let's consider a body part that is much simpler than our brain: our muscles.

Differences in our genes give us the capacity to grow muscles of different sizes. Some people inherit a proclivity to grow large muscles (the front line on any major football team comes to mind), and some people inherit a tendency toward more modest musculature (if you knew me, I might come to mind). Our genes provide the blueprint that enables our muscles to grow to varying degrees when they are repeatedly overtaxed—for example, by weight training, manual labor, or participation in sports.

Nonetheless, it is our lifestyle that determines whether we subject our muscles to more or less strain or provide them with more or less nutrition, thereby causing them to grow or shrink. As a result, muscles of different size are a product of our genes, our environment, and the interaction between our genes and our environment. At the same time, our musculature can also be a matter of personal choice. As this example highlights, evolutionary theory conceives of neither body nor mind as the product of some sort of competition between nature and nurture, nor as the product of an inflexible biological program, nor as something removed from human agency and choice.

These interactions between genes and environment emerge even when genetic effects are very strong. For example, myopia (nearsightedness) is highly heritable, and nearsighted parents are likely to have nearsighted children. Yet studies of hunter-

gatherer eyesight show that there are almost no nearsighted hunter-gatherers. There are various aspects of modern life that might cause myopia—perhaps it's all the close work we do, perhaps it's reading, perhaps it's working in low light—but whatever the cause, the genes that lead to myopia are actually genes that make people sensitive to environmental factors that cause myopia. People who have myopia genes and live in modern environments usually develop nearsightedness; people who have myopia genes but live as hunter-gatherers almost never do. So even effects that are largely genetic can at the same time be largely environmental.

This principle also holds true when it comes to our mind. The contents of our mind are a product of our genes, our environment, and our personal choices. Our genes nudge us in certain directions—sometimes this nudge might more aptly be described as a shove—but we make the decisions that determine the trajectory of our lives.

There are countless examples of human choice overwhelming genetic tendencies, but perhaps a life of celibacy is the clearest case of all. One of the strongest desires that our genes give us is the desire to have sex, because the absence of sex ensures that our genes end with us. Despite that fact, a large number of humans throughout history have decided to forgo all sexual activity. Many have struggled but failed to enact this decision, but many have succeeded. No doubt some of the successful ones wrestled mightily with their decision, but that's the point. Just because our genes give us a massive shove in their preferred direction doesn't mean we have to go that way.

It's easy to imagine a world in which genes have control over our minds, and for many animals they do. But once we took the evolutionary pathway toward greater intelligence and a lifestyle that relies on learning rather than inborn knowledge, our genes had no choice but to relinquish much of their control.

By way of example, consider how meerkats train their young to hunt. Meerkats get most of their nutrition by eating insects, and the ones who live in the Kalahari Desert can't be too fussy about which insects they eat. One of their prey animals is the

scorpion, which is obviously a tricky dinner choice given that it has the power to kill in return. Meerkats are not born knowing how to kill a scorpion, so their parents and older siblings teach them.

As part of their teaching technique, meerkats differentiate how they bring home a scorpion meal as a function of how old the pups are. When the pups are newly weaned, the adult meerkat kills the scorpion before giving it to the pups. When the pups are larger, the adult meerkat breaks off the scorpion's stinger before handing it over but leaves the scorpion alive so the pups can practice killing it themselves. Finally, when the pups are getting ready to venture out on their own, the adult meerkat hands over a live and intact scorpion, which the pups must attack and kill for their dinner.

This process gives the impression of being well thought out, but meerkats will rely on just one signal to determine how to handle the scorpion before giving it to the pups: sound. When researchers play the sounds of very young pups, meerkats kill the scorpion before handing it over. When researchers play the sounds of older pups, the meerkats hand over a live and deadly scorpion. Amazingly, the sounds made by pups at different stages of development induce these behaviors in their adult carers independent of how old the pups actually are. Despite the fact that the carers are in direct daily contact with young and nearly helpless pups, they will offer them an intact scorpion if they hear calls that are made by older and more capable pups.

Data such as these show that meerkat decisions can be determined by the combination of their genes and just one piece of environmental information. No doubt this system evolved because it was computationally efficient (i.e., it didn't require too much brainpower), and in the real world it worked very well—baby pups never make adolescent sounds.

Humans stand in sharp contrast to meerkats and other animals like them. Our genes also influence our decisions, but only in combination with a huge range of input, some of which comes from inside our skull and is a function of how we see ourselves and who we want to be. For this reason, human agency

remains an important determinant of behavior, as people decide whether they're going to be easygoing or forceful, cooperative or competitive, and ambitious or lazy. Our genes are one factor in that decision-making process, but they are only a single factor. As we saw with myopia, genes interact with the environment to exert their influence, so to acknowledge the power of genes is not to refute the importance of upbringing, social class, culture, and such.

The bottom line is that evolutionary psychology is a story about how evolution shaped our genes, which in turn sculpt our minds, but it is not a genetically deterministic story at all. The environment also sculpts our minds, and our culture, values, and preferences play a critical role in who we become—and where we go next.

Evolution is not a warm and fuzzy concept. Whoever leaves behind the most offspring wins, no matter how that goal is achieved. So, it's no surprise that the process itself is often brutal. I remember watching a nature show on TV in which a pack of hyenas tore a baby zebra limb from limb without even bothering to kill it first. I felt sick to my stomach, but for the hyenas, it was just an afternoon snack, and I'm sure they gave it no thought once they finished the last tidbit. Animals that arrive at effective solutions to their problems pass on their genes, and with them, their solutions—whether they're vicious killers like those hyenas or adorable vegetarians like the baby zebra they consumed. Indeed, vicious and adorable, good and bad, moral and immoral—all these are human constructs that don't exist in the natural world. Evolution is amoral.

Why am I reminding you of this? Because the evolutionary pressures inherent in such a world could easily have brought us to a miserable place. Our chimp cousins rarely look out for one another the way we do, and the same holds true for our baboon second cousins. If you read Robert Sapolsky's wonderful book on savannah baboons, *A Primate's Memoir*, you'll see that the life of a baboon isn't much fun unless you're the alpha, with everyone endlessly harassing the monkey below them in the hierarchy. Their solution to the

challenges of life on the savannah could just as easily have been our own, but as luck would have it, Australopithecines evolved to protect themselves by working together. Homo erectus then expanded on their ancestors' loose-knit cooperation with division of labor, and the resultant interdependence gave us a life strategy that was not only effective but kind as well.

One of the most disconcerting aspects of evolution is the enormous role played by random chance. Our existence as a species is the result of innumerable rolls of the dice, every one of which had to go our way. The most trivial perturbations in our past would have changed everything. If our parents had felt amorous on a different night, or if other sperm happened to win the race to fertilize our mothers' eggs, I wouldn't be writing this and you wouldn't be reading it. The probability that either of us got a chance to live at all is vanishingly small, and yet here we are. As Richard Dawkins puts it in his fascinating book *Unweaving the Rainbow*, "We are going to die, and that makes us the lucky ones."

But the mere fact that we get to live is not what makes us lucky. Many animals live a life that I would just as soon forgo, not because it ends in tragedy, as it did for that baby zebra, but because their approach to living is one of endless conflict. Imagine being a seagull and spending your entire life fighting other seagulls for scraps. What makes us so lucky is the pure happenstance that we evolved to be (mostly) good to one another.

Our cooperative nature also set the stage for the evolution of our amazing brain. Our sociality made us smarter individually, but, far more important, it connected our minds to others' minds in a manner that massively increased our knowledge and computing power. As a result, we long ago surpassed the predators that hunted us on the savannah, and are now holding most of the pathogens at bay that are a much greater threat than predators ever were. For the first time in history, we no longer bury almost half our children before they reach adulthood. Evolution is brutal, but those of us with the good fortune to live in established democracies have used the tools that evolution gave us to create unprecedentedly safe

and satisfying lives. We evolved a psychology that continually searches for something better, but a moment's reflection reveals that it's hard to ask for much more than that. <>

[The Life of Imagination: Revealing and Making the World](#) by Jennifer Anna Gosetti-Ferencei [Columbia University Press, 9780231189088]

Imagination allows us to step out of the ordinary but also to transform it through our sense of wonder and play, artistic inspiration and innovation, or the eureka moment of a scientific breakthrough. In this book, Jennifer Anna Gosetti-Ferencei offers a groundbreaking new understanding of its place in everyday experience as well as the heights of creative achievement.

[The Life of Imagination](#) delivers a new conception of imagination that places it at the heart of our engagement with the world—thinking, acting, feeling, making, and being. Gosetti-Ferencei reveals imagination's roots in embodied human cognition and its role in shaping our cognitive ecology. She demonstrates how imagination arises from our material engagements with the world and at the same time endows us with the sense of an inner life, how it both allows us to escape from reality and aids us in better understanding it. Drawing from philosophy, cognitive science, evolutionary anthropology, developmental psychology, literary theory, and aesthetics, Gosetti-Ferencei engages a spectacular range of examples from ordinary thought processes and actions to artistic, scientific, and literary feats to argue that, like consciousness itself, imagination resists reductive explanation. [The Life of Imagination](#) offers a vital account of transformative thinking that shows how imagination will be essential in cultivating a future conducive to human flourishing and to that of the life around us.

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Excerpt: Thinking Imagination

Imagination arises in and through conscious life and aims toward material and symbolic expression. Imagination does not only operate in the isolated mind, as one fantasizes, eyes shut closed to the world, or in the rare ecstatic moment only. Imagination allows us to take up the stuff of the world and of the mind and transform it, and as such it is essential to human flourishing. Yet imagination, perhaps more so than any other mode of consciousness, seems to elude our grasp. For despite over two millennia of thought on the subject of imagination, we have yet to fully understand the breadth of its activity, the depth of its roots in our cognition, and the scope of its influence in shaping human life and experience. The aim of this book is to offer a new understanding of imagination that accounts for the ways imagination invests our experience with possibilities for thinking and for acting, feeling, and being.

Imagination is involved in many kinds of human endeavor, and accordingly this book is aimed at a wide readership and draws from many fields of inquiry. The approach here diverges from the tendency, typical of much of the philosophical tradition, to treat imagination as one species of cognition segregated from others and as separate from creativity in general. Philosophers have often shed light on imagination by focusing on one specific capacity—for instance, inner representations, fantasizing, hypothesizing, or pretense. The ambition here is more encompassing and perhaps also more audacious: to understand the place of imagination in our cognitive ecology, its role in ordinary cognition as well as its exquisite and distinctive manifestations in some of the most special of human experiences. The focus here on the human imagination is not meant to deny the role of imagination in nonhuman animal life, recognized

by philosophers since at least Aristotle.¹ For there is ample evidence that animals do imagine in a number of ways, and human imagination, understood here as arising from our evolved, embodied life, will share something with that of other species. The main focus of this book is imagination as a transformative power, which both helps human beings to reveal the world, or to come to understand it in light of possibilities, and to make world, or to shape the reality before us by regarding it and changing it in new ways, integrating possibilities with what is given. That human beings need imagination to cope with the challenges we face—many of which are due to the activities of our own species alone—also motivates this effort to grasp its depth, breadth, and relevance in human life.

The imagination is not a single mental phenomenon or skill, but multifactorial, a constellation of related activities contributing constitutively to the full dimensionality of human consciousness and our relations to the world. This book shares an approach with those studies that, against the grain of a long tradition, suggest that imagination pervades many aspects of thought and action!¹ Examining some of the modes of imaginative activity here, we will trace exceptional moments of imaginative intensity—such as occur in art, literature, scientific discovery, and invention—to their roots in everyday human thought and practice.

Of course, imagination may often be associated with the unharnessed and lively wandering of children's play, with eureka moments of discovery, or with artistic creativity—experiences distinct from the humdrum and the ordinary that may not seem to have much to do with everyday pragmatic life. Distinctly imaginative experiences differ from mundane thinking in that usual expectations and habits are ruptured by something unpredictable, by some inner impulse of spontaneity. Yet just as ordinary, quotidian life may harbor possibilities for extraordinary, even ecstatic experience,¹ I suggest that such spontaneity is latent within the common flow of human consciousness. Far from being merely a private theater for ineffectual and incommunicable fantasizing, imagining may be prompted by our surrounding influences and inspirations, by communication with others, by

worldly and cultural provocation, as well as by the existential momentum that arises in human self-reflection.

When trying to grasp imagination as both pervasive across thinking and capable of special exertions, some apparent paradoxes arise. For its workings are both natural to ordinary consciousness and, in its most heightened expression as in complex creative activity, depart from the ordinary, sometimes exceptionally so. Imagination draws from fundamental cognitive capacities but also breaks with our cognitive habits, our routine ways of thinking about the world or aspects of it. Creativity—which I regard as an imaginative mode that draws upon several of its facilities—is both situated in our relations to surrounding circumstances and enables their transcendence. Further augmenting the complexity of imagination, imagination has what has been called a reproductive facility—based on and presenting images and ideas from previous experiences—as well as a productive facility—which is meant here that, though drawing from prior experience, imagination generates something new.

This emphasis on the productive imagination, its generativity, sets this study apart from the many accounts that define it primarily in terms of its capacity for reproducing or recreating ideas—making resemblances, copies, or simulations of other experiences and merely recombining them—in short, as a second-order operation of consciousness. The depiction of imagination as essentially reproductive reigned in philosophy almost uninterrupted from Plato to the mid-eighteenth century and remains characteristic of many contemporary views of the mind. Immanuel Kant, Samuel Taylor Coleridge, the Romantic writers, and Friedrich Nietzsche offered alternatives, yet the impact of their exploration of productive and creative imagining has been largely confined to the fields of aesthetics and literary theory or to the literature of the "imaginary," a notion often evasive of clear definition and for the last century most readily associated with the cultural appropriations of psychoanalysis. The reproductive view still holds sway, even where the combinatory power of imagination is emphasized. Of course, a great deal

of what the imagination does can be considered in reproductive terms. Aristotle classified imagination as a form of memory, and David Hume iterated that, despite its apparent freedom—and its crucial role in connecting our otherwise unconnected ideas—its power lies in combining impressions from previous experience. Insofar as new ideas seem to occur to us, imagination retrieves and mixes impressions of states and objects we have experienced before, leading to the commonplace idea that imagination, or creativity, is nothing more than putting old ideas together in new ways. Imagination can indeed be conceived in terms of "the having of states that are not beliefs, desires or perceptions, but are like them in various ways," and those states can be thought as "recreations" by the mind. But since in so doing we can also "project ourselves into another situation and to see, or think about, the world from another perspective," a further dimension of this task—the shifting perspective, projecting possibility in excess of actuality, taking up a point of view on an alternative—is not exhausted by reproduction or resemblance, but involves excess and transformation. This surplus of imaginative play beyond reproduction and combination merits serious consideration, for it is in transcending the actual that imagination, as Jean-Paul Sartre aimed to show, is essential to human freedom.

Yet the obstacles to an adequate grasp of imagination remain considerable and contribute to a convoluted and dramatic conceptual history. Since Plato, philosophers have alternately revered, chastised, mystified, or suppressed imagination as an element in human cognition. Throughout this history there is little consensus on what the imagination actually is, and even in the works of philosophers for whom imagination is a prominent faculty of human consciousness it remains opaque. Kant describes imagination as "a hidden art in the depths of the human soul, whose true operations we can divine from nature and lay unveiled before our eyes only with difficulty." For Hume, despite his combinatory explanation, imagination remains a "kind of magical faculty ... inexplicable by the utmost efforts of human understanding." It has been pointed out that philosophers have so variously defined imagination that it may be difficult to show

how its many forms are related, and that imagination as a mental activity is an "extraordinarily elusive phenomenon." While the products of imagination—such as works of art and literature, myth and cultural narratives—are communally available, as an activity of consciousness, the imagination is experienced primarily subjectively, through whatever is imagined and our introspective reflection on the process of imagining it. Our capacities for specific efforts of imagining—for instance, inner envisioning—differ considerably among individuals, so much that some may deny that there are such modes of consciousness at all. Recent scientific investigations have focused on relevant brain events (such as measuring neurological activity when we visualize and mentally combine objects), yet in complex activities of imagining, scientists have found the involvement of widespread neural networks across several regions in the brain. While progress has been made in identifying such networks, it is still not understood how complex imaginative experiences operate on a biological level. The effort to bridge empirical knowledge about the brain and the phenomenal or subjective levels of experience is underway, but the phenomenal side of that experience, too, still leaves much to be explored and explained.

The imagination is here defined as the presentational capacity of consciousness which can meaningfully transform what is thereby given. The aim here is an encompassing and multifactorial grasp of major modes of imaginative cognition that define human thinking and being. These include inner imaging, seeing-as and related modes of interpretive perception, hypothetical or counterfactual thinking, pretense, and creativity, which makes use of the other modes. Operations in the background of conscious awareness that have been attributed to imagination as conditions of possibility for experience will also be considered. This definition of imagination—and the necessity of a multifactorial account and reference to several strata—will be elaborated through the first three chapters in light of imagination's evolutionary, scientific, and phenomenological contexts. The exercises of imagination especially important in this study involve its integration of possibility with the

given. Thus, despite their importance, dreams, hallucinations, and other largely passive experiences of imaging are more or less set aside in order to focus on the exercises of imaginative consciousness that enable the human mind in grasping reality or in deliberately generating alternatives to it. Chapters 4 through 7 will show how different modes of imaginative activity allow us to take what is there before us—in thought or materially—and transform it in a meaningful way, sometimes toward an effort to know or reveal reality, in others to depart from and transcend it.

When imagination is understood as the presentational and transformational capacity of consciousness in multiple modes of activity, its role in our dealings with reality as well as in our departures from it can be equally recognized. Historically, imagination has been most persistently identified as the capacity for internal representation of previous perceptions retained in memory. For Plato, this was imagination's irrevocable flaw—that imagination merely, and often inaccurately, copied sense perceptions, themselves at a remove from the essential truth of things that could be grasped only by reason. Thus imagination, especially as liberally engaged by poets and artists, was thought to undermine knowledge. Yet Aristotle recognized *phantasia* as a necessary process of cognition, important for object constancy (persistent acquaintance with things despite their intermittent absence), as well as for teleological thinking (aiming for not-yet-present goals). To Plato's critique of imagination, Aristotle countered that no thought is possible without some involvement of imagination. Imagination—in the form of mimetic creativity—is also aligned in Aristotle's poetics with the thought of possibility. Aristotle recognized this relation between the imagination and exploratory thought, by arguing that poetry is more philosophical than history, because it includes a presentation of what could happen and its creative expression toward maximal meaning for human life and action. In this respect imagination can be considered productive, contributing to the presentation and figuration of possibilities.

In the early modern philosophy of Michel de Montaigne, René Descartes, and Blaise Pascal, the

imagination was demoted again to an inessential role, and a renewed anxiety arose about imagination's impact on thinking. For early modern philosophers, our grasp of objective reality—along with the foundations of modern science—depended upon controlling the activity and influence of internal representation. While imagination was held to mediate between the senses and the intellect, and was therefore necessary for thinking, it must not have undue influence on the mind. To perceive is one thing, to imagine is another. Rational thinking and productions of the fancy are assigned to distinct faculties, with the former alone considered essential. To confuse imagination and perception, cognition proper and fantasy, is to court illusion, error, and even madness. As we will see, however, even in this early modern context, imagination is engaged in surprising and important ways in philosophical meditation and discovery.

Later philosophers came to recognize imagination as inextricable from other modes of thinking. By the late eighteenth century, Kant argued that imagination, at the level of underlying cognitive synthesis, plays a role in structuring perception and in the construction of a continuous point of view from which a human subject perceives the world. This structuring role manifests the productive work of imagination, going beyond the capacity to recreate or recombine the stuff of previous experiences and synthesizing what would otherwise be too diverse and unstructured impressions in space and time. Kant thus recognizes imagination in the very configuration of our experience. Of course, Kant will attribute further roles to imagination. In the perception of beauty and other aesthetic qualities, the imagination allows for an element of experience that cannot be entirely captured in conceptual thought. The mind engages a cognitive "free play" between imagination and understanding, and this allows the mind an inner experience of freedom in a world otherwise understood as materially determined. Coleridge, inspired by Kant's aesthetics, hailed imagination as the force of creativity, comparing it to divine creation, while the German Romantics, such as Friedrich Schlegel and Friedrich Hölderlin, found in imagination nothing less than an access, however indirect, to the unity of life itself. By the twentieth

century these somewhat mystifying treatments of imagination were rejected for more tempered assessments. Ludwig Wittgenstein recognized imagination at work in aspect perception, or "seeing-as," for instance recognizing a certain figuration (a mountain, for example) from the bare data of perception (the triangular lines on a page). While Wittgenstein focused primarily on perceptual puzzles, or seeing-as as a kind of "imaginative vision," this use of imagination has been understood as relevant to perception more generally and as relevant to linguistic meaning.

Imagination plays a role not only in perceptual life, and in its elaborations in poetry and art, but also in science, through hypothetical thinking, envisioning, and creativity. While modern scientific inquiry, of course, must conform to standardized procedures of observation and demonstration, its questions must be borne in a mode of projection that necessarily ventures beyond what is already known. The achievement of significant breakthroughs will require leaps of speculation, or reframing of ideas within a new context, in which the thinker must venture beyond the already explicable, and this activity owes something to a cognitive play, one that enables a shifting of perspective and a projection and contemplation of possibilities. Albert Einstein repeatedly recognized the power of imagination in the exploratory thinking of the sciences and described in detail the role of imagining in his own solutions to problems in physics.

Yet recognizing imagination as relevant not only to artistic creativity and aesthetic experience but also to scientific thought strains narrowly conscribed definitions of imagining. In order to grapple with the heterogeneity of imagination, some philosophers have distinguished between the "sensuous," "perceptual," or "experiential" imagination—the capacity to create the inner sensation of perceptual or kinesthetic experience—and the "cognitive" or "propositional" imagination—the capacity, for example, to entertain the thought or idea that such and such is the case. The latter allows a role for imagination even where there is no simulation from sense experience; but in complex activities of thinking, including in science, both forms may be involved.

Despite an explosion of interest in various aspects of imagination in recent decades, there is little scholarship available that offers a genuinely interdisciplinary view of its role across human experience. There exist a few excellent historical surveys, yet none of these attempts to synthesize the diverging accounts presented or offers an understanding of imagination's role in the evolution of our humanity or accounts for the role of embodiment in imagining. Even Eva Brann's monumental study of imagination, despite its elegant and abundant insights into imagination, argues for the "complementary relation" of imagination and thought, rather than for the role of imagination in human thinking as such. It should be said that these accounts predate important new developments in neuroscience, cognitive science, developmental psychology, and evolutionary anthropology, among other fields of inquiry, which can enhance our understanding of imagination and our recognition of its depth and breadth across human thinking, its rootedness in embodied life.

In recent philosophy, discussion of imagination is somewhat divided along methodological lines. Philosophers in the Anglo-American or contemporary analytic tradition are careful to avoid overinflating imagination's powers, and in respect of that aim tend to confine inquiry on imagination narrowly. They may single out one type of imagination for analysis, or describe imagination by way of distinction from other cognitive states, or rely only on a reproductive view of imagining, or demand empirical verification beyond introspective evidence. While a methodological skepticism in this approach yields clarity along with epistemic conservatism, it risks underappreciating the imagination in its full dimensionality, its relevance across human life and thinking. This tradition, moreover, tends to segregate from its account of imagination the more unwieldy notion of creativity. In contrast, in Continental or what is often called post-Kantian European philosophy, the productive imagination is widely accepted and its significance more boldly affirmed. In this tradition imagination or "the imaginary" can be variously identified with desires or drives, with a cultural excess of otherness and difference, with the poetic and aesthetic—ideas

appealing to intuition about the potential depths of imaginative life, resourceful for cultural analyses. However, these forms of the imaginary are often designated in direct opposition to rational thinking, thus again inadvertently segregating imagination from other kinds of cognition, or they are analyzed wholly through textual interpretation without concrete reference to the experience of actual human subjects and what we can know about them. While there are merits to these approaches, the imaginary remains undefined, often deliberately so, left as "accessible to experience without ever being pinned down, let alone exhausted, by a semantic definition." When seen as a cultural repository of drives, or an unconscious force of destabilizing otherness, difference, or negation, rather than within a cognitive dimension, it may be more difficult to assess "the power of imagination exercised in individual works."

The phenomenological strand of the Continental tradition, however, allows for an approach to imagination as an experience of thinking for a human subject, and can be engaged in the context of a contemporary understanding of the mind. Increasingly some researchers have aimed to overcome the methodological differences between analytic philosophy, phenomenology, and cognitive theory. I will draw here pluralistically across these traditions, particularly upon phenomenology and cognitive theory, as they contribute to our understanding of imagination as a cognitive power. In so doing I hope to avoid both the narrow constrictions of some analytic accounts of imagination and the mystifications of some Continental approaches, while steering clear of the procedural idiosyncrasies that often render arguments unapproachable outside these specialist traditions.

While philosophical in substance and method, this account finds inspiration in literature and literary theory, poetry, the arts and aesthetics, anthropology, evolutionary biology, psychology, and the history of the physical sciences, along with examples from everyday life. Readers will find here not a codified taxonomy of imagining, but a conceptual and phenomenological analysis along the main axes of imagining to be described in chapter i, as well as experientially sensitive

explorations throughout the book of imaginative life and thought. The imagination as understood here is relevant to any human experience in which we reflect on the world and accordingly transform it, whether in thought alone, in material, iconic, or linguistic expression, or in embodied action.

Given the differentiation in what follows among major modes of imagining, recognition of their potential interrelation, and the varying levels of imagination's involvement in cognition, we need not mistake the scope of imagination for its uniformity. Not all forms of thinking are equally "imaginative," and not all are imaginative in the same way. Wittgenstein argues that thinking is "a concept that comprises many manifestations of life," the phenomena of which "are widely scattered," and this can be equally said of imagination as a cognitive power. Recognizing imagination's broad relevance does not preclude recognizing the specialness of cultivated, concentrated, or exquisite uses of imagination any more than the recognition of the fact that thinking pervades our consciousness would preclude recognizing rare, profound, and elaborated thoughts or their special cognitive shape. Imagination as a presentational and transformational activity of consciousness can operate at several levels of our cognitive life. The special, sustained, or highly developed transformations of imagining contribute to the construction of fictional worlds and scientific theories, artistic expressions and practical inventions.

This account resists imagination's dismissal as a form of escapism, though that is one important use of imagination that deserves consideration. The characterization of imagination as fantasy, or even exclusively as the autonomous consideration of things absent to perception, may lead to a view of imaginative life as sequestration from reality. The capacity for us to inwardly imagine, in abstraction from our surroundings, of course, may be a source of cognitive freedom. Sartre, for example, argues that "for consciousness to be able to imagine, it must be able to escape from the world by its very nature, it must be able to stand back from the world by its own efforts. In a word, it must be free." Imagination's freedom for Sartre is due to its restriction to "irreality," dealing as it does with

images that are nothing more than consciousness itself intending "nothingness" Maurice Blanchot describes, in similar terms, the "strange liberty" of literary and artistic experience as entering a "void," a space radically separate from and incompatible with the world. Edward Casey defends both imagination's autonomy—its irreducible independence from perception—and its freedom to contemplate pure possibilities, or possibilities for their own sake, such as "when we speak of imagining Pegasus flying through the sky." Because what we imagine is ontologically distinct from reality, imagination does allow us to seem to escape reality, at least in inward thought, contemplation, and feeling. Beyond independent fantasizing, human beings seek out the assisted contemplation of possibilities enabled by fictional literature, film, art, forms of virtual reality, in order, through vicarious experience, to find relief from the real world and from its material limitations.

Yet if the imagination is intrinsically connected to freedom, the latter is not achieved by mere independence from the world or the absence of external constraints. Freedom can be conceived as freedom for action and creation within the context of our material and cultural circumstances, as Sartre himself admits. Freedom, of course, requires the capacity, in reflecting on what we have experienced, to "withdraw" from and "de-sense" its immediate effects, as Hannah Arendt puts it, and to consider it from another point of view. Freedom requires the capacity to stand back and reflect on our potential actions, and even on the desires that may assail us, so that we can consider what attitudes we might adopt to them and how to proceed in light of them. Imagination contributes not only to freedom but to the ethical responsibility freedom entails, allowing us reflection on our possibilities so that we can imagine being or acting or even feeling otherwise than we are and do. Imagination allows us to consider different potential modes of response, rather than merely to react immediately, unreflectively, to pressures of a given situation. In so doing, imagination may provide us the liberty to shape our interactions, to change ourselves or the surrounding world—not with some wave of a magic wand but in and through the circumstances at hand.

The life of imagination shapes our thinking and indeed our whole cognitive ecology. Imagination in its exceptional development in human beings allows us to consider reality as endowed with possibility, to shift perspective and construct alternatives to what we already experience and know. While imagination has been described in this book as relevant throughout much of our cognitive experience in the broadest sense, I have endeavored to show how its involvement in ordinary thinking gives rise to, and can be distinguished from, its special, sustained, and exquisite uses. Imagination is neither wholly mundane nor otherworldly; it is no more and no less marvelous or mysterious than human consciousness itself as an emergent phenomenon of nature.

Imagination, as both embodied and as virtually transcending corporeal limits, as rooted in and going beyond reality, as both engaged in and projecting a world, and as cultivating a virtual interior for human consciousness, resists reductive explanation. As I have aimed to demonstrate in this book, imagination is not a single skill, but involves multiple modes that may overlap and works at a number of levels. Its revelation of possibilities involves generative construction, its retrievals from experience are also transformative, and the reality from which the "merely" imaginative is typically distinguished is itself known and grasped in part through imaginative contributions to cognition. That some opacity may remain in this demonstration of the breadth, complexity, and workings of imaginative experience would be inevitable to the extent that human consciousness itself—its embodiment and the connection between its material substrate and its emergent qualities—is not yet fully understood.

The view of imagination defended in this book recognizes its contribution not only to the arts, literature, and play but also to forms of thinking traditionally reserved for rationality alone or considered immune to imaginative influence. The inclusion of imagination in thinking more broadly may be seen to threaten any neat segregation between objective thought and more unwieldy subjective aspects of embodied consciousness.

But objective thought that would exclude imagination would be severely limited, for imagination enables engagement of the possible involved in any significant study of reality. Just as we are sometimes misled by imagination, we may on other occasions fail to understand complexities because we fail to adequately imagine how things could or might otherwise be.

As the power of rationality and the authority of science in the culture of the new millennium are challenged—by political interests, fundamentalist ideologies, or other cultural pressures—it may be tempting to reject imagination along with confabulation, fiction, escapism, and fantasy untethered to reality. Magical thinking, it may be suggested, may enrapture us emotionally, but any wider distribution of imaginative influence could undermine our ability to cope with reality and defend demonstrable facts. Or it may seem reasonable, in light of the dangers of its misuse, to refuse any praise for imagination that does not in the same breath caution for its disciplined constraint, as if the value to be found in imagination lies only when its transformations and its engagements of possibility are subordinate to explicit epistemic or pragmatic goals. It may seem reasonable likewise to diminish the importance of literature and the arts, as if their indulgence of the fictive and their appeal to the subjective offer nothing useful for coping with the world as it really is. Manifestly imaginative pursuits may be pursued then solely as forms of entertainment, or as material for economically productive creative industries, while creativity may be appreciated where it has commercial impact or injects superficial vitality into institutions otherwise indifferent to human interests. Yet as demonstrated throughout this book, the value of imagination is broader than these applications. As an inextricable dimension of human thinking, imagination's multifactorial engagement is essential for understanding ourselves, our forms of life, and our future possibilities.

Beyond scholarly interest, humanitarian, existential, and ecological concerns are dependent upon the life and health of imaginative cognition. We live in a time of rapid cultural, technological, and ecological change, much of which involves advances

that reflect remarkable use of imaginative innovation. While the world grows smaller through ever more extensive communicative connection, the frontiers of human inquiry are expanding. We reach farther into space and further back in time to the origins of the universe, deeper into the earth and sea, plumb with ever greater nuance the subatomic world, measure the workings of the human brain and experiment with the intricacies of genetics. Just as much as art, literature, dance, film, and music do, all of these pursuits owe much to the power of imagining as it assists human minds in their surpassing of existing knowledge. Yet the same capacities to manipulate and transform the world that lead to knowledge and progress may also change the very nature of what it is to be human and our relation to the surrounding world. Our technologies—some incalculably beneficial, some disastrously detrimental for life—proliferate faster than we can reckon with their effects. More than ever, it seems, we need to cultivate imaginative dimensions of our thinking.

Considering imagination in terms of a cognitive ecology invites consideration of its conditions of life, of its flourishing. If there is a present challenge to the health of imagination in many human contexts today, it may lie less in the suppression of unscripted imagination, as attempted by the totalitarian powers of a previous century, than in the colonization of imaginative thought, its commercialization and commercial saturation, and its educational neglect. Even in the context of inexhaustible sources of stimulation, an ailing, poorly nourished, or atrophied imagination within a human community could presumably lead to the impoverishment of our phenomenal spaces, our world-bound experience as well as our elsewheres, and our forms of attention. The cognitive environment of many modern humans is now characterized by almost constant access to information, images, social connections, and entertainment, whether enriching or distracting. It may be advantageous to reflect upon how such abundance is engaged and experienced. We may find ways to invest in the sources of cognitive vitality that come from and are manifest in deep curiosity, tolerance for the complex, implicit, or not yet understood, stamina for gradual, sustained

inquiry or attention, the cultivation of an inner or reflective landscape, and the value of direct encounter and lived, embodied dialogue with others. Imagination is a living dimension of human consciousness, nurtured not only by exposure to apparently endless variety and fantasy but by our presence to the living reality before us, what may be previously unnoticed divergences within it, and the possibilities that may arise from it. To understand our cognitive ecology, it is necessary to understand imagination as our multifaceted relation to possibility, both for its index to elsewhere and otherwise and for the vitality of the here and now.

The imagination is not a distinctly human function—there is considerable evidence that animals in various ways do imagine—and yet human beings need imagination, among other cognitive resources, to solve the present and future problems we alone have created as a species. In order to develop new solutions to problems facing our world, we have to be able to imagine multiple alternatives to the status quo and new ways to reflect on as well as protect what is worth preserving. Science and respect for its findings are crucial for ecological understanding and action, to name just one example, but the progress of science itself depends in part on imagination, while any sense of connection with nature, and our motivations to heal and preserve it for the present and future, may not be secured alone by the presentation of facts. It is a matter not only of information, but also of knowledge imaginatively cast, what we take the natural world to be and with what connection to ourselves. How we regard and relate to nature—whether we see ourselves as inextricably interwoven with or essentially, pragmatically, or spiritually apart from it—involves a kind of seeing-as that extends beyond perception alone to interpretation, understanding, and valuation. An ecologically stable future may require us to shift our self-conceptions as human beings, devise new conceptions of our existence on the earth, and balance a different understanding of nature with exigent as well as future human concerns. We may require new ways to cast a world horizon in light of the sources of its vitality, new ways to regard and relate to a living future. Of course the potential contributions of imagination do not pertain only to

environmental concerns, but to many of the difficulties we face, not least by countering the unimaginative nature of some of our most persistent errors. As a power of consciousness that affords human thinking both possibility and transformation, imagination is essential both to the flourishing of life around us and to our own. <>

[Life Concepts from Aristotle to Darwin: On Vegetable Souls](#) by Lucas John Mix [Palgrave Macmillan, 9783319960463]

This book traces the history of life-concepts, with a focus on the vegetable souls of Aristotle, investigating how they were interpreted and eventually replaced by evolutionary biology. Philosophers have long struggled with the relationship between physics, physiology, and psychology, asking questions of organization, purpose, and agency. For two millennia, the vegetable soul, nutrition, and reproduction were commonly used to understand basic life and connect it to “higher” animal and vegetable life. Cartesian dualism and mechanism destroyed this bridge and left biology without an organizing principle until Darwin. Modern biology parallels Aristotelian vegetable life-concepts, but remains incompatible with the animal, rational, subjective, and spiritual life-concepts that developed through the centuries. Recent discoveries call for a second look at Aristotle’s ideas – though not their medieval descendants. Life remains an active, chemical process whose cause, identity, and purpose is self-perpetuation.

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Excerpt: When I first encountered the vegetable soul, I thought it an odd curiosity, a strange turn of phrase. As I investigated, I began to realize it had an important part to play in the history of "life" as we know it. Vegetable souls oriented biology for two millennia through the influence of Plato, Aristotle, Lucretius, Pliny, Origen, Plotinus, Ibn Sīnā, Maimonides, and Aquinas. They influenced the shift to modern biology through Gassendi, Leibniz, and Hegel. And yet, I could find no systematic account, no story of vegetable souls. The very term seemed laden with contradiction and was unknown to many historians and philosophers.

I set out to write the book I wanted to read: a history of theories of life prior to Darwin, in particular a history of vegetable souls.

As we move forward in biology, exploring the origins of life on Earth, the possibility of life elsewhere, and the very boundaries of individuality (genetic, microbial, and neurological), it seems worthwhile to review where we have been. Some of the connections we wish to make, between physics and biology, biology and humanity, have

been proposed before. Past successes (and failures) can help us evaluate which concepts work for us.

Vegetable Souls?

The term "vegetable soul" troubles the ear. The two words have such different contexts that joining them strikes us as either funny or nonsensical. It conjures images of tortured carrots and zombie broccoli. Surprisingly, vegetable souls were one of the most popular ways of describing life prior to the Renaissance. The Aristotelian idea of souls as the efficient, formal, and final cause of life dominated discussions of plant life in Europe and adjacent regions from classical antiquity through the High Middle Ages, roughly 2000 years. And yet the idea has disappeared from our vocabulary. A great divide has opened up between the way we speak of rocks and organisms and the way we speak of persons. Vegetables belong to one discourse; souls to another. As scientists and philosophers try to reconnect the two ways of thinking, it is worth looking back at the history of vegetable life and the many attempts to find one theory of life that spans vegetable, animal, and rational domains.

We have strong intuitions about what it means to be alive, but those intuitions are constantly challenged by new discoveries. Microbiologists have uncovered vast realms of tiny organisms living in extreme environments, and even within humans. Astrobiologists look to the stars and ask whether still stranger forms of life might be out there. Both have provoked us to revisit systematic questions about what it means to be alive. Meanwhile, ethical debates, from genetic modification to human cell cultures, from embryos to organ transplants, stretch the meaning and boundaries of life. They have a profound impact on how we understand biological fitness as well as ethical value. The history of vegetable souls provides a broader perspective, more options to consider, and prospects for future research.

This book looks at the history of souls, purpose, and agency as they have been applied to the non-human, non-animal living world. Such a vast swath of reality now includes plants, fungi, protists,

bacteria, and archaeobacteria (and perhaps viruses). All of these were traditionally lumped together as "vegetables" and considered the lowest form of life. Most thinkers believed that vegetables have less freedom, dignity, and drive than animals, but more than mere minerals. Life was seen as a continuum, stretching from the lowest lichen to the smartest man, and perhaps beyond.¹

Vegetable and animal souls were mortal and natural by most understandings of those words and fell into a middle category between the non-living environment and human life. They were the province of natural philosophers, the precursors of modern scientists, as well as theologians. Christians, Muslims, and Jews claimed—and still claim—that humans have a special kind of soul, an eternal soul. That claim, however, once came in the context of a larger theory of life. It came as one aspect of a soul-theory that spoke to the life of plants and animals. We were the "rational animal," but no less animal for that. We lived among a variety of living, ensouled things.

In the Renaissance and Enlightenment, theories of life changed dramatically. Cartesian dualism pushed the human soul out of the natural world, along with will, reason, and agency. Vegetable and animal souls, meanwhile, disappeared. They were neglected in the humanities and intentionally ejected from the natural sciences. Empiricists considered them unknowable, along with formal and final causes. The move proved tremendously successful in the development of modern biology, but it prohibited any common understanding that would bridge human and non-human life.

The medieval understanding of souls—as subsistent, immaterial agents—will never fit with modern science. Aristotle's picture, however, proves more promising. His idea of the vegetable soul—an active, chemical process whose cause, identity, and purpose is self-perpetuation—fits surprisingly well with evolutionary theory. By reviving Aristotle's vegetable souls as dynamic processes of nutrition and reproduction, we can come to a better understanding of biological individuality in both animals and plants. We can also see how dramatically it differs from the subjective individuality so central to the modern humanities.

The vegetable soul can help us recapture and reimagine the continuity of humans with other life.

The term itself may not be recoverable, but we need ways of talking about intermediate levels of purpose and agency. This volume takes a closer look at how vegetable life has been understood through the centuries to prepare the way for a new understanding of life.

Goals for the Book

This book started as an exercise in biology. Scientists require a theory of life when asking questions at the boundaries of life. For the past 20 years, I have been involved in research into the origins of life on Earth and the extent of life in the universe. At first glance, the questions seem large and abstract, but they can quickly become concrete. In 1984, scientists recovered a meteorite from Antarctica. Chemical analysis clearly demonstrated that the rock originated on Mars, but a controversy arose in 1996. Scientists at Johnson Space Center discovered carbon globules within the meteorite. They have the shape, if not the size, of fossilized bacteria and they contain carbon and magnetite structures consistent with known life. This raised a question for researchers. Can we distinguish between materials generated by life and those that arise abiologically? Debate raged over whether this was proof of Martian life. Eventually, the scientific community decided that the evidence was insufficient to the claim, but it established the need for serious, cross-disciplinary research into the boundaries of life. The Curiosity rover is currently exploring Mars, looking for signs of life, and more rovers are planned for the future. The astrobiology community arose around this research program: looking for life. Theories of life have concrete, practical consequences as we explore Mars, Europa, and points beyond.

Researching life-concepts in science, I began to notice a trend. Scientists (and philosophers) propose definitions of life, unwittingly echoing earlier proposals. In the last century, this has frequently been accompanied by promises that current knowledge would reveal a new and definitive theory of life along with the synthesis of life in the laboratory. Despite great advances in biochemistry, there is still no consensus on a

definition, though self-replication and self-regulation stand out as the most promising prospects. Nor has life been synthesized. The further back I looked, the more I saw repetitions of the same themes without definitive arguments.

A few sources from the early twentieth century referred to vegetable souls as natural, material, drivers of life. At first, it seemed to be a rare oddity, something rejected by the founders of modern biology. As I looked deeper, however, I began to see references to Aristotle's vegetable souls appearing regularly, even in the work of Ernst Mayr and other proponents of the modern synthesis. Renewed interest and reinterpretation led to a revival of Aristotelian thinking in the 1970s. Modern biology was not as alien to vegetable souls as I had thought.

Over the past 20 years, many authors have tackled the history of souls, emphasizing the development of concepts of self, mind, and subjectivity from pre-Socratic philosophy to cognitive neuroscience. Excellent examples include Martin and Barresi and Goetz and Taliaferro. None of these works, however, give more than a passing mention to vegetable souls and the activities associated with them: nutrition and reproduction. In the same period, scientists have narrowed the gap between plants and humans, a gap believed insurmountable only 50 years ago. Increasingly, we can connect human behavior with biochemical, neurological, and genetic processes. Plant behavior looks far more complex than anyone imagined. Philosophers have taken this as an opportunity to re-evaluate how we think of humans, plants, and their relationship. The time seems ripe for an investigation of how humans and plants have been linked historically.

The first three sections of this book follow the long and complicated history of vegetable souls and the vegetable life-concept. History always requires a balance between historical detail, compelling narrative, and engagement with current scholarship. Because the term is so unfamiliar, I have leaned toward historical detail, providing a broad chronological coverage focusing on primary sources. It is my sincere hope that others will use this as a jumping off point for more detailed analysis.

First, the term must be brought back into common awareness, if only as an influential aspect of historical thought. Biology has existed for millennia, both as a unified subject matter and as a way of thinking. It studies living beings, including plants, animals, and humans. For 2000 years, it invoked souls as their motivator and organizer. Part I covers the birth of vegetable souls in Ancient Greek thinking, focusing on Plato and Aristotle. Part II explores the development of vegetable souls through the Middle Ages. Influenced by Jewish, Christian, and Muslim theology, souls took on a strongly Platonic character. Part III explains the demise of vegetable souls during the Renaissance and Enlightenment, as Platonism was replaced by other approaches.

In Part IV, I ask whether vegetable souls should be resurrected for modern biology. Though I do not think they can be revived in full, aspects of Aristotelian soul thinking deserve renewed attention. Stripped of Platonic accretions, vegetable souls may still prove useful. Life looks a great deal like an active, chemical processes whose cause, identity, and purpose is self-perpetuation. The sticky parts of this—identity as formal cause and purpose as final cause—become empirically tractable in light of evolution. A nominalist approach to the formal cause allows us to see multiple and non-exclusive, biological individuals all around us. Evolution by natural selection provides a way to understand final causes that is both scientifically rigorous and biologically useful. We may be forced to decide, with Aristotle and Darwin, that individuality and purpose mean something slightly different than we thought. And yet, they are still meaningful.

Recurrent Themes

Throughout the book, I track four interrelated themes: composition, agency, individuality, and purpose. They are related to Aristotle's four causes and, thus, to his definition of a soul: an identity of efficient, formal, and final causes. Life-concepts critically impact the categories we use and the accounts we consider acceptable when describing the world. Divisions between mineral, vegetable, animal, and rational beings permeate common usage among philosophers, among biologists, and

even in public. Two examples bring this home. Descriptions of living things invoke purpose (e.g., the heart is for pumping blood). Descriptions of human behavior invoke agency (e.g., Maurice was responsible for the crash). In both cases, adequate descriptions of in-group subjects require a unique type of explanation; acceptable descriptions outside the group prohibit it. Recent developments in biology and philosophy have called traditional divisions into question and it is worth looking at how we draw these boundaries.

I have attempted to map the shifting borders, demonstrating both the origins and contingency of current conceptions. Historical thinkers did not divide the world in familiar ways and their life-concepts cannot be understood if we attempt to fit them into modern categories. Notably, historical concepts of souls (up to and including Christian treatment of human souls) were not univocally immaterial, intentional, atomistic, or subsistent. Concepts such as imagination, sensation, and agency have been smeared across the vegetable-animal-rational spectrum. This makes terminology difficult. I beg your indulgence in allowing me some linguistic leeway. I have sought to balance descriptive consistency with historical accuracy. The next few subsections set forth my use of philosophical terms. Non-technical readers may wish to skip ahead to the section on Plato and Aristotle.

Composition

What are living things made of? The term substance refers to that which grounds or stands under other things. A generic definition suggests that substance describes the fundamental entities in any philosophical system. They attempt to capture the basic character underlying phenomena, that which persists through change. More specific definitions of substance require ontological commitments about the types of things that can exist and their essential features. Such specific definitions might produce a system where other, non-substantial basic entities exist (e.g., events, experiences, forces) or even replace the narrowly defined "substance." Aristotle, for example, held to forms as substances, while David Hume, maintained that persistent substances are both unintelligible

and nonexistent. I use the term substance in the generic sense. Are living things substances? Are they indivisible and distinct? If not, of what substances are they composed?

Changing ontologies insure that many words, now considered synonymous, had distinct meanings at distinct times. For the sake of consistency, I use several words with a restricted meaning. Material and corporeal refer to bodies (i.e., spatial extension). They exist here but not there, now but not then. They need not have distinct limits. For example, a cloud is physically located, even though it is not discretely bounded. I use physical and natural to refer to things which follow the same basic rules as particular, tangible stuff. Alternatives have included material but non-physical souls which permeate the body and immaterial souls that only interact with matter miraculously. An entity may still be physical and natural if it is further constrained by other rules (as an Aristotelian final cause acting through efficient causes). It simply cannot break the general rules of physics. Three examples clarify the difference. A ghost would be corporeal (it has a visible shape), but not physical (it passes through walls). An electron is incorporeal (it has no volume), yet physical (it obeys physical laws—even when it passes through walls). The soul seeds of Lucretius are both corporeal (they have volume) and physical (they operate by natural laws), but not physical in the modern sense of the word (they have intrinsic motion).

Causal Processes

Living things participate in causal processes in a special way. At least they seem to. Whatever position we take on the metaphysics of causation, we must recognize a unique language for accounts of life and living. We speak normatively and teleologically about even the simplest organisms. We can speak of an *Escherichia coli* cell having fitness and function or, less cautiously, having success and purpose.

Debate persists about the best way to interpret this language. On one side, strict physical reductionists claim that all causes can be fully understood as matter in motion. Thomas Hobbes, T. H. Huxley, and Jacques Monod stand out as clear examples. All living things, including humans, are simply and

exclusively collections of matter moving as part of causal chains that start before and beyond them. Life-specific causation is an illusion. At best, we might claim that the living being represents a specially indexed link in the chain. We attribute significance; no inherent significance exists.

On the other side, strong vitalists claim that life introduces a whole new type of causation. Life anchors causal chains, so that one may meaningfully speak of a living being as the first in a chain of efficient causes. They may be moved by mental states or some other immaterial cause, but within the physical world, they are the ultimate cause. Thomas Aquinas and Rene Descartes advance this position for humans, Georg Stahl for organisms in general. Henri Bergson and Hans Driesch are among the last to promote strong vitalism among all organisms. Vitalism as this type of agency is out of favor in both biology and philosophy. Ideas of agency as human-specific causation, however, remain pervasive.

In recent decades, philosophers have begun to explore the space in between strict reductionism and strong vitalism. A bottom-up approach attempts to describe living things as a special kind of link in the causal chain. They do not provide an anchor, but they do connect causes in a life-specific way. Often appealing to natural selection or metabolic regulation, they view living beings as emergent causal entities. Proponents include Ruth Millikan and Karen Neander. A top-down approach extends aspects of human-specific causation to other living things. This attenuated agency provides potential precursors for human agency, looking at mental states or primitive mental states in non-humans. Proponents (e.g., David Chalmers and John Haught) attribute traits such as intention and normativity to non-humans.

The middle ground is not new. Emergence and panpsychism both flourished in the nineteenth century. Before the seventeenth century, the line between mechanical and human causation was drawn differently, when it was drawn at all. We now associate the term "soul" with mental states, subjectivity, human intention and agency, and religious ideas of immaterial immortality. For two thousand years, however, the term spanned a much

broader range of biological causation and identity. At times, it applied to humans alone, though rarely with all the post-Cartesian modifiers. It was regularly extended to all animals and, occasionally, to all living things.

Activity and Agency

The standard picture of agency connects mental states to physical events causally (Hornsby 2004). Commonly, this refers to a human-specific activity. It requires prospective imagination, a form of internal representation including images of the future. Agency also requires preferences. The human wants something and, thus, has appetite, desire, or—when directed by reason—will. Forming a picture of alternate futures, the human prefers one over another and intentionally moves in favor of it.

In the past few decades, philosophers have asked whether this picture is too narrow. Some of these traits may be present independently (e.g., imagination without will), while others may be present only partially (e.g., retrospective imagination or memory but not prospective imagination). Many human activities occur without intention, from digestion, to reflexes, to unconscious behaviors. Many animal activities appear to involve intentions (e.g., tool use by crows). Tyler Burge and Derek Jones suggest "primitive agency" as "characterized by whole-system guidance of coordinated behavior". After defending a form of top-down causation, wherein the organismic unity impacts behavior, both retreat from attributing primitive agency to plants. Invoking sensation or locomotion, they limit primitive agency to animals and mobile microbes. Xabier Barandiaran et al. suggest "minimal agency" as "an autonomous organization that adaptively regulates its coupling with its environment and contributes to sustaining itself as a consequence." They are more open to extending this type of agency to all living things. Both theories seek to embed a theory of agency within a modern scientific framework.

Martine Nida-Rümelin divides activities differently, distinguishing intentional actions from both "doings" and "happenings." Agents do the former, though unintentionally (e.g., fidgeting). The latter are done to agents by mechanical processes (e.g., digestion). These distinctions depend upon ontological

commitments about whether a subjective entity initiates the causal chain. They also suggest a hard line between active and passive entities. One acts; one is acted upon.

In speaking of causal chains in vegetables, I face a dilemma. If I refer to vegetable processes as happenings or reactions, I run the risk of importing an anachronistic mechanism. Plato saw the vegetable soul as agential, nearly in the modern sense. It has this connotation for many Neoplatonists and antique Christians. On the other hand, if I refer to vegetable processes as doings, activities, or primitive agency, I run the risk of appearing vitalist to modern readers. This is not my wish. Even when I speak of reviving the vegetable soul, I do not see it as immaterial, unnatural, or in any way contrary to modern science. In any case, all these terms seem to preclude the existence of a middle ground.

After much internal struggle, I have decided to begin by using "agency" for causal efficacy in all living things. This extends the term beyond the primitive agency described above, so we might call it "proto-agency." Readers may interpret this proto-agency as an enhanced link in a chain of efficient causes or as an attenuated version of standard agency. I intend it as a place holder so that we can explore the range of historical positions between mechanical passivity and standard agency.

Individuality

Most of us take for granted the boundaries of a living thing. We think that we can easily distinguish the outside and inside of any organism. The question is problematic, however, in countless cases. Bacteria frequently digest nutrients outside their cell walls, providing an indoor—outdoor metabolism. They live in diverse colonies, cooperating for both nutrition and reproduction, blurring the line between unicellular and multicellular life. Non-human animals exhibit a range of behaviors that defy boundaries: from tool use to prostheses to agriculture. Humans frequently use the metabolisms of other organisms to promote survival and reproduction.

Many theories of life, particularly souls, provide ways of counting organisms and differentiating them from their environment. They provide tools for

naming what is essential to an individual or a species. Whenever we ask whether a trait is internal or external, intrinsic or extrinsic, we have introduced (often implicitly) a position on the individuality of an entity. When thinking about composition, we might ask whether the material aspects of an organism are essential to it, or only accidental. The constant cycling of material components within a body suggested to many philosophers that materiality was essential, but that particular material components were only accidental. When thinking about activity, we might ask whether an organism motivates itself (as the start of a causal chain) or is driven by external factors. When thinking about purpose, we might ask about the interaction of organisms and normativity. Ideas about proper function, purpose, and intent suggest organism-specific, hence individual norms.

Individuality can also be used in a technical sense, as referring to the divisibility or indivisibility of an entity. Many philosophers have asked whether the soul represents a fundamental unit of biology as atoms represent a basic unit of physics.

Purpose

The history of life-concepts cannot be separated from the metaphysics of final causes. How do we make sense of Aristotle's idea that final causes—"that for the sake of which"—define and motivate organisms? For 2000 years, final causes were central to constructions of the soul and thus to explanations of life. The meaning of final cause changed radically over that time.

Several attempts have been made to remove final causes from the natural world, often by making them a form of divine causation, essentially an alternative efficient cause brought about by God's agency. Skepticism and empiricism in the Enlightenment rendered such causes incompatible with natural science. Final causes under this head were ejected from the natural world with the adoption of the mechanical philosophy. It remains unclear where they went. Many were happy to leave them in God's hands, real but unavailable to science. Others tried to stretch science to engage them (i.e., natural theology and intelligent design).

Very few tried to eliminate them altogether until the nineteenth century.

Though successful immediately in physics and shortly in chemistry, the mechanical philosophy did not catch on among biologists until Darwin and Mendel provided reductionist explanations of biological function. Nonetheless, biologists continue to use teleological language. Debate persists about how the language of ends maps onto underlying accounts which are truly mechanical. Mary Midgley, Thomas Nagel, and Alvin Plantinga are only the most recent crop of philosophers to ask whether biology is as mechanical in practice as biologists believe. In each of the parts, I discuss how final causes were interpreted in the relevant time period.

Platonic and Aristotelian Approaches

I refer to Platonic and Aristotelian approaches to souls throughout the book. Both attempt to bridge the gap between physical and human-specific causation. Broadly speaking, Platonic approaches favor eternal and incorporeal souls that motivate biological activity. They emphasize the transcendence of biological causes, though they need not exclude them from the physical realm. Souls participate in the greater life of the One, God, or the cosmos. Final causes are more likely to be clearly prospective and intentional. Aristotelian approaches identify mortal and corporeal processes with souls. They emphasize the immanence of biological causes, though they need not reduce them to the physical realm. Souls differentiate both species and biological individuals. Final causes are more likely to be consonant with physical causes.

Vegetable souls and the theories of life that replaced them address a fundamental issue in ontology and epistemology. How do living things fit into a larger picture of the world? And how do we account for them in our explanations? Modern readers will be accustomed to a clear, or at least intuitive, distinction between thinking things and physical things. Vegetable life has always existed somewhere in between.

Part I covers the birth of the vegetable soul, indeed the birth of Western life-concepts in general: vegetable, animal, and rational. Initially, they

operated as a continuum of activities connecting material particulars to ideal universals. Chapter 2 looks at psyche in Homer and the pre-Socratics, setting the groundwork for vegetable souls. Chapter 3 reviews souls in the works of Plato, with an emphasis on the appetitive soul, present in all living things. Chapters 4 and 5 cover Aristotle's life-concepts, focusing on the nutritive soul and the activity that defines it. Chapter 6 covers Greek and Roman appropriation of vegetable souls, along with inputs from Epicureans, Stoics, and Neoplatonists.

Part II covers the development of life-concepts during the Middle Ages. Dominated by Neoplatonic interpretations of Aristotle, souls became less material and less physical, but more substantial. I track two trends. The first led to what I call the Platonic Synthesis. Chapter 7 presents nephesh, the Hebrew equivalent of psyche, and Philo's attempts to reconcile Hebrew scriptures with Aristotle and Plato. He introduced the idea of a dual creation—one physical, the other non-physical—that would become central to medieval ideas about life. Chapter 8 explores psyche in Christian scriptures, which drew on both Greek and Hebrew sources. Tertullian and Origen integrated vegetable, animal, and rational life-concepts with spiritual life-concepts. Chapter 9 deals with Augustine's recapitulation of Philo's dual creation and introduces a subjective life-concept. This sets the stage for medieval cosmology and biology. The human soul, as spiritual and subjective, drew away from vegetable and animal souls. A second trend, the Aristotelian Synthesis built on Islamic falsafah and the new availability of Greek texts in the twelfth century (Chapter 10). Thomas Aquinas formalized this perspective into the system embraced in the High Middle Ages and Renaissance (Chapter 11).

Part III covers the death of vegetable souls in the Enlightenment and the birth of modern science. Descartes and Gassendi embraced the mechanical aspects of Aristotelian causation as well as material and efficient causes. Both ejected formal and final causes from the physical world (Chapter 12). Chapter 13 looks at attempts to understand the relationship between the newly non-physical souls and the physical world, following Bacon, Leibniz,

and Kant. Chapter 14 follows subsequent attempts to reject the mechanical philosophy and return to a more Platonic view of life. Early theories of evolution begin to emerge in the seventeenth and eighteenth centuries (Chapter 15). Finally, Darwin introduced evolution by natural selection, connecting organization and purpose, as well as many features of animal and human life, to vegetable activities (Chapter 16).

Part IV traces some of the surprising developments of modern biology, emphasizing challenges to traditional ideas. Chapter 17 looks at the growing tree of life, including protists, bacteria, and archaeobacteria. The modern kingdom Plantae represents just one evolutionary trajectory among a variety of "vegetable" life forms. Chapters 18 and 19 explore vegetable and animal life-concepts as they relate to individuality. Chapter 20 asks where this all leaves us when thinking about composition, agency, individuality, and purpose among living things. Should vegetable souls be resurrected? <>

[The Routledge Handbook of Religion and Animal Ethics](#) edited by Andrew Linzey and Clair Linzey [Routledge Handbooks in Religion, Routledge, 9781138592728]

The ethical treatment of non-human animals is an increasingly significant issue, directly affecting how people share the planet with other creatures and visualize themselves within the natural world. [The Routledge Handbook of Religion and Animal Ethics](#) is a key reference source in this area, looking specifically at the role religion plays in the formation of ethics around these concerns.

Featuring thirty-five chapters by a team of international contributors, the handbook is divided into two parts. The first gives an overview of fifteen of the major world religions' attitudes towards animal ethics and protection. The second features five sections addressing the following topics:

- Human Interaction with Animals
- Killing and Exploitation
- Religious and Secular Law
- Evil and Theodicy
- Souls and Afterlife

This handbook demonstrates that religious traditions, despite often being anthropocentric, do have much to offer to those seeking a framework for a more enlightened relationship between humans and non-human animals. As such, [The Routledge Handbook of Religion and Animal Ethics](#) is essential reading for students and researchers in religious studies, theology, and animal ethics as well as those studying the philosophy of religion and ethics more generally.

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Toward a New(er) Religious Ethic for Animals Andrew Linzey and Clair Linzey
 Excerpt: In 1975, Peter Singer published his well-known book *Animal Liberation*. The original subtitle of the book — A New Ethics for Our Treatment of

Animals — is, however, often overlooked. A "new" ethic by definition means something original, unparalleled elsewhere. Although Singer seldom makes the point explicit, his thesis necessarily implies a negative judgment on previous moral philosophy. Such is the peril, of course, of using the arguably most enticing word in the English language — namely, "new" Since then we have witnessed "new politics," "new theology," "new philosophy," "new social movements," "new physics," "new ethics," "new literature," and "new age" thinking, to name but a few.

Singer is dismissive of the Jewish and Christian traditions in particular: "Concern for animal suffering can be found in Hindu thought, and the Buddhist idea of compassion is a universal one, extending to animals as well as humans, but our Western traditions are very different. Our intellectual roots lie in Ancient Greece and in the Judeo-Christian tradition. Neither is kind to those not of our own species." Further, Singer writes, "it is beyond dispute that mainstream Christianity, for its first 1,800 years, put non-human animals outside its sphere of concern."

These broad brushstrokes hardly do justice to the complexity of the religions concerned (or Ancient Greece, for that matter) or indeed to the analytical abilities of Singer himself. The irony is that although Singer castigates the Christian tradition in particular, older forms of religious thought come close to articulating much of what Singer and other animal advocates argue for. We are not supposing for a moment that all religious traditions have a good record on the protection of animals. On the contrary, some religious lines of thought have clearly been detrimental to the enlightened treatment of animals: what we might call being part of the problem rather than part of the solution.

Without overlooking the negative aspects (which also are explored in the handbook), it is important to recognize the major pro-animal ideas that emerge from a study of religious traditions worldwide. We highlight here seven of these fundamental ideas variously expressed in most of these traditions. We cannot claim that these are "new" insights, but perhaps we can claim to offer a

clearer, "newer" articulation of these ideas and their relevance to the moral status of animals.

The first idea may be described as the good beyond the human

Despite the moral anthropocentrism that has influenced many religious traditions, it is important to grasp that religious insight is, by its very nature, an appreciation of the other-than-human. That insight may focus on God or the transcendent or ultimate reality, but however we characterize that being or Being, it is beyond the confines of the human. This rather elementary point has considerable moral significance. In any religious system that is truly religious, humans cannot claim to be the only beings of worth in the cosmos or the source of all meaning. The Pythagorean maxim that "man is the measure of all things" cannot be a religious starting point. God or the transcendent, not human beings, is the Creator or origin of all things.

When this is grasped, it will be seen immediately that the widespread view (admittedly encouraged by some theistic traditions) that animals are "made for us" cannot be a truly theological perspective — that is, a viewpoint that begins with God's own perspective. Creatures have a primary value to their Creator; in theistic terms, animals are made not for us but for the glory of God. No theological account that views animals solely on the basis of their use or value to human beings can be regarded as satisfactory. Christianity, which is arguably the most anthropocentric of all world religions, has begun to distance itself from many previous theo-humanistic positions. The archbishop of Canterbury's 1975 commission on the environment declared that "while it cannot be denied that man is very much at the centre of biblical teaching on creation, this teaching does not hold that nature has been created simply for man's sake." And quite specifically, it reverses what some have regarded as the essence of the instrumentalist tradition within Christianity: "To imagine that God has created the whole universe solely for man's use and pleasure is a mark of folly."

It follows from this that much of human thinking and behavior comes close to idolatry. By "idolatry," we mean the attempt to deify the human species by regarding the interests of human beings as the sole or exclusive concern of God the Creator. Perhaps the most important contribution that religion can make to debates about how we should treat animals is simply to insist that humans are not God. It is not our world; we do not own animals.

That last line is of immense importance. The Aristotelian view of animals as essentially belonging to us and made for us,⁶ which has given birth to the legal classification of animals as human possessions, bedevils their true status. From a Muslim perspective, Tim Winter ("Nations like Yourselves': Some Muslim Debates over Qur'an 6:38") reinforces this point by arguing that Islam has avoided the worst of the instrumentalist traditions by accepting that animals have rights over and against the human: "The language of animal rights, a term still contested by some in our day, is naturally at home in the Islamic scriptural, legal, and prophetic universe," he claims. Because "animals are in a real sense 'like ourselves,'" according to the Qur'an, "they are to be resurrected and shown justice by an all-loving God. These rights are intrinsic, not instrumental: whether or not an animal is someone's possession is disregarded."

The second insight concerns our relatedness to fellow beings

Given that we originate in what is beyond ourselves, it follows that that common source similarly endows all other beings with their own lives, purpose, meaning, and destiny. Often we cannot comprehend their meaning or what precise purpose other beings may have in the universe we did not make. But what we have to say is that they belong in the first place to their originating power (as we do) and have their own telos (as we do). Moreover, as we are related to our source of existence, so we are related to all other beings.

The proper religious response should, therefore, be one of awe, astonishment, and amazement at the existence of other beings around us. D. H. Lawrence once spoke of the sixth sense of wonder. We are not alone in the universe; there are other worlds to

be explored and appreciated. For secularists, other beings may be classed simply as background or theater, even simply as things, tools, or commodities, but religious people are on shaky ground if they try to argue in this way. It is wonderment that should correspondingly impel responses of gratitude, humility, and celebration. As one of us has written elsewhere, "the central point is that celebration involves the recognition of worth, of value, outside of ourselves. Human beings are not the sum total of all value; outside of ourselves there is something — and someone — to discover."

At first sight, this might appear to be a notion that relates peculiarly to theistic traditions, but in fact the Buddhist doctrine of interdependency (in Sanskrit, *pratityasamutpāda*) is foundational in all Buddhist traditions. At its most basic, it is a theory about how things come into and go out of existence — a causal theory — but to see it as nothing more than this is a mistake, for it has wide-ranging ethical and salvific ramifications. In practical terms it means that there is no essential difference between humans and nonhumans because all are marked by the characteristic of being dependently originated. It is this fact that explains why humans might be nonhumans in another life and vice versa.

In traditional Chinese philosophy, Deborah Cao ("Confucianism and Daoism: Animals in Traditional Chinese Thought") reminds us, "animals were not segregated and excluded from the moral cosmos as in Western classical philosophy." Indeed, "in traditional Chinese philosophical ideas or practical philosophy, such as Confucianism and Daoism, animals were given consideration as part of the moral and ethical pursuit in search of the betterment of life and society," in contrast to mainstream Western philosophy. "More generally, in early China, animals were considered creatures who functioned as signifying exponents of a larger cosmic pattern rather than creatures conceived as a purely biological species."

Cao further explains that "one of the most important and enduring ideas in traditional Chinese philosophy is the notion of *tian ren he yi* (heaven and humans as one, or humans and nature as one)," and because of this, "human and animal worlds lie

in a continuum, with no firm or essential divisions between the two." The rejection of a clear division between humans and animals is also exemplified in Hindu mythology. Michael Barnes ("Invoking Another World: An Interreligious Reflection on Hindu Mythology") argues that "theriomorphic figures — from Hanuman to Ganesa and Narasimha — remind us that human and nonhuman creatures are all part of one great continuum." And the rationale is telling: "there is something of the nonhuman in each of us because, in the Hindu account of things, human animals were once nonhuman — and vice versa."

Even in heavily anthropocentric African religions, there is not only an *ubuntu* (fellowship) among humans but also the notion of *ukama*, the idea that animals are also part of the community and relationality that bind humans together. As Kai Horsthemke ("African Religions: Anthro-pocentrism and Animal Protection") points out, *ukama* emphasizes "mutual dependence and a sense of unity" but also (at its best) "the moral imperative of respect."

That imperative of respect and fraternity with other creatures has not been entirely lost in Christianity. It is perhaps best illustrated in the lives of the saints, St. Francis of Assisi in particular. St. Francis championed our kinship with all creatures and regarded them as our "brothers and sisters" (see Andrea Barone, "Franciscan Justice, Peace, and the Integrity of Creation: A Creation without Creatures"). St. Bonaventure (Francis's biographer) famously said that "when he [St. Francis] considered the primordial source of all things, he was filled with even more abundant piety,

calling creatures, no matter how small, by the name of brother and sister because he knew that they had the same source as himself." Many passages of hagiography illustrate St. Francis's practical care for animals, including his acts of befriending a wolf, saving worms from being crushed underfoot, and even buying back a lamb destined for slaughter. In other words, the source of all being and beings sets us in a relationship to other beings. The important link here is between the notion of kinship and practical acts of kindness.

The third insight is the experience of reverence for life

Albert Schweitzer famously described how, when traveling down the Ogowe River to his hospital in Lambarene, the idea of reverence first came to him: "Struggling to find the elementary and universal concept of the ethics ... there flashed upon my mind, unforeseen and unsought, the phrase 'reverence for life.' The iron door had yielded. The path in the thicket became visible." In fact, as his biographer Ara Paul Barsam indicates, Schweitzer encountered the doctrine of ahimsa much earlier during his explorations into Indian religion. Schweitzer gave pride of place (surely justly) to the Jain articulation of "the commandment not to kill and not to injure as one of the greatest events in the spiritual history of mankind."

Perhaps we might best say that what Schweitzer notionally encountered years back came to him as personal revelation years later. And "revelation" is not too strong a word. The concept was for him the crowning experience of his life and thought and also his guiding virtue, as it was also for the Jains. As Barsam explains, "for Jains, ahimsa is not simply the first among virtues but constitutes the supreme moral virtue (ahimsa paramo dharma)." It is to ahimsa in its Jain and Buddhist manifestations that we principally owe the long tradition of ethical vegetarianism in India. The early Jains and Buddhists who were contemporaries with each other put pressure on Hindus to adopt more animal-friendly approaches to the idea of sacrifice (though some animal sacrifice still continues within Hinduism). For example, in the Kūladanta sutta of the Digha Nikāya (Pali source), the Buddha intervenes to prevent a Hindu animal sacrifice and instead proposes "bloodless" sacrifices.

The founder and first Guru of Sikhism, Guru Granth Sahib, was adamant in his commitment to vegetarianism, maintaining that "whosoever eats flesh, fish, etc. and takes wine and hemp, all his religious acts will go to waste" (Guru Granth Sahib 1376). As Jagbir Jhutti-Johal explains in "Sikh Dharam: Ethics and Behavior toward Animals," although Sikh practice is variable, all baptized Sikhs are required to be vegetarian.

But it is not only in Indic traditions that vegetarianism has historical provenance. As Cao points out, unlike Confucianism, Daoism "advocates vegetarianism and promotes divine vegetarianism for deities, ritual vegetarianism for priests and community leaders, and complete vegetarianism for others." And even though this is in reality a minority practice, Daoism "emphasizes the importance of freedom and wildness for animal flourishing, recognizing animals and other dimensions of nature as potential teachers of human beings," and not least of all, "people are urged to imagine a world free of cages, corrals, hooks, lures, nets, pens, snares, and traps."

The vision then of a more peaceful world — what Plato himself described as "the Golden Age" in which animal life is respected — has deep religious origins, and not only in Indic and Chinese metaphysics. Jewish and Christian commentators often focus on how humans are given "dominion" in the Hebrew Bible (Gen. 1:28-29), supposing that this means animals are entirely at the disposal of humans, who can use them as they wish. But as Tony Bayfield ("Judaism: The Human Animal and All Other Animals — Dominion or Duty?") notes, "dominion" is most properly defined as responsibility. Those created in God's image have a responsibility to care for other creatures. Bayfield cites Louis Jacobs's authoritative statement that human beings "have an absolute obligation to exercise our power in relationship to fish, birds, and animals in a way that both is consonant with responsible stewardship and testifies to the glory of creation."

We can, however, go further. When the first creation saga (Gen. 1-2) is examined as a whole, it becomes clear that the dominion supposed is actually a vegetarian — or more properly, vegan — dominion since in Genesis 1:29-30 humans and also animals are prescribed a vegan diet. The idea then that dominion means the right to kill is belied by the text itself. The climax of the first creation saga takes place when all creatures rest and enjoy Sabbath harmony. It is that creation, and only that creation, that God describes as "very good" (Gen. 2:2-4). It is a picture of mutual harmony and peaceableness. Of course, such a state of peaceableness does not persist. After the Fall and

the Flood (symbolizing humanity's descent into wickedness), God gives humans permission to eat meat and also to kill for sacrifice (Gen. 9:3f.). So there we have the biblical paradox about killing. Killing does not represent God's original will, yet it is permissible. In her contribution to this book, Deborah W. Rooke ("You Shall Not Eat Any Abominable Thing' Deut. 14:3] — An Examination of the Old Testament Food Laws with Animal Ethics in Mind") sums up the situation as follows:

It is true that the biblical laws not only permit animal slaughter and consumption but also link it to divine worship, so that the God of Israel requires animal sacrifice. This does not appear very animal-friendly. On closer examination, however, there are strict limitations on which animals are permitted for consumption and sacrifice and on human interaction with all types of animal life. Though these stipulations may not be ideal from a modern animal-ethics perspective, they can be read as embodying a sense of respect for animal life that opposes indiscriminate exploitation and destruction of such life and that warns against taking even permitted animal consumption lightly.

But the ideal of biblical vegetarianism has not been lost in Judaism or Christianity. The Jewish vegetarian movement, particularly seen in reformed and liberal Jewish circles, remains a small but significant minority, spurred on by the view of Isaac Kook that the true purpose of the Torah was to limit killing and lead to vegetarianism. And even within Christianity, there is a subtradition espousing vegetarianism that has had considerable historical influence. As Samantha Jane Calvert ("Eden's Diet: Christianity and Vegetarianism") demonstrates, the modern vegetarian movement was effectively heralded by the Bible Christian Church founded in 1809. The church made vegetarianism (in conformity with Gen. 1:29-30) compulsory among its members. Thus, Calvert writes, "vegetarianism is one of the many areas in which sectarian Protestants have made a contribution to British and American life that is out of proportion to their numbers." She continues, "It is something of a paradox that although the modern vegetarian movement has little connection with Christianity today, the Vegetarian Society in Britain was

founded by a group of Christians whose founding minister was a former Anglican clergyman, the somewhat appropriately named Reverend William Cowherd."

The fourth insight found in religious traditions concerns the intrinsic value of each sentient individual being

Philosophers such as Tom Regan have argued that individual animals who are the "subject-of-a-life" should be accorded intrinsic or inherent value. Regan's work in particular has been celebrated by many academics and has been influential among many animal advocates. But in fact, the idea that individual animals have value in themselves, as distinct from human needs or wants, is not new to ancient religious traditions. Indeed, the notion that animals have an individual soul predominates in Eastern religions (Jainism and Hinduism) especially. Animal souls are caught up, as we are, in the cycle of samsara, or the transmigration of souls, in which souls move through one species to another. Such movement would be impossible unless each individual being had an "inner" being beyond sheer physicality. Each animal, one might say, has a subjective self, resulting not just in a biography but in an ancestry. At the very beginning of Indian philosophy, one finds a celebration of the individual soul. Consider, for example, these lines from the Chāndoyga Upanishad:

Whatever they are in this world, whether tiger or lion or wolf or boar or worm or gnat or mosquito, they become That (Existent).

What that subtle essence is, a state-of-having-that-as-its-nature is this universe; that is the Real, that is the Soul (ātman), THAT ART THOU.

Here we find not only the identification of individual beings of all sorts with an individual soul (or the soul) but also an identification of the individual ātman with nothing less than the world soul, the essence of the universe.

Paradoxically, it is also true that Buddhist traditions deny the coherence of the concept of "intrinsic" and yet still are able to preserve the sense of compassion toward nonhuman animals, which is in fact generated by the very fact that there is no

essential characteristic. This is the very thing that allows for change and thence for the spiritual progression of all beings toward enlightenment. Of course, the Buddhist tradition itself found the reconciliation of these ideas somewhat problematic, which led in Chinese Buddhism to the emergence of the concept of "Buddha Nature," which is the idea of potentiality of Buddhahood in all creatures.

Some may think that the comparison between religious conceptions of the soul and the modern philosophical emphasis on the intrinsic worth of animals is far-fetched. But as A. W. H. Bates ("A Spark Divine? Animal Souls and Animal Welfare in Nineteenth-Century Britain") shows, the concept of the soul was sometimes at the center of debates about obligations to animals in the early humanitarian movement. And demythologized, that debate was about the worth of animals in themselves, separate from human wants or needs. They mattered in themselves as shown by their own unique cognitive capacities. The eternal status of animals as loved creatures of God impelled a connection between how we treated them and their hope for a better life.

Mind you, the argument could work both ways, as some humanitarians noticed. It also followed that if animals were not to be recompensed with a life after this one, then their suffering in this world should be of even greater moral significance. Bates cites the view of humanitarian James Lawson Drummond, who saw the connection only too clearly. Surely more to be pitied was the animal who "has no heaven to look to, no bright anticipation of a period when misery shall cease ... Its life is its little all."

Notwithstanding Drummond, the debate about the interior worth of animals has continued until the present day. Although Roman Catholicism, following St. Thomas Aquinas, has maintained a largely instrumentalist view of animals (see Kurt Remele, "Roman Catholicism: A Strange Kind of Kindness — On Catholicism's Moral Ambiguity toward Animals"), a recent statement by Pope Francis maintains that "every creature, particularly a living creature, has an intrinsic value, in its existence, its life, its beauty and its interdependence with other creatures." Such language suggests a breakthrough

in terms of reenvisioning how the moral claims of animals may be subsequently judged by the Roman Catholic Church. It follows that if animals have worth in themselves, separate from human utilitarian calculations, animals have their own interests that should be properly taken into account in moral thinking. It is difficult to believe that the church can maintain the recently reaffirmed view of animals as intrinsically valuable in the long run without seeing its inconsistency with treating sentient beings as machines, tools, commodities, or resources here for us.

The fifth insight concerns sensitivity to animal suffering

It is rather odd that Singer should think the view that the suffering of individual animals should be taken into account is somehow a discovery pioneered by utilitarian philosophers such as Jeremy Bentham and J. S. Mill. In fact, compassion for animals has variously been regarded as a religious virtue. Consider, for example, Father Zossima's advice in Dostoevsky's *The Brothers Karamazov*:

Love all creation, the whole of it and every grain of sand ... Love the animals, love the plants, love everything. If you love everything you will perceive the divine mystery in things ... Love the animals: God has given them the rudiments of thought and untroubled joy. Do not, therefore, trouble [them], do not torture them, do not deprive them of their joy, do not go against God's intent.

Dostoevsky here picks up on one traditional feature of Christian Orthodoxy, what Vladimir Lossky calls its cosmic vision inclusive of animals. This may be an overly generous view of Orthodoxy, but it is certainly true that many Orthodox saints exhibited kindness and befriended animals. Kallistos Ware ("Orthodox Christianity: Compassion for Animals") explains how there are also prayers for animals within Orthodox liturgies, notably Vespers and the Evchologion in Greek, or Trebnik in Slavonic, otherwise known as the Book of Needs.

Dostoevsky's passage also includes a rebuke to human hubris: "Man, do not exalt yourself above

the animals: they are without sin, while you with your majesty define the earth." The recognition that animals cannot sin — and are therefore morally innocent — makes their experience of suffering especially significant theologically and Christologically. It is written of the mystic Margery Kempe that "when she saw a crucifix, or if she saw a man with a wound, or a beast, or if a man beat a child before her, or smote a horse or another beast with a whip, she thought she saw our Lord beaten and wounded." This is a view taken up by John Henry Newman, who specifically compared the suffering of innocent animals with the innocent suffering of Christ himself.

The Qur'an emphasizes how God's providential care extends to animals as well as humans and how animals "glorify God and have their own form of prayer" (see Neal Robinson's chapter, "Islam: Ants, Birds, and Other Affable Creatures in the Qur'an, Hadith, and Sufi Literature"). Similarly, humans are to care for animals. Shiite sources describe how a camel came to the Prophet Muhammad to complain about his treatment, and the Prophet admonished the animal's keeper to spare the camel's life after years of faithful service. Not least of all, the Prophet specifically commended kindness to animals, explaining that such actions "will be rewarded."

In Indic traditions, such sensitivity has karmic warrant. In his chapter "Buddhist Rebirth, Reincarnation, and Animal Welfare," Alex Bruce is clear that "deliberately killing or harming an animal is likely to generate negative karma that will later ripen in the form of suffering, including rebirth in the lower realms of existence."

Kenneth Valpey ("Hinduism: Animating Samadhi — Rethinking Animal—Human Relationships through Yoga") argues that important features of Sāṅkhya-Yoga can provide a valuable "map and mode of conceiving human well-being" that also involves increased sensitivity to animals. He cites the well-known story of the yogi Bharata, who takes birth as a deer during his human life as a yogi. Although this story is usually interpreted as a cautionary tale against squandering the possibilities offered in human birth, Valpey offers another interpretation. It is that "Bharata's story represents a progression

of consciousness that becomes complete only when one has gained empathic experience of animal existence through yoga."« Thus, yoga is seen as a spiritual discipline that extends human sensitivity to other creaturely lives.

The sixth insight concerns selfless living. John Hick, the famous exponent of global theology, characterized all religious conversion as "the transformation of human existence from self-centeredness to Reality-centeredness." As religion connects us with what is beyond us, so it variously encourages us to live for those other than ourselves. A Buddhist Jātaka tale from the Suvarṇaprabhāsa Sūtra famously illustrates this. A prince called Mahasattva encounters a tigress with cubs, and the family is obviously starving and close to death. Overcome with compassion, he lays his body in front of the tigress so they may eat him, receive nourishment, and live. He prays,

To benefit transmigrating beings, may I attain the peace of peerless enlightenment; my mind compassionate and steadfast, I give this body which others find hard to give up; may I achieve the flawless, priceless enlightenment that bodhisattvas so keenly seek. I shall free beings in the triple worlds from the intense fear of the ocean of existence.

Such is the noble ideal of the bodhisattva — or "bodhi-sattva," "enlightenment-being" — the one who delays his or her own final liberation for the sake of all other sentient creatures. The Mahayana tradition, which emerged around 200 CE primarily, created Sanskrit sources and with them the religious ideal figure of the bodhisattva. The act of supreme sacrifice, which the tale illustrates, is of course quite an obstacle for traditional anthropocentric ethics, which as a matter of course always puts human needs above those of every other creature.

Buddhist thought gave rise to a remarkable historical figure as well — namely, Emperor Asoka (literally meaning one who is without sorrow). His is also an incredible story of moral conversion. Formerly a bloody tyrant and warmonger, he converted to Buddhism, and his court was prohibited from royal hunting. He also established medical facilities for injured animals. His legislation

on aspects of animal protection was perhaps the most ambitious and far-reaching in history.

As noted previously, the idea that humans should live generously, even sacrificially, for animals and the earth has resonance even outside Indic traditions. It is often overlooked that in the Hebrew Bible, the second creation saga pictures God creating the garden replete with creatures and then creating human beings "to till and serve" the garden (Gen. 2:15-16). Humans have a diaconal, serving role in relation to God's creation; indeed, that is their very function — to care for what the Creator has made. Similarly, the notion that lordship involves service — indeed, that lordship can only be defined as service — draws heavily on the Christian doctrine of the incarnation, which is the sacrifice of "the higher" for "the lower." This is not a new idea; in fact, there are many passages in the New Testament that speak of the salvific work of Christ extending to all creatures. Colossians makes clear that God's purpose in Christ was to reconcile "all things" to himself (1:15-21), and Romans suggests that the whole creation is in a state of bondage, awaiting the liberty of the children of God (8:18-24).

From this perspective, care for other creatures is not an optional extra but rather is central to Christian discipleship: as God in Christ shows generosity to us, so we should live out that generosity in regard to other suffering creatures. Edward C. Sellner ("A New Ethic of Holiness: Celtic Saints and Their Kinship with Animals") spells out how many who have followed Christ and been celebrated as saints have demonstrated that generosity in their own lives, and he looks at the continuing challenge that they represent to the church:

Instead of teaching that holiness is all about sexual continence and only a specific sexual orientation, the stories of the saints might remind us of the importance of developing an ethic of caring for creation in all its wondrous diversity. Instead of preaching or lecturing on the importance of rules and respect for the hierarchy or elders, the example of the saints might rather teach the need for engaging in ministries of service and

servant leadership. Instead of concentrating attention on the wealthy and the privileged, the saints' lives might affirm the importance of attending to the poor, the neglected, the marginalized, and all those who suffer, human and otherwise.

The seventh insight concerns future (or eschatological) anticipation

The word "eschatological" means "last things," from the Greek word *escha*, meaning "last." All religions have an eschatology — that is, a vision of a better future in this world or the next. Human beings along with other creatures are going somewhere. There is a *telos*, a purpose, and a meaning behind purely worldly phenomena, which are leading to a final point, whether that point be described as nirvana, heaven, enlightenment, or redemption.

It is worth pointing out that almost all religious traditions believe in a transfigured cosmos that is inclusive of animals. Qur'anic teaching accepts that animals are to be resurrected. In the Jain and Hindu scriptures, animals have a soul that moves beyond earthly life, and in Buddhism, enlightenment is the goal of every creature. Even within Christianity, which has formally denied immortal souls to animals, there are in the New Testament unmistakable indications of cosmic redemption. And in Judaism, the Isaianic vision (Isa. 11:1-10) of how the lion and the lamb will lie down together, ushering in universal peace, is the hallmark of messianic redemption.

Given this eschatological orientation, there has been among religious believers a renewed stress on precisely how this better world is to be anticipated in the present. If the Creator's will is to be done "on earth as it is in heaven" (Matt. 6:10-11), the question is how we can at least partially realize this divine will in the present. The World Council of Churches famously spoke of how Christian ethics should be characterized by "eschatological realism." — that is, moving as far as practically possible in this world toward the achievement of universal peaceableness in the next.

This imperative is well expressed by Ryan Patrick McLaughlin in his chapter "How Good Is Nature? The Fall, Evolution, and Predation": "Humans must

become eschatological witnesses to the created order by revealing, if only in fleeting sacramental moments, the kind of peace for which all creation yearns. Humans cannot end all suffering, eradicate predation, or defeat death — these feats can be achieved only by God and that in the transfiguration of the cosmos." The point is that eschatological orientation should inform and empower a more radical peaceableness between all beings. If, as almost all religions teach, there is going to be no killing, exploitation, suffering, or misery in the next world, we need to find ways in which we can, as a matter of fidelity to that vision, express that peaceableness now. Notionally at least, animals are included in this better world, so it is only right that religious discipleship should be similarly inclusive.

This is the world's first handbook on religion and animal ethics and comprises thirty-five original chapters representing almost all the major religious traditions of the world. We are proud to have helped pioneer a new field and to have broken new ground. We hope this will provide resources for the up-and-coming generations who want to look afresh at the relation between religion and ethical concern for animals. There are new courses in animals now emerging in many English-speaking countries, especially universities in the United States and Europe, including courses in animal law, animal philosophy, animals in literature, animals and political theory, animals and sociology, critical animal studies, animal theology, and not least of all, animals in religion. This is one of the heartening signs that new generations of students are beginning to address the topic of animal ethics and especially its grounding in religion and religious history.

This book is divided into two parts. The first part consists of overviews of the various religious traditions worldwide. Of course, no one book can cover every religious tradition that has existed in the world, but we hope that we have at least covered the most important. We have deliberately chosen "insiders" — that is, believers or at least those who have spent a lifetime studying their chosen tradition — to provide these overviews. We have done this because we are convinced that only those who know these traditions personally from the

inside can provide a faithful account of them. The second part examines some of the most contentious issues that arise within religious traditions. These include theological issues, such as theodicy and life after death, and moral issues about our interaction with animals, particularly killing and exploitation. We have also included a section on religious and secular law that addresses some issues about the interaction between religious beliefs and secular legislation.

Since this is a book about animal ethics, we have had to pay attention to the question of ethical language. As we have written many times before, so much of our historic language denigrates animals as "beasts," "brutes," "subhuman," or "dumb brutes" or deploys negative metaphors about animals, such as "snake in the grass," "cunning as a fox," "greedy as a pig," and "stupid cow." With these terms we libel animals — and not only animals, of course. Therefore, we have found it essential to pioneer an ethical or at least more objective terminology. We have used "he" or "she" instead of "it" for individual animals. We have used "free-living," "free-roaming," or simply "free" instead of "wild" because wildness has negative connotations. We have also used the term "companion animals" rather than "pets." Needless to say, exceptions to ethical language have been made in the quotation of texts, particularly historical writings.

This book is dedicated to scholar and theologian Justus George Lawler. He wrote the influential article that first awakened the theological community to the issue, "On the Rights of Animals," way back in 1965. It is a delight to acknowledge such an important pioneer from whom we and others have learned a great deal. <>

[The Palgrave Handbook of Practical Animal Ethics](#)

edited by Andrew Linzey, Clair Linzey, Section Editors: Lisa Johnson, Thomas I. White, Mark H. Bernstein, Kay Peggs [The Palgrave Macmillan Animal Ethics Series, Palgrave Macmillan, 9781137366702]

This handbook provides an in-depth examination of the practical and theoretical issues within the emerging field of animal ethics. Leading experts from around the globe offer insights into cutting edge topics as diverse as killing for food, religious

slaughter, animal companions, aquariums, genetic manipulation, hunting for sport and bullfighting. Including contributions from Lisa Johnson on the themes of human dominance, Thomas White on the ethics of captivity, Mark Bernstein on the ethics of killing and Kay Peggs on the causation of suffering, this handbook offers an authoritative reference work for contemporary applied animal ethics. Progressive in approach, the authors explore the challenges that animal ethics poses both conceptually and practically to traditional understandings of human–animal relations.

Key Features:

- Structured in four parts to examine the ethics of control, the ethics of captivity, the ethics of killing and the ethics of causing suffering
- Interdisciplinary approach including philosophical, historical, scientific, legal, anthropological, religious, psychological and sociological perspectives
- Focussed treatment of practical issues such as animals in farming, zoos and animal experimentation

[The Palgrave Handbook of Practical Animal Ethics](#) is an essential resource for those with an interest in the ethics of modern-day treatment of animals as well as scholars, researchers and advanced students in zoology, philosophy, anthropology, religious studies and sociology.

Excerpt: This is a new book series for a new field of inquiry: Animal Ethics.

In recent years, there has been a growing interest in the ethics of our treatment of animals.

Philosophers have led the way, and now a range of other scholars have followed from historians to social scientists. From being a marginal issue, animals have become an emerging issue in ethics and in multidisciplinary inquiry.

In addition, a rethink of the status of animals has been fuelled by a range of scientific investigations which have revealed the complexity of animal sentience, cognition and awareness. The ethical implications of this new knowledge have yet to be properly evaluated, but it is becoming clear that

the old view that animals are mere things, tools, machines or commodities cannot be sustained ethically.

But it is not only philosophy and science that are putting animals on the agenda. Increasingly, in Europe and the USA, animals are becoming a political issue as political parties vie for the "green" and "animal" vote. In turn, political scientists are beginning to look again at the history of political thought in relation to animals, and historians are beginning to revisit the political history of animal protection.

As animals grow as an issue of importance, so there have been more collaborative academic ventures leading to conference volumes, special journal issues, indeed new academic animal journals as well. Moreover, we have witnessed the growth of academic courses, as well as university posts, in Animal Ethics, Animal Welfare, Animal Rights, Animal Law, Animals and Philosophy, Human-Animal Studies, Critical Animal Studies, Animals and Society, Animals in Literature, Animals and Religion—tangible signs that a new academic discipline is emerging.

"Animal ethics" is the new term for the academic exploration of the moral status of the nonhuman—exploration that explicitly involves a focus on what we owe animals morally, and which also helps us to understand the influences—social, legal, cultural, religious and political—that legitimate animal abuse. This series explores the challenges that animal ethics pose, both conceptually and practically, to traditional understandings of human—animal relations.

The series is needed for three reasons: (i) to provide the texts that will service the new university courses on animals; (ii) to support the increasing number of students studying and academics researching in animal-related fields; and (iii) because there is currently no book series that is a focus for multidisciplinary research in the field.

Specifically, the series will

- provide a range of key introductory and advanced texts that map out ethical positions on animals;

- publish pioneering work written by new, as well as accomplished, scholars; and
- produce texts from a variety of disciplines that are multidisciplinary in character or have multidisciplinary relevance.

The new Palgrave Macmillan Series on Animal Ethics is the result of a unique partnership between Palgrave Macmillan and the Ferrater Mora Oxford Centre for Animal Ethics. The series is an integral part of the mission of the Centre to put animals on the intellectual agenda by facilitating academic research and publication. The series is also a natural complement to one of the Centre's other major projects, the Journal of Animal Ethics. The Centre is an independent "think tank" for the advancement of progressive thought about animals and is the first Centre of its kind in the world. It aims to demonstrate rigorous intellectual enquiry and the highest standards of scholarship. It strives to be a world-class centre of academic excellence in its field.

We invite academics to visit the Centre's website www.oxfordanimaethics.com and to contact us with new book proposals for the series.

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Excerpt: Animal ethics often provokes a range of reactions, some perceptive, mostly not so. Before we conclude, we now turn, briefly, to considering some of the common objections.

Humans have a metaphysical privilege over animals; we should value them more than animals.

Depending on how one defines the term, it can be argued that animal ethics requires humans to possess this metaphysical privilege over animals, in the sense that ethics requires free will, rational choice, and most importantly, moral agency. It seems very unlikely that other sentient beings possess all these abilities or possess them in a way that is analogous to human beings. That accepted, the second part of the objection—namely, that we are therefore of more value than animals—does not follow. All kinds of species have unique abilities and characteristics that are peculiar to their own. That does not of itself make them more or less

valuable (except, of course, for the importance of sentience). Our moral agency makes us special in that we have the power and the duty to serve other creatures, but it does not follow that our interests should always have moral priority. Indeed, quite the reverse. We should use our moral superiority by acknowledging duties to animals that they cannot acknowledge toward us. As Brophy herself argues, "The whole case for behaving decently to animals rests on the fact that we are the superior species. We are the species uniquely capable of imagination, rationality, and moral choice—and that is precisely why we are under the obligation to recognise and respect the rights of animals."

There is also a parallel debate in theological circles, which has increasingly moved away from seeing human moral superiority in crude "dominionist" terms. Almost no theologian today thinks that dominion in Genesis 1 means simply that might is right. Indeed, the (much-overlooked) evidence from the text shows this to be true: humans are made in God's image (Genesis 1:26), given dominion (Genesis 1:26), and then commanded to follow a vegetarian (actually vegan) diet (Genesis 1:29). Herb-eating dominion can hardly be a license for tyranny.

Animal ethics is simply a form of misanthropy. Some people prefer animals to humans.

Some people may prefer some animals to humans, as some humans may prefer some humans to some animals. After all, our preferences are precisely that: our preferences to which we have an individual right. But the general charge that animal ethics results tout court from misanthropy is misplaced, for three reasons. The first is that the ethical theories that emerge from animal ethics so obviously include human beings as well. Human beings are also classed as sentient and as subjects of a life, and they are likewise deserving of respect as individuals. Animal ethics theories in no way diminish human dignity, value, or rights; indeed, the assumption of all such theories is that these very things that humans already (and rightly) possess should be extended to others. Second, the objection fails to grasp that historically, concern for

animals and concern for poor and weak humans were part of the same movement of sensibility. The luminaries of the humanitarian movement of the nineteenth century, such as William Wilberforce and Lord Shaftsbury, were as much concerned for humans as they were for animals. Indeed, it was members of the English Society for the Prevention of Cruelty to Animals (as it then was) who helped found (and financially support) the National Society for the Prevention of Cruelty to Children. This is all well documented in a variety of books. Third, there is a strong link between cruelty to animals and violent and antisocial behavior. We now know (in a way in which previous thinkers could only suppose) that there is empirical evidence of this connection. A great many books have detailed this link. Although it is impossible to adequately treat the subject here, we invite people to examine the evidence.

Caring about animals is just a matter of feeling.

Almost the reverse is the case. Although some people may have strong emotional reactions to animal cruelty and abuse (and understandably so), the theories that emerge from animal ethics are founded on rational considerations (only some of which we have outlined here), buttressed by empirical science relating to animal cognition, awareness, and sentience. Indeed, as many animal ethicists have remarked, the whole intellectual movement, especially since the 1970s, can be seen as a reaction to the erroneous assumption that animal protection is simply a matter of taste or emotional disposition. The voluminous amount of philosophical literature that has accrued is testimony to the rational debate that has occurred at the highest levels of scholarship. Arguably, no other moral issue during the last forty years has received so much rigorous intellectual inquiry and analysis.

Animals cannot have rights since they do not have responsibilities.

One ethical theory—namely, contractualism—holds variations of this view by tying together moral status and rights. But it should be noted that not all contractualists are in agreement. One important exception is Mark Rowlands, who maintains that since humans can speak for and represent the

interests of animals, then animals ought to be included within the sphere of moral considerability. But if a thoroughgoing contractualist view is held, it is certainly true that animals are excluded from (at least direct) moral consideration. But by the same standard, so too are infants, the comatose, and the mentally challenged. In other words, under this theory, some of the most vulnerable humans in our midst also would be deemed to be without moral rights. This is just one of the reasons contractualism is sometimes judged to be an inadequate moral theory. Most animal ethicists would maintain that we need a strong deontological defense of the weak, the vulnerable, and the innocent of all species, which is why the language of justice (including the notion of rights) is often judged appropriate.

Even if animals have some moral status, they are still a marginal issue.

But the question has to be asked: why? Unless one buys into anthropocentrism, instrumentalism, or sheer reductionism, one has to ask, what rational ground can there be for refusing to include animals within the same sphere of moral obligation that we extend to fellow humans? Many people in the past used to defend speciesism by referring to the "differences" between animals and humans. Well, differences there are, both between and within species, but the crucial issue is this: are they morally relevant differences? The point has been widely discussed in the literature, but a consensus has emerged that characteristics such as race, nationality, sexual orientation, gender, and species are morally irrelevant. The key point is whether the being concerned is sentient, not what race, nationality, sexuality, gender, or species the being happens to be.

This is a handbook of practical animal ethics. That does not mean that the following sections and chapters are oblivious to ethical theory. Rather, they demonstrate the relevance of ethical theory by focusing on practical issues. "There is nothing so practical as a good theory," as one American intellectual reminds us. The issues are sectionalized under the headings of control, captivity, killing, and causing suffering, and each section is selected and

introduced by a leading authority in the field. Although other books have focused solely on killing or causing suffering, we have also addressed the arguably more fundamental issues of control and captivity. The topics range through a wide variety of issues, including killing for food, angling, zoos, genetic manipulation, sport hunting, keeping cetaceans in aquariums and dolphinariums, elephant killing, bullfighting, animal experimentation, and industrial farming. Of course, the list of topics covered is not exhaustive, but the book does cover many of the practical issues that arise in animal ethics. There is no one living who is not affected by one or more of the issues raised in this volume.

We have, as editors, had to pay special attention to the question of ethical language. So much of our historic language denigrates animals as "beasts," "brutes," "subhumans," or "dumb brutes" or deploys negative metaphors about animals, such as "snake in the grass," "cunning as a fox," "greedy as a pig," and "stupid cow." With these terms we libel animals, and not only animals, of course. Therefore, we have found it essential to pioneer an ethical or at least more objective terminology. We have used "he" or "she" instead of "it" for individual animals. We have used "free-living," "free-roaming," or simply "free" instead of "wild" because wildness has negative connotations. We have also used the term "companion animal" rather than "pet." None of these choices are without controversy, of course. Arnold Arluke and Clinton Sanders note a problem with this alternative terminology. "Companion animal," they say, implies mutuality in the relationship between the human and the nonhuman animal, whereas "pet" implies a relationship that subordinates the nonhuman animal. The point is well made and is elaborated by Kay Peggs in her excellent chapter, "Animal Suffering Matters." But we have still opted for the use of the word "companion animals" as at least a gesture of hope that ethical language may, in this one case, precede ethical action. Needless to say, exceptions to ethical language have been made in the quotation of texts, particularly historical writings.

This book is a project of the Oxford Centre for Animal Ethics. All the section editors and most of the contributors are fellows of the Centre. The aim of

the Centre is to pioneer ethical perspectives on animals through academic research, teaching, and publication, and the Centre has a worldwide fellowship of more than ninety fellows. All royalties from the sale of this book will go the Centre to further its work. <>

[Society & Animals: Journal of Human-Animal Studies](#) Editor-in-Chief: Kenneth Shapiro [Brill Journal, ISSN: 1568-5306]

[Society & Animals](#) publishes studies that describe and analyze our experiences of non-human animals from the perspective of various disciplines within both the social sciences (e.g., psychology, sociology, anthropology, political science) and humanities (e.g., history, literary criticism). The journal specifically deals with subjects such as human-animal interactions in various settings (animal cruelty, the therapeutic uses of animals), the applied uses of animals (research, education, medicine and agriculture), the use of animals in popular culture (e.g. dog-fighting, circus, animal companion, animal research), attitudes toward animals as affected by different socializing agencies and strategies, representations of animals in literature, the history of the domestication of animals, the politics of animal welfare, and the constitution of the animal rights movement.

The goal of the journal is to stimulate and support the emerging multi-disciplinary field of animal studies, which consists, broadly, of investigations of the ways in which non-human animals figure in our lives. Although emphasizing empirically based studies, the journal also publishes theoretical analyses, literature reviews, methodological contributions, and comments on relevant topics. The editorial board consists of over thirty scholars, professionals (e.g. animal assisted therapists, shelter, zoo, wildlife personnel and etc.), policy makers, and animal advocates.

[Society & Animals](#) is unique in the breadth of subjects covered, methods of papers published, and diversity of scholarly disciplines represented. It is also unique in its encouragement of data based discussion of ethical and policy issues in the current debate over the place of non-human animals in an increasingly human-centered world. <>

[Dreaming in Turtle: A Journey through the Passion, Profit, and Peril of our Most Coveted Prehistoric Creatures](#) by Peter Laufer, Foreword by Richard Branson [St. Martin's Press, 9781250128096]

A fascinating exploration into the world of turtles across the globe; Laufer charts the lore, love, and peril to a beloved species. [Dreaming in Turtle](#) is a compelling story of a stalwart animal prized from prehistory through to today—an animal threatened by human greed, pragmatism, and rationalization. It stars turtles and shady and heroic human characters both, in settings ranging from luxury redoubts to degraded habitats, during a time when the confluence of easy global trade, limited supply, and inexhaustible demand has accelerated the stress on species. The growth of the middle class in high-population regions like China, where the turtle is particularly valued, feeds this perfect storm into which the turtle finds itself lashed. This is a tale not just of endangered turtles but also one of overall human failings, frailties, and vulnerabilities—all punctuated by optimistic hope for change fueled by dedicated turtle champions.

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Excerpt: Human beings should never be responsible for allowing a species to disappear from the Earth.

We must all do whatever we can to keep that from happening.

On Necker, my island in the Caribbean, I suspect we have more animal species than on any other island on the planet. When species are in peril, a few should be kept in captivity to assure that the species continues to exist. Captivity for animals on Necker is not like captivity in a zoo. We make sure the animals enjoy plenty of room to roam. I feel like Dr. Doolittle sometimes, caretaker for so many happy critters, especially the day I watched one of our lemurs feed fruit to a couple of hungry giant tortoises.

The tortoises are among my favorites of the animals living with me on Necker. I was thrilled when we discovered our first Indian Ocean Aldabra giant tortoise egg on the island—another sign that our chelonian community is self-sustaining. In addition to the giant Aldabras, we provide a safe haven for critically endangered Burmese star tortoises and Burmese black mountain tortoises, along with such a comfortable home for red-footed tortoises that they are laying eggs and the eggs are hatching.

As I wrote in my book [The Virgin Way](#), I favor seeking what I call serious fun, and I enjoy doing good while doing well. That's why I appreciate the reporting that author Peter Laufer engaged in during the years he researched [Dreaming in Turtle](#). There are plenty of good books about turtle biology and tortoise evolution. What makes [Dreaming in Turtle](#) a unique read is that it chronicles the serious fun experienced by the dedicated and disparate community of humans who have chosen to intertwine their lives with tortoises and turtles.

Of course there are scofflaws and other villains in the tortoise and turtle subculture. The poachers and smugglers and traders who prey on the animals are identified in these pages; it's important to know all the players—bad and good. But it's fascinating and reassuring to meet the motivated wildlife police struggling to save threatened and endangered species, and the hardworking fellow conservationists—many of whom I've crossed paths with as a result of our efforts on Necker to provide a safe haven. Their stories come alive as the heroes

of *Dreaming in Turtle*, populating with unforgettable personalities this comprehensive and compelling survey of the status of these mesmerizing animals.

Listening intently to everyone with an opinion is another lesson I teach based on my business experiences. Latent herpetologist and swashbuckling journalist Laufer follows that rule in *Dreaming in Turtle* as he travels the world developing his own passion for tortoises and turtles while discovering their ubiquitous presence in all our lives. From Santeria priests in Cuba who sacrifice turtles for their clients to dedicated volunteers risking their lives to protect incubating eggs on Costa Rican beaches, from medicine men in Gabon who grind up tortoise shells to create hemorrhoid cure potions and Cajun cooks in Louisiana brewing turtle soup to undercover agents running risky sting operations in underground Southeast Asian markets teeming with endangered turtles and tortoises, the following chapters bring to life a fascinating cast of characters interacting with turtles and tortoises.

[Dreaming in Turtle](#) tells a cautionary tale of imminent extinction—of what happens when timeless allure combines with illicit markets. But this is a story that can result in a happy ending. The book serves as a call to action because we all can, in our own fashion, help create for animals worldwide sanctuaries like those on Necker. And we must. -RICHARD BRANSON, 2018

Come with me on my quest to document and understand obsessions surrounding turtles and tortoises. As I travel from the giant and infamous Jakarta animal market in Indonesia to a Santeria sacrifice ceremony in Cuba, from a sea turtle nesting beach in Gabon to the turtle-filled bayous of Louisiana, join me and meet a wild cast of characters, including a motley collection of outlaws and their customers—from poachers playing cat and mouse with game wardens, to those obsessive collectors seeking critically endangered species for their illicit collections, to patients desperate for cures and convinced successful treatment only comes from turtle parts, to gourmands ready to break laws for a unique meal.

Looking every bit as prehistoric as they are, turtles and tortoises have lumbered on our land since the age of the dinosaurs. Slow-moving and egg-laying, some live in water and some on land. Some eat meat, using their sharp beaks and strong jaws to slice through prey, while others subsist solely on plants.

These creatures all share a common feature: their bodies are encased in a protective shell that comes in a panoply of shapes and sizes and colors. Many of these species can pull their necks and heads into their shells, which are usually durable enough to protect them from the bite of predators. Their shell rings can hint to us of their age and their shapes telegraph whether they are swimmers or walkers—as do their limbs: some have feet, others flippers. They seem to enjoy good night vision, and tests suggest they're equipped with remarkably long memories. Some live well past a century. For as long as humans have been around, these animals and their eggs have been prized as medicine, religious and pagan talismans, food, decoration, pets, fodder for tales, and so they are of great value to collectors and traders.

Because of their value, the strange and marvelous turtles and tortoises are among the most trafficked and most endangered animals alive today—animals threatened by human greed, pragmatism, and rationalization. The story told here stars turtles and tortoises, along with both shady and heroic human characters, in settings ranging from luxury redoubts to degraded habitats, during a time when the confluence of easy global trade, limited supply, and inexhaustible demand has accelerated the stress on chelonian species. The growth of the middle class in crowded China and Vietnam, where the turtle is particularly valued, accelerates this life-or-death drama. But Asia is not the sole marketplace hoovering up the reptiles. This is a tale not just of endangered turtles and tortoises but also one of overall human failings, frailties, and vulnerabilities—all punctuated by optimistic hope for change fueled by dedicated champions of chelonians.

There is an existential threat to the world's endangered turtle and tortoise populations, populations that serve as indicator species for our

own human survival. If Earth's environment cannot continue to support a stoic animal that's been thriving on the planet since the time of the dinosaurs, the rest of the animal kingdom must be considered in jeopardy and we humans—animals ourselves—should worry.

I research, report, and write about the relationships between humans and other animals. *The Dangerous World of Butterflies* is an investigation into the little-known enclaves of high-dollar international butterfly smuggling. *Forbidden Creatures* is a study of people who live with dangerous and endangered animals such as chimpanzees and tigers—documenting stories from seemingly happy interspecies families to ghastly tragedies. *No Animals Were Harmed* seeks to locate the frontier where animal use becomes animal abuse.

While researching the butterfly book I learned of the Philippine forest turtle, an animal thought to be extinct until a colony of them was located in an isolated island outback. The discovery resulted in frenzied collectors paying as much as \$2,500 a specimen to poachers, who in turn paid as little as \$50 to the locals who captured them—a precious \$50 in a place where feeding a family is an economic challenge. The renewed trade again pushed the turtle toward extinction, and its startstop survival story fueled my intrigue. The Philippine forest turtle led me to begin seeing the lives of turtles and tortoises as a metaphor for our own struggles to survive.

The turtle is not the typical charismatic poster-child animal—it's no cuddly koala, dog-faced harbor seal, or anthropomorphic polar bear—but it is rooted in many cultural identities. The turtle figures in Native American creation myths, and throughout history across cultures worldwide it also symbolizes wisdom, fertility, and long life.

Come along on my journey as I report little-known smuggling, document endangered species on the brink of extinction, and celebrate turtles and tortoises. *Dreaming in Turtle* is a love song to these magical, mystical, and mythological creatures. And it is a call to action. <>

[Humans, Animals, and the Craft of Slaughter in Archaeo-Historic Societies](#) by Krish Seetah
[Cambridge University Press, 9781108428804]

In this book, Krish Seetah uses butchery as a point of departure for exploring the changing historical relationships between animal utility, symbolism, and meat consumption. Seetah brings together several bodies of literature - on meat, cut marks, craftspeople, and the role of craft in production - that have heretofore been considered in isolation from one another. Focusing on the activity inherent in butcher, he describes the history of knowledge that typifies the craft. He also provides anthropological and archaeological case studies which showcase examples of butchery practices in varied contexts that are seldom identified with zooarchaeological research. Situating the relationship between practice, practitioner, material and commodity, this imaginative study offers new insights into food production, consumption, and the craft of cuisine.

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Excerpt: This book ambitiously sets out to reconceptualise what butchery 'is' for an academic audience. To do this, it provides a more holistic approach to the theoretical framework from which we study the practice of butchery. The stress on practice, and particularly social aspects of practice, serves two functions. It aligns a growing trend in social zooarchaeology, recognising the richness and diversity of the human—animal relationship, with 'craft' — observed as a usable framework for assessing production, use, and discard of objects. More importantly, it confronts some of the consequences of economic determinism and methodological constraints that have hampered butchery studies. We understand meat because it is ubiquitous. We study meat today from a nutritional and cuisine perspective, and attempt to see similarities in the past, for example, through meat cuts. Zooarchaeologists conceptualise human—animal relationships through bone but do not situate the practice that transforms flesh into meat. Many of the social features attributed to meat consumption are dependent on butchery and driven by butchering. The nutritional context of meat is only part of the equation; indeed, meat is only part of the carcass!

Incorporating ethnographic research into this book provides an updated view of how different groups around the world engage with all parts of animal bodies, building on a strong foundation of this type of research in archaeology. The ethnographic context also provides a window on how Western views of meat have lost an essential connection to animal bodies, the skills associated with carcass processing, and, perhaps most obviously, the act of slaughter. Ultimately, by illustrating the contours of relationships between butchery, butchering, and practice, I aim to unite the subject matter with larger issues such as social organisation, cultural transitions, and routes to specialisation.

In writing this book, I have drawn heavily on my past experience to bring experiential know-how to an academic audience. In terms of constructing a

new conceptual premise from which we can revitalise the study of butchery, the book incorporates a wide literature. Butchery and butchering are too complex, too deeply integral to culture, too fundamental to people, to be studied from one point of view or in isolation from one another. Alongside research on cut marks, the book borrows from studies of food as culture, food procurement as culture (e.g., hunting), the literature on meat, and the impressive body of work on technology and craft in archaeological contexts.

In this way, I aim to illustrate the nuanced, complex, and rich position that the topic holds in society, rooted in everyday activity. In order to better illustrate daily practice, I engage with a range of ethnographic studies, some of which are based on my own work. However, as important as it is to illustrate diversity, in the interests of thoroughness and to provide detail I have limited the text in specific ways. To achieve a balance between breadth and depth, the extended case study — used to showcase some of the ways we can better interpret the archaeological record — is focused on Roman and medieval Britain. This provides boundaries for the chronological and spatial contexts. In addition, cattle are the main domestic animal discussed throughout the text, and in the archaeological case studies a focus on cattle serves as another boundary for the book.

The book is split into two parts. Part I introduces the archaeological context, then deliberately steps away from archaeology and engages with modern case studies to situate the craft, practice, craftspeople, and technology within the book's conceptual framework. By tackling some of the gaps in our approach to metal-tool butchery, and adding richness through analogy, Part I provides a new grounding from which to renew appreciation for the subject. Chapter 2 begins by conceptualising the main topics under review, offering definitions for cut marks, butchery, and butchering; the chapter then describes limitations in the current analytical process, identifying how this has hampered our ability to describe the actions' of ancient butchers. Chapter 3 positions the book within the wider theoretical discourse on 'activity' in archaeology, serving to marshal the ideas and concepts that have influenced the development of

this book. Chapters 4-6 then develop the wider social and technological contexts. These chapters are based on modern industrial and nonindustrial case studies, drawn from published ethnographic accounts, the ethnoarchaeological literature, and my own ethnographic research, as well as an autoethnography from the modern trade. These chapters examine the 'practice' of butchery, and I deliberately deviate from a focus on cut marks in order to better do this.

Part II re-centers the objective on archaeological enquiry. Equipped now with a more representative and accurate view of the craft and people involved, the book draws on Part I to illustrate gaps in our methodological approach to cut mark recording. This section of the book shows how to mitigate some of the challenges faced by analysts recording this complex dataset and the ways in which we can enrich our interpretation.

Chapters' 7-9 assess the state of the art in archaeology, and how we can enhance our current approach. Chapter 7 discusses how cut marks have been studied from archaeological bone; Chapter 8 describes some of the negative implications for interpretation that have arisen as a result of limitations in our methods. Methodological problems are based on a simple premise: we have been 'observing rather than understanding'; we record marks, less often do we deduce practice. Chapter 9 offers a synopsis of a new methodological approach that places stress on process — the steps and organisation of butchery — as a way to overcome an overemphasis on the mark. The amendments I advocate are based on the principle of assessing the process of butchery, recognised as a key element of the practice but not utilised as a means of situating the craft. In this way, the recording system effectively encourages the analyst to build interpretation during data collection. The application of the approach proposed in Chapter 9 is explored in an extended case study in Chapters 10 and 11, which summarise and discuss the results from six British sites.

As a case focused on butchery, the book highlights issues that are relevant to archaeology. From a methodological perspective, we need to consider how the recording of cut marks can be adapted to

better assess butchery, but also to become systematic and standardised, in other words, to make better use of archaeological assemblages. Zooarchaeology is increasingly turning to molecular methods, which have been a boon for the discipline. However, while offering many benefits, molecular techniques are usually possible on only a small subset of materials and provide a specific type of evidence. Butchery connects us back to the materials, is low cost and widely accessible (with training), and provides evidence of a range of activities that cover both social and economic factors. Studying butchered faunal assemblages does not mandate specialist equipment, nor does it need to incur additional analytical costs. As such, it is accessible to the wider archaeological community. Enhancing our studies of butchery to include new ethnoarchaeological approaches (Chapter 4) expands the types of studies that faunal analysts participate in and their research outputs.

In concluding this introductory chapter, I want to emphasise the uniqueness of the butchery record, which acts like amber, capturing a nuanced indication of human activity and behaviour at a given moment in time. As I explore in this book, butchery provides a way for us to view a long list of human thought processes, spanning the mechanisms of social stratification, to the commodification of animal bodies, and ultimately, the transformation of those same bodies into the metaphorically powerful domain of meat.

Butchery has influenced every culture, whether meat-eating or otherwise. The main thrust of this book has been to champion a deeper appreciation for the wider context of archaeological butchery in order to better assess human—animal relationships in the past. The growing call to embed better ways to study 'knowledge' and 'practice' in the discipline — whether as an aspect of craft production or to understand the people who made things — provides important opportunities not only to study the past but also to connect to the present. For butchery specifically, if we achieve a more holistic assessment of the drivers and outcomes of changes in meat processing, we create links to the wider

historical and contemporary literature on meat, the meat trade, and our modern-day patterns of consumption. This path may ultimately lead to archaeologists having a more substantive voice that helps contextualise meat-eating today. However, as important as connections to the historic and anthropological contexts are, we have the potential to unite our data — indeed, it is incumbent that we do so — to the ecological and climatic research on these topics.

Finally, the book makes a resounding call for practicalism: for sustained attention, even devotion, to all things practical. This applies particularly to those of us who are material specialists and serves as both complement and antithesis to phenomenology. Unless we galvanise our efforts and enact change, archaeologists risk becoming academic spectators of practical knowledge. If we become better at making, we become better at thinking about things made in the past. This is the essential message I wish to convey in this book, woven throughout the descriptions and analyses of butchery contexts across time and location, and which I have exemplified through the experiential knowledge, describing personal skill and activity, that has imbued this book. <>

[Enchanted, Stereotyped, Civilized Garden Narratives in Literature, Art and Film](#) edited by Feryal Cubukcu, Sabine Planka, [Königshausen & Neumann, 9783826064449]

Gardens have been a crucial part in mythology and literature. Throughout English literature for example, the idea of a garden is a recurrent image; these images largely stem from the story of the Garden of Eden, which is found in the Genesis, the first book of the Bible. In the vast library of garden literature few books focus on what the garden means - for example a conceptual idea, a real or imagined place, and a place of action. Gardens reveal the relationship between culture and nature and can in sum be seen as civilized and 'shaped' and therefore domesticated nature. The present volume will discuss the topic of the garden in different theoretical contexts such as ecological, botanical, literary, filmic, art, historical and cultural ones. The single contributions investigate the representations of and the interconnections

between gardens and the above-named domains over a wide timescale, with consideration of how gardens are represented and used as symbols.

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Gardens have been a crucial part in mythology and literature. Throughout English literature, the idea of a garden is a recurrent image; these images largely stem from the story of the Garden of Eden which is found in the Genesis, the first book of the Bible. Gardens reveal the relationship between culture and nature, in the vast library of garden literature few books focus on what the garden means on the ecology of garden as idea, place, and action.

However, what is a garden? John Dixon Hunt writes in his book Greater Perfections that

a garden will normally be out-of-doors [...]. The specific area of the garden will be deliberately related through various means to the locality in which it is set [...]. The garden will thus be distinguished in various ways from the adjacent territories in which it is set. Either it will have some precise boundary, or it will be set apart by a greater extent, scope, or variety of its design and internal organisation; more usually, both will serve to designate its space and its actual or implied enclosure. [...] The garden will therefore take different forms and be subject to different uses in a variety of times and places. To the extent that gardens depend on natural materials, they are at best ever-changing (even with the human care and attention that they require above all other forms of landscape), but at worst they are destined for dilapidation and ruin from their very inception. Given this fundamental

contribution of time to the being of a garden, it not only exists in but also takes its special character from four dimensions. In its combination of natural and cultural materials, the garden occupies a unique place among the arts, and it has been held in high esteem by all the great civilisations of which it has been a privileged form of expression.

Hunt uses in his explanation 'the term 'precise boundary' that seems to be important when talking about gardens and gardening and that can be connected to the term 'fence' as Gille Clément uses it in his definition of what can be labeled as a garden.' Clément, garden architect and professor at the L'École Nationale Supérieure du Paysage à Versailles, writes in his essay about gardens, landscapes and the genius of nature that the garden detracts itself from cultural dispositions. Gardens, as Clément states, seems to be connected a) to the environment because of the possibility to settle the felicitous rules of gardening here and b) to landscape because gardens create them constantly in a new way. A garden, therefore, can be interpreted as a fenced or "enclosed place" as well as a paradise that is tilled and, therefore, cultivated that contains the best, namely what the creator of the garden has planted on their own and what creators appreciate as precious, beautiful, useful and balanced. A garden is, therefore, 'cultivated nature', especially if we consider specific cultural garden images like the Renaissance Garden or the Barock Garden that are expressions of their time. So it can be said that gardens mirror the relationship between society/culture and nature — and they can be seen as a fenced private space that marks someone's property that can possibly cause conflicts as Probst shows in accordance with writings of — amongst others — John Locke, Jean Jacques Rousseau and Thomas Moore.

The forms that garden enclosure can take are limited, but our experience of it can vary considerably, not least as a result of the size of a site. And like that other essential element of garden experience, the art: nature [sic!] ratio, the extremes of enclosure/openness, by isolating one feature at the expense of the other, serve to reaffirm their necessary and habitual

dialogue. A cloister garden allows no views of the surrounding world — it privileges only the eloquent and symbolic sky — yet its studied enclosure affirms by denying the world elsewhere. Conversely, an apparently boundary-less English landscape garden usually recalls us to the garden's habitual enclosure, to the notional center of the open spaces. This is why so many painted representations of landscaped parks, reversing the Baroque view outward from the mansion and its regular garden spaces toward a distant wilderness [...], turn and look back toward the mansion, the still point of the park's turning world [...].

It is not only the wish to create the place within the fence after one's own will but to express the thought of a whole period and, therefore, to express the relationship to the world as well as political thoughts and visions. Additionally, the garden as architectural and stylistic place seems to be the place where people can dream within nature. The garden also symbolizes the tension between nature and artistic designs/interpretations that divides the garden from (pure) nature and cultivated nature like farmland, meadows and woods.

Gardening is both practical and theoretical. An overview over various (international but primarily European) garden theories gives Clemens Alexander Wimmer in his book *Geschichte der Gartentheorie* [History of Garden-theory] which contains various theories since 37 B.C. until today. It shows that lots of artists and thinkers discuss amongst others what a garden has to look like, what plants have to be planted and how plants have to be arranged; additionally, they often integrate and explain their own garden concepts. Wimmer's collection shows that garden theories have changed: in contrast to the older writing newer theories discuss how to make a garden ecological and a living space for animals worthy of protection and are, therefore, connectable amongst others to movements like urban gardening that mark a special form of a garden and gardening : urban gardening is political, it is confined to special areas — especially in metropolises where living space is rare —, and it is connected to the experience of nature and the seasons of the year

(within the city). This form of gardening is constitutive for experiencing the fundamental connections in and of life and, therefore, the circle of life. Interestingly, the garden is no longer a secret place where to hide and to dream but a place that cultivates urban nature, where to meet friends as well as foreigners and, therefore, where to interchange with others. The garden is — in this context — no longer an alternative to the city life but an equal part within the city, where new forms of collectivity and partnerships have been established — and that can sometimes be described as 'urban permaculture'.

Besides what should be called active gardening in this context — even if theoretical outlines are involved —, other 'types' of gardens exist: literary gardens, created by authors and poets to create different emotional effects as in *Lotus-eaters* by Tennyson:

They saw the gleaming river seaward flow
From the inner land: far off, three
mountain-tops,
Three silent pinnacles of aged snow,
Stood sunset-flush'd: and, dew'd with
showery drops,
Up-clomb the shadowy pine above the
woven copse.
They might encapsulate allegorical or
moral terms derived from human
experience:
The woods decay, the woods decay and
fall
[...]

And after many a summer dies the swan.

Tennyson is not the only author our collection shows but there are also others such as Hugo von Hofmannsthal, Herbert George Wells, Leonard Alfred George Strong, William Blake, Leo Tolstoj, Karel Capek, Andrew Marvell, Algernon Charles Swinburne, and Joseph von Eichendorff, to name only a few of them. There are so many different types of gardens functioning differently: gardens are crime sceneries, places of encounters and of get-togethers or places of relaxation — as Hunt has indicated in his above cited list.

Gardens might also symbolize a retreat from the hostile world, a sort of fortress where people live in a more peaceful world than the outside. Sometimes

gardens are places of isolation, imprisonment and withdrawal just in *Snow White and Seven Dwarfs*.

Even in the heart of the city gardens form a pastoral retreat, an ultimate escape from the world of responsibility retaining its primal innocence as composed by Matthew Arnold:

In this lobe open glade I lie
Screened by deep boughs on either hand
And at its end, to stay the eye,
Those black-crowned, red-boled pine trees
stand.

While it is easy to feel the sublime in the gardens such as Wordsworth, it is possible to see that even such landscapes can be essentially social, and everything can be humanized. Instead of looking back to the medieval or the biblical gardens, they echo "a more basic struggle for life amongst creatures frisking, and twisting and coupling" as Browning "delights in its wild energy". The movement toward a humanized landscape represents a strong trend after the 19th century. The enclosed gardens imply a basic need for protection and isolation and they carry with themselves "the perils of claustrophobia, solipsism, and unbearable loneliness". The desire to creep into an enclosed space is shared by a lot of poets and writers. The poets such as Arnold, Tennyson and Rossetti wish to become a part of the garden as well. These internal landscapes reflect the psychological reality as well. This short digression shows how meanings of gardens can change and vary from period to period and — of course — from medium to medium as the following articles of this collection will show. Gardens have been, are and will always be parts of our cultural life. It is no wonder then that the garden as a topic / motif is integrated into several literary and cultural works as well as discussions.

This collection contains essays dealing with the motif of the garden within four sections: "Literary Gardens", "Gardens in Fairy Tales and Children's Literature", "Gardens in Art History, Photography and Culture", and, last but not least, "Gardens in Films and Video Games". The contributions will investigate the interconnections between gardens and literature over a wide timescale, with consideration of how gardens are represented in literary and cultural studies and used as symbols

and of how literature and cultural studies took form in, or influenced, gardens.

The first section, "Literary Gardens", shows that gardens have always been part of literary works. The section starts with an essay by Megan Kitching entitled *The Genius in the Garden: Sacred Places and Cultivated Spaces in Literature*. Kitching examines a key figure in literary accounts of how natural environments are shaped into gardens: the *genius loci* or 'genius of the place.' Her chapter draws on insights from environmental aesthetics and ecocriticism, to rethink how the genius of the place generates narratives of creating and responding to gardens.

Her essay is followed by the contribution of Davood Khazaie and Sara Khalili Jahromi who deal in *Garden Imagery and Connection of Three Worlds in Hafez's Poetry with the poetry of the influential Persian poet Khwāja Shams-ud-Din Muhammad Hāfez-e Shīrāzī* known by his pen name Hafiz and examines the function of garden and vegetative imagery in his poetry. They show that the three main worlds 1) the paradise as the transcendental, divine world, 2) nature as the terrestrial, material world, and 3) beloved as the human world, are connected to each other to gain an aesthetic composition in Hafiz's *Divan* that is linked to the term "bāgh-e nazar" ("garden of glance") that indicates the active role of the human subject in making connection between the above mentioned worlds. In *Paradise Perverted? The Garden as the Nucleus of Ungodliness in Gottfried's of Strassburg Tristan* Miriam Strieder and Denise Mangard deal with the medieval tale *Tristan* written by Gottfried of Strassburg that includes two scenes called 'Baumgartenszenen' (sceneries in the garden of trees) that can be seen firstly as examples for the adulterous love between Isolde, wife of King Marke, and Tristan, the King's nephew. Secondly, the garden is analyzed as a perverted Paradise in contrast to the Garden of Eden. Strieder and Mangard show that Gottfried perverts the biblical allusions of the garden as a paradise — a well-known connotation during the Middle Ages — by connecting the garden with deception, illicit love and uncourtly, even ungodly, behavior. In her essay *Annihilating all that's made /*

To a green Thought in a green Shade' — *The Garden* by Andrew Marvell and the *Myth of Creation* Maria Milena Romero Allué examines Andrew Marvell's last short poem called *The Garden*. She dwells upon the theoretical assumption that the attempt to recreate the mythical garden of delights implies a complex series of oppositions and paradoxes. What seems a mere celebration of the joys of natural life as opposed to urban artificiality has prompted numerous, and diametrically contrasting, critical readings of the lyric: by defining it either as a 'rural' or as a 'pastoral' poem, even as a 'political allegory', critics still debate its genre. In the next essay, 'The poetry of the earth is never dead': *The Garden & British Romantic Poetry*, Argha Kumar Banerjee examines the close link between British poetry and the concept of Romantic garden that was in vogue during the late eighteenth and early nineteenth centuries. Gardens in English literature mark also the center of the contribution of Jake Arthur, *Garden Forms and Politics in Early Modern English Literature*. He contends that the garden's political meanings in early modern literature might better be understood in reference to its physical forms and that gardens work as political images not simply because of biblical archetypes, but because the forms and forming central to gardens at this time furnish writers with a powerful set of resources to analogize power dynamics and political structures. This article revisits the physical garden to better understand poetic gardens, and so contends that gardens have been (and continue to be) rich sites through which writers can frame the flows and contestations of a culture. Leah Edens' *Redefining Archetypes: The Agency of Gardens and Women in Female Authored Novels across the English Enlightenment* examines the interconnectedness of the garden as a reflective place for women within the paradigmatic structures of the Edenic dogma. The traditions of the pastoral, and the evolving aesthetic and philosophical tenets conveys the gardens as spaces of female revolution. Zennure Kösemann's essay *Henry David Thoreau: Free Mind in the Garden* dwells on the poet Thoreau and his special connection to gardens — and especially the process of writing in and about the garden. Todd Barnes examines in 'Natures Journeymen': *Cultivating Political Desires*

in New York City's Shakespeare Gardens. the Shakespeare Garden in New York City's Central Park; since the late 19th century, gardeners and landscape architects the world over have worked to conserve, adapt, and transplant Shakespeare's flora — those represented in the plays and those surrounding their author to urban centers. Barnes' essay considers the role of Shakespeare's art in today's gardens, as well as the role of early modern gardens in Shakespeare's art. Adrian Tait discusses in *Care and Cultivation in the Landscape Gardens of Jane Austen: an Ecocritical Reevaluation of Intra-Acting Components* Jane Austen's novel and shows that Austen's depiction of people, place, and park-life suggests a new and fuller relationship that extends and embodies the ethical within her writings. Jane Austen is also at the center of Laurena Tsudama's essay *The Garden of Empire: Estate Improvement, British Imperialism, and Slavery in Mansfield Park*. In contrast, Tsudama argues that, in *Mansfield Park*, Austen's critique of late eighteenth-and early nineteenth-century estate improvement acts as a covert commentary on the institutions of imperialism and slavery. Tsudama demonstrates that in *Mansfield Park*, the garden and park at home act as a microcosm of the plantation and colony abroad. Ann Beebe shows in her essay *My flower garden has taught me that lesson': Gardens in E.D.E.N. Southworth's Novels of the 1850s* that the gardens of E.D.E.N. Southworth's novels are complicated symbols of identity, creativity, and productivity. Her analysis of the gardens in Southworth's novels of the 1850s reveals a complexity beyond critical stereotyping of her serials as mere popular sensationalism. In her essay *Looking for the Queen of the Desert in Mesopotamia* Feryal Cubukcu showcases historically the role of the garden in Gertrude Margaret Lowthian Bell's travel letters between 1874-1917. Cubukcu demonstrates how Bell's acute observation and mastery of the languages spoken in the region — Arabic, Persian, French, German, Italian and Turkish pave the way to see the correlation between the garden and its dwellers in Asia Minor and Mesopotamia. In *Between Heaven and Hell: Biblical Allusions and Darwinian Intertextuality in the Gardens of Tess Of The D'urbervilles* Emanuela Ettorre discusses the topological relevance of the garden as depicted in

Thomas Hardy's *Tess of the d'Urbervilles*, and demonstrates how this space is informed by a provocative fusion of biblical and evolutionary perspectives. Ettorre shows that the garden becomes a symbolic representation and a metonymic extension of the Wessex in which it is inscribed; it is an integral segment of that "partly real, partly dream-country", governed by the laws and the rhythms of nature. Stephanie A. Marcellus follows in *Garden Escapes in Great Expectations and the Victorian Periodical Press* the connections between gardening periodicals, real garden experiences and their literary representations in the novel *Great Expectations*. Marcellus argues that because of the affordability and accessibility of gardening periodicals, lower to middle class city dwellers came to see the suburb with its gardens as a pragmatic refuge from urban existence and that this real-life trend is represented in *Great Expectations* via Wemmick's castle that is kept as a secret from his London colleagues. Wemmick's protectiveness of his sanctuary serves, therefore, as Marcellus' argues, as a fictional example to demonstrate how the garden was promoted by the periodical press as a real-life antidote to the poisonous cityscape. Garry MacKenzie examines in his contribution entitled *Unearthing Traditions and Cultivating Hybridity: Ian Hamilton Finlay's Little Sparta* the representations of gardens in contemporary British poetry. He focuses on Ian Hamilton Finlay's 'poetry garden' Little Sparta, situated near Edinburgh that has been described as one of Europe's most important twentieth-century art gardens. MacKenzie explores the ways in which the textual installations in Little Sparta highlight that a garden is both a place of contemplation and an intervention that can stimulate political actions. In *Back to Paradise — The Garden as Utopia and Mythical Place in Margaret Atwood's Novel, The Year of the Flood* Sandy Lunau analyzes Atwood's novel *The Year of the Flood* and highlights different aspects. Firstly, she shows how ecocritical aspects function as a theoretical background in Atwood's novel and examines how the garden metaphor with its implications of life in harmony with nature, of growth and nurture correlates with Atwood's political agenda and the moral makeup of her text. Secondly, she points out how Atwood operates with gender stereotypes and relates it to the theoretical

background of ecofeminism. She then connects her argumentation to the function of the garden — as a mythical place — as temple for a form of natural religion, which worships ecological activists and natural scientists as saints. Rose Simpson highlights in her contribution "By The Waters Of Babylon" — Vicki Baum's *Garden of Exile* the literary, and the real-life, gardens of exile in the novels and the extensive personal correspondence of the best-selling Austrian novelist Vicki Baum. Simpson deals with different theories to show that Baum's garden generates the therapeutic recognition of a new *Heimat*, independent of geography and time, which restored psychic equilibrium to an exile writer who had succeeded in the modern Babylon of 1930s Hollywood. In the next contribution Gülsah Tikiz in *Garden of the Subconscious* in Murakami's *The Wind-Up Bird Chronicle* investigates the relationship between the psyche and the outer world by analyzing garden as a symbol in the form of scenes characterized by emptiness, darkness and obscurity. The last contribution in this section is Christian Tagsold's *Japanese Gardens as Realms of the Incomprehensible in Postcolonial Literature*. Tagsold explores how deep-rooted the stereotyped image of the Japanese garden is in the selected novels *The Samurai's Garden* (1996) by the Japanese-American Gail Tsukiyama and *The Garden of the Evening Mists* (2012) by the Malaysian author Tan Twan Eng who both chose Japanese gardens as the main setting for their plots and symbols for Japan.

The second section of this essay collection entitled as "Gardens in Fairy Tales and Children's Literature" starts with two essays who deal with Frances Hodgson Burnett's well known and successful novel *The Secret Garden*. The first contribution by Denise Burkhard's *Agency and Spatial Transformation in Frances Hodgson Burnett's The Secret Garden* deals with the aspect of transformation. Burkhard argues that the effects of the garden are subject to a development that is initiated through Mary's agency, which eventually dissolves some of the novel's binaries, and that garden and child mutually benefit from one another. The secret garden does not only have a direct impact on Colin and Mary in terms of their well-being and health as Burkhard shows, but also

that it brings a change to Misselthwaite Manor and the Craven family. The second contribution written by Kaitlin Downing entitled as *The Social Context of Gardening in Burnett's The Secret Garden* takes into account both English and American national identities. In this case Downing's contribution considers how gardening texts originating in England and the U.S. present Burnett's views of the importance and effects of gardening and argues that Burnett's depiction reflects the more American gardening ideals, in that it offers a socially valuable range of benefits, such as education, physical health, moral training, and social connection. In *Enchanted Gardens: Eco-consciousness in Environmental Picture Books* Sai Prasanna analyzes the picture books *The Curious Garden* (Peter Brown), *The Gardener* (Sarah Stewart), *Grandpa Green* (Lane Smith), *On Meadowview Street* (Henry Cole), and *The Magical Garden of Claude Monet* (Laurence Anholt) and examines gardens as spatial representations of childhood imagination and eco-consciousness. She argues that gardens in picture books represent childhood identity which is defined by the landscape in which children grow up. The last essay in this section is contributed by Anna Rudelli. In *Teaching Gardening to Children: an Analysis of Gertrude Jekyll's Children and Gardens* she deals with *Gertrude Jekyll's Children and Gardens*. Rudelli explores from a pedagogical point of view at first Jekyll's concept that plants have to be considered in close relationship to gardens, and considers secondly the fact that Jekyll advocated the "charms of natural gardens". Rudelli states that *Children and Gardens* provides a valuable insight into the pedagogical meaning of the garden in the upbringing and education of a child, highlighting the importance of teaching the principle of responsibility as well as the limits of freedom by means of taking care of a small plot of land.

The third section of the essay collection deals with "Gardens in Art History, Photography and Culture" and starts with Fabio Colonnese's *The Labyrinth as an Architectural Mediator.: Vredeman De Vries and the Geometric Garden in The Netherlands*. Colonnese deals with a very special garden, the labyrinth, and shows that Hans Vredeman de Vries' *Hortorum Viridariumque Elegantes et Multiplicis*

Forma (1583), a writing that casts a fundamental bridge between Italian Renaissance Garden and Northern Europe Garden and that puts labyrinthine parterres at the center of his garden designs, firstly contributed to confirm the garden as a symmetric still image of architectures and cities. Colonnese also examines that Vredeman innovates the garden as a stage for human motion, ludic rituals, and Biblical event representations. Colonnese concludes that Vredeman finally contributes to a geometrical concept of landscape that is to manifest in most of his works by reinterpreting the middle age tradition of the mythical Maison Dedalus.

Colonnese's essay is followed by the contribution of Alba Romano Pace's *The Garden-Labyrinth and his Chimers as Metaphor of the Unconscious and of Artistic Creation in the Surrealist Painting*, dealing with the labyrinth, too. She examines the labyrinth in art history, especially in surrealist paintings. Romano Pace firstly introduces the labyrinth in art history and then focuses on labyrinths in paintings by Surrealist artists such as André Masson, Pablo Picasso, Oscar Dominguez, Max Ernst, Victor Brauner, Leonora Carrington, Remedios Varo, Mimi Parent, Virginia Tentindo and others. She then explores those real gardens that have become a place of initiation such as the labyrinth created by Eduard James with Leonora Carrington in Mexico, the Tatin's garden in France, and the Tarots Garden created by Niki de Saint Phalle in Italy. Her essay is followed by the contribution of Marguerite Gibson, *Between Worlds: The Juxtaposition of the Australian Colonial Garden*. Gibson explores the colonial Australian homestead portrait through the investigation of the theoretical paradigm of Kant's sublime in *Critique of Judgement* (1790) and emphasizes the conflicting emotions towards the Australian landscape, as a place of safety, beauty, tranquility, yet also one of terror, fear and destruction by showing the unusual and unique juxtaposition between the dangerous wilderness of the indigenous flora and fauna of the Australian landscape to the perceived 'civilization' and control afforded with the European garden space. This section will be closed by Esther Stutz' contribution *The Garden Behind the Sitter. Painted Garden Backdrops in Early Bourgeoisie Portrait Photography*. She follows the photographic trend at the beginning of photographic developments,

namely the combination of garden scenes and portraiture in photographic studios and examines critically the relationship between bourgeois society and the beginning of the medium photography especially when it comes to the appearance of visual conventions and stereotypes. Stutz shows the close connection of bourgeoisie and the motive of the garden as a factor of representation in society at the end of the 19th century in the context of photography because the latter is able to illustrate the use of symbols as romantic garden scenes and shows several examples with different aesthetic approaches to this topic.

The last section of the essay collection, "Gardens in Films and Video Games", opens with Sabine Planka's contribution. In *From Romantic Gnarled Trees and Ruins to Seductive Heterotopias: Tim Burton's Gardens and Landscapes* she examines in the first part of her essay the relation between Tim Burton and art historical gardens and landscapes, in the second part she shows how Tim Burton integrates in accordance to Foucault a garden as a 'culinary heterotopia'. It is clear that Burton's movies show a wide range of gardens and landscapes in his movies that show his unique style. Tammie Jenkins' essay entitled *Visualizing Cultural Spaces: (Re) Imagining Southern Gothicism in the Film Midnight in the Garden of Good and Evil* (1997) argues that the film uses the garden as a cultural space in the tradition of Southern Gothicism. Jenkins uses narrative analysis to examine the ways in which gardens are used to create counter-narratives to explain events, phenomena, or experiences embedded in the actions or words of the film's characters. She shows how Southern Gothicism is used in the film to portray the concept of a garden as a physical and a subliminal place, in what ways gardens are used as cultural spaces, and what types of aesthetics are (re)imagined. Jenkins' analysis is followed by Lily Chi's contribution *Prospects in the Garden at Marienbad*. She examines three gardens, separated in time but intertwined for the issues they raise about. A brief exposition of the 17th-Century French garden, focusing on the exemplars of André Le Nôtre, serves as the basis for more detailed study of two 20th-century works: Alain Resnais' and Alain Robbe-Grillet's *L'Année dernière*

à Marienbad, and *The Garden*, a drawing from the early work of architect Daniel Libeskind. Chi uses primary historical sources, contemporaneous philosophical texts, and formal analysis to interpret and situate the three works in their critical contexts to show how gardens reveal embedded logics, and opens up critical and creative possibilities. The last essay dealing with gardens in films is contributed by Susanne Scharnowski. In *Vegetable Gardening between the Private and the Political, Past and Present. Space and Place in Richard Laxton's Grow Your Own, or: On the Importance of Growing Shark Fin Melon* she follows the topic of gardening, especially the (urban) vegetable gardening. After discussing different theories and aspects of urban gardening and the motif of the German allotment garden ("Schrebergarten"), she analyzes Richard Laxton's *Grow your Own* (2007) that presents a community of traditional English allotment gardeners, and Mike Leigh's film *Another Year* (2010), that uses gardening as a structural element as well as an ambiguous symbol. The last essay of this section and of our essay collection examines gardens in videogames, a field that has gained publicity within the last few years. Stefan Schöberlein shows in *Garden Warfare — Videogaming's Green Thumb* that the garden in video games is seen as a walled-in, protected space that replenishes drained resources or adds meditative and decorative elements to the player's virtual domestic space. By discussing and analyzing different video games Schöberlein examines the notion of "gardening" in video gaming through its functional differentiation from "farming" to reflect on the garden as an ideological place: a space that suggests monastic serenity and inwardness, while also always being a Victory Garden — an ideological monument to competition and war.

This essay collection presents lots of gardens, a potpourri of gardens, which hopefully enrich the field in discussing gardens in different cultural and literary fields through different theories. Editing an essay collection is always an adventure. It is like having a garden: the call for papers is like the seeds that have to be planted, they grow when the contributors write their essays that are like the flowers that bloom at the end of the day. The result is what we as editors had in mind and what we

have appreciated as precious, beautiful, useful and balanced as to speak with Clement: a collection of essays that show a wide range of theoretical and critical approaches. <>

[Climate Change: The Science of Global Warming and our Energy Future, Second Edition](#) by Edmond A. Mathez and Jason E. Smerdon [Columbia University Press, 9780231172837]

This second edition of [Climate Change](#) is an accessible and comprehensive guide to the science behind global warming. Exquisitely illustrated, the text is geared toward students at a variety of levels. Edmond A. Mathez and Jason E. Smerdon provide a broad, informative introduction to the science that underlies our understanding of the climate system and the effects of human activity on the warming of our planet.

Mathez and Smerdon describe the roles that the atmosphere and ocean play in our climate, introduce the concept of radiation balance, and explain climate changes that occurred in the past. They also detail the human activities that influence the climate, such as greenhouse gas and aerosol emissions and deforestation, as well as the effects of natural phenomena. [Climate Change](#) concludes with a look toward the future, discussing climate model projections, exploring the economic and technological realities of energy production, and presenting a view of the global warming challenge through the lens of risk. Each chapter features profiles of scientists who advanced our understanding of the material discussed. This new edition expands on the first edition's presentation of scientific concepts, making it ideal for classroom use for a wide swath of undergraduate and masters students with both science and nonscience backgrounds.

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Excerpt: "RAIN, HEAVY AT TIMES, will begin in late morning and continue into the evening hours as a cold front sweeps across the area ..." Ah, the weather forecast—what would we do without it? There is no shortage of conversation about the weather, which, after all, touches our daily lives. For some, the weather is very important—especially if their harvest depends on it. For others, it is more tangential. We're thinking of ourselves here; on most days, we just want to know about our treks to work in New York City. Will rain or snow make it impossible or just more miserable than usual?

And then there is climate. What might a climate forecast be like? "The next decade will bring persistent showers and mild temperatures from January through March and extensive periods of no rainfall at all throughout the summer months." Hmm ... that seems a bit remote from our immediate worry of getting to work. Although it may appear harder to connect the implications of climate to our daily lives, it is relevant. Climate dictates the kinds of clothes we keep in our closets and the way the buildings around us are made. It may drive our decisions about where to live, when we decide to visit places around the world, and what kind of car we choose to buy. So how are they different, weather and climate?

Weather and Climate

Upon reflection, it becomes clear that there are essential differences between weather and climate,

even though they are inextricably linked. Weather refers to conditions in the atmosphere at any one time. The familiar radar images on television show that local weather systems develop and dissipate rapidly over the course of hours to a day. On a continent-wide scale, weather systems form and decay over days to a week or so. A persistent weather system, such as a warm spell, may last for a couple of weeks or even more, especially in mid-latitudes, where the tracks of weather systems are commonly determined by the position of the polar jet stream, as chapter 1 explains.

Climate, in contrast, can be thought of as the "average weather" for a particular region over some period of time. We place "average weather" in quotes because climate itself is changing, so a weather average must always be defined over a specific time interval that may be different if determined over another. In any event, "region" can refer to the entire globe, as in global warming; to a large landmass, such as eastern North America; or to a small land area, as in the "microclimate" of a particular valley in a larger wine-producing region.

Although we have become adept at forecasting weather hours to a day or so ahead, predictions beyond that become progressively more uncertain with distance into the future. Weather is inherently chaotic. Strictly speaking in terms of chaotic context means that small changes may result in large differences in how a system will eventually develop. In other words, to predict weather accurately, we would have to know the temperature, humidity, barometric pressure, wind velocity, precipitation, and other characteristics of a weather system everywhere across an affected region, and even then prediction would be accurate for only the next week or two.

Being an average condition, climate is not chaotic—at least not in the same way that weather is. Instead, it displays stable and distinctive patterns of change on specific timescales. Examples include annual changes such as monsoons, which are shifts in winds that bring seasonal rains to a number of regions in the tropics and subtropics. They also include fluctuations that occur only every several years, the most notable of which is the El Niño-

Southern Oscillation (ENSO) phenomenon, referring to the periodic shifts of winds and ocean currents that bring warm water to the equatorial eastern Pacific Ocean and dry conditions to the western equatorial Pacific, and that influence climate in far-flung parts of the globe.

What does all of this mean for those forecasts that we originally imagined? On a day-to-day basis, climatologists like to boil down the differences between climate and weather to their essence: You dress for the weather and build a house for the climate. Or how about: Climate is what you expect; weather is what you get. If you are a dog owner, you may prefer: Weather is like the dog running back and forth, and climate is like the leash driving the ultimate path. Whatever your preference—and you may have your own—these examples are illustrative of the differences and dependencies of weather and climate.

One additional point must be emphasized. Climate change is a long-term phenomenon. This inherently protracted characteristic, at least in terms of human timescales, creates one of the conundrums surrounding attempts to reduce carbon dioxide (CO²) emissions from the use of fossil fuels, the main culprit in global warming. It is simply difficult to marshal either the individual or the collective will to make the changes necessary to avoid the negative impacts of global warming because they generally do not appear to affect our immediate lives.

The Climate System

Climate is a dynamic system resulting from the combined interactions of various parts of Earth with one another and with the Sun. The components include the atmosphere; the ocean (hydrosphere); glaciers, terrestrial ice sheets, and sea ice (collectively known as the cryosphere); the living biomass (biosphere); and even the solid Earth (lithosphere). Think of it as your body, with all its parts interacting in an interlocking whole. And like your body, the climate system is not just a set of physical interactions, but also a complex chemical system, with matter flowing through its various parts and influencing its characteristics.

The atmosphere, being the medium in which we live, is the part of the climate system that affects us most directly. The atmosphere contains greenhouse

gases—the gases that absorb infrared (IR) radiation—and in this way, it keeps Earth's surface in a habitable temperature range. Indeed, without such gases, Earth's surface would be frozen and lifeless. The atmosphere also plays a major role in transporting heat and moisture around the planet. Because Earth is a sphere, the Sun's heat is more intense near the equator than near the poles. This uneven distribution generates winds that carry heat from the equator toward the poles and from the surface to the upper atmosphere. Additionally, the atmosphere is not isolated from the ocean. The ocean circulates, in part driven by the winds and guided by the positions of continents, and thereby also transports heat toward the poles. Indeed, the ocean holds far more heat than does the atmosphere, but it flows much more slowly. Many of these interactions are also important in the transport of moisture around the planet. For instance, much of the rain that falls on land was originally evaporated from ocean water. The atmosphere therefore takes up enormous amounts of moisture and redistributes it around the globe based on its large-scale patterns of circulation. Finally, the atmosphere also holds ozone (O³), which shades the surface of Earth from much of the lethal ultraviolet (UV) radiation received from the Sun.

As for the chemical interactions, the most important are the exchanges of carbon among the atmosphere, ocean, and biosphere (which includes the dead biomass held mainly in soil). In fact, we can think of these spheres as reservoirs where nearly all the carbon on or near Earth's surface is stored. This description leads to the concept of the carbon cycle, referring to the flow of carbon among the various reservoirs. In months to decades, photosynthesis by plants and decay of organic materials affect the amount of CO² in the atmosphere, but over longer periods, it is the ocean that exerts the dominant control on atmospheric CO² content because the amount of carbon in the ocean is nearly 50 times that in the atmosphere. If we think of the climate system as something like our body, the atmosphere and the ocean are its main organs, and the carbon cycle is the circulation system that connects them to each other and to other organs.

Most of the carbon (more than 99.9 percent) on Earth exists not in the ocean, atmosphere, or biosphere (the "surface" reservoirs), but in a deep reservoir in the form of rocks—that is, the lithosphere. The lithosphere is part of the climate system mainly because carbon flows between it and the reservoirs on Earth's surface, but this flow is far slower than the flow of carbon among the surface reservoirs. Over millions of years, a close balance has apparently persisted between two processes:

The flow of carbon from the surface to the rock reservoirs by means of the removal of CO² from the atmosphere and the ocean through the formation of carbonate and other carbon-bearing rocks. The return of CO² to the atmosphere by means of the breakdown of those rocks at the high temperatures and pressures of the deep Earth. In fact, this long-term balance appears to have acted as a natural, planetary thermostat, maintaining conditions on Earth's surface that have allowed for liquid water to be stable and that have been conducive to the evolution and survival of life since nearly the beginning of Earth's history.

The different parts of the climate system also interact through feedbacks, or phenomena that amplify or diminish the forces that act to change climate. An example helps to envision them. As the Arctic warms due to the buildup of greenhouse gases, sea ice melts. As sea ice melts, there is less bright ice to reflect solar energy back to space, and the ocean absorbs more energy. The greater absorption of energy, in turn, further warms the ocean and overlying atmosphere, causing even more ice to melt. In this way, the melting of ice amplifies the warming due to greenhouse gases alone. This feedback in part accounts for why the Arctic is more sensitive to global warming than is the rest of the planet. Feedbacks can be complex and can operate in unpredictable ways, and they are one reason that projecting future climate is fraught with uncertainty.

The climate system is complicated in other ways, one of which is that the various climate phenomena operate on different timescales. Some of these phenomena and their associated timescales are familiar—for example, the daily variations of

warm days and cool nights, and the annual passage of the seasons. Other phenomena occur on longer or irregular intervals but on timescales that are understandable, and still others occur on timescales beyond the human experience and are consequently difficult to imagine. Our knowledge of the last may also be incomplete because the evidence for them is buried (commonly and literally) in the geological record.

Climate Change: Separating Facts from Fears

What we do know from the available records, both geological and observational, is that the climate is changing. Hardly a day goes by without some mention of it in the news. Earth's climate is warming; CO² and other greenhouse gases have been building up in the atmosphere mainly as a consequence of the burning of fossil fuel; and the scientific evidence is now overwhelming that this buildup is causing the warming. These statements are the facts of climate change.

Less certain are how much the climate will warm in response to growing emissions and to what extent the warming will change the world around us. Should the warming be substantial, it may have huge negative impacts on biodiversity, ecosystems, agriculture, ocean life, the global economy, and the well-being of human societies everywhere. These possible results are the fears of climate change.

It is important to separate the facts from the fears. The facts give us insight, but the fears reflect the risks. Ultimately, we have to understand the risks if we are to develop intelligent policies to deal with global warming. To assess the risks, we need the knowledge, so let us start with the facts.

OBSERVATIONS OF CLIMATE CHANGE: THE FACTS

In addition to CO², the greenhouse gases include methane (CH₄), nitrous oxide (N₂O), ozone (O₃), and water vapor (H₂O). These gases reside mostly in the troposphere, the lower 10 to 15 kilometers (30,000-50,000 feet) of the atmosphere, where the weather occurs. Here, the greenhouse gases absorb heat radiated from Earth's surface and thus act as a giant insulating blanket.

Greenhouse gases have been building up since the beginning of the industrial age, but only since 1958 has the CO² content of the atmosphere been measured directly, beginning first on the top of Mauna Loa in Hawaii, as described in chapter 4.2. The remarkable Mauna Loa record shows that the amount of atmospheric CO² has been continuously climbing over the years. In 1958, the average CO² content of the atmosphere was 315 parts per million (ppm) is uncertain. This is reflected in the numerous estimates of twenty-first century sea-level rise that range from about 30 to 150 centimeters (1-5 feet)

The stakes, nonetheless, are high. Worldwide, two-thirds of the cities with populations of more than 5 million people are vulnerable to the effects of rising sea level (the most serious of which are flooding during storms and coastal erosion). A sea-level rise of just 0.5 meter (20 inches) could threaten 10 percent of the world's population, amounting to some 700 million people, 75 percent of whom live in Asia. The rise will be gradual, but even a meter (40-inch) rise in this century will impose enormous economic costs and possibly also disrupt society in ways that are difficult to foresee.

Thinking About the Future in the Face of Uncertainty

As noted, we know neither exactly how much or how rapidly sea level will rise, nor how drought will affect the global food supply in the distant future. Yes, we are, for the most part, ignorant. But this is exactly the point. We are smart enough to know that we are putting ourselves at risk, but we are not so smart that we can precisely gauge the risk.

Speaking of risk, this concept was invented to deal with an uncertain future. Most of us buy insurance to mitigate risk, such as the personal financial risk associated with a house burning down. We can also buy insurance, in a sense, to alleviate the effects of climate change by adopting policies that seek to minimize the change. But there is a big difference in the two cases: while insurance should allow us to buy a new house, if climate change unleashes globally drastic calamities, unlikely as this might be, we are out of luck because we will not be able to buy a new planet. The important points are that efforts to limit climate change and

to mitigate its impacts are exercises in risk management, and that understanding the problem in that light should help guide our response. Again, this perspective is developed in chapter 12.

It is worth pointing out two characteristics of the climate system that further exacerbate the uncertainty of our future. First, the climate system possesses inertia: it takes time for the system to reach a new balance in response to the forces that have acted to change it. In other words, even if greenhouse gas emissions were to be immediately capped at today's levels, warming would continue for several decades. By one estimate, there is currently more than 0.6°C (1.1°F) worth of warming already locked in, or "in the pipeline," since the year 2000. Second, as the climate changes, it can reach tipping points, or large abrupt shifts in response to the forces that were gradually causing it to change. The geological record is replete with instances of abrupt and dramatic shifts in climate.

On a related note, students often ask us why, considering that climate has changed dramatically in the past in response to only natural forces, we should concern ourselves with human-induced changes. The answers are simple. First, complex societies were not around to experience the huge shifts of the past. The climate of the past 11,600 years, known to geologists as the Holocene, has been stable by the standards of the past 1 million years, and complex societies have been around for only about the past 6,000 of those years. Second, the current human-induced changes are proving to be far more rapid than any natural changes. So the climate system has within it the possibility of bringing about changes that are both more dramatic and more rapid than societies have ever experienced, and that could challenge their abilities to adapt.

The Story

This book is divided into four parts and takes a somewhat unconventional approach to presenting its subject. Part I is not about climate change; rather, it is about the climate system. The concept of the Earth system, of which the climate system is a part, is fundamental in geological thought, and understanding how the climate system works—in other words, how the components of the climate

system interact dynamically and chemically with one another—is a necessary prerequisite to understanding how climate responds to the forces that are acting to change it. Thus Part I recounts the fundamental characteristics of the atmosphere and the ocean, and the ways in which they interact dynamically and chemically with each other through the carbon cycle.

Part II introduces the equally fundamental concept of radiation balance, which is the scientific framework that has emerged for thinking about climate change. Here we describe the many factors that influence radiation balance. We also explore the fascinating story of past climate changes, or paleoclimate, which gives us essential insight into how climate is changing today and how it will change in the future as more greenhouse gases are injected into the atmosphere. The story focuses on the past 3 million years, but we also visit a more distant time to seek additional insight.

Part III concerns the numerous consequences of climate change. It begins by exploring how climate change since the end of the last glaciation has influenced the course of human history. It then documents the rapid increase in global temperature that has occurred over the past century and some of the changes that we are beginning to experience as a consequence of that warming. These include changes in patterns of precipitation and drought and in the occurrence of severe weather events. The Arctic is especially sensitive to warming and, at the same time, has an important influence on global climate, so we also investigate the changes there. As noted, sea-level rise is an important concern, leading us to examine what is happening to the Greenland and West Antarctic ice sheets.

Part IV is about the future. Although climate models tell us a great deal about the behavior of today's climate, they are the main means of portraying future climate, and for that reason they are included here. We argued earlier that mitigating climate change is an exercise in risk management, and recognizing this serves as a basis for developing intelligent policies to alleviate the effects. For these reasons, we devote some attention to climate risk.

Finally, obviously central to the future is how the world is going to satisfy its insatiable appetite for energy while keeping carbon emissions in check. It is the vastness of the energy-producing enterprise that astonishes, and we take on this subject as the final chapter.

That is the story. It is complex, it suggests that we face a difficult future, but it also implies that we can avoid the most dire consequences of climate change by intelligent action. <>

[Climate without Nature: A Critical Anthropology of the Anthropocene](#) by Andrew M. Bauer, Mona Bhan [Cambridge University Press, 9781108423243]

This book offers a critical reading of the Anthropocene that draws on archaeological, ecological, geological, and ethnographic evidence to argue that the concept reproduces the modernist binary between society and nature, and forecloses a more inclusive politics around climate change. The authors challenge the divisions between humans as biological and geophysical agents that constitute the ontological foundations of the period. Building on contemporary critiques of capitalism, they examine different conceptions of human-environment relationships derived from anthropology to engage with the pressing problem of global warming.

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Excerpt: On Wednesday, January 21, 2015, the United States Senate voted 98-1 to approve a resolution that stated, "[I]t is the sense of the Senate

that climate change is real and not a hoax." Shortly afterward, the Senate rejected a follow-up resolution that linked the reality of climate change with human activities: "[C]limate change is real and human activity significantly contributes to climate change." That the Senate could acknowledge that climate change was real and not acknowledge the role of humans in it serves as a fitting reminder of the politics of global warming in the United States as well as in many other parts of the globe, especially as it pertains to questions of human activities and responsibility. On one hand, it demonstrates that many people are reticent to accept (or at least are politically motivated to deny) the overwhelming scientific evidence that points to the role of human fossil fuel consumption in changing the planet's atmosphere and climate. Yet, on the other hand, it also highlights the increasing difficulty of ignoring what many senators and many of their constituents are beginning to experience and perceive: record-setting temperatures, more frequent heat waves, earlier spring agricultural planting seasons, the increasing difficulty of ice fishing on thin ice, and "white" Christmases that are now romanticized visions of a former time in some places. Alarming for many concerned citizens and scientists, it seems that the process of global warming is intensifying to the degree that it is becoming perceptible to human experience. The number of times that TV meteorologists speak of conditions that are "unseasonably warm" or "Mother Nature's" ruse of raining instead of snowing during a Midwestern January event is increasingly difficult to ignore. And yet there is still a sizable population, both among politicians and the public, who deny the role humans are playing in warming the planet. As Oklahoma senator Jim Inhofe stressed in his rejection of the second resolution, "[T]he hoax is that there are some people that are so arrogant to think that they are so powerful that they can change climate."

Given this political context, the "Anthropocene" — a proposed designation to formally acknowledge the "recent age of humankind" on the geological timescale of earth's approximately 4.5 billion year stratigraphic record of rock chemistry, species evolution, and climate change — is a much needed scientific and public call to foreground the actions

of humans in altering the planet's ecology, surface materials, and broader systemic functioning. And yet, at the same time that the Anthropocene highlights human action in shaping earth's climatic trajectory, the designation also continues to hold people apart from Nature while overlooking the vast differences that characterize the human species. As a proposed new geological or historiographical period, most scholars place its beginning around either 1800 or 1950 — marking the time when humans became a "geophysical force" following the advent of the steam engine and their subsequent reliance on fossil fuels in the case of the former, or the "great acceleration" in the consumption of fossil fuels and many other human activities that affect the earth system in the case of the latter. The Anthropocene periodization, for many of its proponents, identifies a time when the earth system has "left its natural geological epoch" as a consequence of human activities. In short, prior to the onset of this new period, earth's climate operated in a "natural" state. After the beginning of this period, humans have "replaced nature as the dominant environmental force on Earth". Paradoxically, while earth systems scientists recognize human actions as constitutive elements of the earth system, in their common characterization of the Anthropocene they continue to hold humanity and Nature apart.

Ironically, it is arguably the perpetuation of this dichotomy that impedes a progressive politics of global warming. Is it not precisely an ideology of Nature that exists without human influence, either now or in the past, that is mobilized by those who are no longer global warming naysayers but refuse to see the ways human interventions (undoubtedly some more than others) have and could contribute to climate change? As we demonstrate in this book, humans have long been embedded in the material workings of the earth system, and many of its environments and its planetary conditions have not been unaffected by humans for at least thousands of years. This recognition, we suggest, might potentially provide the basis for a more progressive politics of climate change in which representations of the global environment or climatic system as stable or natural, whether now or in the past, are replaced with a historically

informed view on the complexity of how the environments that humans inhabit have always been constituted, not in some pure domain that stands apart from human society but instead through differentiated and place-based human—nonhuman relationships that articulate with climatic conditions. Would that not open up debate about what configurations of people and other-than-human inhabitants of particular places are desirable, for whom, and how those might be achieved, constituted, or disrupted? While these might very well be the political goals and implications for advocating the designation "Anthropocene," the concept, as first and foremost a new period in which humans have replaced "nature," may largely work against them by reifying Nature's very existence as separate from Society.

To address the questions above requires a temporally much deeper historical understanding of how humans have been differentially embedded in the material workings of the earth system than what most proponents of the Anthropocene have hitherto stressed. The Anthropocene's emphasis on the emergence of humans as a "geophysical force" within the last 50 or 200 years — or, in some arguments that have linked the Anthropocene period to the development of a capitalist and colonial world system, the last 500 years — has hardly begun to underscore how humans began contributing to much of what is considered to be natural about the planet's atmospheric conditions and environmental systems prior to the onset of this proposed new epoch. To do so necessarily requires archaeology and the detailed studies of human land use and technological and social practices over the long term. Yet despite a considerable emphasis among archaeologists on studying human responses to climate change in the past, archaeologists themselves have been largely silent on questions of the Anthropocene until very recently.

In this book we review material on long-term and contemporary relationships between humans and the planet's ecology and atmosphere to examine the historicity and the political implications of the Anthropocene designation. Doing the latter, however, also means addressing the role of political economic forces as well as actors

differentiated by class, race, gender, or location in shaping the current climate crisis. To be clear, the Anthropocene has hardly been produced equally by a singular *Anthropos*. If we recognize that many formulations of the Anthropocene fail to account for both the differentiated responsibilities and vulnerabilities of humans, it is also imperative to ask how, and under what conditions, are such inequalities produced and intensified. Given this context, we are faced with a critical question: How might letting go of Nature, not just in the present but also in the past, disrupt the foundational premise of the Anthropocene and yet be cognizant of the ways in which systems of production, human inequalities, and differentiated social contexts have contributed significantly to ongoing global warming, particularly over the last few hundred years? At the same time, how might we account for human experiences of a changing climate, which necessarily differ across social, economic, and geographical divisions? The US Senate has now belatedly acknowledged what nearly all of the world's scientists and many of its citizens have long known: Climate change is "real." This means that addressing the politics and implications of global warming also requires addressing how people conceive, experience, and perceive their relationships with their changing environments, a task that is best suited for cultural anthropology. A critical anthropology of the Anthropocene thus requires collaboration that draws on the strengths of the discipline's different methods and the domain expertise of its various subfields. In the pages that follow we combine archaeology and sociocultural anthropology to consider the empirical basis and the philosophical and political implications of the Anthropocene.

The idea for this collaboration began during a conversation in 2011 about how the combined insights from archeology and cultural anthropology could be used to counter climate's "abstractness," which has arguably greatly impeded wider policy and public support against mitigating global warming and its devastating consequences for human and nonhuman populations of the world. How could anthropology, with its deep commitment to historical understanding and social and political justice, use the experiences of people to build a

politics that is mindful of large-scale climatic shifts while also being attentive to the ways people engage with houses, cars, soil, sand, sediments, mountains, trees, animals, and glaciers? It was clear to us that, as anthropologists, we had to address the category of "weather" to rethink and reimagine a politics of global warming that privileged people's everyday experiences, rather than rely solely on rendering concrete abstract data from atmospheric and climate scientists. At the same time, however, we also recognized what many earth system scientists have demonstrated for a long time: that earth's climate is a dynamic assemblage of interactions among a multitude of different things and materials, ranging from the gravitational pull of massive celestial bodies that impact earth's orbit around the sun to the production of atmospheric methane by microscopic bacteria in waterlogged soils on earth's surface. Thus, materializing climate — by which we mean foregrounding how humans are embedded in a broader materiality that is constitutive of social, environmental, and climatic conditions — was a common point of departure to both assess how humans participate in climatic production over the long term and also how they perceive and experience their lives and welfare within this broader materiality. This seemed especially important within the context of shifting weather patterns, which are increasingly becoming the norm for populations across the globe with consequences for people's lives and livelihoods, their cultures, and modes of engaging multiple social and material worlds. Indeed, as we detail in this book, the rapid and profound transformations in people's sociomaterial lives are taking place within the context of large-scale infrastructural interventions and the intense commodification of environmental resources such as land and water, which are dramatically altering the relationship between humans and nonhumans and shaping people's perceptions and experiences of weather.

Since our conversation in 2011 we have both conducted multiple field seasons of anthropological research in South Asia, an area of the planet that is highly vulnerable to climate change. Bauer conducts research in South India on periods during which inhabitants of the Southern Deccan began differentially reshaping environmental conditions

and simultaneously contributing to atmospheric greenhouse gas concentrations, all in the context of developing social inequalities thousands of years ago. Bhan conducts research among contemporary mountain communities in the heavily militarized and war-torn border provinces of Jammu and Kashmir. These communities are currently experiencing massive ecological catastrophes that include an unprecedented number of floods associated with melting glaciers and extensive infrastructural development that is limiting people's access to resources and disrupting their networks of kin and family. The critical understanding of the Anthropocene and the intervention that we offer in the following pages could not have been written with just one of these research settings and methods. By bringing together insights from archeology and cultural anthropology we thus hope to shed critical light on the Anthropocene concept and some of the most pressing issues of environmental and social justice of our times, the politics of which most of our politicians are just beginning to confront.

In our view, anthropology should embrace the calls of earth systems science for understanding the role of humans in earth's functioning; but the claims of earth systems science and the claims of the Anthropocene are not the same, and must not be conflated. The former points to relationships between humans and nonhumans in giving shape to earth's history. The latter gives unique abilities to the human species as a modern geophysical force to master Nature. We contend that to recognize the long-term historicity of humans as geophysical actors does not weaken the kind of political mobilization around anthropogenic climate change that usage of the Anthropocene as a political label was intended to achieve. On the contrary, it calls attention to the numerous relationships that people establish with other things and organisms that contribute to atmospheric conditions and climate. To call attention to the climatic effects of historical land use is not to deny that the effects are different under capitalism, or since the "great acceleration" and nuclear bomb. Rather it highlights that to exist on this planet is to be embedded in the earth system and to have an effect on other beings so that we might think more critically about the

assemblages we participate in, produce, enable, and disrupt. This recognition does not frame current global warming as an "inevitable outcome of human becoming". Precisely the opposite, it calls attention to the earth system as a historically contingent emergent product of relationships among tangible and differentiated people and things — rice fields, soils, trees, cattle, and cars — that mediate human-related atmospheric effects and contribute to its functioning. In other words, it gives us a framework to acknowledge how specific actions (e.g., using fossil fuels) shape earth's present and future while acknowledging that the historical subject and actor need not be understood solely as the species, or a generalized anthropos.

This does not weaken our commitment to address how capitalist systems, the obsessive drive for profit, or the unequal relations of production are related to the ongoing climate crisis. On the contrary, challenging the Anthropocene narrative disrupts the sharp distinctions between Nature and humanity, which we argue is crucial for refuting modernist ideologies of Nature and for reshaping an environmentalism that might actually constrain political responses to global warming. As long as one maintains and legitimizes the distinctions between Nature and humanity, whether in the past or in the present, one provides an easy alibi for many political pundits to acknowledge climate change as a real phenomenon and yet maintain its strictly "natural" origins, divorced from human actions or, as we have shown here, from human—nonhuman entanglements that have long produced environments and related climatic assemblages. Indeed, it is precisely the binary between Society and Nature that is mobilized by those who are no longer global warming naysayers but who refuse to see the ways human interventions have and could contribute to climate change, such as the US senators with which we opened this volume.

In our view, it is no happy coincidence that most academic discussions of the Anthropocene are directed at those who are aware of the alarming changes to global climate that are being wrought by human activities, and particularly the consumption of fossil fuel usage. Indeed, social scientists and humanities scholars who are debating the utility of the Anthropocene generally need no

further convincing by earth system scientists of the long-term climatic effects of anthropogenic greenhouse gas production. As Latour conveniently notes in his essay on conceptions of agency and politics of the Anthropocene: "Even though we have to continue fighting those who are in denial, I propose that we let them alone for a moment and seize this opportunity to advance our common cosmopolitics" (4). In concluding, however, we think it is important to pause for a moment and take stock of the position of those who are in denial, so that we might more fully address the concerns of those who champion the cause for earth's many human and other-than-human inhabitants. To fight those who are in denial we have to recognize the concepts through which they deny.

For most citizens and politicians — and there are many, especially in India and the United States! — who are resistant to developing policies to reduce fossil fuel consumption and greenhouse gas concentrations climate change is a "natural" phenomenon. Climate is conceptualized as external to and impenetrable by human society. It is Nature. This is why we are skeptical of the ability of the dominant Anthropocene narrative to further generate a public around the problem of global warming, or to erode the position of those that fiercely contest human roles in shaping earth's trajectory for all species on the planet. While the Anthropocene makes an explicit call to refute the claims that global warming is "natural" and to recognize human participation in shaping earth's systemic functioning, it is critical to point out that it does so at the cost of maintaining the same ontological footing on which many politicians foolishly stand — reproducing the very ideology of Nature that enables their position. We thus find it difficult to accept that marking a departure from earth's "natural epoch" with the emergence of our species as a geophysical force in 1945 or 1784 is really the best narrative for calling attention to the gravity of global warming and the importance of taking responsibility for mitigating its effects. The Anthropocene effectively cedes the terms of Nature and Society, and thus does little to disrupt the comfortable locations of many who believe that there is such a thing as a climatic system that is

insulated from the biosphere and the activities of all those living on earth, including humans.

In the end our principal point is a basic one: If the most radical political aims of the Anthropocene are to disrupt the belief in the externality of Nature and to ask people to take responsibility for impacting the climatic system then the Anthropocene narrative fails in its essential formulation. First, in its efforts to hold humans accountable as a singular geophysical force it absolves them of their culpability for differentiated actions. Second, it is difficult to agree with the many claims that the Anthropocene ushers in a period that is post-Nature, or after-Nature, when its periodization and unapologetic anthropocentrism effectively reproduces the concept. If the defining characteristic of modernity is the push to purify the world into two distinct spheres of Nature and Society, then the search for the Anthropocene—the spatiotemporal demarcation at which the Earth system departed from its natural trajectory—is the ultimate extension of this project to the globe. While many plants and animals continue to go extinct, the Anthropocene narrative gives a high modernist ideology of controlling natural forces a new lease of life. An unintended consequence of this is thus quite unfortunate: It leaves no scope for alternative ways of environmental engagement that exist, or existed, within human—nonhuman societies past or present, and thus profoundly undermines an alternative politics of human—nonhuman relationships that does not treat humans as autonomous actors or follow the Promethean script of controlling and subduing Nature.

By downplaying the role of humans in environmental production during a prior period, the Anthropocene does precisely the opposite of what many who advocate its usage hope to achieve. Rather than holding humans responsible for producing environments at multiple spatial scales and over multiple temporalities, it ironically rehashes the evolutionary distinctions between savagery and civilization while reproducing an ideology of Nature as a depoliticized domain that existed outside of human action and history. How, then, can we question those who are apathetic to a politics of global warming now? As Morton reminds us, to live on earth is to coexist. "Ecology shows us

that all beings are connected. The ecological thought is the thinking of interconnectedness" (7). In our view, doing away with the Anthropocene divide allows us to more fully call attention to the various ways that humans have long been connected to earth's history and how they continue to be connected to it today. In asking people to take responsibilities we are simultaneously further enabled to foreground a much broader range of "response-abilities".

It is here where we find ourselves joining voices with others that have sought to resist fatalism, and to call attention to what can be done — the ways in which situated human and other-than-human relationships continue to affect climate and all life on earth. This is a charge that falls squarely in the domain of anthropology, a discipline uniquely equipped to investigate how human welfare articulates with a variety of other things and beings at multiple scales and temporalities, and in contexts that have been folded into modern capitalism as well as those that are, or were, outside of it. This means taking seriously the material interconnections offered by earth systems science while also providing a critical appraisal of the Anthropocene narrative — a narrative that attributes action to a generalized anthropos and reproduces a modernist ideology that can hardly serve as the basis for recognizing the variety of ways humans engage, perceive, and imagine living with the various other constituents of earth. Indeed, if the anthropos does act, it does so only as a heterogeneous assemblage of people as they differentially and situationally establish relationships with others and a plethora of dynamic materials and living creatures. It is how these relationships are forged, rendered, reproduced, and altered that thus partly gives shape to earth for all. Through investigating them we might similarly imagine our roles in shaping earth differently. Anthropology — with all of its subfields — could not be more critical to this project. <>

[The Oxford Handbook of Energy and Society](#)
edited by Debra J. Davidson and Matthias Gross
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[The Oxford Handbook of Energy and Society](#)

presents an overview of this expanding area that has evolved dramatically over the past decade, away from one largely dominated by structural, political economic treatments on the one hand, and social-psychological studies of individual-level attitudes and behaviors on the other, toward a far more conceptually and methodologically rich and exciting field that brings in, for example, social practices, system complexity, risk theory, social studies of science, and social movements theories. This volume seeks to capture the variety of scales and methods, and range of both conceptual and empirical analyses that define the field, while drawing particular attention to indigenous peoples, poverty, political power, communities and cities. Organized into seven sections, chapters cover social theory and energy-society relations, political-economic perspectives, consumption dynamics, energy equity and energy poverty, energy and publics, energy and governance, as well as emerging trends.

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Excerpt: A Time Of Change, A Time For Change: Energy-Society Relations in the Twenty-first Century

ENERGY, simultaneously ubiquitous and invisible, is the current upon which cultures, economies, politics, technology, and relations of social power have ridden throughout human history. Invisible, but eminently directional, that current describes a historic trajectory ever uphill. Just as increased energy inputs enrich our ecosystems in increasingly complex webs, so too has there been a clear relationship between energy consumption and social complexity, despite significant leaps in efficiency. As noted by Urry, "contemporary cultures presuppose huge concentrations of energy so as to power the modern world and its machines." Securing access to energy over time is a key task for ensuring the survival of any society, but at least since the close of World War II, those fortunate enough to live in Western, developed countries have had the luxury of complacency—so long as the lights turn on and the gas station is open, most people in the West could leave it to a handful of

engineers, politicians, and corporate executives to figure out the details outside the limelight. The 1973 oil crisis did capture attention, but at least in the USA it was mainly understood as political crisis—a response to US support for Israel during the Yom Kippur War—rather than an oil supply crisis per se. That attention was all too brief; the solar panels installed on the White House by Jimmy Carter later in the 1970s were ceremoniously removed by Ronald Reagan. Taking society's cue, sociologists too largely ignored energy, although there have always been those on the outskirts who have attempted to draw the discipline's attention for a century.

That current, always turbulent, is beginning to shift in ways that have begun to jar scholars, politicians, and business executives alike. The political, social, and economic importance of energy has come to the fore at the beginning of the twenty-first century, and there are no signs of it receding again into the background. First, as has been made strikingly clear in international climate negotiations, this current is made up of a few main channels and many small streams, with the populations of a small number of developed countries consuming vastly more energy resources than the remainder, with over a billion people today lacking secure access to electricity. As has been noted repeatedly in these negotiations, developing countries have a right to enjoy the benefits of fossil-fuelled economic development, too. And yet, as has also been noted, energizing the rest of the world up to the standards enjoyed in the highest-income countries is not climatologically, ecologically, or even geologically possible with fossil fuels. Even for those developed economies, there is a rapidly receding confidence in our ability to continue to rely on conventional fossil fuels to foster economic growth. Remaining global reserves of fossil fuels are indeed quite large, but they consist primarily of unconventional sources, including shale, heavy oil, bitumen, and kerogen. The economic costs of their exploitation, not to mention the environmental and social costs—through methods like oil-sands mining, hydraulic fracturing, deep-sea drilling, gas-to-liquids and coal-to-liquids processes—are currently higher than those same costs associated with conventional deposits, and they may well continue to escalate in

the future in the absence of substantial technological advances or alternatives. Regardless of their quantity or quality, burning them currently accounts for upward of 70% of the greenhouse gas emissions that have been attributed to rapid climate change.

However, there are few indications that fundamental shifts in the current consumption patterns and energy-intensive lifestyles that characterize modern societies will emerge with ease. To the contrary, the world's hunger for energy appears to be following an upward trajectory, and fossil fuels remain the most readily accessed, due in no small part to preexisting political and physical infrastructures that have evolved to support those fuel types. The present challenge is considerable: to effect a socio-technical transition to energy-society relations that are greenhouse-gas-emission free, while also minimizing other environmental impacts, and at the same time ensuring equitable access to energy resources. Whereas the Industrial Revolution was effectively an energy revolution, as coal and oil were used to industrialize and mobilize the Western world, contemporary transitions will necessarily be equally revolutionary. As with earlier energy transitions, doing so promises to both require and facilitate concomitant transformation of forms of social organization that may very well leave no social subsystem unaffected. One important driver of this transition is political-economic in nature, and given the political power of fossil-fuel interests today, any efforts toward transition away from reliance on such fuels have been and will continue to be fiercely resisted. Investment decisions that shape the direction of research and development are also pertinent. A third key driver pertains to the organization of energy access: our current, highly centralized systems of energy production and delivery increasingly are being called into question, and in some cases are being replaced by decentralized modes of energy production, including small-scale, community-based, and cooperative models. Other drivers are subtler, described by discourses and cultures of energy that follow unpredictable pathways, yet strongly shape everything from legislation to consumption practices.

New Political Realities

The reluctant acceptance by members of the international political elite of the inevitability and severity of the impacts of climate change has marked forever a fundamental shift in the politics of energy. The title of Jörg Friedrich's recent book, *The Future Is Not What It Used to Be*, describes a notable decline in confidence in our prospects for continuation of the economic progress enjoyed by the West since the close of World War II. Historical trajectories of economic growth stop here, and twenty-first-century societies seem to be left with a rather poor set of choices: put the brakes on the economy, or set the climate to boil.

The crux of the issue is a dilemma dubbed the carbon bubble: representing the carbon content of remaining fossil-fuel reserves that must be kept in the ground to prevent dangerous levels of global warming. According to an analysis published in *Nature*, a third of global oil reserves, half of natural gas reserves, and over 80% of coal reserves should remain unused from 2010 to 2050 in order to meet the target of limiting global warming below 2°C. The implications for the world's economies in general are alarming. Fossil fuels are used to heat and electrify homes, offices, and factories, and, perhaps most crucially, to move things. The mobility of people, material goods, and currencies defines contemporary societies to such an extent that there are almost no activities that are significant in the modern world that do not entail movement of some kind, virtually all of which depends upon oil. But the implications of the carbon bubble also have a far more specific character: much of those fossil fuels are already "owned" by energy companies, whose portfolios depend on their expected future exploitation; ergo, a bursting of this bubble would render some of the largest and most powerful corporations in the world, and many petro-states, penniless. As quipped by Biel, "in a bizarre way, wealth flows to those who cause the most entropy;" and collective efforts to restrain that entropy constitutes a direct threat to those interests.

This context sheds light on the increasingly acerbic politicization of climate science. As research by McCright and Dunlap indicates, efforts by members

of the US federal government to manipulate climate science at the behest of conservatives goes back decades. None of this should come as a surprise since, as noted by Friedrichs, "when our entire way of life is at stake, the struggle over knowledge is bound to be political." Global social movement attention to climate change has nonetheless continued to grow alongside these efforts. And, sharing less of the limelight, but no less consequential, growing resistance in civil society to fossil-fuel development has also emerged, taking the form of divestment campaigns, local resistance to pipelines and hydraulic fracturing, and a growing number of legal efforts to hold government and industry accountable. Personal- and community-level experiments in low carbon transition are also growing in number, and with the increasing availability of small-scale renewable electricity-generation technologies, many consumers have become "prosumers," demanding more control over the goods and services that they consume. Attention by civil society to energy and climate change is significant, and already has generated results: a number of nations, states and provinces, and municipalities have instituted bans on hydraulic fracturing; fossil-fuel divestment campaigns continue to grow in number and effectiveness; and protests such as No Dakota Access Pipeline (#NODAPL), which 10 years ago would likely not have attracted even national attention, has generated an international response.

Underlying this momentum, however, lurks an elephant: optimism regarding prospects for a smooth and rapid renewable energy transition are increasingly recognized as overly naïve. Research by York, among others, illustrates that expanding the use of non-fossil-fuel energy sources does not necessarily suppress the use of fossil-fuel energy sources. In response, Geels urges his transition-focused colleagues to focus not just on up-scaling green alternatives. As he argues, ironically, the prevalence of academic attention among transition theorists on new innovations in renewable energy "may serve to protect existing regimes by detracting attention from the fossil fuel burning problem". In short, environmental social scientists need an equally ambitious research program focused on preventing existing fossil-fuel reserves

from being burned. There is no better example of this than the inflated subsidies committed to fossil fuels. According to a recent International Monetary Fund (IMF) Report, pre-tax basis subsidies for petroleum industries reached \$480 billion in 2011. When the negative externalities from energy development and consumption are factored in, that subsidy rises to \$1.9 trillion. Favoritism toward fossil fuels is not the only constraint; even renewable energy alternatives generate opposition or introduce challenges of their own, and are, furthermore, also associated with environmental impacts, and thus, as Venderheiden reminds us, the politics of energy involves selecting from among a set of imperfect options, and some scholars believe that many of the alternative energy resources are simply not up to the job of powering our current global economies.

Even further backstage are enduring political issues that are not in the limelight (but then again, they never have been) as the geopolitics of fossil fuels has more often than not been a behind-the-scenes affair. The consistent backstage position of oil geopolitics is, in and of itself, remarkable: struggles to control world energy resources played a role in both world wars and the Iraq War. The need to secure transport routes has always been the centerpiece of maritime military movements, constituting heavy state revenue commitments. Marriott and Minio-Paluello note that the "oil roads" that run from extracting states to consuming states have remained remarkably constant over the decades. These researchers describe the pipeline routes from the Caspian region to EU markets as a tangled web, laid atop a checkerboard of unstable and conflicting states, with Iran, Russia, Kazakhstan, Azerbaijan, and Turkmenistan squabbling over control of production, and this mass relocation of fossil fuels requires constant coordination of logistical and financial resources. Meanwhile, the emergence of both new producing states, including several underdeveloped African nations like Algeria and Angola, and new consuming states like China has disrupted a decades-old geopolitical regime previously dominated by a small set of Organization of Petroleum Exporting Countries (OPEC) and the United States. China may have plenty of coal, but must import oil to support its

rapid industrialization. Production in the extreme periphery, like Nigeria, has had disastrous social, economic, and ecological effects.

New Material Realities

While energy and society relations are in many ways socially constructed, with numerous social factors shaping demand, supply, and delivery of energy resources—many of which will be explored in detail in the chapters to follow—those resources still have a physical (and ecological) reality that comes into play in markets, politics, and cultures. Underlying this materiality is a simple fact: one cannot produce or create energy, but can only transform it from one source into another. A power plant does not produce energy, or "power;" but rather transforms it, as when nuclear energy is transformed into electrical energy. Energy is not something that simply disappears or "evaporates"; it is merely transformed, either by itself or by human activity, and is thus always a part of social life. Through the process of transformation, from a raw material into a product that can be used, another transformation takes place, from more concentrated and organized, to more dissipated and disorganized forms. Interest in this entropic law has been largely limited to energy scholars, although a number of social scientists, from Marx to Georgescu-Roegen, have given it attention. Today, the arguments of these scholars that entropy is far more than esoteric are beginning to resonate.

That resonance is associated with a new material context that is unprecedented for our century-long relationship with fossil fuels. The concept of "peak" fossil fuels has been largely misrepresented in public and political discourse to imply that we are running out of oil, gas, and coal reserves. As energy analysts are quick to point out, the earth's crust is still replete with the stuff. But the quality of those reserves has been in decline since the first moment of extraction, and continued reliance on fossil fuels portends an increasing intensity of investment and ecological impact as the quality and accessibility of remaining reserves declines. This historic trend is alarming for environmental reasons—the explosion on British Petroleum's Macondo drilling rig has been attributed to corporate negligence, but the fact that the well was

drilled to an unprecedented depth of nearly 25,000 ft (7.6 km) rendered such an accident more likely, and more disastrous. Why would British Petroleum choose to drill at such a depth? Simply because more accessible reserves are becoming harder to find, to the extent to which we may no longer be able to rely on increases in fossil-fuel-based energy consumption to support growth. As noted by Moore, our turn toward lower quality fuels "has brought with it a monstrous turn towards toxification on a gigantic scale—from unprecedented oil spills to the 'hydraulic fracturing' of natural gas exploitation to coal's mountaintop removals, energy production in late capitalism increasingly manifests as a qualitative leap forward in the erosion of the conditions of human, never mind extra-human, well-being."

This historic trend is just as alarming for economic reasons. Again referring to Moore, the prospect of discovering new global reserves capable of underwriting the next century's progress at anything close to the pace enabled by the capture of fossil fuels during the previous century is slim. The recent boom in fracking has been hailed loudly by proponents as the rebirth of energy independence in places like the United States, but for those with any understanding of the limited quality of shale reserves, and the costs of their exploitation, this moment in the history of fossil fuels is more accurately conceived as the retirement party. Over the past few years, energy companies have adjusted to current economic realities by taking on increased debt, while petro-states lower royalties and offer other forms of subsidy, but these management strategies clearly have their own limits. Why does this matter to our economies? "If the dollar is pegged to anything today, it is pegged to a barrel of oil".

New Epistemological Realities

Energy is in many ways a special field of study. Energy is an inherent, intrinsic aspect of social change that can be seen not only as the glue that holds together different elements of the social order, but also as a force that helps to transform them, by facilitating the creation of new social arrangements. Energy also sets the boundaries by which such transformations must abide. The

structuration of energy access is a complex problem that touches on many areas of science and culture. Access to energy and the development of innovative new technologies are interlinked with geology and engineering, as well as economic and political processes, and cultural patterns of energy use. The social sciences have in many ways remained on the sidelines of inquiry, but that appears to be starting to change.

The genre of energy and society research in the social sciences has evolved quite dramatically over the past century, a course that began with the prevalence of structural, political economy treatments. To these were added social-psychological attitude studies, particularly during the 1980s oil embargo, which motivated efforts to stimulate conservation in the West. Toward the end of the twentieth century, the field began to open up considerably, with the inclusion of cultural studies, social practice and actor-network theories, multilevel systems transition theories, and, most recently, a return to those original materialist accounts, but with the integration of recent advances in complexity theory, among other insights. This historical trajectory has brought forth a conceptually and methodologically exciting field that is well represented in the chapters in this volume. The developments in social analysis of the energy-society relationship that have emerged have the potential to fertilize the discipline of sociology and related fields with pertinent new ideas and findings germane to contemporary politics and economics, while simultaneously advancing social theory.

Sociology has not always been fertile ground for the consideration of energy and society relations. Major parts of the discipline were founded on principles of what Catton and Dunlap called human exemptionalism—the belief that social processes can only be explained by other social processes—and thus adherents to the discipline for the most part neglected the role of energy in society, as well as any other causal mechanisms other than those originating in the social sphere. The handful of scientists speaking to energy-society relations came from neighboring fields in the social sciences—like anthropology and economics—or even further afield, in the natural sciences. Wilhelm

Ostwald, having coined the term sociological energetics, was a chemist by training; Howard T. Odum developed the concept of emergy—an effort to capture the embodied energy in all material components of social life—from his disciplinary home in ecology. Herbert Spencer, despite his development of a concept of energetic sociology, was more of an evolutionary biologist and philosopher than a sociologist in today's understanding. Spencer developed an ambitious theory of social evolution based on the principles of energy—an effort largely lost on contemporary scholars due to strong criticism of other aspects of his work. Leslie White was also an anthropologist, and drew heavily from the natural sciences to develop his understanding of the material (energetic) bases of social, and in particular economic, change.

William Cottrell's work, published in book form in 1955, is among the few works focused on energy to emerge from sociology prior to the 1980s, and continues to be held in high regard among energy and society scholars today. Cottrell provided a history of social development from low-energy societies to modern industrial societies, placing particular emphasis on the explanatory power of the forms of energy available, and the role of technology in determining that availability. Many current sociologists and others have continued to find merit in the work of economist Georgescu-Roegen. Georgescu-Roegen was quite preoccupied by energy's entropic character, and its implications for economies and societies, in which we continually yet fruitlessly attempt to oppose this force. As noted by both Georgescu-Roegen and Cottrell, economic growth necessitates an increase in overall material and energetic flows; equally important, power is intimately associated with control over energy, and shifts in energy availability and form thus have enormous disruptive potential.

More recently, the changing material circumstances discussed in the preceding have reinvigorated materialist approaches, integrated with more recent scholarship in complexity theory. These scholars frame energy-society relations in metabolic terms of funds and flows, path dependency and transition. John Urry stated, "the human and physical/material worlds are utterly

intertwined and the dichotomy between the two is a construct that mystifies understanding of the problem of energy." And yet he devoted much of his last decade of life to seeking that understanding. His treatment of the private automobile offers an exemplar of the integration of materialism and complexity theory. The car is strangely absent from sociology, he notes, and yet Western society has been wholly shaped physically and culturally to accommodate it. Importantly to his analysis, it is also the single most important form of personal environmental impact, and wholly dependent upon a resource access to which is in decline: oil. And yet the "car-driver"—a hybrid assemblage of activities, technologies, infrastructures, and cultures—is frustratingly resilient. Urry notes, "what is key is not the 'car' as such but the system of these fluid interconnections."

Working our way down to the bottom of the pecking order are individual consumers. Consumer attitude studies emerged in the 1980s, and attention to energy consumers has continued to grow in the ensuing decades, although today this field has expanded considerably to include, at one end of the spectrum, more sophisticated computer-based statistical behavioral modeling. Much of this work identifies a consistent "value-action-gap" between the expressed sentiments of consumers and their actual behavior, reinforcing what Jevons quipped so long ago: "It is wholly a confusion of ideas to suppose that the economical use of fuel is equivalent to a diminished consumption. The very contrary is the truth." At the other end of the spectrum are actor-network-theory-influenced analyses that place far more emphasis on the cultural context within which consumption practices emerge. Currently the repertoire of energy and society analysis within sociology also includes a panoply of studies at all scales, but particularly, an explosion of work focused on communities, albeit with a postmodern twist. As described by Campbell and colleagues the very concept of community has been recast within sociotechnical energy systems, highlighting the roles of spatially-delimited communities of interest and practice, described in terms of "flows of agency, capacity, and value ... [and] the sociocultural role of power within any energy production regime." Similarly, sociologists

have begun to play with the concept of energy culture, defined by Sheller as "specific assemblages of human mobility, transport of goods (logistics), and energy circulation ... embedded in ongoing processes of mobilizing, energizing, making and doing". These conceptual innovations have been stimulated in large part by the socio-technical innovations unfolding around us, particularly the opening up of energy politics due to the increased access to decentralized and less capital-intensive forms of electricity generation, disrupting entrenched power relations. Those power relations themselves have received renewed attention, with a greater degree of focus on the role of energy itself in shaping those relations.

While attention to energy issues is growing in sociology, as well as other areas of the social sciences and humanities, many of these efforts remain at the fringes of academic inquiries into energy. We hope that this Handbook will help to close that gap, while presenting an overview of a field that has achieved a considerable level of maturity and relevance.

Our contributors represent the discipline of sociology primarily, but we also have included contributors in complementary fields, where we believe such complementarity is valuable to the study of energy and society. The frequency with which we have felt the need to do so reflects the necessarily interdisciplinary nature of the research inquiries involved, and the cross-fertilization across disciplines that has enriched this body of scholarship as a whole. We also have sought to bring together contributors who can provide a broad international perspective, and we have included both senior scholars as well as emerging scholars whose work we feel has strong potential to make significant new contributions to the field.

The organization of this Handbook was done with a number of specific objectives in mind. First, we have attempted to capture a variety of scales and methods, and a range of both conceptual and empirical analyses that define the field. We include contributions that focus on the continued importance of, and rapid changes in, the roles of individuals, communities, industries, scientists, states,

and civil societies. Recent developments in energy production, consumption, politics, and governance are all highlighted, notably as they pertain to the rapidly growing sectors of renewables and non-conventional fossil fuels. The book is divided into seven parts capturing what we believe are the primary sociological fields of inquiry into energy and society today. Each part contains a handful of diverse perspectives within each of these fields, and is prefaced with a short essay synthesizing the key themes.

In Part I, "Key Contemporary Dynamics and Theoretical Contributions," we highlight sociology's response to calls on global society to radically transform its relationship with energy away from dependence on fossil fuels, or to confront the collapse of civilization's ecological foundations. Necessarily broad in scope, this field draws on complexity theory and systems thinking to grapple with society's precarious relationship with energy today. Part II, "The Persistent Material and Geopolitical Relevance of Fossil Fuels," offers a set of contemporary analyses, highlighting the renewed interest among many scholars in structural and political-economic perspectives, and the persistent material and geopolitical relevance of fossil fuels.

Part III, titled "Consumption Dynamics," highlights the elemental role played by individual consumers in energy consumption and the prospects of energy system transition. Attention is given, first, to global consumption patterns, exploring in particular geographic shifts in sites of consumption, with consumption rates growing rapidly in emerging economies. Attention then turns to research on recent empirical studies that have attempted to quantify the "behavioral wedge;" the potential efficiency gains that could be realized with relatively minor shifts in household behavior, and its flip side, the so-called value-action gap, before turning to more recent work that evaluates energy consumption for a social practice lens.

Part IV, "Perspectives on Energy Equity and Energy Poverty," offers perspectives on equity, and poverty in energy access, highlighting the extent to which sources of the earth's energy resources are by no means equitably distributed. The negative

social and environmental impacts of development, moreover, are borne by communities at the sites of production, while the resources themselves and the wealth they generate are most often exported for consumption elsewhere. Analyses that integrate both the sociopolitical and biophysical structures of energy-society relations raise uncomfortable questions about energy, poverty, and justice.

Part V is focused on "Energy and Publics:" The role of public perceptions, their expression in politics and the market, and their emergent effects have in many circumstances had a notable influence on energy policymaking, and in ways that do not necessarily favor improvements in sustainability, energy conservation, and efficiency. This section will especially focus on agenda-setting processes for critical energy issues by using different social theoretical frameworks.

We then turn in Part VI, "Energy (Re) takes Center-Stage in Politics;" to the role of states and social movements to explore dynamic shifts in energy politics and governance taking place today, including the growth in number, and successes, of mobilized opposition to energy developments such as pipelines, mountaintop removal (coal), coal/open-cast mining in general, and hydraulic fracturing, as well as renewable energy developments. These encounters raise the possibility that we are experiencing the emergence of a new energy-focused global social movement, one that is independent of and yet has several implications for the politics of climate change. At the same time, significant shifts in governance have had their effect on energy politics, with de-decentralization in some cases, while in others more centralized governance structures have emerged.

We close in Part VII, "Emerging Trends in the Energy-Society Relationship;" with a relatively retrospective section, contemplating emerging trends in the energy-society relationship. We are experiencing rapid shifts in several aspects of contemporary society with direct or indirect implications for the energy and society relationship. Drivers of these changes include technology, politics, and the growing political salience of climate change, among others. One compelling trend of note involves the "prosumer" movement:

describing the rapid expansion of household-level micro-generation of renewable energy and citizen-led developments of new technologies, representing a dismantling of the centralized control structure that has defined energy delivery for decades. Other observations have opened up new lines of sociological inquiry, including case studies of local energy transition. <>

[The Power of Ritual in Prehistory: Secret Societies and Origins of Social Complexity](#) by Brian Hayden [Cambridge University Press, 9781108426398]

[The Power of Ritual in Prehistory](#) is the first book in nearly a century to deal with traditional secret societies from a comparative perspective and the first from an archaeological viewpoint. Providing a clear definition, as well as the material signatures, of ethnographic secret societies, Brian Hayden demonstrates how they worked, what motivated their organizers, and what tactics they used to obtain what they wanted. He shows that far from working for the welfare of their communities, traditional secret societies emerged as predatory organizations operated for the benefit of their own members. Moreover, and contrary to the prevailing ideas that prehistoric rituals were used to integrate communities, Hayden demonstrates how traditional secret societies created divisiveness and inequalities. They were one of the key tools for increasing political control leading to chiefdoms, states, and world religions. Hayden's conclusions will be eye-opening, not only for archaeologists, but also for anthropologists, political scientists, and scholars of religion.

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As will hopefully become evident, my journey into the world of secret societies has been a long but fascinating one. The scenes conjured up by early ethnographers never fail to amaze and sometimes even perturb many readers, including myself. They are some of the most extraordinary accounts in the ethnographic record. So it seems odd that archaeologists have overlooked them for so long in most places. The goal of this book is to place secret societies at the forefront of archaeological consciousness and to have them occupy their rightful place in prehistorians' accounts of how and why many important sociopolitical and religious changes took place in the past. However, the prominence of ritual and religion in the emergence of socioeconomic and political complexity has always been something of an odd feature. The vast amounts of time and effort supposedly devoted to the spirits at Chavin, Teotihuacan, Stonehenge, Avebury, Ur, Karnak, and countless other major centers all seem strange if their only basis was belief in the supernatural. The argument in this volume is that secret societies provide the missing link to explaining how and why these developments took place. I hope that readers will find this less-taken-path as fascinating as I have.

Reading the early ethnographies for this book has deepened my appreciation for the very significant contributions that so many pioneering ethnographers made during the last part of the nineteenth century and the first decades of the twentieth century. It is apparent that they realized the importance of recording as much detail as possible about traditional ways of life that were rapidly disappearing, and they seem to have spared no effort to record those vanishing cultural traditions. We are incredibly lucky that they were active in recording information on secret societies when they were, for, as Bailey realized, there was a narrow window of time when this was possible. In his example, if Francis La Flesche had tried to

record Osage ritual information ten years before 1910, no priest would have discussed religion with him. Ten years later, and any knowledgeable priests would have all been dead. This same situation characterizes many other areas where ritual information was obtained. We all owe a tremendous debt of gratitude to these early ethnographers, as well as the priests who realized that their traditions were dying and wanted to have them recorded for their descendants. They were true visionaries. We also owe a great debt to the institutions and their leaders that sponsored and published so much of this remarkable work. J. W. Powell, Director of the Bureau of American Ethnology in the Smithsonian Institution, was a particularly key figure, but there were many others on all continents and in many other institutions. I am profoundly grateful for all these early records...

The Secret

This book is about secret societies: their dynamics, their *raison d'être*, their characteristics according to ethnographic accounts, and their importance for understanding changes in the archaeological record. Secret societies embodied some of the most awe-inspiring events in the cultural repertoires of traditional societies. They brought to earth masked spirits who performed supernatural feats and exerted exceptional influences on the living. Those in high positions claimed to hold the secrets of the universe and of life, to be able to control spirits, confer wealth, bring the dead back to life, exorcise the possessed, and perform supernatural feats. Secret societies often built elaborate special structures. These organizations may have been precursors of both stage magic shows and institutionalized religions, and they may have played critical roles in the foundation of complex political organizations.

By firelight, terrifying spirits could appear together with cannibals and supernatural destroyers. Primordial forces, unlike anything seen in normal life, were invoked, unleashed, and reined in again. Secret societies had mystery, pomp, impressive displays, and above all, claims to secret supernatural power. Adepts ate burning coals or spewed them out of their mouths as fountains of fire. The initiated appeared out of smoke or fell

from the skies; they menaced the uninitiated who were forced to hide or flee. Behind the staged dramas, there were often real and macabre displays of ruthless power including human sacrifices. Trespassers on to the grounds of secret societies were killed or, if they were lucky, got off with a beating.

Reading the early ethnographic descriptions is not always for the faint of heart. The accounts may captivate readers owing to their incredible descriptions, but the images evoked can perturb sensitive dispositions and invade dreams. Secret society members did not shirk from using any tactics they could to impress and intimidate their fellow villagers, no matter how gruesome. Memberships in the most important societies came at high costs not only in terms of material property, but in physical and emotional terms as well. In addition to harrowing physical ordeals, total commitment to the societies was demanded. To prove such commitment, candidates in some societies had to make their wives available for sex with leaders of the society or even give their wives away, or they had to provide human sacrifices, engage in cannibalism, or even eat their own sons. To enter into the world of secret societies is to enter a world of mystery, magic, mortification, smoke and mirrors imbued with supernatural and real power. At times, comparisons with the "dark side" of the Force in Star Wars might not be too farfetched.

Perhaps because of these features, secret societies have fascinated amateur and professional researchers of politics and religion for well over a century, and the accounts are still captivating. As early as the 1840s, Paul Kane recorded a Hamatsa ceremony and used the term "secret society" to refer to exclusive ritual organizations on America's Northwest Coast with costly initiations. Considerable anthropological attention was subsequently devoted to secret societies from 1890 to 1940, although much less interest has been displayed by academicians since then. Members were usually sworn to keep the secrets of their society's power on pain of death. Secret societies occurred in tribal and chiefly societies and, in some cases, persisted into modern industrial societies. Anthropological luminaries such as Franz Boas and Philip Drucker have written extensively on secret

societies, while innumerable books have been written about contemporary secret societies such as the Freemasons.

There are occasional excavation reports that have identified "dance houses" or "auditoriums" in California, and there have been many excavations of kivas in the Southwest. However, even in these areas, treatments generally stop at the description and identification of ritual structures. In most other areas, secret societies have been ignored altogether. Whitehouse, in particular, was a pioneer in promoting the existence of secret societies in prehistoric cultures, especially Neolithic caves.

In archaeology, it has become fashionable to invoke the vague power of ritual and beliefs in attempts to explain cultural changes of the past, especially where impressive ritual structures appeared. However, the precise way in which rituals could create religious or political power has remained nebulous. At most, the existing explanations simply attribute major religious constructions to the power of beliefs and rituals without anchoring explanations in more tangible facets of culture. Alternatively, explanations have appealed to various social stresses that rituals purportedly helped alleviate. In contrast, secret societies have the potential of linking ideologies and rituals to the acquisition of power and particularly to explain why religion or ritual has played such an important role in the emergence of more and more complex societies leading up to civilization.

As yet, the potential importance of secret societies has gone largely unrecognized in archaeological theoretical worlds. Where there have been attempts to identify and situate secret societies, or "religious sodalities," in broader cultural dynamics, as in the American Southwest, the architectural remains have generally been interpreted in functional terms, especially as a ritual means for reducing social tensions and binding amalgamated kinship groups together in the same community (notable exceptions include Gamble 2008, and Ware 2014). This functionalist interpretation is in stark contrast to the ethnographic accounts of secret societies which the following chapters illustrate.

In Europe and Asia, the very concept of a secret society seems to be unknown or not well understood among archaeologists. The recent weighty tome on the prehistory of religion from Oxford University Press does not even have an index entry for secret societies or ritual sodalities, and there is no discussion devoted to them other than two very brief passages. This lack of attention by archaeologists is curious since the anthropological literature describes secret societies as playing prominent roles in community dynamics. Given the widespread ethnographic occurrence of secret societies in tribal societies, it would indeed be surprising if secret societies did not play important roles in many prehistoric cultures throughout the world. The goal of this book is to help rescue secret societies from this state of oblivion in archaeology and to demonstrate that they likely played pivotal roles in sociopolitical and religious developments in the past. I am convinced that they constitute a sort of "missing link" in the cultural evolution of more complex societies.

I have been investigating secret societies for more than twenty-five years and have concluded that they provide a critical link in our understanding of how individuals augmented their power in many communities and regions. I first became alerted to the potential importance of secret societies when D'Ann Owens undertook a study for me of the ritual contexts of children's handprints and footprints in the Upper Paleolithic painted caves of France. In order to understand what those rituals may have been like, she examined the ethnographies of complex hunter/gatherers to see what kinds of rituals children were involved in. Owens concluded that the most likely context for children's participation in rituals was secret societies.

On the basis of that study, I realized that secret societies not only could be potentially identified in the archaeological remains of complex hunter/gatherer and tribal cultures, but that secret societies were often the most powerful organizations in those societies. Moreover, the power they wielded cross-cut kinship and even community boundaries. Serendipitously, in my own excavations at the Keatley Creek site on the Canadian Plateau, there were several puzzling small structures about 100-200 meters from the

core of that large prehistoric village of complex hunter/gatherers. I initially thought that these small outlying structures might be dwellings of outcasts, migrants, specialized hunters, possibly shamans, or women's menstrual houses. However, after Owens' study, and given the very secluded nature of the structures on the outskirts of the residential area at Keatley Creek, together with the ethnographically documented existence of secret societies during the nineteenth century in the locality, it occurred to me that these might be specialized ritual structures used by secret societies. Subsequent investigations of those structures have largely confirmed this interpretation, a topic that will be discussed further in Chapter 10.

Given these developments, together with my ongoing interest in aggrandizer strategies for promoting aggrandizers' own self-interests, I was keen to find out more about the underlying nature of secret societies, and was fortunate to have Suzanne Villeneuve take up the research program dealing with the small peripheral structures at Keatley Creek. She became intrigued by the issues involved and has vigorously pursued additional research projects related to the possibilities and problems surrounding these structures. The following chapters owe a great debt to the early ethnographies, and I hope that many readers will find the resulting observations and thoughts as exciting as I do. Thus, I would like to begin with some discussion of why secret societies are important for archaeologists and exactly what a secret society is.

Why are Secret Societies Important?

The preceding comments provide a general background for understanding why archaeologists and anthropologists should be interested in secret societies. More specifically, these reasons can be enumerated as follows.

First, secret societies are recognized in their own communities as being important and powerful, often embodying the most elaborate traditions of their cultures in terms of ritual, art, music, food, dance, costumes, and language — all aspects that make individual social groups unique and contribute to their cultural identities.

Second, secret societies only appear to emerge among transegalitarian (complex) hunter/gatherers and subsequent agricultural tribal or chiefdom societies. As such, they constitute a relatively recent phenomenon in cultural evolution, likely extending back only to the Upper Paleolithic, or in exceptional circumstances perhaps back to the Middle Paleolithic.

Third, because the most powerful members of communities generally dominate the highest ranks of secret societies, and because they control significant resources and means to advance their own hegemonic control in the community, secret societies constitute powerful driving forces for cultural changes including major changes in ideologies, cultural values, and beliefs, as well as new sociopolitical relationships including an increased centralization of power.

Fourth, secret societies generally include members from different kinship groups and even communities, thus establishing a supra-kinship and supracommunity level of organization, control, and power with a far wider demographic and economic base than otherwise might have existed. Secret societies, therefore, could have served ambitious individuals as the means for establishing community and regional political organizations with centralized control. Ware emphasizes that ritual sodalities in the American Southwest were regional organizations that often encompassed different linguistic and ethnic groups. Other ethnographers have explicitly linked the development of secret societies to the limitations of kinship systems for developing political control (e.g., Chapters 2 and 7). Such regional organization also characterized the American Northwest Coast, the Great Plains, the Great Lakes, California, Africa, and Melanesia. Thus, secret societies have a strong tendency to form far-reaching regional networks or interaction spheres.

Fifth, secret societies are important because they constitute a major means for extracting surplus resources and wealth from community members and for concentrating these surpluses in the hands of a few individuals. Moreover, they only appear to have occurred in areas capable of producing significant surpluses. Both the carrot and the stick

were often employed, with rewards for those who contributed and intimidation or coercion used for those who were reluctant contributors. Supernatural justifications for these levies and physical means of enforcing requisitions typified many secret societies.

Sixth, secret societies may have led to the development of some of the most notable prehistoric ritual centers and ultimately to the formation of regional state religions. Archaeologists have long been aware that religious institutions seem to have played key roles in the emergence of political complexity, from the first "communal buildings" or shrines of the Neolithic, or even the Epipaleolithic, to the dominating temple or mortuary mounds or megaliths of early chiefdoms, to the impressive ziggurats and pyramids of the first states. The scale of investment and the artistic efforts devoted to religious institutions dwarf any other undertaking in these polities that archaeologists have detected. Yet, for a long time, attempting to deal with religion was considered a hopeless task by many archaeologists, as exemplified by Hawkes' dictum that religion and ideology are the least accessible, if not totally inaccessible, aspects of prehistory. Similarly, in an interview in *The Mystery of Stonehenge*, Atkinson stated that when archaeologists reach for past people's minds, they slip through your fingers like sand (CBS 1965). As a result, for a long time, the reason why religion was so central to the emergence of political complexity was viewed in terms of religious fanaticism or other mysterious factors. It has only been recently that ethnographers, ethnoarchaeologists, and archaeologists have begun to investigate the link between politics and religion. I argue that it is no happenstance that chiefs and early kings played prominent roles in rituals and feasts. Because of the political roles that secret society members played within — and between — communities, secret societies appear to have considerable potential for understanding why ritual and religion were such central elements in the early development of political systems. It can be argued that secret societies were the first institutionalized manifestation of ritual organizations linked to political power, and that this was, in fact, the explicit goal of secret societies. Therefore, the

political dimension of secret societies may be critical to understanding the evolution of political systems.

Seventh, secret societies play important roles in lower or middle range archaeological theory. They are eminently visible archaeologically, especially where caves or specialized structures were used. They had ideological characteristics which help to explain the changes in iconography that characterize key periods in the archaeological record in certain areas, such as the European and Near Eastern Neolithic, and even the Upper Paleolithic. And the existence of secret societies helps explain unusual features of the archaeological record such as the use of deep caves, therianthrope images, human sacrifices, and cannibalism.

Thus, there are a variety of important reasons why archaeologists should be interested in secret societies. It should be emphasized, however, that no claims are being made for the universal occurrence of secret societies in the development of complex societies, especially since alternative organizational frameworks could serve similar functions of extending political control beyond kin groups. Alternatives to secret societies could have included: saroans (large-scale work exchange groups), hunting societies, feasting societies, military and marital alliances, age grades, village administrations, extending kin networks to clan—phratry—moiety dimensions, pilgrimage organizations, other types of sodalities, and spirit quests. Nevertheless, secret societies appear to have been relatively common at the transegalitarian and chiefdom levels, and they were powerful tools for promoting the self-interests of ambitious individuals, especially in terms of political control.

The main emphasis in the opening chapters of this book will be on complex hunter/gatherers since they represent the first clearly recognizable step in this trajectory, long before agriculture was introduced. If we are to understand the reasons why secret societies formed, the contexts that they emerged in, and their impacts on existing social or political frameworks, it will be critical to examine complex hunter/gatherer societies. But first, it will

be useful to obtain a few more insights into the nature and the character of secret societies.

What is the Secret?

One misconception needs to be addressed from the outset. The term "secret society" instills visions of clandestine meetings by people whose memberships and activities are carefully concealed from public scrutiny. In fact, this is not what is secret in secret societies. Instead of a hidden existence for these ritual organizations or a membership that was kept secret, everyone was usually well aware of the existence of these societies and knew who belonged to them. Members even flaunted the fact that they had been initiated, and they usually put on public displays to awe everyone in their communities with their arcane and profane powers.

The real "secret" was the ritual knowledge that members claimed was the key to their supposed arcane supernatural powers. The most important secrets were known only by the highest ranking members of secret societies. As Brandt observed among the Hopi, the secrecy was internal, not external. Secret knowledge was kept from lower ranking members as well as from the public. Such knowledge was typically supernatural in nature but need not have been. <>

[The First Farmers of Europe: An Evolutionary Perspective](#) by Stephen Shennan [Cambridge World Archaeology, Cambridge University Press, 9781108422925]

Knowledge of the origin and spread of farming has been revolutionised in recent years by the application of new scientific techniques, especially the analysis of ancient DNA from human genomes. In this book, Stephen Shennan presents the latest research on the spread of farming by archaeologists, geneticists and other archaeological scientists. He shows that it resulted from a population expansion from present-day Turkey. Using ideas from the disciplines of human behavioural ecology and cultural evolution, he explains how this process took place. The expansion was not the result of 'population pressure' but of the opportunities for increased fertility by colonising new regions that farming offered. The knowledge and resources for the farming 'niche' were passed on from parents to

their children. However, Shennan demonstrates that the demographic patterns associated with the spread of farming resulted in population booms and busts, not continuous expansion.

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Excerpt:...The examples described show that different combinations of static/ increasing fertility and increasing/decreasing child survival can result in increased reproductive success and population

growth for sedentary ways of life, including cultivation, compared with mobile foraging, because of reduced metabolic loads and/or decreased risk and improved weaning possibilities. Moreover, improved infant survival and greater reproductive success can still be consistent with poorer health and lower life expectancies for the population as a whole (Pennington 1996). It is important to note though that population growth depends on the sedentary adaptations and cultivation having a higher sustainable carrying capacity — supporting more people per unit area — than mobile alternatives, which is not the case everywhere. Even then, however, high fertility will eventually be matched by high mortality, sooner rather than later given the implications of even low rates of increase, as we have seen. This situation can be mitigated if promising dispersal opportunities are available, as with the European colonisation of North America: growth can continue but it is now spatially expansive rather than locally intensive. Moreover, promising dispersal opportunities also introduce a further consideration, not immediately obvious, that tends to favour life histories that increase fertility: demographic competition for expansion. In terms of the competition for reproductive success, a strategy that postpones reproduction when an expansion opportunity exists will be less fit than one that takes immediate advantage.

Finally, the 'variance compensation hypothesis' proposed by Winterhalder and Leslie is also likely to be relevant to the transition, in that the costs of having extra children may be higher for non-sedentary hunter-gatherers given the requirement for mobility, so they may err towards the low side of a notional ideal number of children in the face of environmental unpredictability. Agriculturalists on the other hand, may tend to err on the high side, not just because of the increased unpredictability of child survival as a result of increased disease risk but also because children become useful in farming at a young age. Kaplan et al. showed that males in hunter-gatherer societies do not start producing more than they consume until the age of 20. In agricultural societies older children actually subsidise the investment in younger ones.

As we will see, traditional archaeological accounts of the link between the origin and spread of farming and population emphasised the idea of population pressure and were puzzled by the evidence that adopting farming seemed to be associated with a decline in human health, as well as increasing amounts of labour: it was seen effectively as expulsion from the Garden of Eden of the 'original affluent society'. It should be clear now from what has been said that to think in terms of human well-being as a goal in this context is mistaken. While levels of well-being at population equilibrium may vary in different populations depending on local circumstances, what matters is the short-sighted evolutionary process of achieving reproductive success in the circumstances prevailing. This is reflected in the long-term global analysis by Ashraf and Gaylor described above, which showed that technology and land productivity had a positive impact on population density but not standard of living. The ethnographic and historical evidence indicates that the largescale adoption of sedentism and farming created a Malthusian population pull as a result of the increased reproductive success associated with the increased energy availability and improved recruitment that ensued, while high population growth is by no means incompatible with poor nutrition and health.

As Page et al. point out, however, while ethnographic studies like theirs make possible an analysis of variation within the population studied and allow us to distinguish the demographic mechanisms in action in the uptake of farming as a result, they do not allow the exploration of long-term trends or the reasons for them. Why did some Agta become sedentary and start farming given that the reproductive advantages only appear after the changes have occurred? Even studies based on the evidence of historical demography only take us so far in this respect, important though they are. Bocquet-Appel's proposed Neolithic Demographic Transition, on the other hand, gives us a very broad-brush picture of the long term, but again, given that the change is a consequence of farming, does not address how it began, and others would place more emphasis on infant survival than increased female energy availability. The chapters that follow will provide a much more

detailed long-term picture both of the demographic patterns associated with the origins of agriculture in south-west Asia and its spread westwards, and their causes as well as their consequences. In order to understand these we need to take into account not just the relationships between population, subsistence and environment that have long been the object of discussion but the cultural evolution of subsistence practices.

As we saw with Gibson's Ethiopia example, the circumstances favouring increased reproduction can rapidly dissipate. The long-term consequences of farming depended on the long-term transmission of farming practices from generation to generation and on this continuing to provide a survival and reproductive advantage compared with alternatives. Under standard natural selection, specific versions of genes that provide a selective advantage over others will be passed on from generation to generation and will spread through a population because they improve survival and reproductive success in some

way. On the basis of the ethnographic and historical evidence we have seen we can suggest that agriculture represented a cultural strategy that was under natural selection. It was transmitted from generation to generation and spread because it improved survival and reproductive success in comparison with other possibilities, but it depended on the continued transmission of agricultural knowledge and domesticated plant and animal resources. That knowledge could be transmitted from farmers to non-farmers but it could only continue to provide a selective advantage if it was passed on by parents to their children. On average, the grandchildren of anyone who failed to pass on the knowledge and resources would be fewer in number than those of individuals who did. It follows from this that, as well as providing a measure of economic growth at a given point, the population growth rate associated with farming as a culturally transmitted subsistence strategy is also a measure of its fitness, and one that we can get from the archaeological record.

The domestic crops and animals themselves can be regarded as part of a transmitted environment that maintained the selective conditions favouring the

farming way of life in a process of 'niche construction', not only by altering physical environments but also by changing the nature of social institutions such as property rights that would have affected the payoffs of different economic and social strategies.

On the other hand, if farmers found themselves in a situation where conditions for farming were less favourable, perhaps as a result of climate change, then the selective advantage might disappear, with various possible consequences. People might return to foraging, though this would almost certainly result in a drop in local population and, in many cases, an increase in mobility. However, if the social norms associated with farming practices were very powerful this might not happen and migration to seek more favourable conditions could take place. It certainly cannot be assumed that a technical innovation overcoming the problems created by the new conditions would automatically occur.

Structure of the Book

In the light of the theoretical foundations established in this chapter the book provides an account of the processes at work in the origins of agriculture in south-west Asia and the spread of the form of agriculture that developed there westwards into Europe. In doing so it makes use of the rapidly growing body of evidence available on population patterns, especially that from the increasing number of analyses of ancient DNA, which give us for the first-time direct information on population relationships. Chapter 2 begins by giving an account of the different ideas that have been put forward to account for the origins of agriculture in the region and how these have changed over recent years in the light of new ideas and new discoveries, with a particular focus on the indications of increasing subsistence intensification from the Last Glacial Maximum c.24,000 before present (BP) to the end of the last Ice Age c.11,700 BP and associated demographic patterns. It goes on to describe current evidence and ideas on the emergence of cereal agriculture, accepting the view that this was not something that took place very quickly or in a single location but, on the contrary, that it was a drawn-out process taking 2000-3000 years and going on in many different

locations in the so-called Fertile Crescent, from the southern Levant, through south-east Anatolia to the Zagros mountains on the Iran—Iraq border. In a similar vein the evidence for animal domestication is reviewed and it is shown that there is a great deal of variation in the regional trajectories towards increased control and consequent domestication of animals but that it was ongoing across a broad region of the northern Fertile Crescent from south-east Anatolia to the Zagros. Regional population patterns are then discussed before turning to one of the major developments in understandings of the origins of agriculture over the last 20 years, the recognition that it did not just involve subsistence, population and ecology but also major social changes, including new social institutions and property rights, that can usefully be seen from the cultural evolutionary perspective of 'niche construction'.

Chapter 3 looks at the initial expansion of farming in a westerly direction from the broad core zone where it developed, but it begins with an account of the influential model that has framed most accounts of the spread of agriculture as a demographic process, Ammerman and Cavalli-Sforza's 'wave of advance' model, which raises many of the issues that are considered in this and later chapters. The earliest evidence for the expansion of subsistence practices involving animal and plant management comes from the island of Cyprus, long before a reasonably consistent set of farming practices was developed, and its early date seems surprising given that it involved a presumably risky maritime colonisation. The expansion across Anatolia to western Turkey and across the Aegean Sea to mainland Greece, on the other hand, took place later, when a fairly consistent farming 'package', including dairying, had already been established. This dispersal was extremely fast, but it stopped at the northern edge of the Aegean for 300-400 years before spreading equally rapidly northwards into the Balkans, as far as the river Danube and beyond. New ancient DNA evidence has shown that the Anatolian—Aegean farmers were the starting point for the population expansion that brought farming to the rest of Europe.

Chapters 4 and 5 describe the spread of farming westwards through Central Europe and the Mediterranean respectively. In both cases the ancient DNA evidence now tells us that the mechanism of spread was the population expansion just mentioned and that absorption of local hunter-gatherer populations played a very minor role, at least partly because there were probably very few hunter-gatherers in the areas where farming pioneers settled. Both expansions were rapid: farming communities reached the English Channel by the Central European route and Portugal via the north coast of the Mediterranean within 500 years, but the population growth was not maintained. New data shows that in most places the demographic boom associated with the arrival of farming communities was followed by a crash. In much of Central Europe this seems to have been associated with extensive warfare.

Further expansion into Britain and southern Scandinavia did not occur for another 1000 years. The question is why. Unlike most of the other chapters, which focus on the initial arrival of farming and its consequences, Chapter 6 examines the 7th millennium BP, the period when farming societies were present in most of continental western and Central Europe but the farming frontier in the north and north-west was static. The account given rejects the long-standing view that this was because of ongoing resistance from indigenous hunter-gatherer groups whose societies were only gradually undermined. On the contrary, in much of this broad area farmer populations were declining or static and their distribution restricted to the small areas initially colonised by the first farmers. It was only in the latter part of the 7th millennium that internal expansion out of these small enclaves occurred, so that farmers now occupied much broader areas of the landscape. This led to greater interaction with the local foragers, reflected in the increased forager component in the DNA of the farming groups. However, developments at the western end of the farming zone were distinctive because here communities descended from the Mediterranean expansion met those with a Central European cultural ancestry, a meeting now directly detectable in ancient DNA. The result was new

patterns of contact and striking sui generis social developments in areas such as Brittany.

Chapters 7 and 8 describe the expansion of farming into southern Scandinavia and Britain and Ireland. Like all the other expansions described it was extremely rapid in both cases. Again the emerging ancient DNA evidence suggests that we are dealing with a population expansion rather than local adoption of farming, effectively a continuation of the expansion that had begun in west-central Europe a couple of hundred years earlier, though there seems to be a greater continuity in subsistence strategies in Scandinavia. In Britain and Ireland and Scandinavia too there was a pattern of population boom and bust, though the timing was rather different. At the height of the boom in both cases large numbers of ditched and banked enclosures of considerable size were constructed, most probably as a result of social competition, and in Britain at least this time also shows evidence of warfare and violence. Following the population crash distinctive new social and cultural patterns emerged in both the British Isles and southern Scandinavia, although the reasons were different in the two cases.

Finally, Chapter 9 draws together the common threads that have emerged It and looks at their implications for the ideas developed in the first chapter, focussing on the action of a number of evolutionary processes operating at different timescales. <>

[Innate: How the Wiring of Our Brains Shapes Who We Are](#) by Kevin J. Mitchell [Princeton University Press, 9780691173887]

A leading neuroscientist explains why your personal traits are more innate than you think

What makes you the way you are—and what makes each of us different from everyone else? In [Innate](#), leading neuroscientist and popular science blogger Kevin Mitchell traces human diversity and individual differences to their deepest level: in the wiring of our brains. Deftly guiding us through important new research, including his own groundbreaking work, he explains how variations in the way our brains develop before birth strongly

influence our psychology and behavior throughout our lives, shaping our personality, intelligence, sexuality, and even the way we perceive the world.

We all share a genetic program for making a human brain, and the program for making a brain like yours is specifically encoded in your DNA. But, as Mitchell explains, the way that program plays out is affected by random processes of development that manifest uniquely in each person, even identical twins. The key insight of [Innate](#) is that the combination of these developmental and genetic variations creates innate differences in how our brains are wired—differences that impact all aspects of our psychology—and this insight promises to transform the way we see the interplay of nature and nurture.

[Innate](#) also explores the genetic and neural underpinnings of disorders such as autism, schizophrenia, and epilepsy, and how our understanding of these conditions is being revolutionized. In addition, the book examines the social and ethical implications of these ideas and of new technologies that may soon offer the means to predict or manipulate human traits.

Compelling and original, *Innate* will change the way you think about why and how we are who we are.

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Excerpt: Becoming A Person

Just showing that a trait is genetic does not mean that there are genes "for that trait." Behavior arises from the function of the whole brain—with a few exceptions it is very far removed from the molecular functions of specific genes. In fact, many of the genetic variants that influence behavior do so very indirectly, through effects on how the brain develops.

This was dramatically highlighted by the results of a long-running experiment in Russia to tame foxes. Over 30 generations or more, scientists have been selecting foxes on one simple criterion—which ones allowed humans to get closest. The tamest foxes were allowed to breed together and the process repeated again in the next generation, and the next, and so on. The results have been truly remarkable—the foxes did indeed end up much more tame, but it is how that came about that is most interesting.

While they selected only for behavior, the foxes' appearance also changed in the process. They started to look more like dogs—with floppier ears and shorter snouts, for example—even the coat color changed. The morphological changes fit with the idea that what was really being selected for was retention of juvenile characteristics. Young foxes are tamer than older ones, so selecting for genetic differences that affected the extent of maturation could indirectly increase tameness, while simultaneously altering morphology to make them look more like pups.

This highlights a really important point. Just because you can select for a trait like tameness does not mean that the underlying genetic variation is affecting genes for tameness. The effect on tameness is both indirect and nonspecific, in that other traits were also affected. Though their identities are not yet known, the genes affected

are presumably involved in development and maturation somehow.

The same kind of relationship holds in us. As we will see, the genetic variants that affect most psychological traits do so in indirect and non-specific ways—we should not think of these as "genes for intelligence" or "genes for extraversion" or "genes for autism." It is mainly genetic variation affecting brain development that underlies innate differences in psychological traits. We are different from each other in large part because of the way our brains get wired before we are born.

But this is only half the story. Genetic variation is only one source of differences in how our brains get wired. The processes of development themselves introduce another crucial source of variation—one that is often overlooked. The genome does not encode a person. It encodes a program to make a human being. That potential can only be realized through the processes of development. Those processes of development are noisy, in engineering terms. They display significant levels of randomness, at a molecular level. This creates strong limits on how precisely the outcome can be controlled.

Thus, even if the genetic instructions are identical between two people, the outcome will still differ. Just as the faces of identical twins differ somewhat, so does the physical structure of their brains, especially at the cellular level. The progressive nature of development means that this inherent variability can have very substantial effects on the outcome, and, along with genetic differences, be a major contributor to differences in people's psychological makeup.

In sum, the way our individual brains get wired depends not just on our genetic makeup, but also on how the program of development happens to play out. This is a key point. It means that even if the variation in many of our traits is only partly genetic, this does not necessarily imply that the rest of the variation is environmental in origin or attributable to nurture—much of it may be developmental. Variation in our individual behavioral tendencies and capacities may thus be even more innate than genetic effects alone would suggest.

A Look Ahead

This book is split into two main sections. In the first, I present a conceptual overview of the origins of innate differences in human faculties. We will start by looking at the evidence from twin and adoption studies of genetic effects on human psychological traits, brain anatomy, and brain function. These studies can begin to dissociate the effects of nature and nurture as contributors to variation across the population. They aim to explain not what makes individuals the way they are but what makes people different from each other. Because they are often misconstrued, we will look carefully at what the findings mean and what they don't mean.

We will then look in more detail at genetic variation, where it comes from and the kinds of effects it can have. We will examine how differences in the DNA sequence ultimately impact the kinds of traits we are interested in—often, as discussed above, through effects on development. We will look in depth at the mechanisms underlying the self-assembly of the brain's circuitry to see how it is affected by variation in the genetic instructions. And we will consider just how noisy and inherently variable those developmental processes can be. In the end, I hope to have convinced you that both genetic and developmental variation contribute to innate differences in people's natures.

In the final chapter of the first section we will look at the role of nurture in shaping people's psyches. The human brain continues to mature and develop over decades, and our brains are literally shaped by the experiences we have over that period. It is common to view "nurture" as being in opposition to nature, such that the environment or our experiences act as a great leveler, to smooth over innate differences between people or counteract innate traits in individuals. I will describe an alternative model: that the environments and experiences we each have and the way our brains react to them are largely driven by our innate traits. Due to the self-organizing nature of the processes involved, the effects of experience therefore typically act to amplify rather than counteract innate differences.

With that broad framework in place, we will then examine a number of specific domains of human

psychology in the second section. These include personality, perception, intelligence, and sexuality. These diverse traits affect our lives in different ways and genetic variation that influences them is therefore treated very differently by natural selection. As a result, their underlying genetic architecture—the types and number and frequency of mutations that contribute to them—can be quite different. Much of the variation in these traits is developmental in origin—the circuits underlying these functions work differently in part at least because they were put together differently. This means that random variation in developmental processes, in addition to genetic variation, also makes an important—sometimes crucial—contribution to innate differences in these faculties.

We will also look at the genetics of common neurodevelopmental disorders, such as autism, epilepsy, and schizophrenia. There has been great progress in recent years in dissecting the genetics of these conditions, with results that are fundamentally changing the way we think about them. Genetic studies clearly show that each of these labels really refers to a large collection of distinct genetic conditions. Moreover, while these disorders have long been thought to be distinct, the genetic findings reveal the opposite—these are all possible manifestations of mutations in the same genes, which impair any of a broad range of processes in neural development.

The final chapter will consider the social, ethical, and philosophical implications of the framework I've described. If people really have large innate differences in the way their brains and minds work, what does that mean for education and employment policies? What does it mean for free will and legal responsibility? Does it necessarily imply that our traits are fixed and immutable? What are the prospects for genetic prediction of psychological traits? What limits does developmental variation place on such predictions? And, finally, how does this view of the inherent diversity of our minds and our subjective experiences influence our understanding of the human condition?

Determinism

I have presented the case in this book for the existence of innate differences in psychological traits, arising from two sources: genetic differences in the program specifying brain development and function, and random variation in how that program plays out in an actual individual. The second source is often overlooked, but its effects mean that many traits are even more innate than heritability estimates alone would suggest. In short, we're born different from each other. The slate is most definitely not blank. To many people, this may be the most obvious thing in the world, based on their common experience of other human beings, especially children. To others, however, it may smack of genetic determinism. It may sound like a claim that our genes determine our behavior—that we are slaves to them with no real autonomy.

This is not the case at all. The claim is far more modest. It is simply this: that variation in our genes and the way our brains develop cause differences in innate behavioral predispositions—variation in our behavioral tendencies and capacities. Those predispositions certainly influence how we behave in any given circumstance but do not by themselves determine it—they just generate a baseline on top of which other processes act. We learn from our experiences, we adapt to our environments, we develop habitual ways of acting that are in part driven by our personality traits, but that are also appropriately context dependent.

Along the same lines, the evidence that parenting does not have a strong influence on our behavioral traits should not be taken as implying that parenting does not affect our behavior at all. We may not be molding our children's personalities, but we certainly influence the way they adapt to the world. Our actual behavior at any moment is influenced as much by these characteristic adaptations and by the expectations of family and society—and, indeed, the expectations we build up of ourselves—as by our underlying temperament. Slates don't have to be blank to be written on.

But if I can evade the charge of genetic determinism, I may still appear guilty to some of the related crime of neuroscientific reductionism. In delving into the detailed mechanisms underlying

mental functions and what may cause them to vary, it may seem as if I am reducing those mental functions to the level of cells and molecules, none of which has a mind or is capable of subjective experience. It may look like such explanations leave no room for real autonomy, for thoughts and ideas and feelings and desires and intentions to have any causal power, for free will to exist at all.

Once again, this is not the case—nothing I have presented in this book is a threat to our general notions of autonomy and free will. The fact that there is a physical mechanism underlying our thoughts, feelings, and decisions does not mean we do not have free will. After all, to expect that thoughts, feelings, and decisions would not have any physical substrate is to fall into dualism—the idea that the brain and mind are really fundamentally distinct things, the mind somehow immaterial. This is a fallacy, and one that is hard to climb back out of once you've fallen into it. The mind is not a thing at all—at least, it is not an object. It is a process, or a set of processes—it is, simply put, the brain at work.

Thoughts and feelings and choices are mediated by the physical flux of molecules in the brain, but this does not mean they can be reduced to it. They are emergent phenomena with causal power in and of themselves. Some pattern of neural activity leads to a certain action by virtue of it comprising a thought with some content and meaning for the organism, not merely because the atoms bumping around in a certain way necessarily lead to them bumping around in a new way in a subsequent moment. The precise details of all the atoms don't matter and don't have causal force because most of those details are lost in the processing of information through the neural hierarchy. What matters is the information content inherent in the patterns of neuronal firing that those atoms represent and what that information means. When I make a decision it's because my patterns of neural activity at that moment mean something, to me.

We all have predispositions that make us more likely to act in certain ways in certain situations, but that doesn't mean that on any given instance we have to act like that. We still have free will, just not in the sense that we can choose to do any old

random thing at any moment. I mean, we could, we just usually don't, because we are mostly guided by our habits (which have kept us alive so far) and, when we do make deliberative decisions, it is between a limited set of options that our brain suggests. So, we are not completely free, we are constrained by our psychological nature to a certain extent. But really that's okay—that's what being a self entails. Those constraints are essential for continuity of our selves over time. Having free will doesn't mean doing things for no reason, it means doing them for your reasons. And it entails moral responsibility in the pragmatic sense that we are judged not just on our actions but also on our reasons for those actions.

This does raise a provocative idea, however—that some of us may have more free will than others. In each one of us our degree of self-control varies in different circumstances, depending on whether we are tired, hungry, distracted, stressed, sleep deprived, intoxicated, infatuated, and so on. And over our lifetimes the impetuosity of youth gives way to the circumspection of adulthood. But the mechanisms that allow us to exercise deliberative control over habitual or reflexive actions also clearly vary in a more trait-like fashion between people. Some people are far more impulsive than others, as we saw in chapter 6. Many suffer from compulsions or obsessions or addictive behavior that they cannot control. And people in the grip of psychosis or mania or depression are clearly not in full control of their actions, which is why we do not hold them legally responsible. You could say that some people are more at the mercy of their biology than others, though that difference itself is a matter of biology.

Self-Help

There is a massive self-help industry devoted to the idea that we can change ourselves—our habits, our behaviors, even our personalities. From psychotherapy or cognitive behavioral therapy to mindfulness, brain training, or simply harnessing the power of positive thinking, there are scores of different approaches and an endless supply of books, videos, seminars, and other materials to help you become your best self. These suggest that we can learn the habits of highly effective people, and

we too will become highly effective. That we can overcome stress, anxiety, negative thoughts, relationship problems, and low self-esteem, manage our anger, boost our mood, achieve the goals we always hoped for, and generally become a happier person. The slightly paraphrased title of one self-help book promises to show you how to rewire your brain to overcome anxiety, boost your confidence, and change your life. Others proclaim that you can "Immediately achieve massive results using powerful (fill in the blank) techniques!"

Lately, what had been an almost exclusively psychological literature has been suffused with supposedly groundbreaking discoveries from neuroscience, which seem to confirm the possibility of change and elucidate the mechanisms by which it can occur. Two areas in particular have caught the public's imagination.

The first is neuroplasticity or brain plasticity—the idea that the structure of the brain is not fixed but quite malleable, with the implication that prewired need not mean hardwired. And this is quite true, to a certain extent. The brain is constantly rewiring itself on a cellular scale—that is how it learns and lays down memories to allow behavioral adaptation based on experience, by forming new synaptic connections between neurons or pruning others away. There is nothing revolutionary about this—it is simply how brains work. It is also true that, after injury for example, the brain can sometimes rewire circuits on a much larger scale, which can aid recovery or compensation for the injury in some cases or lead to additional problems in others.

But the brain is not infinitely malleable, and for good reason—it has to balance the need to change with the need to maintain the physical structure that mediates the coherence and continuity of the self. If it were undergoing wholesale changes all the time we would never be us. While young brains are highly plastic and responsive, these properties diminish drastically beyond a certain stage of maturation—indeed, they are actively held in check by a whole suite of cellular and extracellular changes. The period of plasticity is extremely protracted in humans, reflecting the fact that we have greater cognitive and neural capacity

to continue to learn from experience over longer periods of time. But at some point the brain and the individual have to stop becoming and just be.

This limits the amount of change we can expect to achieve. It is certainly possible to change our behaviors—with enough effort you can break a habit or overcome an addiction. And that may be a perfectly laudable and worthwhile goal in many circumstances. But there is little evidence to support the idea that we can really change our personality traits, that we could, for example, learn to be biologically less neurotic or more conscientious. You may be able to learn behavioral strategies that allow you to adapt better to the demands of your life, but these are unlikely to change the predispositions themselves.

For children the situation may be different. There may be periods in which intensive behavioral interventions can alter developmental trajectories. For example, a child with autism may be taught to consciously look at people's faces as they are speaking—this may encourage better linguistic and social development than would have tended to occur otherwise. But even here the opportunities to effect long-lasting change are still limited. These kinds of interventions, in either typically or atypically developing children, will always be fighting against both the innate predispositions themselves and their cascading effects on the experiences individuals choose and the environments they select or create, which will tend to reinforce innate traits.

The second idea that is popular these days is known as epigenetics. We came across the word epigenetic in chapter 4, where it was used to refer to the processes of development through which an individual emerges. The modern usage refers to something quite distinct—the molecular mechanisms that cells use to regulate gene expression. In any given cell at any given time, some genes will be active—the proteins they encode will actually be being produced—while others will be silent. This allows muscle cells to make muscle cell proteins and bone cells to make bone cell proteins, and so on. But cells also respond to changes, either internal or external to the cell, by increasing or decreasing the amounts of proteins made from various genes.

Epigenetic mechanisms of gene regulation allow these kinds of changes to be locked in place for some period of time, sometimes even through the life of the cell and any cells it produces. That is precisely what happens in development as different cell types differentiate from each other.

The attraction of epigenetics for the self-help industry stems from the idea that it acts as a form of cellular memory, turning genes on or off in response to experience and keeping them that way for long periods of time. The problem comes from thinking that turning genes on or off equates somehow to turning traits on or off. If you're talking about something like skin pigmentation, that might apply—I can expose my skin to the sun for a period of time and this will lead to epigenetic changes in the genes controlling pigment production, and I'll get a nice tan that will last for weeks. But for psychological traits, the link between gene action at a molecular level and expression of traits at a behavioral level is far too indirect, nonspecific, and combinatorial for such a relationship to hold. Moreover, if much of the variation in these traits comes from how the brain developed, the idea that you can change them by tweaking some genes in adults becomes far less plausible. So, despite their current cachet, neuroplasticity and epigenetics don't provide any magical means to dramatically alter our psychological traits.

This brings me to a final point, and really it is just my personal opinion. To me, the self-help industry is built on an insidious and even slightly poisonous message. It all sounds very positive—the possibility of change—but really it relies on the idea that you're not good enough as you are, that other people are better than you, but if you buy our products or take our classes or just think positively enough then you can be better too. It plays on some of the least attractive aspects of human psychology, often explicitly using envy as a marketing ploy—of neighbors who've got more money than you, that guy at work who got promoted ahead of you, or that woman who just seems to have the perfect life. And it is often targeted at the more neurotic among us, with claims of overcoming anxiety, worry, stress, low confidence, and low self-esteem, playing on those

very personality traits to convince people they need to be changed.

This is not a self-help book—clearly. But perhaps there is something positive in highlighting a different view. There is a power in accepting people the way they are—our friends, partners, workmates, children, siblings, and especially ourselves. People really are born different from each other and those differences persist. We're shy, smart, wild, kind, anxious, impulsive, hardworking, absent-minded, quick-tempered. We literally see the world differently, think differently, and feel things differently. Some of us make our way through the world with ease, and some of us struggle to fit in or get along or keep it together. Denying those differences or constantly telling people they should change is not helpful to anyone. We should recognize the diversity of our human natures, accept it, embrace it, even celebrate it. <>

[Science and Humanity: A Humane Philosophy of Science and Religion](#) by Andrew Steane [Oxford University Press, 9780198824589]

Andrew Steane reconfigures the public understanding of science, by drawing on a deep knowledge of physics and by bringing in mainstream philosophy of science. Science is a beautiful, multi-lingual network of ideas; it is not a ladder in which ideas at one level make those at another level redundant. In view of this, we can judge that the natural world is not so much a machine as a meeting-place. In particular, people can only be correctly understood by meeting with them at the level of their entire personhood, in a reciprocal, respectful engagement as one person to another. Steane shows that Darwinian evolution does not overturn this but rather is the process whereby such truths came to be discovered and expressed in the world. From here the argument moves towards other aspects of human life. Our sense of value requires from us a response which is not altogether the same as following logical argument. This points us towards what religion in its good forms can express. A reply to a major argument of David Hume, and a related one of Richard Dawkins, is given. The book finishes with some brief chapters setting religion in the context

of all human capacities, and showing, in fresh language, what theistic religious response is, or can be, in the modern world.

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Excerpt: Six points to be shown in the book are introduced. Science is a rich tapestry which does not at all suggest that the world is a purposeless machine, but nor does it replace the arts and humanities. We respond to our situation through all our powers of expression, including forms of giving in which our very identity is shared and allowed to be shaped in return.

It is time to shake off a widely believed but mistaken idea of what science is and how it interacts with human life in the round.

For a long time now it has been the habit of science writers to present their discipline as if it was the be-all and end-all of knowledge, and everything else follows in its wake. Particle physicists have written about their forthcoming 'theory of everything' as if it amounted to the final word on the nature of reality, the very 'mind of God'. I accuse also the ten thousand websites, and the popular books that have spawned them, that have presented Darwinian evolution as if the authors knew the purpose of each organism's life to be the proliferation of that organism's genes. The same fundamental error is promoted by neuroscientists who, waxing lyrical over wonderful magnetic images of the living human brain, have declared or implied that all the functioning of the brain is about to be laid open, with no input from the arts and humanities required.

It is my opinion, and the central thesis of this book, that all such visionaries in fact have a skewed vision of both science and the arts. I think that what poets do, and what literary critics do, and what musicians do, is every bit as truthful and insightful about the nature of reality as is what physicists and chemists and biologists do (and mathematicians, engineers, historians, philosophers, and so on). Of course the afore-mentioned skewed visionaries will immediately claim that they agree, and they did not intend to deny or undermine the validity of the arts. But the fact is, the way they have presented science is such that science would and must do

exactly that, whereas I think that when grasped correctly, it does not.

For thirty years I have had an intense desire to get a more truthful vision of the nature of the physical world and human life in it, a vision which does not fall into the error of misconceiving science and presenting it in hegemonic fashion, the way this is done in numerous popular books.

To be clear, let me say that I wholeheartedly welcome many of the points science writers make, especially about being honest and careful about evidence, and letting the world be what it is, and celebrating the richness that ordinary physical stuff is able to support, without overlaying it with superstition. Such writing gives voice to the widespread wish to affirm that the physical, material world is itself the expression of what matters, and it does matter, whether or not it is a temporary phenomenon. All this is welcome. But in our celebration of scientific knowledge we have to allow also for basic philosophical points, such as the difference between a text and its meaning. For example, when one human being meets another, they see plenty of evidence, but what conclusion do they form? The very same evidence might be interpreted to mean 'here is a slave that I can use' or 'here is fellow human being, every bit as worthy of consideration as myself'. It is not self-evident that people will always come to the second conclusion, and furthermore, it is not the case that any study of fundamental physics will suggest either that they should or should not. What shall we do, then? Is the 'modern, scientific' view the view that moral considerations are really just subtle power games with no intrinsic beauty and truth of their own? The point I want to argue in this book is that whereas the adjective 'modern' might apply to that conclusion, the adjective 'scientific' does not.

The overarching aim of this book is to get in view something that pays deep attention to the natural world and to the whole of what goes on in human life. I mean attention in the sense advocated by the French philosopher Simone Weil; it is the decision to work hard at listening sympathetically and seriously to the realities that address us, both in the wider natural world and in our shared life. In the present context, it is the decision to listen

sympathetically and seriously both to what science is and does, and to what other areas of discourse are and do. If one takes up this challenge, then one discovers something important and liberating. One discovers that the picture of the natural world that we obtain from scientific study is not the one widely assumed in contemporary culture. It is widely assumed that science is somehow 'on the side of', or implies, or is the natural partner to, the view that the physical cosmos, and life on Earth, is a sort of huge machine moving blindly into the future, and this motion has no purpose or meaning beyond the stories or meanings that we and other animals invent for ourselves. I aim to show that this is not so. Rather, scientific study, approached with a little bit of philosophical maturity, is perfectly in tune with, and indeed strongly suggests, the view that the natural world is capable of giving physical expression to a rich and deep range of languages, including all the ones that are important to human life, and in this rich expression we do not invent meaning but discover it. I mean here 'languages' such as justice, ethics, and aesthetics, to name a few. There is not just an appearance of these things in the dynamics of human affairs, but the reality of them.

When one states it bluntly like this, some may feel that this is obvious and does not need to be argued. However, it has repeatedly happened that scientists have supposed that their job is to reconfigure the whole human outlook, and replace all these languages by a single machine-like paradigm in which words like 'justice', 'good', and 'bad' have little or no meaning. It is important to show why such a supposition is wrong. Furthermore, this is not a case of a conflict in which the arty types fight a misconceived rearguard action against the inevitable truth of an outlook calling itself 'scientific', and which regards people as mere carrier bags for molecules. Rather, this latter picture has got science itself wrong, and is not genuinely 'scientific'.

What is going on here? How can an expert in physics, or in biology, or in neuroscience be at the same time wrong about physics, or biology, or neuroscience? It is partly owing to the compartmentalization of knowledge, and, I think, there is something of the myth of Pygmalion

involved. In this story, the sculptor Pygmalion makes a statue of great beauty, and falls in love with it. The statue comes alive and various outcomes are imagined. In a similar way, a practitioner of any area of intellectual study may become so thrilled with the concepts at work in their area, that they fall in love with those concepts and begin to think they can explain everything. The concepts might be quantum fields and space-time, or genes and replication, or neural networks and synaptic potentials, for example. It seems so natural to think that each area can explain everything that is built out of the things studied in that area. Why not? What is wrong with this way of thinking?

The central argument of this book is twofold. I will argue, first, that scientific explanation does not take the mistaken form I just described, and, second, that analytical reasoning does not constitute the whole of what is required to get at truth. With regard to the first argument, I aim to show that scientific explanation is in fact two-way, not one-way, and that this naturally allows and indeed suggests the presence of further layers of meaning in the world, beyond the categories of science. Concerning the second, these further layers of meaning are explored by the arts and humanities, and, more humbly and tentatively, in spirituality. Those forms of spirituality which deserve attention are the forms which deal convincingly with the whole of this framework of meaning.

By saying that scientific explanation is two-way, not one-way, I mean that science is not a ladder in which physics explains chemistry which together explain biology, and so on. Rather, biology illuminates physics just as much as physics illuminates biology. The situation might be compared to the relationship between a stone and an arch. The nature of an arch is not explained by the nature of stones, even when the arch is made of stones. After all, the arch could have been made of wood. Rather, the arch is an example of a shape which has certain generic properties, and such a shape can happen when stones are gathered and configured in a certain way. This is reasonably straightforward and obvious, but one must think it through at length in order to see the wide

ramifications of this way of thinking for the whole scientific picture of the natural world.

Having got science right, we can venture into and respect the humanities, by which I mean the rich variety of further studies that people undertake in literature, arts, music, language, politics, and so on. The book does not address any specific issues within those subjects; it merely acknowledges their complete validity as disciplines having their own appropriate language and discourse. But having acknowledged all this, I want to go further, and ask what it is we ultimately rely on, and what we should aspire to. This is the question of how to help one another locate or 'frame' our lives in the most truthful and creative way.

It is widely agreed that the notions of gratitude and generosity are central to truthful living, and many (myself included) feel that forgiveness is equally central. In this book I am not going to argue about the relative merits of different values, except in a few general terms, but I will present some carefully constructed philosophical arguments in this area. The aim is to show the following points:

1. The structure of the natural world is such that high-level principles describe and constrain what can be supported by low-level dynamics.
2. A description of a physical object or process in terms of its internal structure does not address the question of whether or not the object or process serves a purpose in a wider context.
3. The question of whether the story of life on Earth has meaning beyond being a mere sequence of events ('just one thing after another') is not resolved by scientific study, but this does not imply that it is a non-question, nor that we have no means to come to reasonable judgements about that.
4. It is not possible to employ rational argument in order to derive one's most basic allegiance, or set of allegiances, from other considerations.
5. A certain well-known philosophical argument, found in various forms in Thomas Aquinas, David Hume, and Richard Dawkins, is unsound.

6. It is possible to give a coherent, meaningful, and attractive sense to the notion that we are called upon to respond to truth and reality via the whole of our personhood, using all our powers of expression, including our very selves as personal beings.
7. The first item in this list is emphasized because it feeds into the discussion of the other items.

The argument referred to in item 5 is, in brief, the claim that theistic types of religious response are either superfluous or simply don't help in making sense of our experiences. Aquinas argued against this; Hume and Dawkins assert it.

In the last item I am alluding to the notion that truth is rich in nature, having a sufficient degree of richness that certain widely used religious metaphors are appropriate. That is to say, personal language such as 'Parent' is appropriate when approaching the universal reality that most deeply supports and emancipates all things. Here I am talking about that non-contingent reality correctly named 'God', but I avoided the word because it is so widely misused.

In a previous book I offered a perspective on science and religion which was not so much an attempt to persuade as to display. I was inviting the reader into a gallery, to show some at least of what it is like to understand and accept science while also understanding and accepting what some forms of theistic religion are trying to say. The present book is more of an argument; it does set out a careful case for various positions. But I have limited aims, and they are mostly philosophical in nature, as indicated above.

In this book I am trying to convey an idea about the structure of science, and explanation more generally, that is sufficiently different from what people have been taught to assume that it cannot be neatly tacked on or fitted in to much contemporary discourse. Rather, that discourse itself must change. I will present arguments for this idea, but much of the work consists simply in getting the idea in view. This is like teaching a language or an artistic style: you have to begin to speak the language, or to allow the style to work on you,

before you can assess its success. The book therefore includes some science, and some philosophy, and some poetry and a little polemic, and some other things.

Part I of the book, Chapters 2-9, presents the structure of what happens in the various parts of scientific study, and hence what this tells us about the nature of the physical world. The scientific picture of the natural world is rich and fluid, moving between multiple types of discourse; the physical world is not a machine but a meeting place. In particular, Chapters 7 and 8 look at the Darwinian evolutionary process, with a view first to pointing out category errors in existing literature, and then to getting a sense of what kind of process it is.

Part II of the book, Chapters 10-17, looks at what science cannot do, and how discussion of values and of religious ideas operates. Science, though full of insight and usefulness in its own domain, remains severely limited in how it can help us. This is because science cannot answer the most basic, everyday questions we face, such as, 'What shall I do this afternoon?'. To answer such questions we must pay attention to further ways in which reality impinges upon us and addresses us. This is about the notion of value, and forming judgements about what would be good or bad, better or worse, and what is worthy of our commitment. The concept of values and the concept of goodness invoke from us a type of response which is not altogether the same as following a reasoned argument, and there is nothing irrational or unworthy about admitting this.

Part III, Chapters 18-22, presents, in a positive way, an outlook which tries to do justice to all the various themes. The aim is to show how certain mainstream religious ideas can inhabit this picture without awkwardness. The book is not shy of spirituality, and indeed it ventures to include a few spiritual exercises, but it holds back from presenting any fully defined framework of religious life. Rather, my aim is to present science in harmony with art in such a way that the journey to spirituality is available, not closed off. This is important because humans are spiritual creatures, and to refuse them this journey (for example by suggesting that one must part from reason in order to undertake it) is deeply unjust. <>

[The Adoption Machine: The Dark History of Ireland's Mother and Baby Homes and The Inside Story of How Tuam 800 Became a Global Scandal](#)

by Paul Jude Redmond [Irish Academic Press, 9781785371776]

May 2014, the Irish public woke to the horrific discovery of a mass grave containing the remains of almost 800 babies in the 'Angels' Plot' of Tuam's Mother and Baby Home. What followed would rock the last vestiges of Catholic Ireland, enrage an increasingly secularised nation, and lead to a Commission of Inquiry. In [The Adoption Machine](#), Paul Jude Redmond, Chairperson of the Coalition of Mother and Baby Homes Survivors, who himself was born in the Castlepollard Home, candidly reveals the shocking history of one of the worst abuses of Church power since the foundation of the Irish State. From Bessboro, Castlepollard, and Sean Ross Abbey to St. Patrick's and Tuam, a dark shadow was cast by the collusion between Church and State in the systematic repression of women and the wilful neglect of illegitimate babies, resulting in the deaths of thousands. It was Paul's exhaustive research that widened the global media's attention to all the homes and revealed Tuam as just the tip of the iceberg of the horrors that lay beneath. He further reveals the vast profits generated by selling babies to wealthy adoptive parents, and details how infants were volunteered to a pharmaceutical company for drug trials without the consent of their natural mothers. Interwoven throughout is Paul's poignant and deeply personal journey of discovery as he attempts to find his own natural mother. [The Adoption Machine](#) exposes this dark history of Ireland's shameful and secret past, and the efforts to bring it into the light. It is a history from which there is no turning away.

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Excerpt: As Ireland gears up for yet another national debate about women's reproductive rights with the 8th Amendment referendum, Paul Redmond's *The Adoption Machine* is a timely reminder of how women and girls who 'got into trouble' were dealt with in the early years of the new state, up to the end of the last century.

This book is a personal story and a crusade, one of the first and clearest accounts of conditions in the misnamed Mother and Baby Homes, a cruel mix of Victorian and Catholic morality, institutions which he describes 'were generally a cross between a maternity hospital with no doctors or nurses and a low-to-medium prison.

This was the worst manifestation of the repression of women, the collusion of Church and State to restrict reproductive rights. Fear of women's sexuality created an entrenchment and an over-reaction that led to intrusive levels of supervision on a parish basis into the lives of young women and men.

Irish women, especially those from the working classes and rural poor, who became pregnant outside of marriage during the greater part of the twentieth century, were considered a great shame; they were castigated as sinners, shunned, tainted and ultimately cornered. Removed from their families and communities and hidden behind the grey walls of 'Mother and Baby Homes' to give birth in secret. They were completely isolated and helpless when their children were taken from them. This book documents how initially the children were neglected and starved and often died in alarming numbers while nobody noticed or cared. Later the potential for the religious orders to earn enormous sums of money from adopting out the children, often illegally, became a thriving industry with babies delivered to Catholic couples from Ireland, Britain and the United States.

The relentless journeys of natural mothers and their children to deal with the scars of that separation are brutally and yet sensitively told in this contemporary account. This is a lived and living history, of lives still unfolding and quests still incomplete - all the more powerful because you know that this is now.

This is the biggest scandal of Independent Ireland, the biggest cover-up, the bitter result of Church and State collusion, and yet there is very little said about it in the national narrative. Often confused with the Magdalene Laundries, which specifically didn't take pregnant girls, the Mother and Baby Homes never made the headlines until Catherine Corless made her claims of 800 dead babies in Tuam, ultimately forcing a commission of investigation which is presently ongoing.

Paul Redmond was instrumental in the campaign to secure that investigation. Born in Castlepollard Mother and Baby Home in the 1960s, Paul's personal story is interwoven with the history of Castlepollard and all the Homes. His personal journey was one made all the more poignant because he makes it with and for his crib mates and particularly on behalf of the fallen ones, the ones that didn't make it. He tells of himself and another man, along with five women all survivors who made the trip to Castlepollard in August 2011. 'It was an odd situation. We shared so much and

yet we were strangers walking into the unknown together ... I left the cemetery a fundamentally different person, a man with a mission, hellbent to do something. I hadn't a clue what to do or how to do it but I knew something had to be done.' And he did!

In fact, Paul continues to do so much. He is the author of the first serious research into mortality rates and conditions in Mother and Baby Homes, an advocate for the rights of adopted persons and their natural mothers, a serious campaigner who worked with many of the groups and key individuals who organised around these issues, Paul is a big man with a big heart, tireless energy and unrelenting patience and humanity.

Paul touches on a story of a woman who got in touch with my Dáil office after spending years going through official channels to locate her daughter, who had been taken from her, without her consent, in Castlepollard on St Patrick's Day in 1966. Wanting her daughter to have her medical history and worried that she was running out of time, she wrote of being led up the garden path so many times by those from whom she sought help to trace her. She had spent a lifetime searching and finding nothing. In three days Paul found her and within the week successful phone contact was made. The endings are rarely so happy but there is no pain worse than that of not knowing. The struggle for your own identity is one everyone makes, but it can be a longer road with substantial barriers placed in the way when you are adopted.

This book is necessary; it's about the history of Irish adoptions, particularly the heart-breaking illegal adoptions. It is about the struggle that Paul Redmond took up, on behalf of his crib mates. It tells of his growth as an advocate and campaigner. No doubt the experience has been a learning curve for him, but throughout it all he remains calm, reasonable and determined. It is a subject that would make any person seethe with anger. When I first met Paul in 2012, he stood out as someone who had taken control and directed his energy into a fight for justice. For those who had their identities stolen, who had subsequently been grossly misled and ignored, they may never find closure but they have a true advocate in Paul Redmond.

In August 2011, I visited my birthplace, Castlepollard Mother and Baby Home, in the company of six other people adopted from there. We had met on Facebook and another lady and I had organised the visit. Years later we realised that we were the first known group of adoptees to return to their old home as a group.

My childhood fantasy was of an old Georgian house with my young mother in an oversized chair that was covered with warm, colourful throws, by a window where golden sunshine streamed in as I lay swaddled in her arms. Gentle nuns fluttered around, cooing and happy.

The reality in 2011 was a cold, grey, ugly institution. Empty rooms and peeling paint. Our group visited the Angels' Plot and stood on the narrow strip where unknown hundreds of babies and children had been buried just a few feet below where we walked around. We planted a tree in their memory.

That forgotten plot affected me deeply. It was life-changing. I left as a survivor determined to do `something. In the days and finally years that followed, I hunted down every scrap of information I could find about Castlepollard and particularly the Angels' Plot, and then I broadened my attention to the other Mother and Baby Homes in Ireland. More Angels' Plots. More horrors. I became an activist by default. The `something' I wanted to do, I realised afterwards, included never letting people forget. I wanted to ram hard facts and figures down Ireland's throat.

I published all my research, nearly 100,000 words, across the various adoption groups. I did a little unpaid citizen journalism about the Homes and our campaign for truth and justice. Over the years, my family, friends and fellow activists increasingly nagged me to write a book and tell the story properly, and I finally cracked and agreed to do it in early 2017. I took four months off work over the summer and simply sat down and wrote. And I couldn't stop. The book grew to twice its intended size before I was finished, and I still feel it is not enough.

Approximately 100,000 girls and women lost their babies to forced separation since independence in 1922. Church and State considered the illegitimate babies as barely human. At least 6,000 babies died in the nine Mother and Baby Homes where some 35,000 girls as young as 12, and women as old as 44, spent years of their lives, and almost no one cared. Even now, mothers and babies still cry out for remembrance and justice. Their cries from beyond the grave are ignored by Irish society, just as the cries of their short poignant lives were ignored in the Homes.

The Adoption Machine is not just a book. It is also an activist tactic and part of our ongoing campaign to ensure that the last, dirty secret of Holy Catholic Ireland is finally dragged into the light. It is a rage against the machine. A voice in the wilderness. A memorial to my fallen crib mates.

And, as I write from the deepest part of my heart, I still hear the voices of the angels crying for justice. And remembrance. And love.

There are many villains in this story. There are a handful of heroes too. These heroes are all too human; flawed, stubborn products of their time. Yet they all share one feature: they had good hearts. Whether they succeeded or failed is not important, they tried their best. They too should be remembered: Aneenee FitzGerald-Kenney, Alice Litster, Dr James Deeny, June Goulding, among others.

This story begins with such a hero, Captain Thomas Coram ... <>

[The Preacher and The Prelate: The Achill Mission Colony and the Battle for Souls in Famine Ireland](#) by Patricia Byrne [Irish Academic Press, 9781785371721]

This is the extraordinary story of an audacious fight for souls on famine-ravaged Achill Island off Ireland's Atlantic coast during the nineteenth century. Religious ferment swept across Ireland in the early part of the 1900s, and Protestant clergyman Edward Nangle's Mission Colony was to lift the destitute people of Achill out of degradation and idolatry and into salvation. The fury of the island elements, the devastation of famine, Nangle's own volatile temperament, and

the unbearable suffering of his wife Eliza and her children, all threatened the project's survival. In the years of the Great Famine the ugly charge of 'souperism', offering food and material benefits in return for religious conversion, tainted the Mission's work. John MacHale, powerful Catholic Archbishop of Tuam, spearheaded the Catholic Church's fight back against Nangle's colony, with the two clergymen unleashing fierce passions, with vitriol and polemic spewing out from pen and pulpit. Did Edward Nangle and the Achill Mission Colony save hundreds from certain death, or did they shamefully exploit a vulnerable people to religious conversion? This dramatic tale of the Achill Mission Colony spectacularly exposes the fault-lines of religion, society and politics in nineteenth-century Ireland, and continues to excite controversy and division to this day.

It seems like a creation of Arthur Miller, or Ibsen or — indeed - John B. Keane: a ravaged island community, a young zealous preacher and the established but impoverished priest; all obsessed with survival —some physical and others spiritual. *The Preacher and The Prelate* tells the true story of evangelical Protestant clergyman Edward Nangle's Achill Mission which, at the height of the Great Famine, sought to lift the destitute people of the remote Achill Island out of their desperation and save hundreds from certain death. His proselytizing efforts would meet huge resistance from the Catholic Church and hierarchy in a remarkable episode that exposed the fault-lines of religion, society and politics in nineteenth century Ireland.

[The Preacher and The Prelate: The Achill Mission Colony and the Battle for Souls in Famine Ireland](#) the extraordinary story of an audacious fight for souls on famine-stricken Achill Island in the nineteenth century. religious ferment swept Ireland in the early 1800s. A young, delicate clergyman Edward Nangle underwent a radical conversion and embarked on a life-long project. He resolved to civilise and evangelise by bringing the bible to the people using their native language. Yet the obstacles were overwhelming. The fury of the island elements, the devastation of famine, and Nangle's own volatile temperament all threatened

the project's survival — in addition to the dominant Catholic church's vigorous opposition.

In the years of the Great Famine the ugly charge of 'souperism', offering food and material benefits in return for religious conversion, tainted the Achill Mission's work. John MacHale, powerful Archbishop of Tuam, spearheaded the Catholic Church's fightback against Nangle's Protestant colony, with the two clergymen unleashing fierce passions while spewing vitriol and polemic from pen and pulpit.

Rev. Edward Nangle and the Achill Mission Colony save hundreds from certain death, or did they shamefully exploit a vulnerable people for religious conversion? *The Preacher and The Prelate* is a uniquely local story, through which the great themes of famine, Imperialism, sectarianism and evictions are played out. The dark events and bloody disputes of those awful years still prove contentious to this day. <>

[The New Mind Readers: What Neuroimaging Can and Cannot Reveal About Our Thoughts](#) by Russell A. Poldrack [Princeton University Press, 9780691178615]

A revealing insider's account of the power—and limitations—of functional MRI. The ability to read minds has long been a fascination of science fiction, but revolutionary new brain-imaging methods are bringing it closer to scientific reality. [The New Mind Readers](#) provides a compelling look at the origins, development, and future of these extraordinary tools, revealing how they are increasingly being used to decode our thoughts and experiences—and how this raises sometimes troubling questions about their application in domains such as marketing, politics, and the law.

Russell Poldrack takes readers on a journey of scientific discovery, telling the stories of the visionaries behind these breakthroughs. Along the way, he gives an insider's perspective on what is perhaps the single most important technology in cognitive neuroscience today—functional magnetic resonance imaging, or fMRI, which is providing astonishing new insights into the contents and workings of the mind. He highlights both the amazing power and major limitations of these

techniques and describes how applications outside the lab often exceed the bounds of responsible science. Poldrack also details the unique and sometimes disorienting experience of having his own brain scanned more than a hundred times as part of a landmark study of how human brain function changes over time.

Written by one of the world's leading pioneers in the field, [The New Mind Readers](#) cuts through the hype and misperceptions surrounding these emerging new methods, offering needed perspective on what they can and cannot do—and demonstrating how they can provide new answers to age-old questions about the nature of consciousness and what it means to be human.

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Excerpt: Thinking on 20 Watts: The Ultimate Scientific Challenge

Understanding how the brain works is almost certainly the most challenging scientific problem of our time. How can three pounds of tissue perform mental feats that outstrip the ability of the world's most powerful computers while consuming less energy than a dim lightbulb? Answering this question is the goal of neuroscientists, who study it at many different levels. Much of our current knowledge about how the brain works comes from studying other species, ranging from worms or fruit flies up to mammals like mice, rats, and monkeys. While this research has given us many important insights, most of us ultimately want to understand how the human brain works, and there are many aspects of the human mind that simply can't be studied in nonhuman animals: if we want to

understand how humans think, we need to study humans:

This book will tell the story of how a set of new technologies has given us the ability to study how the human brain works in greater detail than ever before. These tools are known as neuroimaging methods, because they allow us to create images of the human brain that show us what it is made of (which we refer to as its structure) and what it is doing (which we refer to as its function). One tool in particular has revolutionized our ability to image the brain: magnetic resonance imaging (MRI). This incredibly versatile technique has provided neuroscientists with the ability to safely watch the human brain in action, which has allowed us to understand how the brain accomplishes many psychological functions. In some cases MRI can even allow us to decode what people are experiencing or thinking about by looking at their brain activity when they are performing a task or simply resting—what some audaciously call "mind reading" but what is more accurately known as decoding. And the power of MRI is not limited to studying the brain only during a fixed point in time. MRI has also shown us how experiences change the brain, and how individual human brains change over time from childhood to old age. It has shown us that all human brains follow the same general plan, but there are also many differences between people, and these studies have given insights into the brain dysfunctions that lead to mental illness. In doing so, MRI has raised many new questions that go beyond science, ultimately addressing some of the fundamental questions about how we view ourselves as humans. If thinking is just a biological function that we can visualize with MRI, then what becomes of the mystery of human consciousness? If decisions emerge from the computations of the brain, then in what sense are "we" responsible for our choices? Is addiction a "brain disease," a failure of self-control, or both? Should we worry about the ability of marketing researchers to use brain imaging to more effectively sell us their goods? It is these kinds of questions that we will grapple with after providing an overview of both the power and the limitations of neuroimaging.

What Is Neuroimaging?

When I use the term "neuroimaging" I am referring generally to a set of techniques that allow us to look at the human brain from the outside. There are a number of different ways to do this, but I will focus mostly on MRI because it has become the most widely used tool for brain imaging owing to its safety and its flexibility. Different kinds of MRI scans can be used to measure many different aspects of the brain, and we will roughly group them into what we call structural and functional MRI. Structural MRI measures different aspects of the makeup of brain tissue, such as how much water or fat is present in the tissue. Because different parts of the brain contain different amounts of these substances, they will show up on the MRI image as brighter or darker. These aspects of the brain are very useful for detecting diseases of the brain, and for understanding differences in size and shape of different brain parts between people, but they don't tell us what the brain is doing—for that, we need to use functional MRI, or, as it is usually abbreviated, fMRI. fMRI came about when researchers discovered how to use MRI to detect the shadows of brain activity through its effects on the amount of oxygen in the blood. It is fMRI that provides the colorful images like the one shown on the right in color plate 1—in which parts of the brain seem to "light up." We will discuss the invention of fMRI and how it works in much more detail in chapter 2. First, we need to ask: What does "brain function" mean?

The Brain as a Computer

Each of the body's organs has evolved to serve a particular biological function: the heart pumps blood, the lungs oxygenate the blood, the digestive system extracts nutrients from food, and the kidneys filter waste products from the blood. What is the biological function of the brain? Whatever that function is, it's clearly very important—the brain accounts for only about 2% of the body's weight, but it uses about 20% of the energy consumed by the body.¹ If I had to come up with a simple label for what the function of the brain is, I would say: it processes information. Certainly not in the same way that your laptop or smartphone processes information, but nonetheless we can think of the brain as our body's central computing

system, extracting information from the world and using it to choose how to act, with the goals of living long, prospering, and (most importantly for evolution) reproducing. The brain is not the body's only computer—for example, the gut has its own as well, known as the enteric nervous system, with about half a billion neurons—but it's certainly the most important when it comes to the things that make us uniquely human.

While it might make sense to call it a "computer," the brain is definitely not like most computers that we are familiar with in the world. Those silicon-based computers follow the recipe these trials he would zap my parietal lobe with TMS, hoping to scramble the activity there and disrupt my memory. I don't think the TMS had a very strong effect on my memory, but it did have another very striking effect: every time he zapped me, I experienced a strong metallic taste on half of my tongue. It turns out that the TMS pulse was probably also stimulating nerves in my face that are involved in the perception of taste, and that's why I had this experience. This highlights one of the challenges with using TMS to study the brain—its effects are fairly widespread, at best targeting an area roughly the volume of a golf ball, and often stimulating nerves or muscles outside the brain as well.

Studying the Mind

I have just made the argument that the brain and the mind are identical, which might lead you to think that studying the mind and studying the brain are the same thing, but that's not quite right. We call people who study the brain "neuroscientists" and those who study the mind "psychologists." In particular I am referring to experimental psychologists, who use experimental methods to try to understand how the mind works by testing hypotheses about how people will behave in certain situations. This is the field that I initially trained in; it was only after I came to Stanford in 1995 as a postdoctoral fellow that I began to use neuroimaging to study the brain.

A nice example of this kind of experimental psychology research comes from a study by the psychologists Henry "Roddy" Roediger and Jeff Karpicke of Washington University, who examined

how we can best learn and remember new information.' In their studies, the experimental participants are presented with short paragraphs about various topics, such as sea otters or the sun. Participants were split into three groups: one group was told to read the paragraph four times (without getting tested at all), another was told to read it three times and was then tested once on the content, and the third was allowed to read it once, and was then tested on it several times. All of the groups were then asked how well they thought they had learned the materials, and the results were clear that the members of the first group (who had read the passage four times) were much more confident in their knowledge. The three groups were also tested on their knowledge of the material in the paragraph, either five minutes or one week later. The results of the immediate test were in line with the subjects' own predictions: memory was better for the people who had read the passage multiple times. However, a week later the results were strikingly opposite: The people who had been so confident immediately after learning had forgotten the most, and the people who had only read the paragraph once now had the best memories. Based on this research, the researchers proposed a theory that says that bringing information back from memory is actually one of the most powerful ways to cement the information into memory for the long term.

What's essential to note is that even though the research by Roediger and Karpicke is studying the workings of the brain, the study didn't measure the brain directly and the paper itself never mentions the brain. One can study the workings of the brain by measuring behavior, without actually looking at the brain itself. However, most psychology researchers now believe that the best way to understand the mind is to study both behavior and the brain simultaneously. This is the fundamental idea of the field known as cognitive neuroscience, of which I consider myself a member.

Cognitive Neuroscience before Neuroimaging

The focus of this book is on neuroimaging, which today is the most important tool of cognitive neuroscience. However, the field itself existed well

before the advent of neuroimaging. Lore has it that the name "cognitive neuroscience" was hatched by Michael Gazzaniga and George Miller while they shared a taxi in the late 1970s. Miller was a famous experimental psychologist, perhaps best known for his 1956 paper titled "The Magical Number Seven, plus or minus Two," which pointed out that humans are limited to processing a small amount of information at once (usually about seven things) across many different domains. Gazzaniga, who most would consider to be the father of cognitive neuroscience, was famous for his studies of "split-brain" patients, which had shown how the two hemispheres of the brain can act independently. The field that these two researchers envisioned would combine psychology and neuroscience research approaches to provide a better understanding of how the brain gives rise to the mind.

Before neuroimaging, the only way to understand human brain function was to study people with brain damage and examine how specific damage leads to specific cognitive problems. This method first took hold in the nineteenth century, when European neurologists like Paul Broca and Carl Wernicke examined the postmortem brains of patients who had suffered from stroke, and noted that the location of the stroke corresponded with different types of language impairments. This is, in a sense, relying on Nature to do our experiments for us. However, Nature is an unreliable lab partner: Strokes can be large and messy, and results are often difficult to interpret for this reason. However, in rare cases the natural experiment can be much more specific. A fascinating example comes from a small set of individuals with a disease called Urbach—Wiethe syndrome, who have been studied by Ralph Adolphs from Caltech and his colleagues for a number of years. This is a disease that primarily affects the skin, but it also has a very specific effect on the brain, causing degeneration in a part of the brain called the amygdala, which has long been associated with emotion and fear. These patients have normal intelligence and mostly normal cognitive function, but they do show a very specific deficit: they largely do not experience fear. In one study, these researchers exposed an Urbach—Wiethe patient (known by her initials,

"S.M.") to stimuli that would make most of us shiver: live snakes and spiders, a haunted house, and clips from scary films like *The Blair Witch Project* and *The Shining*. None of these things fazed her; in fact, the researchers reported that at the haunted house, "She reacted to the monsters by smiling, laughing, or trying to talk to them." The only kind of fear that has been identified in these individuals is the fear of suffocation. This kind of research provides us with important clues about the brain systems that are involved in experiencing fear, and many other psychological functions have also been studied in this way, using patients with different kinds of lesions or brain disorders. Lesion studies still play a critical role in cognitive neuroscience because they allow us to ask a specific question: Is a particular brain region necessary for a particular cognitive function? Neuroimaging can't answer this question—sometimes brain areas can be active when a person does a task, but lesions to that area don't actually impair his or her ability to perform the task.

The Unlikely Success of fMRI

Since its invention in the early 1990s (which is discussed in much more detail in the next chapter), fMRI has overtaken all other methods in cognitive neuroscience, including lesion studies and other neuroimaging methods. However, in retrospect it's amazing that fMRI works at all. Its success relies upon a set of chemical and biological dominoes that all had to fall into place for it to have any chance of working, almost as if nature conspired to help make it just a bit easier for us to understand how the brain works (though just the tiniest little bit).

The first biological fact that makes fMRI possible is that the firing of neurons is relatively localized across the brain. Take the portion of the brain that processes visual information, which neuroscientists very creatively call the "visual cortex." Within this part of the brain, different sections respond to information coming from different parts of the visual world. Another part of the brain, in the temporal lobe (the auditory cortex), responds to sounds, and yet another (the motor cortex) makes my fingers move as I type words on the page. Different parts of the brain seem to do different things (that is, there is some degree of modularity,

as we discussed above), and as we will see it is this localization of function that will ultimately allow us to decode what a person is doing or thinking of simply by looking at brain activity—the concept of decoding that I introduced earlier. It's possible to imagine that evolution could have constructed the brain very differently, with every function involving every part of the brain equally. In fact, until the middle of the twentieth century some very famous neuroscientists (such as Karl Lashley) believed that this was the case. However, the demonstration of clear effects of specific brain lesions on specific functions finally convinced the field that function is localized in the brain, at least to some degree.

Another aspect of the brain that makes fMRI possible is that brains are organized in a relatively similar way across individuals. Every human (and in fact nearly every mammal, except for monotremes such as the duck-billed platypus or spiny anteater) has a visual cortex that sits at the back of the brain, receives input from the eyes, and shows activity that is related to vision. Similarly, most mammals have a motor strip at the rear of the frontal lobe that controls the hands, whiskers, paws, or paddles. Again, we might imagine that evolution could have given us a random, haphazard organization of brain areas that varies from one individual to another, like spots on a calico cat. In this case, it would be very difficult to combine neuroimaging data across individuals, which we often need to do in order to gain statistical power through averaging. We also would not be able to compare the results with those from animal research, which can give us better insight into exactly what is happening in a particular area. Instead, research using nonhuman animals has provided important validation for results from fMRI research. The alignment across people is far from perfect, but it's good enough that we can warp together the brains of different people in order to analyze them as a group.

A third crucial biological fact is that the firing of neurons results in changes in blood flow that happen in a localized fashion as well. When neurons become active in a particular part of the brain, blood flow increases within the very close vicinity of those neurons (though we don't yet fully understand how this works). Without such tight

localization, we would be able to see changes in blood flow but wouldn't be able to tie them closely to the neurons that caused them.

The final biological domino is the fact that this blood flow response to the area of active neurons is, in an important sense, an overreaction—at least with regard to oxygen. Blood brings with it a number of important things that neurons need, two of the most important being glucose and oxygen. What we know is that the brain seems to deliver about the right amount of glucose to make up for the energy used by the neurons when they fire, but it sends too much oxygen relative to the small amount that is used by neurons. The details of exactly how this works are still the fodder for spirited academic arguments, but what we know for sure is that it is this overflow of oxygenated blood that lets us detect the activity of neurons using fMRI.

The chemical fact that makes fMRI possible was discovered by the Nobel Prize-winning chemist Linus Pauling in the 1930s. He was studying the magnetic properties of the hemoglobin molecule, which is the molecule that carries oxygen in the blood. What he discovered was that oxygenated hemoglobin (which is what makes fresh blood red) was not magnetic, but deoxygenated hemoglobin was "paramagnetic." A paramagnetic substance is not a magnet itself, but it takes on magnetic properties in the presence of a magnetic field. Think of a paper clip, which is not magnetic on its own, but when put next to a bar magnet will become magnetic. The invention of fMRI took advantage of the relationship between oxygen level and the magnetic characteristics of blood, by developing particular ways to use the MRI scanner to detect these differences.

What Can't Neuroimaging Tell Us?

While fMRI has shown itself to be incredibly powerful, it has also been used in ways that go beyond what it can actually tell us, which was illustrated well in an event from 2007. On November 11 of that year, an op-ed piece titled "This Is Your Brain on Politics" was published in the *New York Times*.¹ The authors, well-known neuroscientists and political scientists, reported results from a study in which they used fMRI to

measure brain activity while so-called "swing voters" viewed video clips of candidates in the then-ongoing US presidential primaries. Based on these data, they drew a number of broad conclusions about the state of the electorate, which were based on the brain areas that were active while viewing the videos. One of the claims in the op-ed was that:

Emotions about Hillary Clinton are mixed. Voters who rated Mrs. Clinton unfavorably on their questionnaire appeared not entirely comfortable with their assessment. When viewing images of her, these voters exhibited significant activity in the anterior cingulate cortex, an emotional center of the brain that is aroused when a person feels compelled to act in two different ways but must choose one. It looked as if they were battling unacknowledged impulses to like Mrs. Clinton. Subjects who rated her more favorably, in contrast, showed very little activity in this brain area when they viewed pictures of her.

Here was the verdict on Barack Obama:

Mr. Obama was rated relatively high on the pre-scan questionnaire, yet both men and women exhibited less brain activity while viewing the pre-video set of still pictures of Mr. Obama than they did while looking at any of the other candidates. Among the male subjects, the video of Mr. Obama provoked increased activity in some regions of the brain associated with positive feeling, but in women it elicited little change.

As I read this piece, my blood began to boil. My research has focused on what kinds of things we can and cannot learn from neuroimaging data, and one of the clearest conclusions to come from this work is that activity in a particular region in the brain cannot tell us on its own whether a person is experiencing fear, reward, or any other psychological state. In fact, when people claim that activation in a particular brain area signals something like fear or reward, they are committing a basic logical fallacy, which is now referred to commonly as reverse inference. My ultimate fear was that the kind of fast-and-loose interpretation of fMRI data seen in the *New York Times* op-ed would lead readers to think erroneously that this

kind of reasoning was acceptable, and would also lead other scientists to ridicule our field.

What's the problem with reverse inference? Take the example of a fever. If we see that our child has a fever, we can't really tell what particular disease he or she has, because there are so many different diseases that cause a fever (flu, pneumonia, and bacterial infections, just to name a few). On the other hand, if we see a round red rash with raised bumps, we can be fairly sure that it is caused by ringworm, because there are few other diseases that cause such a specific symptom. When we are interpreting brain activation, we need to ask the analogous question: How many different psychological processes could have caused the activation? If we knew, for example, that mental conflict was the only thing that causes the anterior cingulate cortex to be active, then we would be fairly safe in concluding from anterior cingulate activity that the person is experiencing conflict when viewing images of Hillary Clinton. On the other hand, if many different things can cause the region to be active, then we can't safely draw that conclusion. It shows an example of each of these two different cases. Work that I published in 2006 showed that activity of individual brain regions was not very specific for different psychological functions (that is, it's more like a fever than a round rash), and thus that this kind of simple reverse inference is problematic.' The anterior cingulate cortex is a prime example of this. When we looked across many thousands of published neuroimaging studies in a later study, we found that this area was active in about one-quarter of all those studies, which involved many different types of cognitive tasks. This means that we cannot tell very much at all about what a person is doing from the fact that the anterior cingulate cortex was active.

Throughout this book, I will return to the fact that there is no simple one-to-one mapping between psychological states and activity in specific brain areas. As we will see, it is possible sometimes to decode the contents of a person's mind using fMRI, but it requires sophisticated statistical analyses along with careful interpretation.

A Road Map for the Book

The goal of this chapter was to give some background in the kinds of questions that cognitive neuroscientists ask, as a prelude to discussing how we use neuroimaging to ask them. In the rest of the book I will lay out the story of how neuroimaging came to be, what it can and can't tell us, and where it is going.

The first section of the book focuses on the development of neuroimaging as a tool for studying the mind and brain. In chapter 2, I will describe how researchers in the 1980s began to use a method called positron emission tomography (PET) to study how brain activity related to mental function, building on a century of prior ideas about the relation between brain activity and blood flow. Their discoveries led to the development of functional magnetic resonance imaging (fMRI), which is now the dominant technique for measuring brain activity in humans, relying on an amazing confluence of biology, chemistry, and physics. In chapter 3, I discuss how fMRI grew from being a new technique to the most powerful tool in human neuroscience. We will see how it was validated as a measure of brain activity, and how it was used to ask specific questions about how the brain is organized. In chapter 4 we will dig more deeply into how fMRI has been used to decode the contents of the mind and to attempt to achieve "mind reading." In chapter 5, I will discuss how fMRI has shown us how experiences change the brain, and how individual human brains change over time.

The second section of the book will focus on the ways in which neuroimaging has begun to influence the world outside of the laboratory. In chapter 6, I discuss the ongoing attempts to use neuroimaging evidence in the courts, including the attempt to use fMRI for lie detection and why this is currently problematic. In chapter 7, I discuss the use of neuroscience tools to better understand how humans make choices and, ultimately, use them to find ways to sell us things more effectively, via the new field of consumer neuroscience. In chapter 8, I discuss how cognitive neuroscience has improved our understanding of mental illness, and discuss the ethical and social challenges of thinking of mental illnesses and addictions as "brain diseases."

Finally, in chapter 9 I discuss the future of fMRI and how its limitations may be addressed using other new methods. <>

[The Oxford Handbook of Religious Diversity](#) edited by Chad V. Meister [Oxford Handbooks, Oxford University Press, 9780195340136]

There exists today a rich and abounding diversity of religions in the world—a diversity with respect to both belief and practice. But it is a diversity that poses many challenges and raises many questions, most especially in a pluralistic milieu. How do we engage in effective dialogue with religious others? What should public education reflect in a religiously pluralistic context? What role might the diversity of religions play in developing a global ethic? How do the various religious traditions deal with the plurality of religious belief and practice? What role does gender play in such discourse?

[The Oxford Handbook of Religious Diversity](#) is a volume of thirty-three original chapters that cover numerous issues in religious diversity and draw readers into the heart of the current dialogue. It is divided into three parts: *Contours of Religious Diversity*, *Key Issues Relevant to Religious Diversity*, and *Differing Perspectives on Religious Diversity*. Chapters in the first part trace the general features of religious diversity discussions from four different fields: history, religious studies, philosophy, and sociology. Part two explores key theological, philosophical, sociological, and public policy issues relevant to religious diversity. The third and final part provides differing analyses of religious diversity from multi-faith, gender, and global points of view. An indispensable guide for scholars and students, the Handbook makes a state-of-the-art contribution to the field with essays crafted by experts representing a wide variety of religious and philosophical perspectives.

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Excerpt: In their Introduction, editors Lene Kühle and William Hoverd quote Robert Wuthnow, former president of the Society for the Scientific Study of Religion (ISSR) who in a 2003 presidential address said:

[...] heightened religious diversity [in the United States] [...] posed a significant challenge to ways in which we, as ordinary citizens, think about religion or, as scholars, teach about it and could research about it.

The editors, who represent the steering group of a Danish research project 'The Critical Analysis of Religious Diversity' (CARD), position their research project and this book in line with the challenge posed in this quote, and in conjunction with another one taken from a 2008 publication by Lori Beaman and Peter Beyer:

...the meaning and implications of the term diversity are contested. By this we mean that there is no single way to conceptualize diversity, and further, that there are consequences to naming diversity as something to be studied.

The CARD project and its outcomes, as represented and exemplified in this book, follow the recent decades of scholarly interest: an interest not just in religion 'as such' or 'out there' but an interest in the popular conceptualisations as well as the scholarly notion(s) of religion ('religion'), an interest in what these notion(s) and categories of religion do to the study of 'it' as well as to the political, cultural, societal ways of seeing and handling 'religion' and religion(s).

It is the critical analyses of the way(s) that scholars and others (media, politicians, states, etc) conceive of, think of, deal with, regulate, and control religion(s), religious pluralisms and diversities that constitutes the core research interest of this volume.

This, however, does not mean that the volume is just a ('highbrow', abstract, ivory-tower) academic exercise in theoretical or methodological critical self-reflections on the analytical (and political) category and categorization of 'religious diversity'. It is, of course, a book in which the editors and the authors also describe, analyse, and discuss the actual and factual consequences of the various conceptualisations and categorisations of religious diversity evident in their case-studies. It is, thus, not

just the general, scholarly discussions but and multiculturalism, while in discourses on secularism, social cohesion and state neutrality the term may take on a more negative tone. There are, all in all, quite a number of reasons why it is so difficult to get hold on religious diversity. From being a relatively specific concept most used by scholars of religion (mainly Sociologists and Philosophers of religion) with reference to modern western societies, it has now become a key concept in interdisciplinary, often politicised scholarly as well as public debates aiming to address and describe religious diversity as a historical and global phenomenon. It is certainly no surprise that the concept suffers from confusion and lack of clarity. Individual scholars try to bring clarity to the discussions, but the task at hand is immense. We suggest that the task at hand can be better addressed by a community of scholars.

The Critical Analysis of Religious Diversity Network

The idea of a network for the Critical Analysis of Religious Diversity (CARD) Network arose in 2011 when two editors of this volume had the good fortune to be hosted by the Religion and Diversity Project (RDP) at the University of Ottawa, Ontario, Canada. Headed by Canada Research Chair, Professor Lori Beaman, the Religion and Diversity project had been awarded seven years of funding devoted to the study of the contours of Religious Diversity in Canada, as well as, the study of the implications of these contours for promoting a just and peaceful society. Inspired by the work being conducted by the RDP in Canada, Lene Kühle and William Hoverd, being scholars from small understudied Western nations (Denmark and New Zealand) with very different demographics, culture and geographies wanted to find a way to further understand the contextual nature of religious diversity in terms of our own nations and experiences. It was our observation that studies of religious diversity were, at that time, taking place within certain national contexts and utilising methods derived by the intuition of individual scholars. We felt that there was an opportunity to collectively analyse the methods with which these scholars are studying diversity within their own research and research areas.

The CARD Network was formed when in 2012, Principle Investigator Lene Kühle, Aarhus University in association with Jørn Borup, Aarhus University, William Hoverd, Massey University and Tim Jensen, University of Southern Denmark were awarded a Danish Research Council Grant to fund a two-year study of the methods used to study religious diversity. The CARD network was a call to develop a reflexive understanding of methods applied to researching religious diversity. We turned our attention towards an analysis of the processes by which scholars define religious diversity. We wanted to know what research methodologies investigators use to study religious diversity. We recognised that each country's religious context impacts the categories which are being used to study diversity. We aimed to identify how context dependent these research methodologies might be and to what extent they could be decontextualised for others to apply to their own investigations of diversity. Moreover, we wanted to collect these methods together into one place where they could be utilised, critiqued and improved by the academic community. Thus, the goal of the network, and now this volume, was to identify these various research approaches and analyse their various strengths and limitations for future usage by other scholars in the field, as well as, to use this new knowledge to further our understandings of religion. The project's ultimate goal was to attain a clearer understanding of how religion is being conceptualised, defined and policed by States and the scholars who study religious diversity within those nations. Moreover, what we found in the end was that this question was insufficient, because we need also to consider how the empirical reality of religious practice is an additional, often confounding, factor to also be considered.

The Critical Analysis of Religious Diversity Network was launched at a meeting in 2013 hosted by Jørn Borup and the Centre for Contemporary Religion, Aarhus University. In the first meeting, twenty-two scholars from around the world met to discuss how to conduct research on religious diversity in an intentionally critical and reflexive manner. The first meeting concentrated on assembling a wide variety of international scholars to explore the theme how to study religious diversity. The international focus

was an attempt to think about a variety of global contexts of religious diversity, which included the United States, United Kingdom, Australia, and Canada, but was not dominated by the scholarship and assumptions about religious diversity drawn from these contexts. It asked participants to reflect upon the ways their scholarship constructed the social realities of religious diversity in the world. In particular, they were requested to identify and highlight what assumptions were they drawing upon when they developed their studies of diversity. CARD initially aimed to collectively analyse the context dependent methods that scholars are currently using to study diversity within their specific nations. We asked scholars to reflect upon the following ten methodological questions when presenting their work:

1. Does your research use the term religious diversity, pluralism or both terms? Do you see the terms as distinct from each other?
2. What methods are researchers currently using to study religious diversity? Are they using quantitative data, qualitative data, census data, or micro, macro, comparisons?
3. What are scholars finding to be the strengths and weaknesses of these methods for this research?
4. What artificial limitations and relationships have researchers assumed when using broad categories to define religious groups such as Buddhist, Christian and Muslim?
5. How have researchers treated individuals who profess multiple religious affiliations and those who associate their religion with their national or ethnic identity?
6. Is your research constrained by human rights discourses and law? How is non religion being assessed?
7. How have numerically small religious groups been treated by researchers? Are researchers finding that new categories and/or definitions of religious belief are necessary?
8. How have scholars addressed the relationship between the nation state and religious diversity in their context?

The first CARD Network meeting concluded that because religious diversity is a concept which is often used interchangeably or in interplay with related concepts like religious pluralism, religious plurality, multi-religious or multifaith, and therefore discussion of conceptualisations of religious diversity cannot ignore these concepts. It asked 'what are the consequences of applying these different terms and what happens if religious isn't singled out, but is instead seen as a dimension of multiculturalism or general diversity or even superdiversity?' Consequently, we found that the study of religious diversity also raises questions of how religious and religion is defined and who gets to define what counts as religion? And that the concept of religious diversity may refer to different diversities: i.e. the existence of a diversity of religious organisations, religious traditions or religious individuals? Furthermore, the network noted that in empirical studies there is always the question of research design and methods. Specific methods allow the researcher to see some things while overlooking others. Consequently, a topic of huge political salience for the study of religious diversity is the issue of how the political environment and media constructions of diversity may influence the categorisations we use in our scholarship.

The network identified that a critical approach to religious diversity requires awareness and self-reflexivity of the necessary choices being made in a research project. The prefix 'critical' is an often-used, but seldomly clearly defined concept. This became obvious when a group of scholars in 2013 established the Journal of Critical Research on Religion. The launching of the journal and in particular the 2015 April editorial, "How can mainstream approaches become more critical?" prompted vivid debates on what 'critical research on religion' entails. The British philosopher Andrew Sayer has outlined five ways the term 'critical' can be understood. In a minimalist sense it is only taken to mean a questioning of older ideas, making every kind of research critical. A second understanding of critical refers to the reduction of illusions in society. Central in this understanding of critical is a process of denaturalisation in which the concept's (in this case religious diversity) air of

being simple, natural, 'given' is scrutinised and brought into question.

Sayer coined the concept 'explanatory critique' for the third position which identifies false beliefs and practices based on these beliefs and explains why these false beliefs are held. Stronger conceptions of critical may encompass two other elements; orientation towards emancipation and a critique of suffering. The CARD network has evolved independent from the journal's content, but shares many of the concerns including the call for "new ways to unmask the processes through which we position our own intellectual tasks". But where the Journal of Critical Research on Religion connects directly to the tradition of critical theory (and the more specific concepts of critical discussed and advocated by Sayer), the understanding of the concept 'critical' adopted in the CARD network after discussion at network meetings is connected to the less demanding concept of critical as implying denaturalisation. Some scholars may work with those deeper notions of critical suggested by Sayer. Unlike the scholars working with the Critical Research on Religion Journal, the CARD network is not advocating paradigm shifts. Rather we encourage scholars to share the reflections they are already making for the benefit of the scholarly community to enable an environment where, with Latour's words in mind, research should not "in advance, and in place of the actors, define what sort of building blocks the social world is made of...".

Importantly, there is not one right way to study religious diversity, but we argue that there are research projects which are more considerate, more deliberate and simply better thought out. Thus, in order to encourage more robust — and more critical — research on religious diversity, it was decided to formulate a check list as a way of summarising some of the issues raised in the network's discussions that might need to be considered in religious diversity scholarship. The Check List for Critical Religious Diversity Research, (See conclusion) produced by our network is a tool for any scholar engaging in research on religious diversity. The checklist is in no way intended as proscriptive, rather it should be a departure point that can offer a catalogue of issues worth

considering when embarking on empirical studies of religious diversity. The check list was posted on the network's website and it will be discussed in more detail and included as a tool for others to consider in their scholarship in book's conclusion.

With this contextual and reflexive groundwork established, the second CARD Network meeting was hosted by Tim Jensen and Odense University in the seaside town of Nyborg in June 2014. It aimed to further develop the findings of the first meeting in specific contexts. This included the construction and management of religious diversity in the domains of law, education and health. Moreover, it aimed to move the discussion into other contexts such as ancient history and Asian contexts to start to consider how broadly the term and study of religious diversity might be applicable. The second network meeting initiated work on the website www.cardnetwork.au.dk gathering among other things literature on religious diversity and the checklist.

Overview of the Book

The content of the CARD network meetings constitutes the content of this volume. The book is divided into three parts. All sections hold a small introduction to the problematics addressed by the different chapters in the sections. The first section of the books Theoretical and Methodological Issues consists of four chapters. The goal of the first section is to present a number of different critical approaches to religious diversity scholarship. The authors are present their method for studying religious diversity and reflect self-critically on how their use of concepts and choice of method frame religious diversity in particular ways. Chapter 1 (Beyer) presents a theory of how the concept of religion has developed parallel to a differentiation of a secular sphere applied with reference to a study of young adults of the first generation in Canada, Chapter 2 (Griera) presents religious diversity as organisations, while Chapter 3 (Hoverd and Kühle) presents religious diversity as individual adherence with reference to the question of censuses. Chapter 4 (Dawson) discusses fixed versus dynamic concepts of religious diversity under the framework of a revitalised conceptualisation of

modernity as a fruitful way to approach religious diversity.

The second section is called II Religious Diversity in NonWestern Contexts and addresses the question of non-modern and/or non-Western religiously diverse contexts. Chapter 5 (Marcos) finds similarities between contemporary and Christian apologetic discourses in the Roman Empire. Chapter 6 (Borup) argues that in Asia, religion has to a lesser degree than what is the case in the West been pressed to conform to specific structures. Chapter 7 (Travagnin) questions whether it is possible to talk about religious diversity in China at all even if concepts of religious diversity are imposed by the government.

The third section III Religious Diversity in Societal Contexts concerns the representation of religious diversity in different societal spheres i.e. law courts, multi-faith councils, and education. It addresses how these societal representations and understandings of religious diversity may clash with academic conceptions. Chapter 8 (Tunger-Zanetti and Bauman) investigate the emergence of multi-faith councils in Switzerland and their construction of religious diversity. Chapter 9 (Bramadat) presents a case of controversy in the public sphere where the spheres of law, education and media overlap. Chapter 10 (Halafoff) investigate how the 'challenge of religious diversity' is handled in more or less successful ways by employing multi-faith and religious education initiatives respectively. Chapter 11 (Christensen) discusses the handling of religious diversity in research on media and religion. Chapter 12 (Burchardt) shows how the legal concepts protecting religious diversity compete with claims to other human rights in post-apartheid South Africa. In this section, it also becomes clear that scholarly conceptions do not necessarily have the upper-hand when questions of religious diversity become an issue of contest. Also that 'bringing religions together' whether in real life or for research purposes is not always easy.

We conclude by bringing together the central aspects from the various chapters in the context of the Checklist. The Checklist is placed here rather than in the beginning to avoid reifying it. We want to keep it as a working tool, as well as, a work in

progress. By putting the Checklist last we want to emphasise that the efforts to develop a research agenda for religious diversity with innovative theories and meticulous methods is only beginning to emerge. The conclusion thereby aims to initiate a discussion of the implications of moving away from just saying "religious diversity" to thinking about the term as an object of knowledge, power and social construction. The editors understand that this is no end in itself, but we argue that trans-contextual studies of these processes will lead to a greater critical understanding of the manner in which agency, power and language together construct the way in which scholars use the term religious diversity, as both an analytical device and as a descriptor for the way in which religion functions within a particular context. The concept of religious diversity is a concept of the public discourse as well as an academic concept. Not least in the current epoch of post-secularity, religious diversity has brought into civil society concerns of cultural and political challenges, some of which are directly related to conceptualizations, performances and discourses of the issue or religious diversity. Common scholarly questions regarding religious diversity ask how different religious groups can coexist within neighbourhoods, workplaces, and nations. The study of religious diversity also raises questions of how religion is defined and who gets to define what counts as religion? These questions have now become high-stake political issues: Religious diversity brings with it concerns about how religious groups should participate within civil society.

From the 2000s, religious diversity has become a topic of significant attention for academics and civil society. This book's chapters have outlined a number of the issues, problematics and potentials surrounding the critical study of religious diversity that will inevitably require further research. This concluding chapter summarizes the various chapter contributions, as well as providing an outline of what the editors consider might be a fruitful research agenda for the study of religious diversity. This book arose from the auspices of the Critical Analysis of Religious Diversity network (CARD Network). The network, founded by a small grant from the Danish Research Council in 2012,

took its point of departure from a number of critical questions (presented in the introduction) that the editors had posited around how scholars used the term 'religious diversity' in their work. Throughout the CARD network's discussions, it became increasingly clear that the investigation of how the term was used shifted our thinking beyond the discussion of linguistic obscurities; it tasked us to critically engage with how the term's usage affects the object of study, i.e. the rich variation in religious practice that abounds within different societies.

In the first 2013 workshop, the CARD network developed a tool, a checklist for the critical analysis of religious diversity, which we believe can constitute an important resource for reflexive praxis when it comes to the study of religious diversity. This checklist is presented later in this conclusion. In addition to the checklist, this book's contributions allow us to articulate, with more precision, what we mean by the term 'a critical analysis of religious diversity' and how we think this could be performed which is why the title of the present book is 'The Critical Analysis of Religious Diversity.' We claim that the critical analysis of religious diversity, which we advocate, stands on four pillars:

- the dynamics of diversification and homogenisation are both fundamental to human life;
- it is crucial to distinguish between the official or academic concepts (academic, folk, official) of religious diversity and the actual phenomenon of everyday religious diversity as it exists within a society;
- religious diversity is often related, but not necessarily identical to, other fields (ethnic, linguistic, cultural) of diversity;
- concepts and analyses of religious diversity are contingent upon biased data of a dynamic empirical context.

As a result, empirical research on religious diversity can prioritize certain interpretations of data which can potentially unduly skew our concepts of diversity.

The first pillar is the realization that the dynamics of diversification and homogenisation are fundamental to understanding social and religious life. Human beings are creative and constantly create new understandings of the human condition. Human beings are however also social beings which need to feel connected to joint meanings, which are created through processes of voluntary, as well as, coerced homogenizations. This first pillar is usually assumed in cultural diversity scholarship, but it is perhaps so implicit that it is often not stated directly and is at risk of being overlooked. Obviously, the approaches to the study of this first pillar may differ. For example, on the one hand, Jorn Borup states "the field is also a matter of gaze: the focus on religious diversity also expresses a new cultural, political and academic focus with broader perspectives on the general study of religion as well" (p. 128). Andrew Dawson, on the other hand, emphasizes the need to understand the 'new diversity' as "patterned by overarching processes and transnational dynamics that are typically modern in character. Consequently, when it comes to thinking about this first pillar of scholarship, the important point is therefore not only focusing on how processes of diversification take place, but also recognizing that both their constructedness and their rootedness in global processes are important to study.

The second pillar of critical scholarship is the crucial distinction between the ('folk, official or academic) concepts of religious diversity used and that of everyday religious diversity as it exists as a phenomenon within a society. Indeed, religious diversity may exist within a society without the need for having a concept for it. In this volume, this distinction is very clearly expressed by Mar Marcos, who discusses the presence of tolerance regarding religious diversity in the Greco-Roman world, in a situation in which tolerance of religious diversity was uncontroversial and thus needing no descriptive words to describe the phenomenon. For Marcos, it was only with the advent of Christianity in the ancient world, that the presence of different religions became controversial and a matter of scrutiny. In addition, we need to acknowledge that emic and etic understandings of religious diversity are different, and this difference matters. Stefania

Travagnin's area of research occurs in a different in time and place, her approach of counterposing emic and etic concepts of religious diversity, is similar. She suggests that what often appears at first glance to be an ambiguous and fragmented Chinese religious landscape is in fact highly structured. Especially, if we look at it from the perspective of traditional Chinese understanding of a 'heterogeneous stability', which the Chinese would call 'harmony'. This book offers a final example of this second pillar, again set in a very different context, namely that of present-day Switzerland in the work of Andreas Tunger-Zanetti and Martin Bauman. Tunger-Zanetti and Bauman's work observes how different often inconsistent categorizations of religious groups becomes salient when it comes to organizing everyday inter-faith activities and this categorization serves the purpose of excluding and including 'religions'. Consequently, this second pillar acknowledges that an important dimension of research on critical analysis of religious diversity must therefore include an acknowledgement of the pre-existing, often officially sanctioned, conceptualizations of religious diversity as well as the embedded choices of religious diversity which occur within everyday practice. In the future, a thorough conceptualization of both emic and etic conceptualizations of religious diversity will be fruitful for future research in this area.

The third pillar acknowledges that, 'religion' is a modern western concept, which assembles practices and ideas of the past and the present to a 'packaged' concept, that of (world) religions and that the concept of 'religion' and 'religious' though born out of the specific historical (and religious) context is often useful for understanding logics and dynamics of (what we call then) religious diversity more generally. Peter Beyer's chapter tells the story of the differentiation of the concept of religion and of religious diversity, i.e. the historical account of how religion (in singular) became religions (in plural). However, religious diversity is often studied alongside with and inseparable from other kinds of diversity. Religious diversity is often difficult to distinguish and extricate from ethnic diversity (something evidenced by the concept EthnicReligious diversity or Ethno-Religious

diversity). The simultaneous coexistence of many different types of diversity may be saturated into the concept of superdiversity, which insists of the importance of a 'multidimensional perspective on diversity'. Moreover, as Buchardt argues in this volume, religion may not always be the primary dimension of a discussion about diversity. However, we contend that there may often be a useful critical point in analytically distinguishing between religious diversity and other kinds of diversity. Roger Brubaker argues that the conflation between, for instance, religious and linguistic diversity as 'cultural stuff' is 'flattening' and that it may be helpful to also focus on what it is that makes religion distinctive (Brubaker 2013, 16). For example, while it is generally perceived as a resource to be bilingual and relatively unproblematic to hold a mixed ethnic background, when it comes to religion this perception does not always hold. Religious adherents may in many contexts be forced to choose between religious identities and not be both Muslim and Christian at the same time. Halafoff's chapter presents a useful illustration of how young people, who have chosen an identity as 'religious' try to fit their understandings and past experiences into the structures made available by the interfaith organization 'Interaction'. Halafoff clearly states that the processes she charts are not to be generalized because most young people in Australia do not consider themselves to be religious, and in this way Halafoff makes an important statement in terms of knowing the limits of the phenomenon studied:

The fourth pillar recognizes that, empirical research on religious diversity is often entangled by and within dynamic empirical realities, where conflicting narratives of representation and biased data potentially create blind spots and skewed concepts of diversity. This interpretative challenge is embedded in the fact that discussion on religious diversity is, as Dawson suggests, part of a revival of worries about religion. Bramadat's chapter, on how research on religious diversity can become difficult when it has become part of societal debates in a highly politicized context, exemplifies this challenge nicely. Another example is provided by Griera's comments on the role of interlocutors in

empirical research. In the mapping of religious diversity in Catalonia, religious groups were contacted through key informants, but the sample turned out to be strongly biased in terms of gender and age and the opinions represented by the key informants were unrepresentatively orthodox. Ultimately, there is probably little that can be done to address the interpretations that come to the forefront of empirical data, but what is prioritized and what is excluded or marginalized in this type of research needs to be discussed and considered. Kühle and Hoverd discuss the dependence on collection of data by the state and how some states may produce data on religious diversity, which in some cases allow for quite good descriptions of the religious fields, even if the pre-selected viewpoint of a census will always have its blind spots and unacknowledged priorities and understandings. One such understanding is that the nation state remains the most relevant level from which to measure religious diversity, even if religious landscapes normally vary quite substantially from city to countryside or across regions. Christensen's chapter similarly points to the existence of a form of methodological nationalism in research on religion and media, which functions as a potential blind spot. Christensen's work acts as part of a more generally warning on an uncritical reproduction of the narratives studied.

Ultimately, this warning about the uncritical reproduction of narratives about religious diversity in fact, maybe the most general statement of the aim of the CARD network and this book. Our request for scholars to practice reflexivity in their work on religious diversity is hardly controversial. However, this is easier said than achieved. The reflective considerations required are complex and not easily systematized. This is where we now turn to the checklist for critical research on religious diversity, mentioned already in the introduction. We suggest that the checklist, as discussed below, can be a useful reflexive tool for undertaking a critical analysis of religious diversity.

Checklist for Critical Research on Religious Diversity

The checklist is intended to assist anyone engaging in research on religious diversity. The checklist

summarises and formalises the issues raised in discussions at the first and second CARD network meeting. In and of itself, the list does not constitute any particular revelatory rocket science. Yet we believe it to be helpful, rather than proscriptive, for developing critical research on religious diversity and because its value lies in that, it supplies an exhaustive carefully peer reviewed (globally and trans-disciplinary) and considered list of issues scholars should consider as part of their research. We are particularly indebted to network member Professor Rosalind Hackett who championed the checklist's genesis.

The checklist is divided into seven themes: terminology, methodology, context, framing, theories, funding/institutional logics and outcomes. Each theme will be discussed below, but first a qualification is required. The checklist makes it clear that when we talk about research it is a particular kind of scholarship we have in mind, namely empirical research. There is an abundance of theoretically oriented literature in for instance philosophy and theology. This literature is useful and though the checklist may be helpful for this kind of research as well, it is primarily written with empirical researchers in mind.

Terminology

'Terminology' covers a number of questions regarding the use of concepts. Religious diversity has a number of conceptual partners: thus it can be a concept which is often used interchangeably or in interplay with related concepts like religious pluralism, religious plurality, multi-religious or multi-faith. Even if scholars employing these terms are not always aware of it, these terms all have different origins and histories. Bender and Klassen for instance point to how ' [c]ontemporary articulations of religious pluralism have reproduced older distinctions between "world religions"...'. The concept of the 'big five', i.e. the world religions (Buddhism, Christianity, Hinduism, Islam, Judaism) has been widely criticised for the way it universalises Western, Christian and colonial concepts of religion. Despite the fact that many scholars continue to see a value in the concept of world religion scholars doing research on religious diversity may find value to consider the benefits

and limitations of these 'world religion' concepts for their research on religious diversity when focusing on the traditions of Buddhism, Christianity, Hinduism, Islam, Judaism. Thus, the checklist asks scholars when they study religious diversity to be attentive to how 'religious terminology' is being employed and by whom, as well as, why they might be using that particular terminology.

Methodology

The question of methodology is central to empirical studies. 'Methodology' concerns the choice of methods, where a distinction is often made between qualitative and quantitative methods, though mixed methods would seem to provide a good, but very rare choice of methodology. Specific methods allow the researcher to concentrate on certain aspects of an object of study while overlooking or deemphasising others. A widely used measure of religious diversity by quantitative methods is the Herfindahl index. The Herfindahl index is a commonly used measure of market concentration and as a measure of religious diversity is based on membership proportions. Other measures take their point of departure in the presence of different religious traditions, like the Adherence Diversity Index, which is in a way similar to the Herfindahl index because it measures the diversity of religious traditions and which combined with the Organizational Diversity Index, which measures the existence of different religious organisations within faith traditions.

However, there are problems inherent within these methods of measuring religious diversity; they include ascertaining reliable knowledge about the relevant religious organisations, as well as, the problems of categorisation: because when assigning groups to simple categories whether that is for a database or a measurement it inevitably relies on researchers' judgments. Quantitative analysis allows these researchers to use their samples to make broader claims about a religious population, perhaps even at a national level, with a clear statistical discussion of the error implicit in the analysis. However, survey researchers face other problems. Some of the problems concern the measures used to locate religious identity or affiliation all together. British sociologist of religion,

David Voas has, on the ground of his extensive experience with surveys on religion, created what he terms Voas' first and second law of religious statistics. Voas' first law reads that a quarter of responses to religion questions are unreliable as people will reply something different if asked again. Voas' second law states that a similar amount of responses lack validity, suggesting that the answers do not mean exactly what they appear to mean. Another well-known problem for survey scholars researching religious diversity is that the groups sampled are often so small that it is impossible to undertake any form of reliable or representative analysis. Neither can a measure of identification with a religious group tell us anything about practice, belief, or community involvement. Moreover, quantitative measures of religious diversity face the problem and criticism of crudeness and of reducing complexity (and representations of diversity) in the process of measuring religious diversity. But scholars employing quantitative methods may receive praise for their openness to criticism caused by rigorous methods of selecting and defining variables 'that can more easily be escaped in discursive treatments of the same phenomena' (Voas 2014, 116). The lack of a description of the precise procedures used by qualitative research obviously pose a problem if research is to be repeated or compared and research using qualitative methods is less likely produce generalisable results. Clearly, all empirical methods have their problems and blind spots. The methodology question on the checklist attempts to bring these challenges forward for the individual researcher to be aware of and for scholarly communities to address and reflect upon utilizing a variety of approaches to overcome the limitations of their current method (for instance by employing complementary and supplementary methods).

Context

The questions collected under the title 'Context' pertain to the time and location of the study. Unlike the concept of religious pluralism which may be regarded as a "fully modern concept arising in concert with the equally modern ideas of secularity and religion" and "in response to particular challenges in the development of Western liberal

democracies" (8), by contrast (religious) diversity is generally believed not to be limited to modern times: Religious diversity occurs throughout history. However, different historical eras vary enormously in relation to how religious diversity interacts with and may be restricted by specific ideals of what constitute orthodoxy and the needed level of enforcement of uniformity (Dixon, Freist and Greengrass 2009, 2). Dixon, Freist and Greengrass suggest that historians tend to have overlooked these dynamics: 'no one single or inescapable history captures the phenomenon of religious plurality in the early-modern period. There were numerous settings, multiple dialogues and varied effects' (5). Given our caveats above, special precautions should of course be taken for studying religious diversity in periods where the phenomena of religious diversity, tolerance and even pluralism is present, and especially so when studying contexts where concepts are either non-existent or are very different from modern concepts. Similar arguments may be made in regard to the study of religious diversity in non-Western contexts. It is well-known that the modern concept of religion holds a Christian legacy and that we need to acknowledge that the concept of diversity also originates from the western context of 19th century nation-building. Thus, religious diversity may, unsurprisingly, fit better into self-understandings and practices of Christian communities and identities than those of Asian contexts and religions. The challenges of studying religious diversity in, for instance, Japan demonstrates that multiple religious' belongings are so common that the concept of diversity, in this context, may become a misnomer. The gap between official definition and lived religion is for instance seen in the Religions Yearbook published by the Japanese Ministry of Education and Bureau of Statistics, which states that more than three-quarters of the total population visits Shinto shrines, but surveys find that only 2-3% of Japanese identify themselves with Shintoism. The checklist asks scholars to consider how useful the notion of religious diversity is to the particular context that they study, and care should be taken before assuming that notions of religious diversity are useful across all time periods, cultures and societies.

Framing

'Framing' goes beyond the question of the definition of the term religious diversity and focuses on questions of what is included and excluded from the study. Religion is only one aspect of diversity and importantly we must ask the question how does religious diversity function as part of a larger pattern of diversities? How does the study deal with cultural religion of the majority population or incorporate ethno-religious identities of many religious minorities? The culturalisation of majority religion (i.e. 'removing minority religion from the realm of the religious to the domain of culture') may, according to Lori Beaman and Winnifred Sullivan, have the effect of denying rights, and may also have 'potentially deleterious effects for minority religious groups'. Another related important dimension of framing religious diversity, is how to study (and include) people without religious adherence: Is non-adherence included as a dimension in the pattern of religious diversity and do we need to make distinctions between, for instance, active atheism, agnosticism and indifference? We also must be attentive to the fact that often religious communities hold different conceptualizations of their religion to that held by the public and the academic interest in their religion. Some groups may — for reasons of mission or funding- be more than eager to participate in anything which gives publicity, while others might try to evade attention or even hide, because they want to avoid contact with an ungodly world or because they know that what they believe and practice is considered problematic by the majority of their society. Another framing issue occurs when important religious dimensions of a study are not singled out, but instead are seen as a dimension of a general diversity or even superdiversity? Subsuming religious diversity as part of a general diversity domain (e.g. 'multiculturalism') may highlight some aspects while other aspects like 'the special grammar' of religious diversity are left unexplored. Religious diversity may look different from other forms of diversity (i.e. ethnic, linguistic, national), even if religious diversity also contains traits similar to other categories of cultural difference. The analytical fruitfulness of (sometimes) keeping

religion separate from other world views is made in the recent work of Peter Berger when he distinguishes between two pluralisms, the pluralism of different religious options co-existing in the same society and the pluralism of the secular discourse coexisting with various religious discourses. The checklist argues that when it comes to framing our scholarship we always need to be attentive to the important questions of who and what is included and who and what is excluded from the discussion of diversity.

Theories

Issues stated under 'Theories' concerns the overall theoretical framework into which the study of religious diversity may be included. Theoretical discussions on religious diversity in the sociology of religion have to a large extent been framed by theories on the relationship between secularisation and religious pluralism that were put forward by Peter Berger in the late 1960s. Berger argued for a dialectical relationship between religious pluralism (which he defines as "a situation in which there is competition in the institutional ordering of comprehensive meanings for everyday life") and secularisation (defined as "the process by which sectors of society and culture are removed from the domination of religious institutions and symbols").

It may be said that Berger is making a subtle distinction here between diversity and pluralism, where the former refers to the mere existence of different worldviews, and the latter to the active interaction in terms of competition between the worldviews. Berger's commentators have, however, often conflated this distinction and substituted the concept of pluralism with religious diversity, defined simply as the existence of different religions. This is for instance evident in attempts to test Berger's 1960s theory of the relationship between religious diversity and religious vitality, which boomed in the 1990s. Since then, efforts to find relations between secularisation/ religious vitality and religious diversity have been seriously halted due to lack of consistency regarding results and the criticism concerning the measurement of religious diversity. Empirical testing, as such, did not interest Berger, but it was nonetheless empirical realities which in the late 1990s after decades of

increasing doubt about his own theories, that resulted in Berger restating the consequences of religious pluralism:

What I did not understand when I started out — my God, it's now almost forty years ago is that What has changed is not necessarily the what of belief but the how of belief. Someone can come out with an orthodox Catholic statement of belief -'I believe everything that the Pope would approve of'- but how that person believes is different. What pluralism and its social and psychological dynamics bring about is that certainty becomes more difficult to attain. That's what I mean by the how of belief

Berger's *Alters of Modernity* reads as a return to his 1967 discussion under revised conditions. As mentioned above, Berger now distinguishes between a general pluralism and a religious pluralism of 'peaceful coexistence' of religions. His thinking now operates with two pluralisms, the pluralism of different religious options co-existing in the same society and the pluralism of the secular discourse that coexists with various religious discourses: 'For the faith of individuals the implication of this is simple and exceedingly important. For most religious believers faith and secularity are not mutually exclusive modes of attending to reality; it is not a matter of either/or, but rather both/and'.

An important theoretical change regards how the new definition of religious pluralism represents a change from a descriptive, but perhaps slightly negative conceptualisation of religious pluralism as competition (which erodes the plausibility of religion), to a positive definition emphasizing peaceful cohabitation. Pluralism is defined as a peaceful coexistence (something Fenggang Yang would use the term plurality for). Now absent is the insistence that pluralism by necessity entails a decline of religion. In an apparent contrast to Berger's 1999 — insistence on 'desecularization, religion and secularity are now not mutually exclusive: 'The ability to handle different discourses (to use Alfred Schutz's term, different relevance structures) is an essential trait of a modern person' (Berger 2014, 53). Berger's approach to diversity/pluralism puts emphasis on consequences

for the individual, while other theories take meso or macro perspectives. Other theoretical insight into religious diversity includes Andrew Dawson's and Peter Beyer's work, presented in this volume.

There are however also some methodological consequences from a chosen theoretical approach: for example, Berger's approach to diversity/pluralism entails an emphasis on the individual and perhaps surveys, individual interviews or participant observation. Other pieces of some of the research on religious diversity draws on general social research theories such as organizational ecology or generalized social trust. Almost all of the research takes its point of departure in a claim about growing levels

of religious diversity. However, a gap exists between empirical and theoretical thinking about religious diversity because much of the research that has so far been conducted on religious diversity is not very theoretical. The checklist prompts scholars to reflect upon the operational concepts they are using, it asks if you are using rights or legal discourses, and ultimately whether or not new concepts or definitions of religion are required to encapsulate a fuller understanding of the object of study.

Funding/Institutional Logistics

The headlines 'funding/institutional logics' regard the restrictions set by funding schemes, university priorities and any political interests the researcher may encounter. In the last decades, religious diversity has increasingly become a highly potent political issue. A strong connection to political discussions entails a risk of the scholar's framework and research questions being formed or influenced by political concerns and problems rather than scientific concerns and problems. Religious diversity has become regarded as something which should be governed. Embedded in this expression is an assumption of religion being either intrinsically good, as a positive expression of a multicultural reality, where negative implications of religion are ignored or explained away as 'something else'. Or the opposite is also possible, i.e. religion is assumed to be intrinsically problematic. Canada Research

chair Lori Beaman summarises the current situation as a situation in which

[R]eligious diversity is imagined as something that is a relatively recent development, and as something requiring scholarly and policy attention as a problem to be solved. One of the results of this 'crisis of diversity' has been a springing up of numerous research initiatives aimed at studying and resolving this 'problem' of religious diversity.

Beaman herself as a leader of one of these projects, the Religion and Diversity project, is contributing to an 'industry around identifying problems and solutions related to, especially, religious diversity'. Her recommendation is not to refrain from research in these highly politicised areas, but to raise criticism of 'armchair "solutions" to diversity emanating from political theory and those who had little or no familiarity with empirical data about religion...' and instead attempt to reformulate the interests of research for instance in relation to the political driven research 'over-attention to negative narratives about diversity'. Beaman's concerns are certainly expressed in the questions on the checklist, where some of these implications are spelled out: how does the researcher intend to pay back- to the funders, but also to the people participating in the research? When thinking about these issues one topic of significant political salience is the issue of how the political environment and media constructions of diversity may influence the study. Indubitably, this problem-oriented agenda is likely to be part and parcel of the package that researchers contract themselves into when engaging in current research on religious diversity. The checklist requests that scholars remain cognizant of the boundaries that may be placed on their research by funding arrangements, the need to keep various gatekeepers content, and carefully consider what limitations that they may place upon your analysis and results.

Lastly on the checklist, we consider the relatively mundane, but still crucial consideration of how to frame the outcomes of one's religious diversity research. Are you planning to offer something back to the researched field? Good critical empirical

research needs to be developed with the overall aim of the study in mind, as well as, a clear idea of where the work will be disseminated. The results of our research can be politicized, but they can also be used to counter dominant narratives.

Additionally, we need to acknowledge that there can be consequences from our findings for the people and groups that we study. Religious diversity research can, therefore have positive and negative impacts upon inter-religious relations, government policy, educational reform, resource development, media representation and religious literacy. Consequently, we need to develop a clear reflexivity of the ethical consequences of dissemination since our research can impact all these areas. As such, the final section of the checklist asks scholars to consider, in advance, the impact and potential consequences of the dissemination of their research once it is completed.

Check List

Terminology

- What are the operational terms of your project (religious diversity, religious pluralism, religious plurality, religious field, multi-religious society, multi-faith, multiculturalism, superdiversity or other)?
- Is religion central or peripheral to your study?
- How do you define the term(s) and if you use more terms how do they relate to each other?
- How is 'religious' understood? In terms of beliefs, practices, values, symbols, institutions?
- What are the boundaries of the concept? And how do you deal with terms such as spirituality?
- Is your terminology/definition/categorization based on emic and/or etic perspective?
- Are you including groups resisting the designation as religious?

Methodology

- What methods are you using to study religious diversity?

- Are you using quantitative data, qualitative data, or micro, macro, longitudinal style/ multi-sited, comparisons?
- What is the unit of analysis of your research? (Individuals, worship places, organisations, rituals...?)
- How do these methods inform each other? Could the use of mixed methods or innovative methods be of help?
- What are you finding to be the strengths and weaknesses of these methods for your research?
- How does your research treat individuals who profess multiple religious affiliations and those who conflate their religion with their national or ethnic identity?
- What do you consider a member of a particular religion and what criteria do you use for it?
- How does your research treat intra-religious differences?
- Does your research take into account different 'spokespersons' or interlocutors for religious organisations?
- Is there any gender or age bias? How do you deal with it?
- How does your choice of focusing on majority or minority religion(s) influence your choice of methods?
- In what ways does your method reckon with difficulties of accessing minority groups?
- And of accessing majority groups?
- Do you take into account issues of confidentiality? How do you deal with it?

Context

- What is the scope of the study (in terms of space and time)?
- Does your data cover the scope sufficiently?
- Which are the criteria used to decide the scope of the research?
- What is the political context?
- Who holds an interest in religious diversity?

- Is religious diversity a controversial subject?
- How does changing understanding of private/public religion inform your study?
- What is the role of the media in forming categories of religious diversity?
- What is the role of the academia in forming categories of religious diversity?
- What is the role of the state, law and human rights in forming categories of religious diversity?
- Do you for instance use census data or other types of 'official data'?
- How does conceptualization/categorization of religious diversity have impact on the empirical field of religious diversity?

Framing

- Does the research focus on dominant groups or does it include less visible groups and organizations with ambiguous religious identity?
- What limitations and relationships have you assumed when using broad categories to define religious groups such as Buddhist, Christian and Muslim?
- How are unbelief/non religion/spirituality being assessed?
- Are these phenomena included in your understanding of religious diversity?
- Does your research focus with the differences between religious groups or also on commonalities?

Theories

- Beyond diversity which operational concepts (identity, ethnicity, race, cosmopolitanism, secularization, citizenship, social cohesion) are you using?
- Is your research informed by human rights discourses and law?
- Are new categories and/or definitions of religion necessary?

Funding /Institutional Logistics

- Is there pre-existing research on religious diversity in your area (government, policy organization, academic)?
- Are you using the same categories as this research?
- Does the way your research is funded set limitations for your study?
- Does it influence the perception of and reaction vis-à-vis the project by the field?
- How do you negotiate your accesses to the research field?
- How does the funding/institutional logic affect the relationship of the researcher with the researched?

Outcomes

- What is the overall aim of your study?
- How will it be disseminated?
- What will be the consequences for the people you study in terms of for instance inter-religious relations, government policy, educational reform, resource development, media access and representation, religious literacy?
- Does your work on religious diversity have implications that need ethical consideration?
- Have you planned to offer something in return to the researched field?

The critical approach advocated in this book calls for reflection on methodological and other choices made in the research process. In summary, the checklist is a short form of relevant questions and concerns that experts in the study of religion found to be of relevance. It does not exhaust the number of questions which could be posed and it does not suggest that there are simple or 'correct' answers available. This book has attempted to put a little more flesh on the checklist by selecting a number of essays written by scholars associated with the CARD network. The scholars do not represent a tight community — and represent no school or movement. The CARD network is an open network that any scholar can join simply by reflecting on the question in the checklist or browsing the list of recommended readings at the website www.cardnetwork.au.dk. Ultimately, the CARD

Network and this volume has achieved its purpose if successive scholars study religious diversity critically nuance their questions, methodology, results and analysis more carefully. <>

[Your Place in the Universe: Understanding Our Big, Messy Existence](#) by Paul M. Sutter [Prometheus Books, 9781633884724]

An astrophysicist presents an in-depth yet accessible tour of the universe for lay readers, while conveying the excitement of astronomy.

How is a galaxy billions of lightyears away connected to us? Is our home nothing more than a tiny speck of blue in an ocean of night? In this exciting tour of a universe far larger than we can imagine, cosmologist Paul M. Sutter emphasizes how amazing it is that we are part of such a huge, complex, and mysterious place.

Through metaphors and uncomplicated language, Sutter breathes life into the science of astrophysics, unveiling how particles, forces, and fields interplay to create the greatest of cosmic dramas. Touched with the author's characteristic breezy, conversational style—which has made him a breakout hit on venues such as The Weather Channel, the Science Channel, and his own popular Ask a Spaceman! podcast—he conveys the fun and wonder of delving deeply into the physical processes of the natural universe. He weaves together the past and future histories of our universe with grounded descriptions of essential modern-day physics as well as speculations based on the latest research in cosmology.

Topics include our place in the Milky Way galaxy; the cosmic web—a vast web-like pattern in which galaxies are arranged; the origins of our universe in the big bang; the mysteries of dark matter and dark energy; how science has dramatically changed our relationship to the cosmos; conjectures about the future of reality as we know it; and more.

For anyone who has ever stared at the starry night sky and wondered how we humans on Earth fit into the big picture, this book is an essential roadmap.

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Excerpt: Perhaps this was All a Big Misunderstanding

How the heck do you write a book about the whole entire universe? And not just all the gory physics on scales small and great, but how our knowledge of the cosmos has changed in the past few hundred years, and how that's influenced our views of the heavens, the Earth, and ourselves? And how we got to know what we know now, through all the twists and turns and dead ends and blind alleys and just-kiddings of scientific research?

I honestly have no idea, so I suppose we're about to find out together.

If you're already familiar with at least some aspects of the cosmic tapestry that I'm about to unfurl (unfold? I'm unsure here of fabric storage techniques), then I sincerely hope you appreciate the slightly warped perspective I have on the history of cosmology and the history of the universe. When it comes to the past four hundred years, and the past 13.8 billion years, certain stories, certain people, and certain physics have

always captured my attention more than others, and naturally I wrote about those and pretended the uninteresting stuff doesn't matter.

If you're completely new to matters cosmological, well, then you're in for a real treat. You're going to encounter some interesting (to put it mildly) characters, crazy physical processes, and, of course, seriously intensive and possibly therapeutic discussions on deeply enigmatic mysteries of the cosmos. I promise I'm doing my best to hit the right level between blow-your-mind and hold-your-hand. But I don't know your background, your interests, or when you dropped out of school, so don't worry if a section or two (or heck, the entire book) gets a little confusing. Go ahead and give it another shot—I won't mind.

Of course, I need to toss in an obligatory thanks to a good fraction of the human race. From the dedicated scientists (or protoscientists, in some cases), both named and unnamed, who actually figured out all this stuff, to all the people who have supported me, guided me, taught me, told me I was wrong (that happened a lot), and generally helped make me, me and this book, this book. You know who you are—and thank you for buying this book out of a sense of obligation—so you'll understand why I won't bother listing all your names. My publisher set a word limit, after all.

I'm sure that in some way I owe you a deep and sincere apology after you read this book. If you're a fan of history, then my choices to ignore/simplify/disregard certain aspects of the complicated and intertwined nature of human lives and pursuits might irritate you. If you're a fan of physics, then my choices to ignore/simplify/disregard certain aspects of the complicated and intertwined nature of natural processes might irritate you. If you're a fan of formal writing and good grammar, then you probably haven't even made it this far.

Depending on your own personal belief and/or philosophical system, there's a really solid chance at some point you will read something that will deeply, terribly offend you, causing you to hurl the book at the nearest wall. It's cool, we all do it. I just hope you know that it's not my intention to offend you—either with my style or my substance—but to

play a game of show-and-tell with the universe. This is the story of the cosmos as revealed by the tools of scientific inquiry, which have so far proven to be pretty awesome in that regard. I personally find the heavens above us deeply profound, awe-inspiring, and worthy of further study, and I hope the humble paragraphs you're about to encounter (a) do the universe justice and (b) spark a similar passion in you.

But besides being a story of how we look at the universe, this book is also a tale of how the universe looks back at us—about our relationship with the night sky and how we (mostly mistakenly) think it intersects with our daily lives. Some of you (not necessarily you, but somebody) might take that as a critique on a particular religious or philosophical or other nonscientific belief. OK, fine. That's not the point of the book; but I'm not your boss and I'm not going to tell you what to do.

Is this book important? Is it necessary? Is cosmology the study of our entire universe—vital to the advance of human civilization? Well, are you important and necessary and vital? In the grand sense of things, probably not. But we still keep you around and take you out to dinner, don't we? The game of science isn't to make the world a better place; although some scientists are, thankfully, engaged in exactly that—it's to make a better understanding of the world. Science itself is a method, a tool, for studying nature. That tool can be applied in many cases, from what's causing your migraine (besides chapter 4) to the origins, history, and contents of the universe.

Trying to figure out how nature works, even in literally unreachable parts of our cosmos, is an end in itself. That's exactly the point: to learn more, because being curious and learning stuff is kind of fun, if learning stuff is your kind of fun. And it's my kind of fun, so that's why this book exists. I have loved learning all these facets of cosmological matters through my youth and professional career. Beyond that, I owe it to you. It's you—the taxpayer, the friend, the supporter—who makes science happen. It's you who keep the lights on and the streets clean and the accounts in order and the beans sprouting, enabling a small percentage of

the population to follow a particularly odd passion for wrestling with nature on a daily basis.

This book is yours—in a certain sense, you own the collective knowledge summarized in these pages. You also literally own this book, unless you stole it, in which case shame on you.

The most important thing to remember, above all else, no matter your level of familiarity, your personal beliefs, the ease with which you get offended, or any other trait that might affect your perception of this work, is to purchase many copies of this book to distribute to your friends, family, coworkers, acquaintances, mail carriers, local fire department, students, teachers, priests/rabbis/imams, pets, strangers, landscape architects, interior designers, representatives of the local AFL-CIO chapter, and government leaders, and of course a backup copy for yourself.

Science is for sharing, people.

So let's get moving. <>

<>

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