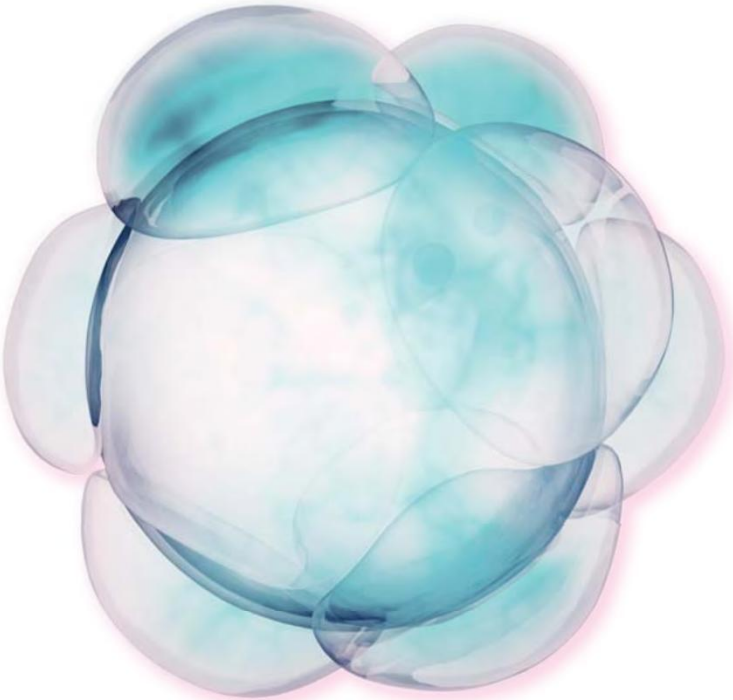
Believing in Dawkins

The New Spiritual Atheism



Eric Steinhart

'One of the most original and exciting philosophers today'
Yujin Nagasawa

Eric Steinhart
Department of Philosophy
William Paterson University
Wayne, NJ, USA

ISBN 978-3-030-43051-1 ISBN 978-3-030-43052-8 (eBook)
https://doi.org/10.1007/978-3-030-43052-8

Cover credit: Mopic/shutterstock.com

This Palgrave Macmillan imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Contents

List of Figures

Chapter 2

Chapter 3

Chapter 4

Chapter 5

Chapter 6

Abbreviations for Dawkins' Writings

Clinton Richard Dawkins has written many books, and I will frequently refer to them. Besides his books, I will use many of his articles. And, besides these writings, I have transcripts of some of his lectures and debates. I have watched many of his videos. But my focus will be on his published writings. I will refer to a few of his many newspaper articles. Since many of his short articles have been incorporated into his books, I will mainly refer to the books. To make reference to his works easier, I will use abbreviations followed by page numbers. For example, (GD 97) refers to page 97 in *The God Delusion*. Information about each book or article is in the References. To make my own writing flow more easily, I'll put these references into footnotes. If some paragraph has many references, *I'll list them all in the note for its first sentence*. Here is a list of some of his writings, along with the abbreviations I will use for them:

- SG (1976) *The Selfish Gene;*
- EP (1982) *The Extended Phenotype;*
- BW (1986) *The Blind Watchmaker;*
- EE (1988) The evolution of evolvability;

- AVL (1994) An atheist's view of life;
- ROE (1995a) *River out of Eden;*
- CMI (1996a) *Climbing Mount Improbable;*
- OTTR (1997) Obscurantism to the rescue;
- UR (1998a) *Unweaving the Rainbow;*
- ADC (2003a) *A Devil's Chaplain;*
- TL (2003b) *The Tanner Lectures;*
- SS (2004a) The sacred and the scientist;
- WHO (2004b) Who owns the argument from improbability?;
- IA (2006a) Intelligent aliens;
- SSSF (2007) Should science speak to faith? (with Krauss);
- FH (2007) *The Four Horsemen* (with Dennett, Harris, Hitchens);
- GD (2008) *The God Delusion;*
- GSE (2009) *The Greatest Show on Earth*;
- AK (2012a) Afterword to Krauss;
- MR (2012b) *The Magic of Reality;*
- BCD (2015a) *Brief Candle in the Dark*;
- AT (2016) *The Ancestor's Tale*;
- SITS (2017) *Science in the Soul.*

1

Introduction

1 Beyond Biology

At the start of his career, Richard Dawkins was famous for being a biologist; by the end, he was famous for being an atheist. As a biologist, he attracted a lot of academic attention; but as an atheist, he attracted attention both academic and public. He was reviled by many popular religious writers. He was attacked by academic theologians and theistic philosophers. However, as far as I know, no atheistic thinkers have risen to his defense. I am an atheist and I will defend Dawkins here. Consequently, I will be dealing here with his views on religion and spirituality. I will *not* be writing about his biology. I will *not* be doing philosophy of biology or philosophy of science. From an entirely atheistic perspective, I will be doing philosophy of religion and spirituality.

To justify the thesis that there is more to Dawkins than just biology, it will be helpful to briefly list his books. His most biological books are *The Ancestor's Tale* and *The Greatest Show on Earth*. They focus almost entirely on the details of evolutionary biology. Yet they also mention theological and philosophical issues. *The Selfish Gene* and *The Extended Phenotype* are still biological, but they are also more abstract. They both contain extensive discussions of ideas from computer science and information theory.

E. Steinhart, *Believing in Dawkins*,
https://doi.org/10.1007/978-3-030-43052-8_1

They talk about philosophical topics closely associated with values and ethics. And they contain many thematic references to theological issues.

Then there are three books in which the abstract sciences play central roles: *The Blind Watchmaker*, *Climbing Mount Improbable*, and *River Out of Eden*. In these books, more purely mathematical structures are frequently in play. They deal with multi-dimensional spaces of possible organisms, adaptive landscapes, dynamical systems, optimization strategies, and so on. They talk about computers and programs, making great use of digital simulations. They discuss philosophical and theological topics. And, in these three books, these discussions are far more detailed and serious. They contain serious reflections on the nature of value, meaning, purpose, and larger cosmic themes. They are filled with ideas taken from Stoicism and Platonism.

Next comes *The God Delusion*, which explicitly gets into philosophical and theological issues. Most of *The God Delusion* is devoted to topics that lie entirely outside of biology or any of the empirical sciences. It discusses issues in ethics, in cosmology, in metaphysics. His two collections of essays, *A Devil's Chaplain* and *Science in the Soul*, also frequently address philosophical issues. Perhaps surprisingly, even his book *The Magic of Reality*, a book for children, gets into some interesting epistemology. All these books contain many Stoic and Platonic themes. After that comes I think his most philosophically interesting book: *Unweaving the Rainbow*. *Unweaving the Rainbow* is a fascinating meditation on the value and meaning of science. But *Unweaving the Rainbow* does far more than discuss these aspects of science. *Unweaving the Rainbow* is an intensely *spiritual* book. It develops a theory of the meaning and purpose of life. It discusses the metaphysical significance of beauty and truth. It pays deep homage to mathematics. Old Platonic themes are here on full display.

2 One Rational Magisterium

One great problem with Dawkins concerns his status as a celebrity atheist. This fame means that people often talk about his ideas without reading his writings. I have read all his books and many of his

articles. And I will often refer to their pages. Very often. But since ending every sentence with a note makes for rough reading, I'll often use just one note for all the references in each paragraph. I'll put it after the first sentence. On the basis of his texts, I will argue that Dawkins uses science to do something beyond science. Consider his take on the relation between science and religion. Dawkins develops his own position on the science-religion relation by attacking the position of Stephen Jay Gould. Gould said science and religion are two *non-overlapping magisteria*. Dawkins refers to this as NOMA. NOMA means that science and religion deal with separate issues. Hence there are two sides to NOMA. On the one side, *science but not religion* deals with issues of fact; on the other side, *religion but not science* deals with issues of value and meaning. And, according to NOMA, neither side knows what the other is doing. The domain of fact does not intersect with that of value.

NOMA ties important concepts and values to God. It binds them to God by negative implications like these: if there is no God, then there is no objective morality; if there is no God, then there is no life after death; if there is no God, then there is no meaning. NOMA gives you this stark dichotomy: *either God or else nihilism*. Here's NOMA at work: "On the one hand, we can delude ourselves, clinging to the infantile illusion that some One, some Thing, is looking over us, somehow orchestrating the universe with each of us personally in mind. Or we can face, squarely, the reality that life is meaningless."[1] Of course, a *theist* would believe that—but why would an *atheist* believe it? The NOMA dichotomy is false. Atheism does not imply nihilism.

Dawkins attacks NOMA on both sides.[2] On the first side, he argues that religion and science overlap on many questions of fact. Religions make empirical claims: a great flood covered the entire earth; Jesus came back to life after he died; the Virgin Mary was raised bodily into the sky. Dawkins correctly says these are entirely scientific claims. On the second side, he agrees that science by itself has little to say about morality and meaning. But now Dawkins makes two important points. The first is that

[1] Barash (2006: 257).

[2] NOMA on both sides (OTTR; GD 77–85). Rational moral philosophy (SITS 271; OTTR 397–8; ADC ch. 1.4; AVL). Science cannot answer (GD 80, 185; SSSF). Rational universe (TL 73–4; see UR *xi*, 151; SSSF).

moral debates depend on facts. For example, facts about embryology are relevant to moral debates about abortion. The second is that religion has no moral authority. Moral authority comes from *rational moral philosophy*. Moreover, Dawkins recognizes that there may be deep questions which science cannot answer. Consider the rationality of the universe. Science reveals that the universe is *orderly*; but does it reveal that the universe is *rational*? You could argue either way. Yet Dawkins says he has a profound faith in the rationality of the universe. His profound faith is not scientific—to decide that the universe is rational is to make a *philosophical* decision.

As a scientist, Dawkins obviously values evidence.[3] But Dawkins is no positivist. A positivist thinks that every meaningful statement is empirically decidable—it can be verified or falsified using evidence alone. Dawkins affirms that theistic design might be indistinguishable from evolution by natural selection. No empirical evidence can decide against a God who generates all the empirical evidence. Likewise empirical evidence cannot tell us whether or not we are living in some digital simulation. The arguments against a God who emulates evolution (like the arguments for or against simulation) will be rational philosophical arguments. On the one hand, there's no evidence that some things exist outside of our observable universe. On the other hand, there's no evidence against things existing outside of it. Evidence alone is not enough.

Dawkins uses both science and philosophy to build a single *rational magisterium*. His rational enterprise uses empirical science to answer factual questions about our universe. It uses philosophically extended science to answer questions about value and meaning. For the sake of completeness, it also uses philosophically extended science to answer questions about ultimacy—it covers metaphysics and ontology. Of course, to rationally extend science, it is not necessary to add any new types of entities to science. Scientific documents contain symbols that refer to many kinds of objects. They refer, of course, to material things. But they also refer to properties and relations, to abstract laws and

[3]Theistic design (BW 316). Simulation (GD 98).

patterns, and to purely mathematical objects. Theists (and atheists too) are fond of saying that scientific naturalism is just materialism. Anybody who says that has not studied much science. Science includes logic and pure mathematics.

This rational enterprise competes with the old theistic religions.[4] It pushes their answers to every question out into the irrational abyss. Old religious concepts are given new rational yet irreligious meanings. Consequently, as the rational enterprise starts doing the old jobs of religion, it begins to *resemble* religion even though it is *distinct from* religion. It has become popular to refer to this distinctive likeness as *spiritual but not religious*. Dawkins says he is a spiritual person. He says science is a spiritual enterprise. He insists that "religion is not the only game in town when it comes to being spiritual." Dawkins is building an *irreligious spirituality*.

Atheism can be as spiritual as any theism.[5] The atheist Iris Murdoch wrote *The Sovereignty of the Good* and *Metaphysics as a Guide to Morals*. The philosopher Andre Comte-Sponville has written *The Little Book of Atheist Spirituality*. The atheist Sam Harris has written *Waking Up: A Guide to Spirituality without Religion*.[6] These excellent books show that there are at least three ways to build existentially rich spiritualities outside of theistic religions. Atheists have written about the sacred, the holy, and the numinous. The philosopher Dan Dennett talks about sacred values. He declares that "This world is sacred." The atheist philosopher Quentin Smith has developed an atheistic conception of holiness. The writer Christopher Hitchens argues for developing irreligious conceptions of the numinous, ecstatic, and transcendent. I will argue that the Dawkinsian texts support a *spiritual atheism* of great existential power.

[4]Spiritual person (SITS 5). Science is spiritual (ADC 27; SS). Game in town (FH 49).

[5]Murdoch (1970, 1992). Comte-Sponville (2006). Harris (2014). Dennett (2006: 22–24; 1995: 520). Smith (1988). Hitchens and Blair (2011: 45–47).

[6]Harris practices Buddhist meditation. Haught (2008, ch. 1) argues that the New Atheism begins with its own versions of the Buddhist Four Noble Truths.

3 From the New Atheism to Spiritual Naturalism

Dawkins presents his atheism in many books and articles.[7] He focuses on it in *The God Delusion*, where he argues that God does not exist. When he talks about God, Dawkins means the God worshipped in the Abrahamic religions. These are mainly Judaism, Christianity, and Islam. More generally, his atheism excludes all supernatural gods and goddesses. For Dawkins, to say some deity is supernatural means that it did not evolve. Many theists attacked *The God Delusion*. Much public debate has focused on Dawkins' atheism. Theists have spent far more energy attacking Dawkins than they have attacking other recent atheists. Why? Perhaps because he speaks and writes with a deeply religious voice. His books are saturated with religious allusions, images, and concepts. But I will argue for a deeper explanation: theists find Dawkins deeply threatening, because his work supports an alternative spirituality.

When it comes to the spirituality of science, Dawkins resembles Carl Sagan.[8] Sagan often waxed poetic about the spiritual aspects of science. Sagan wrote that a religion that "stressed the magnificence of the Universe as revealed by modern science might be able to draw forth reserves of reverence and awe hardly tapped by the conventional faiths." Sagan thinks this religion will emerge. After telling us that Sagan's books "touch the nerve-endings of transcendent wonder" once touched by religion, Dawkins tells us that his books have the same aspiration. He argues that science can arouse wonder, awe, ecstasy, and other deep emotions. These emotions were once thought to belong to religion, rather than to science. But Dawkins argues that science does a better job of arousing and satisfying those emotions than religion.

Dawkins reports that people often used to tell him that science is just another religion.[9] He used to emphatically deny the charge. But then he started to wonder what might happen if he accepted it. If science

[7]God is Abrahamic (TL 64, GD 15, 33–41, 56–7, 84, 184, chs. 4, 8, 9). Supernatural means not evolved (GD 96–9). Attacks (BCD 174).

[8]Conventional faiths (Sagan 1995: 52). Dawkins quotes Sagan (TL 58–9; GD 32–3; SITS 80). Transcendent wonder (GD 33). Science does a better job (SITS 269).

[9]SITS 269.

is a religion, then it should be taught in religious studies classes. He proposed a religious studies curriculum, which includes the empirical sciences. It teaches rational moral philosophy and rational metaphysics. It will instill in its students a deep faith in the rationality of existence. It will celebrate the mathematical beauty of nature. It will cultivate in its students a profoundly spiritual way of life. Dawkins argues that his religious curriculum would stand out as a superior alternative to the old theisms on every point. Should this new curriculum be called a rational religion? A scientific religion? Perhaps this is the new religion predicted by Carl Sagan. Dawkins *almost* endorses a kind of scientific religion.

Dawkins often talks about *Einsteinian religion*, which he contrasts with supernatural religion.[10] And while he rejects supernatural religion, his view of Einsteinian religion is more positive. Thus Sideris argues that Dawkins is *consecrating* science—he is trying to turn it into a new religion. But Dawkins quickly points out that Einsteinian religion isn't really *religion*. He says that science can be "religious in a non-supernatural sense of the word." But he does not prefer that sense. Religion conventionally involves humans trying to relate to alleged supernatural deities. Dawkins rejects unconventional uses of the term "religious". The deep aesthetic and emotional appreciation of nature is not religious. He thinks "religious naturalism" is confusing. He likewise rejects unconventional uses of the term "God". He rejects the pantheistic use of the term "God" to refer either to the whole universe or to some special aspect of it.

Science is *not* a religion.[11] On this point Dawkins is right. And religious naturalism just isn't religious. Thus Dawkins correctly rejects both religious naturalism and Einsteinian religion. But his rejection points to the open space between science and religion. Here again we can refer to being *spiritual but not religious*. Dawkins affirms that science can be spiritual in an irreligious sense. So perhaps his Einsteinian religion should be called *Einsteinian spirituality*. However, calling it Einsteinian

[10]Einsteinian religion (TL 58–64; GD 33–40). Einsteinian religion resembles *dark green religion* (Taylor 2010). Sideris (2017). Non-supernatural (ADC 27; ROE 33). Uses of "religious" (GD 33–5; ADC 147). Against religious naturalism (TL 60–1; GD 34; ADC 146). Against pantheism (GD 40–1).

[11]Science not a religion (TL 59; SITS 273). Religious naturalism (Oppy 2018: ch. 4). Science is spiritual (ADC 27; SITS 5). de Botton (2012). Rosenberg (2011).

ties it too closely to the views of one historical figure. Many others have contributed to this naturalistic spirituality. To refer to this Dawkinsian alternative to religion, I will use the name *spiritual naturalism*. Here we are *spiritual naturalists*. Our spiritual naturalism contains empirical science extended by rational philosophy. It affirms both moral and mathematical objectivity. Against Alain de Botton, we reject nostalgia for religion. Against Alex Rosenberg, we reject both scientism and nihilism.

As one of its many projects, spiritual naturalism shows that the jobs once done by God can be done by natural entities. What jobs did God do? To map out the divine job description, we will use the classical *Five Ways*. These are the five proofs which Thomas Aquinas thought revealed the existence of God. According to him, each proof shows that some special object plays some ultimate role in reality. He identifies each of these five objects with God. Although atheists love to find faults with the Five Ways, that will not be our strategy. We will revise those Ways by adding a twist at the end—the ultimate objects revealed by the Five Ways are not God. They are natural things. Rather than rejecting the Five Ways as invalid or unsound, we *naturalize* them.

The first and second ways in Aquinas are usually lumped together, and referred to as cosmological arguments.[12] They argue for a *first cause*. Since his entire theory of complexity requires that existence begins in simplicity, Dawkins explicitly affirms that there must be some simple first cause of all things. When he discusses cosmological arguments, Dawkins objects only to the step that finally identifies the first cause with God. The first cause is not God. On the contrary, Dawkins suggests naturalizing it by identifying it with the big bang or some other physical entity. To naturalize these first two ways, we will find the naturalistic first cause. The third way argues for some *ultimate necessary being*, and it is also said to be a cosmological argument. We will naturalize this third way by arguing for a naturalistic necessary being.

The fourth way is known as the degrees of perfection argument, which often gets grouped with the ontological argument by Anselm. It stands out because it is an argument from pure reason. But the *most perfect being* is not God. The fifth way is the argument from design. It has

[12]Dawkinsian first cause (GD 184). Is not God (GD 101–2, 184; BCD 420).

organic versions that deal with the structure of organisms and ecosystems. Dawkins shows that the *organic designer* is not God; it is evolution by natural selection. But the design argument also has cosmic versions that deal with the structure of the whole universe (for instance, the so-called fine tuning argument). Dawkins suggests that the *cosmic designer* should also be replaced with some kind of cosmic evolution (though probably not Darwinian). Here then are five natural things: the first cause; the necessary being; the most perfect being; the organic designer; and the cosmic designer. They are neither identical with God nor with each other.

Each specific job that God allegedly did generates a *local problem* for spiritual naturalism: find the natural entity that really does that job. Each natural entity is a local solution to its own local problem. On the metaphysical assumption that nature is rational, and thus self-consistent, these local solutions need to be fitted together into a harmonious whole. The local problems generate a *global problem:* find that system of local solutions which best satisfies constraints like self-consistency. Of course, there may be other constraints. Dawkins often says that simplicity is a constraint. On that metaphysical assumption, we need to find the simplest system of local solutions.

4 A Sanctuary for Spiritual Naturalists

As I read Dawkins, I see a collection of fragmentary sketches for a large system of concepts and practices. This large system is our spiritual naturalism. But these sketches are incomplete and not entirely self-consistent. These fragmentary outlines raise many problems for an atheistic spirituality. If they can be solved, the result will be an atheistic spirituality which can compete more successfully against theism. It should be able to provide the *theoretical benefits* of theism (but without God). It should even be able to provide the *practical benefits* of theism (but without God). As a Dawkinsian atheist, I accept his arguments that theism is both false and harmful. And as a philosopher, I am obligated to try to develop an alternative that is true and beneficial.

It is helpful to think of the Dawkinsian texts in architectural terms. His fragmentary sketches for spiritual naturalism are like architectural drawings. Sometimes they depict little windows, while other times they portray enormous spires reaching towards the stars. The edifice is vast. But these architectural diagrams are often unclear, incomplete, and inconsistent. I want to clarify them, fill in their missing parts, and resolve their conflicts. So I'm using his writings to construct a novel building. Sometimes I'm just completing a window or a door in ways they were clearly intended to be finished. But what about the immense towers and grand interiors? Dawkins outlines them, but he rarely says how they should be supported. Massive engineering is needed. To fit his fragmentary plans into a coherent and self-supporting structure, I will add some large-scale frameworks. I aim to complete our spiritual naturalism in a systematic way.

Given the Dawkinsian fragments and foundations, I prefer to think of myself as building a *sanctuary*. It is a sacred place, filled with joy and light. It is a spiritual refuge, a gleaming city. This sanctuary is made of thoughts, and we are constructing it together inside of our minds. We build it by systematically completing the Dawkinsian rational magisterium. Although religion is excluded from this Dawkinsian sanctuary, religious *people* are more than welcome. Their faiths they must leave at the door. As we build this sanctuary, we will not "debate God." We agree with Dawkins that God does not exist, and we have no interest in talking about non-existent things. Apart from an obligatory section dismissing the God hypothesis (Sect. 2.1 in Chapter 4), we will ignore God. Spiritual naturalism assumes that the meanings of spiritual terms are constituted by associated practices. Hence our Sanctuary permits no theistic practices—it permits neither worship nor prayer. As spiritual naturalists, we have our own practices. I will refer to this shining structure as the *Sanctuary for Spiritual Naturalists*.

The Dawkinsian architectural outlines for this Sanctuary suggest a building every bit as wild and glorious as the *Basilica i Temple Expiatori de la Sagrada Familia*. The Sagrada Familia was outlined by an architectural genius, namely, Antoni Gaudi. But Gaudi often didn't go into the specifics. Some of these specifics were profound—like how to support the enormous spires. And so later architects had to use their own

imaginations and skills to complete the Sagrada Familia. The same holds true here. While Dawkins is an architectural genius, with a vision of grand sanctuary, his critics are right that he doesn't have the skills to make it all work. His own edifice would collapse under its own weight due to internal structural problems.

The title of this book is *Believing in Dawkins*. But believing in Dawkins does not mean treating his works like inerrant scriptures. Dawkins makes many mistakes, and he celebrates the scientific duty for self-correction.[13] Believing in Dawkins resembles believing in Antoni Gaudi. Just as *believing in Gaudi* means continuing his architectural enterprise, so *believing in Dawkins* means continuing his rational enterprise. It means correcting his mistakes, making his larger ideas mutually consistent, completing his arguments, filling in the details of his sketches. Believing in Dawkins means using his texts to build the Sanctuary for Spiritual Naturalists. On the basis of the Dawkinsian texts, I'm building this Sanctuary. I'm *building on Dawkins*.

Nevertheless, to ensure that the Sanctuary for Spiritual Naturalists stands up, I will often need to go beyond those Dawkinsian texts. I will often take ideas from the Stoic and Platonic philosophers. And I will often have to use my own philosophical training and imagination. Hence the faults in this Sanctuary are mine. When I add new material to this sanctuary, I will try to indicate that it comes from other philosophers, or from myself. And since the Dawkinsian texts are often ambiguous, they can be developed in many ways. This Sanctuary is only of many possible sanctuaries.

5 The Stoic Framework

When Dawkins wrote *Science in the Soul*, he gave it the subtitle *Selected Writings of a Passionate Rationalist*.[14] Consequently, spiritual naturalism is a passionate rationalism. It contains all the psychology needed to analyze our responses to the universe. Dawkins often says that many

[13]UR 31.

[14]Aesthetic and emotional (UR; SS). Sacred and holy (SS). Soul (SITS 212–15). Gratitude (2010). Exuberance (2013).

apparently religious responses to nature are really just aesthetic and emotional. The *sacred* and the *holy* are merely emotional responses to the overwhelming vastness of the universe. The *soul* is just the mind. *Gratitude* for your very being is merely a misfiring social emotion. *Spirituality* is just exuberance.

This reduction of religious responsiveness to personal psychology presents a problem.[15] While awe is one way of responding to the vastness of the universe, horror and terror are others. While the scientific picture of the universe brings spiritual uplift and ecstatic transport to some, it brings insomnia and nihilistic pessimism to others. Among the many conflicting ways of responding to the universe, which ways are right? If all the responses are equally valid, then Dawkinsian spirituality degenerates into relativism. Dawkins persistently objects to relativism. Likewise spiritual naturalism rejects the idea that all aesthetic-emotional responses are equally valid.

Against relativism, Dawkins argues that some aesthetic-emotional responses to the universe are *appropriate* while others are *inappropriate*.[16] It is inappropriate to be depressed or to complain about life. It is wrong to seek refuge in the comforting delusions of religion. It is ethically immature to fail to take responsibility for your own life. It is appropriate to rejoice in the scientific revelation of the structure of nature. It is right to courageously embrace your fate. It is noble and mature to make your own meaning in life. He says "it's such a wonderful experience to live in the world." And he declares that our universe is "a grand, beautiful, wonderful place." His distinction between appropriate and inappropriate responses to the universe parallels his distinction between good and bad poetic science. When scientifically-inspired poetry responds appropriately to nature, it is good; otherwise, it is bad.

However, if some responses are appropriate while others are not, then there must be some *standards* of appropriateness. They do not come from science. They seem to come from something like morality: you

[15]Opposite responses (SITS 269; UR *ix*). Objects to relativism (ROE 31–2; UR 21, ch. 6; ADC chs. 1.2, 1.7; GD 18–9, 319–20; GSE ch. 1).

[16]Depressed (UR *ix-xi*, 1–3; GD 404–5). Refuge (GD 20–22). Responsibility (GD 403–4). Rejoice (UR 6, 36). Make meaning (GD 404; FH 24–5). Wonderful life (FH 99). Good and bad poetic science (SITS 33, 150).

ought to respond this way rather than that way. It therefore looks like the aesthetic-emotional responses depend for their correctness on moral standards. After all, concepts like sacredness, holiness, and gratitude all revolve around values. When Dawkins naturalizes religious concepts by reducing them to merely psychological concepts, he isn't being fully clear. His reduction depends on hidden assumptions about value. The aesthetic-emotional responses to reality are more like moral responses regulated by deep standards of value.

For example, to say that something is *sacred* means that it is precious to somebody.[17] Dawkins points out that the Grand Canyon is sacred to many Amerindian tribes. He says the Grand Canyon confers stature on the Amerindian religions. And he says that "if I were forced to chose a religion, that's the kind of religion I could go for." He lists many things that are sacred to him. Thus sacredness is *extrinsic* preciousness; it is preciousness *to* somebody. But extrinsic preciousness depends on *intrinsic* preciousness. And intrinsic preciousness is *holiness*. Things are sacred because they are holy. Hence the holy and the sacred involve value. Since they involve value, they do not belong to the purely empirical part of Einsteinian religion—they belong to rational moral philosophy. Dawkins affirms that many things are sacred and holy. If we are going to take him seriously, then we cannot avoid metaphysics: holy things are like mirrors which reflect some ultimate source of value. This ultimate source of value is entirely natural. And, because holy things reflect it, we ought to treat them with reverence and respect. We ought to revere the fossils in the National Museum in Kenya. We ought to revere the giant redwoods in the Muir Woods. Because they shine with holy light, we ought to regard them as sacred. We should *consecrate* them.

Of course, since we are talking about how humans ought to respond to nature, we aren't really talking about morality. Morality specifies how intelligent social agents ought to behave towards each other. So the Dawkinsian standards point to duties deeper than morality. If we ought to respond to nature in some ways, then we have *duties to nature*. Since existence itself is natural, we have *duties to existence*, or *obligations to being*. To behave virtuously towards being is to respond to it

[17] Amerindian religions (SITS 1). Things sacred and holy (SS).

appropriately; to behave viciously towards being is to respond to it inappropriately. But if these duties and virtues are not moral, then what are they? Philosophers use the term *axiology* to refer to the most general study of value. Axiology includes but exceeds morality. We have duties to nature because of its non-moral axiological features. Dawkinsian principles require that those axiological features are objective. And if nature has objective axiological features, then it is even possible for nature to have duties to itself. This is consistent with the Dawkinsian thesis that Einsteinian religion includes rational moral philosophy. Rational moral philosophy is just part of rational axiology. But rational axiology is not part of empirical science; it is a part of rational metaphysics.

Axiological standards can be expressed as if-then rules. Here are two axiological rules: on the one hand, if something generates happiness, then the appropriate response to it is existential positivity (joy, love, gratitude, optimism, etc.); on the other hand, if something generates suffering, then the appropriate response to it is existential negativity (despair, hatred, revulsion, pessimism, etc.). These two rules express the *utilitarian* approach to value. Utilitarians say that suffering is evil, while happiness is good. Nagasawa uses utilitarianism to motivate the *atheistic problem of evil*.[18] It can be expressed like this: (1) Dawkins says that nature is saturated with suffering; (2) if nature is saturated with suffering, then the appropriate response to it is existential negativity; (3) but Dawkins says the appropriate response to it is existential positivity; (4) hence Dawkins contradicts himself. Here believing in Dawkins means rescuing him from this apparent contradiction. To carry out this rescue operation, I must employ some deep metaphysical principles. Dawkins never discusses them. They need to be added to his rational magisterium. By adding them I am building on Dawkins.

When Dawkins discusses appropriate and inappropriate ways of responding to nature, he is relying on some deeply buried metaphysical assumptions.[19] He inherits many of them from Nietzsche. When Dawkins says that atheism is life-affirming and life-enhancing, he is

[18]Nagasawa (2018).

[19]Channeling Nietzsche (GD 405). Live dangerously (Nietzsche, *Gay Science*, sec. 238). Old teacher (ADC 13). Holy enough (Nietzsche, *The Will to Power*, sec. 1052). Suffering in evolutionary world-view (ROE 131–3; GSE 390–6).

channeling Nietzsche. Nietzsche distinguished between the Christian and the Dionysian ways of life. The Dionysian way of life includes *amor fati*, the courageous love of fate. Dawkins often endorses *amor fati* (see Sect. 4 in Chapter 3). The Dionysian way of life entails that we ought to live dangerously (but not stupidly). Here Dawkins enthusiastically quotes an old teacher, who explicitly endorsed this Dionysian way of life. Nietzsche said that the Dionysian person regards existence as being "*holy enough* to justify even a monstrous amount of suffering." Dawkins does discuss the problem of suffering in an evolutionary world-view. And what he says about suffering points towards a Dionysian solution: it points towards the holiness of being, it points towards Nietzsche. Dawkins makes much more sense if what Nietzsche said about being is right. The fact that Nietzsche refers to the *holiness of existence* doesn't make him less of an atheist; on the contrary, it makes him even more deeply atheistic. The holiness of existence is the holiness of nature; it is an objective axiological feature of nature. *Amor fati* is the objectively appropriate emotional response to this holiness. To avoid self-contradiction, that is, to solve the atheistic problem of evil, Dawkins needs this Nietzschean holiness of nature. His value-theory needs to be Dionysian rather than utilitarian. But Nietzsche got his Dionysian ideas from the Stoics.

The Stoics had faith in the rationality of nature. Dawkins affirms a similar faith. Both the Stoics and Dawkins argue for the necessity of rational moral philosophy. They both affirm *amor fati*. The Stoics affirmed it because they thought the universe was regulated by the *Logos*. The Logos is the rational and providential ordering of nature. The Stoics reasoned like this: since the Logos is providential, it ensures that everything is *for the cosmic best;* since you are a part of the universe, everything that happens to you is for the cosmic best; since it is appropriate to love the cosmic best, you can and should love everything that happens to you. On the one hand, if nature is regulated by the Logos, then love of fate is the right response to it. On the other hand, if it is not, then *amor fati* is not the right response. So either Dawkinsian principles entail something like the Logos, or else Dawkins is wrong to recommend *amor fati*. Either Dawkins embraces something like the Logos, or else he contradicts himself.

I will argue that Dawkinsian principles *do* entail something like a modernized and naturalized Stoic Logos.[20] The old Logos doctrine, when thought of in modern physical terms, says that *nature is purely structural*. The updated Logos doctrine closely resembles the recent philosophical doctrine called *structural realism*. To say that nature is providential now just means that nature is a structure which is *intrinsically* for the best. It is a structure which is for the best *in itself*. Nature is holy. But if nature is for the best in itself, it does *not* follow that it optimizes your happiness, nor that it optimizes human happiness. After all, the Stoics were not utilitarians. They did not reduce goodness to happiness nor evil to suffering. The Stoic Logos works to maximize the virtue that emerges in competitive struggle. It works to maximize the *arete* that emerges in the strife-torn *agon*. Any suffering or happiness that emerges from this drive to maximize *arete* is an axiologically irrelevant by-product. The solution to the atheistic problem of evil is to reject utilitarianism. The correct axiological rule is this: if nature maximizes *arete*, then the appropriate response to it is existential positivity.

Dawkins frequently relies on Stoic values and principles. He inherits many Stoic doctrines. Consequently, as I build the Sanctuary for Spiritual Naturalists, I will use many Stoic ideas. As I incorporate them into the Sanctuary, I will ensure that they are modernized and naturalized. This naturalized Stoicism will provide the *outer framework* for the Sanctuary. It will allow me to make greater sense of many Dawkinsian ideas. It will allow me to fit many Dawkinsian fragments into a more coherent ethical and metaphysical whole. It will allow me to show how Dawkins solves the atheistic problem of evil. Of course, I do *not* claim that Dawkins is a Stoic; but I do claim that, without certain Stoic ideas, Dawkins doesn't make much sense. Believing in Dawkins means trying to make sense out of Dawkins, and Stoic ideas help me to make that sense. But is this Stoic framework architecturally adequate?

[20] Structural realism (French and Ladyman 2010). Not best for us (Mulgan 2015).

6 The Platonic Framework

Since Stoicism raises many questions which it cannot answer, the Stoic framework is not deep enough to support the Sanctuary. Since Dawkinsian spirituality includes many ideas that do not fit into any Stoic architecture, it is not strong enough either. So the Stoic framework is not adequate. Fortunately, Dawkins himself points to a stronger and deeper framework. He points to a kind of naturalized Platonism. I will argue that, apart from this Platonism, much of what Dawkins says about the meaning and value of science makes very little sense. But I aim to make sense of Dawkins.

When Dawkins talks about physical things, he frequently turns to information theory and computer science.[21] He built digital worlds for his biomorphs. He used artificial life programs to explain the evolution of spider webs and eyes. He is intrigued by the idea that our universe is a digital computation. His many treatments of things as programs makes his ontology look less like materialism and more like the *patternism* of Ray Kurzweil. According to this patternism, reality is fundamentally composed of structures of pure information. Dawkins turns to mathematics. He talks about abstract spaces of possible organisms, which he explicitly says are mathematical structures. He endorses the thesis, from Peter Atkins, that the entire universe is constructed out of the self-elaborations of the empty set. And, when it comes down to the real distinction between science and theology, Dawkins does not appeal to empiricism or to materialism. He appeals to mathematics. Not surprisingly, Dawkins argues that the mathematical structure of reality is objectively beautiful (Sects. 5.1 in Chapter 3 and 2.3 in Chapter 4).

Plato argued that the purpose of life is to get out of the cave.[22] Dawkins replaces the cave with the burka (a garment that almost blinds us), and says that the purpose of life is to take off the burka. He argues

[21] Biomorphs (BW ch. 3; EE; BCD 363–94). Webs and eyes (CMI chs. 2 & 5). Our digital universe (GD 98, 186; SITS 85). Kurzweil (2005: 5, 371, 386–388). Abstract spaces (BW ch. 3; CMI ch. 6; ADC ch. 2.2; AT 676). Are mathematical (CMI 200). Atkins empty set (BW 14; GD 143–4). Appeals to mathematics (AK 190; UR 63–4).

[22] Burka (GD 405–20). Sacred truth (SITS 22–8). Intensely Platonic (UR 1–5, 312–3). Blessed (UR 5; see ADC 12).

for the sacredness of truth and scientific objectivity. His book *Unweaving the Rainbow* celebrates the Platonic values of light and vision. Its beginning and ending are intensely Platonic. Evolution escapes from the cave as it runs from blindness to vision. Dawkins says that we are "hugely blessed" to be able to *open our eyes* on the cosmic spectacle. He says that *vision makes life worth living*. It makes life worth living because it enables us to get outside of the universe by building scientific models of it in our heads. Getting out of the universe resembles getting out of Plato's cave. Vision provides life with its ultimate sufficient reason, because it enables us to *reflect* the structure of the universe back to itself through scientific modeling. Of course, this vision is not merely empirical. Here again Dawkins turns to mathematics: to fully appreciate the grandeur and beauty of nature, we must look into it with mathematical eyes. This too is Platonic. But what makes vision a source of value?

Plato answers that as we step out of the cave, we become illuminated by the light of the sun.[23] Light is a powerful symbol. Light is closely associated with enlightenment, while darkness is linked with ignorance, superstition, irrationality, and evil. Dawkins often talks about light. He says we are illuminated by a spotlight. When some New Atheists tried to brand themselves as the *Brights*, Dawkins endorsed it. He says that as we mentally step out of the universe, we are illuminated by a light that makes life worth living. If we are blessed by vision, then we are illuminated by a holy light. For Plato, of course, this holy light shines from the Good. The Good is not a deity. On the contrary, the Good is a moral standard which can be used to judge the actions and characters of any deity. Much as Plato used it in his dialogs to condemn the Olympian deities, so Dawkins uses it in *The God Delusion* to condemn the Abrahamic deity. Of course, the ancient Platonists were not Abrahamic monotheists. They rejected Abrahamic theology: the Good is not God. As Christianity conquered Rome, they *opposed* it. For their paganism, they were often violently persecuted. Dawkins explicitly condemns the cultural violence done by the Abrahamic monotheisms.

[23] Spotlight (UR 5). Brights (2003c; GD 380). Worth living (UR 312). Plato on the Good (*Republic*, 508b–9b). The Good is not a deity (Murdoch 1992: 37–38, 475–477). Platonists used the term "God" to refer to their divine mind; they rarely identified it with the Good. Violently persecuted (Nixey 2018). Cultural violence (GD 282–3).

To reduce the Good to God is both conceptually and morally wrong. To reduce the Good to God is to commit an act of cultural violence. It is to participate in the mono-theo-normative *hijacking* of the Good.

Dawkins often talks about *hijacking*.[24] He says religion has hijacked our most precious concepts. For example, he says "The word 'spiritual' has been hijacked by religion." He says "don't let religious people hijack you … because you call yourself a spiritual person." The list of hijacked concepts is long (spirituality, holiness, sacredness, transcendence, the abyss, ecstasy, being-itself, mystical experience, and so on). Theists hijacked these concepts by tying them to God, where have been held hostage for nearly two thousand years. NOMA facilitates this hijacking by insisting that these valuable concepts belong exclusively to the religious magisterium: if there is no God, there is no spirituality. Nevertheless, since words (and their concepts) are our servants and not our masters, we are free to separate them from religion. We are free to *reclaim* those concepts for spiritual naturalism. We can naturalize them by separating them from God. Following Dawkins, I aim to reclaim these hijacked concepts. To aid in this reclaiming, I will employ the old pagan philosophies of Stoicism and Platonism.

For Platonists, nature strives to maximize self-vision; it strives to see itself. Among the Platonists, I'm also including the so-called Neoplatonists. Thus Plotinus portrays nature as rapt in self-vision; and, as nature sees itself, it comes to see the Good.[25] For Platonists, nature strives to see itself because it has a *duty* to see itself. Nature does its duty. The logic of duty is known as *deontic logic*.[26] It is the logic of obligation, of what *ought* to be. Two qualifications follow. The first states this duty of nature is not a moral (or ethical) duty. Moral duties involve intelligent social agents; but nature is not intelligent or social; hence its duty towards itself is not moral. The duty of nature towards itself is *axiological*. Thus nature does its axiological duty. It satisfies its axiological

[24]Against hijacking (BW 131; FH 51; GSE 340, 376; AT 158). Precious concepts hijacked (UR 18, 114, 210; GD 354; SITS 77, 226). Word "spiritual" hijacked (2013: 0:05–12, 1:17–25, 1:41–53). Words our servants (BW 1).

[25]Plotinus (*Enneads*, 3.8).

[26]The deontic logic used here includes the axioms of standard deontic logic, and is close to Andersonian-Kangerian deontic logic.

obligations, it satisfies the demands of deontic logic. The second qualification recognizes that nature does not literally see itself. More accurately, nature is rapt in self-reflection. The holiness of nature is its *reflexivity*, its capacity to reflect itself back to itself through parts that mirror the whole. These parts include organisms (or computers) that reflect nature back to itself by doing science and mathematics. Dawkins supports these Platonic themes. What makes life worth living? Reflexivity.

Nature serves the Good by maximizing reflexivity. It serves the Good by bringing forth sharper eyes and smarter brains. What are the elevations on Mount Improbable? They are degrees of reflexivity. But maximizing vision also requires maximizing visible richness. It requires maximizing beauty. To maximize vision is to maximize both that which sees and that which is seen; hence to maximize reflexivity is to maximize both that which reflects and that which is reflected. The Darwinian lesson is that the best way to maximize reflexivity is to maximize the *arete* that emerges in the *agon*. Holiness shines through *arete*. All parts of nature serve the Good by striving for greater *arete* in their *agons*. Since we are parts of nature, we too are obligated to serve the Good. We have holy duties to maximize reflexivity. We have holy duties to build models of the cosmos inside the cosmos. You ought to love your fate because your fate serves the Good. As you strive for *arete* in your *agon*, you will suffer. And thus your suffering has meaning. But now your suffering is not a Christian condemnation of life; it is Dionysian affirmation of life. Still, what is the Good? It is a purely transcendental object. Doesn't Dawkins reject transcendence? The physicist Alan Lightman had a mystical experience. Discussing it with Lightman, Dawkins says "You can't out-transcendence me."[27] Dawkins doesn't deny transcendence. He reclaims it from theistic bondage. The modern atheist Iris Murdoch illustrates this reclamation. She replaces God with the Good. She replaces the supernatural Abrahamic deity with a natural pagan ideal.

As I build the Sanctuary for Spiritual Naturalists, I will incorporate many Platonic ideas. I will ensure that this Platonism gets naturalized, and I will give many arguments to support it. This naturalized Platonism will provide the *inner framework* for the Sanctuary. It will enable me to

[27]Lightman (2018). Dawkins on transcendence (Dawkins & Lightman 2018: 12: 28–40).

fit the Dawkinsian fragments into a highly coherent philosophical whole. Of course, I do *not* claim that Dawkins is a Platonist. Sometimes he appears to support Platonism, sometimes he seems to reject it.[28] But believing in Dawkins means building on Dawkins. It means trying to make greater sense out of Dawkins, and Platonism helps me make that sense.

References

Barash, D. (2006). What the whale wondered: Evolution, existentialism and the search for 'meaning'. In A. Grafen & M. Ridley (Eds.), *Richard Dawkins: How a Scientist Changed the Way We Think* (pp. 255–262). New York: Oxford.

Comte-Sponville, A. (2006). *The Little Book of Atheist Spirituality* (N. Huston, Trans.). New York: Viking.

de Botton, A. (2012). *Religion for Atheists: A Non-Believer's Guide to the Uses of Religion*. New York: Random House.

Dennett, D. (1995). *Darwin's Dangerous Idea: Evolution and the Meanings of Life*. New York: Simon & Schuster.

Dennett, D. (2006). *Breaking the Spell*. New York: Viking Penguin.

French, S., & Ladyman, J. (2010). In defence of ontic structural realism. In A. Bokulich & P. Bokulich (Eds.), *Scientific Structuralism* (pp. 25–42). New York: Springer.

Harris, S. (2014). *Waking Up*. New York: Simon & Schuster.

Haught, J. (2008). *God and the New Atheism: A Critical Response to Dawkins, Harris, and Hitchens*. Louisville, KY: Westminster John Knox Press.

Hitchens, C., & Blair, T. (2011). *Hitchens vs. Blair: Be It Resolved Religion Is a Force for Good in the World*. Berkeley, CA: Publishers Group West.

Kurzweil, R. (2005). *The Singularity Is Near: When Humans Transcend Biology*. New York: Viking.

Lightman, A. (2018). *Searching for Stars on an Island in Maine*. New York: Random House.

[28] For Platonism (BW 65–7; CMI 200, 218; ADC 82–3; AT 504; SITS 289). Against Platonism (GSE 21–7; SITS 287–97).

Mulgan, T. (2015). *Purpose in the Universe: The Moral and Metaphysical Case for Ananthropocentric Purposivism*. New York: Oxford University Press.
Murdoch, I. (1970). *The Sovereignty of the Good*. New York: Schocken.
Murdoch, I. (1992). *Metaphysics as a Guide to Morals*. London: Chatto & Windus.
Nagasawa, Y. (2018). The problem of evil for atheists. In N. Trakakis (Ed.), *The Problem of Evil: Eight Views in Dialogue* (pp. 151–175). New York: Oxford.
Nixey, C. (2018). *The Darkening Age: The Christian Destruction of the Classical World*. New York: Houghton Mifflin Harcourt.
Oppy, G. (2018). *Naturalism and Religion*. New York: Routledge.
Rosenberg, A. (2011). *The Atheist's Guide to Reality*. New York: W. W. Norton.
Sagan, C. (1995). *Pale Blue Dot*. London: Headline.
Sideris, L. (2017). *Consecrating Science: Wonder, Knowledge, and the Natural World*. Oakland: University of California Press.
Smith, Q. (1988). An analysis of holiness. *Religious Studies, 24*(4), 511–527.
Taylor, B. (2010). *Dark Green Religion: Nature Spirituality and the Planetary Future*. Berkeley, CA: University of California Press.

2

Complexity

1 The Complexity Liturgy

1.1 Scientific Liturgies

Our Platonism entails that we have a holy duty to study nature scientifically.[1] Much of *Unweaving the Rainbow* is devoted to showing the spiritual value of doing science. If doing science is spiritual, then learning it is also spiritual. One reason for the spirituality of science is that it reveals the sacred truth of nature. I will eventually discuss other reasons to affirm the spirituality of science (Sects. 4 and 5 in Chapter 3). Spiritual naturalists affirm that both doing and learning science are spiritual activities.

Spiritual naturalism assigns new meanings to old religious terms. To work through a course of scientific topics for the sake of spiritual development is to perform a *liturgy*. For example, to study complexity for its spiritual value is the *complexity liturgy*. Some aspects of this liturgy may be tedious or difficult—it involves setting some heavy stones into place. Since complexity plays a foundational role in Dawkinsian thinking, this

[1] Science is spiritual (ADC 27; SITS 5). Sacred truth (SITS 26, 326).

E. Steinhart, *Believing in Dawkins*,
https://doi.org/10.1007/978-3-030-43052-8_2

liturgy is worthwhile. It will be followed by the four *physical liturgies*. These are the atomic, molecular, biological, and thermodynamic liturgies. After these liturgies, I turn to the cosmological liturgy in Chapters 4 and 5, then the ontological liturgy in Chapters 6 and 7. These liturgies are spiritual exercises. By doing these liturgies, you build the Sanctuary for Spiritual Naturalists inside of your own mind.

1.2 Combinatorial Complexity

When Dawkins defines complexity, he talks about the complexities of *types* of things, rather than the complexities of particular individuals.[2] He does this because one particular individual can be an instance of many types. The astronaut Neil Armstrong is an instance of the type *human*, the type *material thing*, and many other types. All these different types have different complexities. Dawkins starts his discussion of complexity with an observation about mountains and airliners. On the one hand, if you scramble the parts of a mountain, you almost always end up with a mountain. The type *mountain* doesn't care much about its internal structure. So the type *mountain* is simple. On the other hand, if you scramble the parts of an airliner, you almost never end up with an airliner. The type *airliner* cares greatly about its internal structure. So the type *airliner* is complex. How can we make these ideas more precise?

To find the raw complexity of some type of thing, start by decomposing some example of that type into some set of parts. All the possible arrangements of those parts makes the set of *arbitrary arrangements* of the type. Every arbitrary arrangement is a way of scrambling the parts of the type. Some of those arbitrary arrangements preserve the type while others destroy it. All the ways that preserve the type go into the set of *stable arrangements*. Each set has some size, which is its *multiplicity*.[3] The size of the arbitrary set is the *arbitrary multiplicity*, while the size of the stable set is the *stable multiplicity*. Now we need to compare these two multiplicities.

[2] BW 6–9; SITS 122.

[3] BW 7; CMI 77; GD 137–9; AT 688.

The arbitrary arrangements of a simple type tend to preserve it. So the stable multiplicity of a simple type is very similar to its arbitrary multiplicity. If we divide some number by a similar number, we get a small number. This small number indicates the low complexity of the simple type. Suppose there are one trillion ways of scrambling the mountain, and one billion of them preserve its type. The arbitrary multiplicity is one trillion while the stable multiplicity is one billion. One trillion divided by one billion is one thousand. This is the low complexity of the type *mountain*.

The arbitrary arrangements of a complex type tend to destroy the type. So the stable multiplicity of a complex type tends to be much smaller than its arbitrary multiplicity. If we divide some greater number by some much smaller number, we get a large number. The large number indicates high complexity. Suppose there are also one trillion ways of scrambling the airliner, but only one thousand ways preserves its type. One trillion divided by one thousand is one million. The type *airliner* has high complexity.

The *raw complexity* of any type is its arbitrary multiplicity divided by its stable multiplicity. One problem with this definition is that the complexities get very big very fast. Another problem is that complexity is often thought of as an informational quantity, to be measured in binary digits (bits). Both problems can be solved by taking the *logarithm* of the raw complexity.[4] More precisely, the complexity of an instance of some type is the logarithm of its arbitrary multiplicity divided by its stable multiplicity. The complexity of the type is the average of the complexities of its instances.

1.3 Spiritual Lessons from the Liturgy

The complexity liturgy teaches at least three immediate spiritual lessons. The first lesson is that *complexity is improbability*. Consider a field strewn with Boeing 747 parts.[5] Focus on the type *airliner*. So the stable multiplicity is the *airliner multiplicity*, which is the number of ways

[4]The number of bits needed to encode some number is its base-2 logarithm.

[5]BW 234; GD 137–9.

the upper bound on neutrons is the same. So the number of books in the atomic library is forty thousand. There are forty thousand possible kinds of atoms.

The atomic library has two dimensions or axes. Its vertical axis counts protons, while its horizontal axis counts neutrons. This two-dimensional space is sometimes called *Segré space*.[12] Of course, atoms also include electrons. But we can ignore them now. You can picture Segré space as a building with two hundred floors. Each floor contains a single shelf, with two hundred books. The books in each shelf are arranged in order of increasing neutron numbers. If we apply the Dawkinsian theory of complexity to atoms, it turns out that the complexity of an atom corresponds to its proton number.[13] So the books on higher floors are more complex atomic types.

Figure 1 illustrates part of the atomic library. Wherever two lines intersect in this Figure, there exists some possible atomic type. More technically, these types are called *isotopes*. Black dots mark the stable isotopes. Most of the atomic types are not stable, so the majority of intersecting lines are not marked by dots. The laws of physics define a narrow line of stability surrounded by a vast region of instability. Of the forty thousand books in the atomic library, only a few hundred actually contain atoms. Most of these atomic types are actually empty. Yet they are *possibly* occupied.

These possible kinds of atoms are not particular physical atoms. Although all uranium atoms belong to the same kind or type, that type is not itself an atom of uranium. What are these types? One traditional answer to this question is known as *Platonism* (Sect. 2 in Chapter 6). Platonism says that the possible types of atoms are abstract forms of atoms. Forms are also known as universals, essences, or natures. The form of an atom defines its structure in terms of the properties and relations of its parts. Every physical atom *is an instance of* or *is an example of* an abstract atomic form. Thus every physical oxygen atom *instantiates* or *exemplifies* the abstract oxygen-form.

[12]Magill and Galy (2005: 31–32).

[13]The *n*-th type of atom has *n* protons. A little mathematics shows that the complexity of the *n*-th type of atom is the logarithm of the *n*-th Bell number.

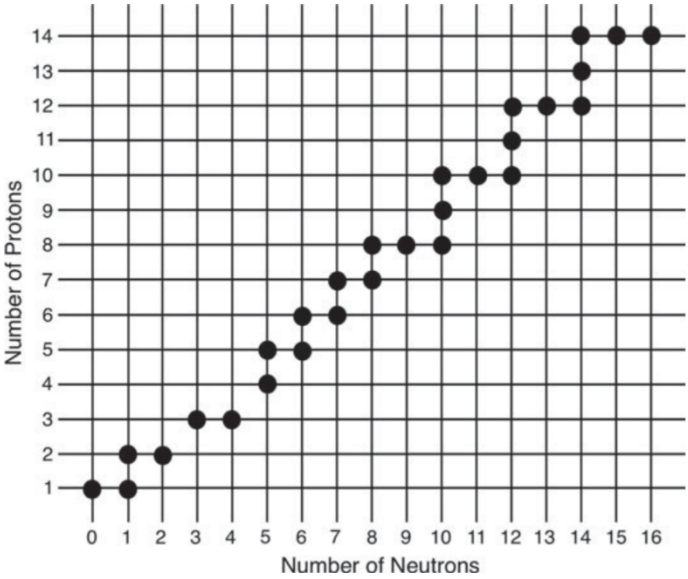


Fig. 1 Some floors in the library of possible atoms

Platonism says these atomic forms exist objectively. They are not concepts in our heads or words in our languages. Thus Segré space is an objectively existing abstract mathematical space. Should we affirm mathematical objects? As naturalists, we accept those kinds of things that appear in scientific theories. Since mathematical objects appear in those theories, we accept them. But our naturalistic Platonism does not support any dualism. Segré space is both physical and mathematical. Dawkins says Platonism works for simple things like geometric shapes; if it works for them, it also works for simple things like atoms.[14] Much of what Dawkins says makes very little sense outside of a Platonic metaphysics. As I go over the Dawkinsian texts, I will often use a Platonic framework to organize his philosophical fragments. I will use it to help raise the Sanctuary for Spiritual Naturalists. However, this Sanctuary is my own construction. Believing in Dawkins means building on Dawkins.

[14]SITS 289.

2.2 Abstract Atomic Arrows

The big bang fills up the hydrogen book right away with zillions of atoms.[15] It also fills up the helium and lithium books. So the universe starts by filling up the books on the bottom floors of the atomic library. These primordial simple atoms make up the start of atomic evolution: the atomic *alphas*. After these simplest atoms are formed, they start to evolve into more complex atoms. As the first atoms are gathered together by gravity, they forms stars. Almost all the atoms heavier than helium are formed by stars. The first stars mostly fuse two hydrogen atoms into one helium atom. This fusion is a nuclear reaction, which can be symbolized using an arrow like this:

hydrogen + hydrogen → helium.

This reaction arrow expresses a *type* of reaction among *types* of atoms. It is an abstract arrow that moves from a pair of hydrogen books to a helium book. The atomic library is criss-crossed by arrows linking books to books. These abstract arrows have concrete models. If two particular hydrogen atoms fuse into one helium atom, then those changing atoms physically model the abstract arrow. When we present reaction arrows, we'll omit some irrelevant details. Here are some reaction arrows:

helium + helium → beryllium;
beryllium + helium → carbon;
carbon + helium → oxygen;
carbon + carbon → neon + helium;
oxygen + oxygen → silicon + helium;
oxygen + oxygen → magnesium + helium + helium.

There are thousands of other possible reaction arrows. Fusion reactions generate atoms all the way up to iron. Atoms beyond iron are mostly formed when stars explode. The exploding stars fuse atoms all the way up to uranium and sometimes beyond. Many heavy atoms are also produced during the merger of neutron stars.

[15] Stars (GD 169; GSE 426). Fusion (SG 12–13; UR 52; AT 592–8).

Nuclear reactions preserve mass: the mass on the right side equals the mass on the left. The mass includes any mass converted into energy. Hence the nuclear reactions resemble equations involving mass numbers. The mass number of an atom is its total number of protons and neutrons. Since every atom has an exact mass number, the atoms are *natural models of numbers*. The mass number of an atom is written as a superscript before its symbol. Since hydrogen has mass 1, and its symbol is H, hydrogen is written as ^{1}H. An oxygen atom with eight protons and eight neutrons is symbolized as ^{16}O. The nuclear reaction equations involve something like addition:

$^{1}H + {}^{1}H \rightarrow {}^{2}He \qquad 1 + 1 \rightarrow 2$
$^{1}H + {}^{2}H \rightarrow {}^{3}He \qquad 1 + 2 \rightarrow 3$
$^{3}He + {}^{3}He \rightarrow {}^{4}He + {}^{1}H + {}^{1}H \qquad 3 + 3 \rightarrow 4 + 1+1$
$^{16}O + {}^{16}O \rightarrow {}^{24}Mg + {}^{4}He + {}^{4}He \qquad 16 + 16 \rightarrow 24 + 4+4.$

But the last two equations aren't exactly additions—they are transformations. What kind of transformations? The atoms are letters in an alphabet. Stringing atoms together makes a word. Thus H is a letter, He is a letter, H + H is a word, and He + H + H is a word. As letters get changed into letters, words get changed into words. Each atomic reaction arrow transforms an old string of letters into a new string of letters.

Every atom has a path from itself to itself, and the probabilities of these self-paths determine the *stabilities* of types of atoms.[16] If the path from an atom to itself is extremely probable, then it is *stable*. But if its self-path is improbable, it is *unstable*. Unstable atoms decay into stable atoms. Magnesium-23 decays in seconds into sodium-23 plus a positron (which we'll ignore). The arrows look like this:

$^{23}Mg \rightarrow {}^{23}Na$ high probability;
$^{23}Mg \rightarrow {}^{23}Mg$ low probability.

Atomic decay illustrates the Dawkinsian principle of the *survival of the stable*. It illustrates the principle of *differential survival*—unstable atoms perish, stable atoms persist. More complex atoms are usually less stable. Atoms with odd proton numbers are less stable than atoms with even

[16]Atomic stabilities (AT 594–8). Survival of stable (SG 12–13; BW 44).

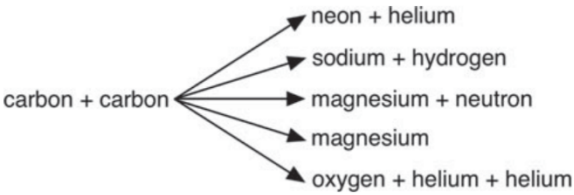


Fig. 2 Some nuclear reaction arrows

numbers. Hence some atoms are *fitter* than others, and the laws of physics exercise a *selective* effect. Dawkins says that atomic differential survival is the earliest form of natural selection. The physical laws select some possible atoms for actualization, while others remain merely possible.

A single atomic collision can often go down many paths. When stars fuse carbon, five reaction arrows gain almost all the probability.[17] Since these five are not all equally probable, probability is *non-randomly distributed* over them. Their probability distribution is *skewed*. Figure 2 shows these five arrows, with probability decreasing downwards. Obviously, arrows with higher probability are more frequently selected. Picture *resistance* as the inverse of probability. High probability arrows have low resistance. Flows of matter are more likely to follow arrows of lower resistance. This is *differential selection* of arrows. It is *arrow selection*. Of course, some explanation is needed here: why are the probabilities skewed? What is the skewer?

2.3 The Atomic Computers

Dawkins is obsessed with computers.[18] His *weasel program* illustrates the slow accumulation of complexity. His *biomorphs program* illustrates evolution. He used programs to simulate the evolution of spider webs

[17] De Loore and Doom (1992: 95–97).

[18] Biomorphs (BW ch. 3; EE; BCD 363–94). Spider webs (CMI ch. 2). Eyes (CMI ch. 5). Digital genetic code (BW 111–5; ROE 19). Cells compute (SG ch. 4; EP ch. 2). Brains compute (SG ch. 4; EP ch. 2; UR ch 12). Survival machines (SG *xxi*). Ecosystems compute (CMI 72, 326; ADC 12). Digital physics (SITS 80–5).

skewed or finely tuned to maximize the likelihood that it does reach that finality. Of course, as teleonomic algorithms gain complexity, they can also gain mentality. As swarms of atoms evolve into thinking organisms, teleonomy evolves into purposiveness. And if a convergent algorithm strives for some finality, it need not reach it. The doubling algorithm can run towards infinity without reaching it. Algorithms can fail.

Among convergent algorithms, some aim at finalities of greater complexity. They strive to transform their simpler inputs into more complex outputs. What should we call these complexity-increasing algorithms? Here we turn to Aristotle. Aristotle said that things have directionalities, they aim at more complex finalities, because they are running internal programs, which he called *entelechies*. Spiritual naturalism happily adopts this Aristotelian term: an entelechy is a convergent algorithm which teleonomically increases complexity. Computers that run entelechies need not be intelligent or purposive. They can be mindless automatons and utterly unconscious robots.

Any computer that runs an entelechy is a *crane*.[22] The stars are *atomic cranes*. A crane is a system of transformational arrows that tends to increase complexity. Cranes lift matter to greater heights of complexity. A crane is a big arrow made of little arrows, and it points to more complex finalities. It will be useful to have a word to refer to the lifting actions of cranes. The word *moil* is an older English word for labor. Thus cranes *moil* towards their finalities. Although moiling is convergent, it need not be goal-directed or teleological. Moiling is teleonomic striving. The finalities of cranes are their *ecstasies*. The term is used in the sense of *ek-stasis*, which means *to stand outside*. The limit of a series stands outside of the series and so is the ecstasy of the series. If any crane moils towards some finality, then that finality is its ecstasy.

2.4 The Evolution of Atomic Complexity

An atomic computer is any whole composed of atoms. Its atomic hardware is the totality of all possible nuclear reaction arrows, and this hardware is programmable. The programming of any atomic computer

[22]Dennett (1995). Dawkins (GD 99, 168, 185–8; AT 634, 688).

is its software. Atomic computers have two layers of software. The *first-order* software running on any atomic computer consists of the probabilities of its reaction arrows. These probabilities vary from thing to thing. The probabilities inside a uranium-powered nuclear reactor differ from those inside an apple. Those on the surface of the earth differ from those in the core of the sun.

The first-order programming of any thing can change over its lifetime. Our sun began as an immense but diffuse cloud of hydrogen. The probability of hydrogen staying hydrogen was very high, while its probability of fusing into helium was very low. As gravity pulled this cloud together, it formed a proto-star. When it ignited, its first-order probabilities changed. At the core of the sun, the probability of hydrogen staying hydrogen decreased drastically, while its probability of fusing into helium rose sharply. It began fusing hydrogen into helium. At the current time, in a star like our sun, the probability of helium fusion is very low. But as our sun turns into a red giant, that probability will grow. It will fuse helium into beryllium, carbon, and oxygen. As the sun ages, the laws of physics specify the changes in its first-order reaction probabilities. The factors that specify first-order changes are the *second-order* programming of the sun. The second-order programming *skews* the first-order programming so that our sun does not fuse atoms randomly. The probabilities of the first-order reaction arrows in our sun are skewed so that complexity increases—our sun runs an entelechy.

Three arguments now confirm that the stellar software is highly skewed away from randomness. The first argument starts with the fact that there exists a stable line of atoms rising through Segré space.[23] The atoms sitting in this *line of beta stability* have highly probable self-arrows. But a line is a highly non-random structure. The second argument observes that the stellar reaction probabilities facilitate the growth of complex atoms. If they were random, atomic complexity would not grow. Since it does grow, they are skewed far from randomness. The third argument observes that the stellar algorithms change in ways that *reinforce* the steady growth of complexity. The *changes* in the first-order stellar algorithms are skewed far from randomness.

[23] Jaffe and Taylor (2018: 310–312).

Hence the second-order stellar software is also highly skewed away from randomness. All these probabilities and their changes are skewed towards increasing complexity. The stars run entelechies, which are very improbable algorithms. And they run self-reinforcing entelechies, which are almost vanishingly rare in the total space of possible stellar algorithms.

All these probabilities and their changes are skewed in extremely improbable ways. Dawkins insists that improbable things cannot emerge from chance alone. Hence there must be some non-chancy explanations for these stellar algorithms. They must have been skewed by *non-random factors*. Since these factors skew the distribution of probabilities, they can be gathered together into the *skewer*. The skewer pushes probability around in the space of arrows. It twists the arrows so that they point upwards. The skewer drives stellar programs away from random software and towards entelechies. Since entelechies are very improbable, the skewer must be very powerful. *What is it?* Whatever it is, it is entirely natural, and it acts in every star. It emerges from the laws of physics, and they act everywhere in the universe. All the stars participate in the skew. All the stars are little complexity-increasing computers. Together, they make a big computer.

The big atomic computer consists of all the stars in the entire history of the universe. Its hardware consists of Segré space plus all possible nuclear reaction arrows. Its software consists of the first-order probabilities of those arrows, plus the second-order programming that drives them to change. The software guides the flow of energetic matter through Segré space, from the big bang until the end of time. If you could watch this flux from outside of Segré space, that is, from outside of the atomic library, and from the big bang to the end, then you would see a big *atomic arrow* rising like a flame up into the atomic library. The growth of this big atomic arrow emerges from the flow of matter through all the little first-order nuclear reaction arrows.

The skewer ensures that the big arrow of atomic complexity grows like a volcano. The height of a volcano grows over time. So the complexities of the most complex atoms increase over time. This does not mean that all atoms grow more complex—the universe still contains mostly hydrogen. The higher volcanic strata rest on the lower strata. So if some

higher atomic complexities are populated, then all the lower complexities were or are populated. The volcano grows narrower as it grows higher: more complex atoms are rarer. It grows by *accumulation*. New rocks get piled on top of old rocks. If any rocks fall down the volcano, they were first carried to the top. Atoms can only lose the complexity which they previously gained. Simpler atoms can fuse into more complex atoms, and complex atoms can fission into simpler atoms. But fission depends on fusion, decay depends on growth. The atomic computer runs an entelechy. It is a crane which moils towards its ecstasy. The volcano only rises. Of course, it will eventually erode away; but *the volcano itself* does not perform that erosion. As the complex arrows disintegrate, the volcano and its arrow also disintegrate. The atomic arrow never *grows* downwards. It always grows upwards, and therefore points beyond itself, to possible atoms which will never be realized in our universe. It defines a self-surpassing process, which strives for an unattainable infinity. It moils towards that infinite ecstasy.

3 The Molecular Liturgy

3.1 The Library of All Possible Molecules

Since atoms join together to make molecules, the atomic liturgy is followed by the *molecular liturgy*, which deals with chemistry. The laws of chemistry in our universe define a *library of possible molecules*. It resembles the atomic library, except that the book s in this *molecular library* are abstract molecular forms. They are connect-the-dots networks, in which types of atoms are linked by types of chemical bonds. The books on the higher floors define molecular types with higher complexities.

The complexities of molecular types are defined combinatorially. Consider formic acid, whose network is shown in Fig. 3. Its set of atomic parts is {H, H, C, O, O}. There are lots of ways to arrange these five atoms into molecules. They can be arranged into carbon dioxide and dihydrogen: COO and HH. Or into water and carbon monoxide: HOH and CO. To find the Dawkinsian complexity of formic acid, you count the ways of rearranging its atoms and then you do some arithmetic.

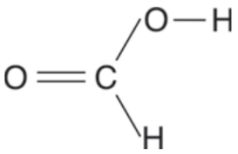


Fig. 3 Formic acid

Table 1 Some floors in the molecular library

Floor	Molecule	Floor	Molecule	Floor	Molecule
15	benzene	212	aspirin	14700	insulin
10	formic acid	119	dopamine	4030	vasopressin
8	boric acid	64	histamine	1870	oxytocin
6	ethylene glycol	31	acetic acid	527	LSD
2	formaldehyde	25	octane	335	adenosine
0	water, methane	18	carbon dioxide	245	tryptophan

Its complexity is the logarithm of its arbitrary multiplicity divided by its stable multiplicity. Formic acid turns out to be very complex, even though it has only a few atoms. Although chemists generally agree with Dawkins that molecular complexity needs to be defined combinatorially, they have developed their own detailed theories of chemical complexity.

The chemist Steven Bertz developed a combinatorial theory of molecular complexity, which has been applied to the PubChem molecular library.[24] Table 1 illustrates some molecules, along with their Bertz complexities. The Bertz complexities can be used to assign these molecules to their floors in the molecular library. But the complexity of any thing can also be defined as the number of bits of information it contains. Dawkins endorses informational ways of measuring complexity, and chemists like Thomas Bottcher have proposed ways to measure the information in any molecule. Both the combinatorial and informational approaches to molecular complexity are consistent with the Dawkinsian principle that complexity is improbability.

[24]Bertz (1981). PubChem <pubchem.ncbi.nlm.nih.gov>. Informational complexity (ADC 100–2, 210). Bottcher (2016).

3.3 The Evolution of Molecular Complexity

Many other planets (and moons) in our solar system appear to run molecular entelechies.[27] Planets like Venus, Mars, Jupiter and Saturn have produced complex molecules. Moons like Enceladus, Titan, and Europa appear to run entelechies. Dawkins estimated that there are one-hundred billion billion planets in our universe. Current data suggests our universe contains about *two hundred billion trillion* planets—planets are common. Surveys indicate that the Milky Way contains tens of billions of earthlike planets in the habitable zones of sunlike stars. Many of these planets run molecular entelechies. Hence *molecular cranes* are common in our universe.

A molecular entelechy is a program which increases complexity. The arguments that applied to the atomic entelechies also apply to molecular entelechies. All the molecular entelechies in the universe are first-order and second-order programs skewed very far from randomness. Our best current estimates indicate that complex planetary chemistry is common. Look into the starry sky, and you are looking into a universe saturated with entelechies. Some deep non-random factors in the laws of physics skew molecular computation towards complexity everywhere. All across the universe, the skewer twists molecular matter into more complex shapes. The skewer acts directly on reaction probabilities and indirectly on flows of matter. What is it?

A Stoic would say the skewer is the Logos. It shapes the flow of the *pneuma*, the *pyr technikon*, the designing fire. This Stoic appeal to flowing fire-energy suggests that we turn to thermodynamics. On Earth, molecular evolution is driven mainly by flows of thermal energy from the sun. And on moons like Titan and Europa, it is driven by flows of heat generated by tidal forces. More generally, it looks like molecular cranes are heat engines. They are *far from thermodynamic equilibrium*. They dissipate their heat into cold dark space. This dissipation drives material flows

[27] Dawkins estimates planets (BW 142–6, 164–6; CMI 283; GD 165; GSE 421). There are at least two trillion galaxies in the observable universe (Conselice et al. 2016). The Milky Way contains between two and four hundred billion stars and at least one hundred billion planets. Multiplication yields at least two hundred billion trillion planets in the universe. Planets in habitable zones (Petigura et al. 2013).

on planets to self-organize. This suggests that *thermodynamic forces* skew molecular programs into molecular entelechies. They push the probabilities away from randomness and towards those that increase complexity. Moreover, complexity is linked with information, which is linked with entropy, and entropy is a thermodynamic quantity. Somehow, thermodynamics drives self-organization. But we can still ask: *why* do the laws work this way? To answer this question, we will eventually turn from Stoicism to Platonism.

3.4 The Replicator

At some point, the molecular crane running on Earth produced a molecule that could make copies of itself.[28] It produced a *replicator*. Dawkins is obsessed with replicators. Perhaps the first replicators were peptides (chains of amino acids). Or maybe they were RNA. But earthly replication converged onto DNA. A *strand* of DNA is a string of four chemical letters. Two strands of DNA bind to make a *helix*. Suppose some DNA helix consists of the two strands X_1Y_1. This strand replicates in two phases. During the first phase, the two strands X_1 and Y_1 separate. During the second phase, each strand binds with a copy of its old partner. Thus X_1 binds with Y_2 and Y_1 binds with X_2. The result is two new helixes X_1Y_2 and X_2Y_1. So DNA replication is a molecular arrow:

$$X_1Y_1 \rightarrow X_1Y_2 + X_2Y_1.$$

The first replicator crosses two important philosophical thresholds.[29] The first is the *information threshold*. Each strand of DNA is a series of letters (or bases) in a molecular alphabet. This alphabet contains the four letters A, C, G, and T. Since there are four letters, each can be expressed using two binary digits. For example, A is 00, C is 01, G is 10, and T is 11. Thus DNA stores information in digital form. The digital nature of DNA permits it to self-replicate. This threshold is Platonic, because evolution now turns away from the particular sequence of DNA atoms

[28] SG ch. 2; EP ch. 5; BW 128–37.

[29] Digital DNA (BW 115–20; ROE 11–20; UR 89–97; AT 603; SITS 214). Digital self-replication (BW 112, 115; ROE 19).


image
not
available

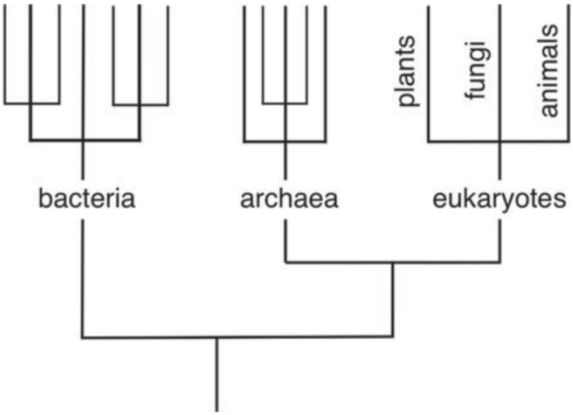


Fig. 4 A highly simplified tree of life

Over time, they evolve into more complex forms of life. The actual evolution of life fills out the phylogenetic tree of life.[33] Figure 4 shows an *extremely* simplified tree of life. Of course, these *actual organisms* are not the only *possible organisms*. Just as there are abstract spaces of possible atoms and possible molecules, so there is an abstract space of possible organisms.

Dawkins often talks about this abstract space, which we will call the *biological library*.[34] It resembles the atomic and molecular libraries. He says it is a mathematical structure, a multi-dimensional space in which the points are books. Each book contains all the information needed to define some possible type of organism. The biological library contains the forms of all possible organisms on all planets in the entire universe. Of course, various objections can be raised against this library. Nevertheless, since Dawkins refers to it, the Sanctuary includes this library. Its books are the Platonic forms of possible organisms. An old approach to these forms treats them as *biological essences*. But Dawkins objects to the old doctrine of biological essences. Do his objections defeat Platonism? Biological essentialism is an obsolete version of Platonism.

[33] Soltis and Soltis (2019).

[34] Biological library (BW ch. 3; CMI ch. 6; ADC ch. 2.2; AT 676). Is mathematical (CMI 200). Against essences (GSE 21–7). Better Platonism (Wagner 2014).


image
not
available


image
not
available