

Science

As

Natural

Theology

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Arthur D'Adamo

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Contents

Prologue	8
Our Goal	10
Worldviews	12
Monism	16
Dualism	16
Monism	17
Our fundamental assumption: monism	19
A Philosophical Approach	20
Component entity (preliminary)	20
Relative existence	21
Component entity	22
Dependent existence	22
Ground of existence	22
Motion	23
Act	23
Flow	24
Corresponding concepts	26
Simple entity	27
Absolute existence	27
Independent existence	28
Ultimate ground of existence	28
That which moves, acts, flows	28
God	30
Christianity	30
Judism	31
Islam	31

Buddhism	31
Hinduism	32
Taoism	32
Sikhism	33
Zoroastrianism	33
An Attitude of Awe	36
The Child's Hierarchy	37
Matter and Form	38
Natural Theology	44
Creation	48
Objects	51
Joined object	52
Fused object	52
Said Object	53
Properties	55
Emergent Property	56
The static and dynamic view	58
Our place in the universe	60
First Reflection	68
Identity	72
Other identity	75
Singular Identity	76
Essential and accidental properties	78
Said identity	80
Revisiting the natural answer	83
Personal Identity	86
No true, unchanging identity	87
Mind (Descartes)	88
Mind (Contemporary)	91
Consciousness	94
Soul	98
Forever me?	100
The "I"	104
Origin of the "I"	105
Fear	107
360 degree security	109
Explaining suffering	110

Self-preservation (ego)	112
The Two Self Argument	113
Self-preservation (religion)	114
Second Reflection	116
Barn Raising	116
Experience of God	118
Experience of God	121
More accounts	124
Unitive experience	127
Alternative explanations	129
A working hypothesis	133
Theoretical constructs	134
Third Reflection	138
Notes	142
Prologue	142
God	143
Attitude	143
Natural Theology	143
The "I"	144
Personal Identity	144
Experience of God	144
Bibliography	146

Prologue

Imagine creating a list of all the gods and goddesses worshipped over the centuries, in Greece and Rome, in India and in China, on the two American continents, in Africa, and elsewhere. The list would include the following names:

Anuket	Astarte	Atlas	Dyeus	Freyja	Gaia
Isis	Ixcacao	Izanagi	Kali	Kichigonai	Lakshmi
Mat Zemlya	Olorun	Pangu	Quetzalcoatl	Ra	Tengri
Thor	Toci	Venus	Viracocha	Xi Wangmu	Zeus

And more. Thousands more. Unless we believe all those gods and goddesses genuinely exist, we must regard at least some of them as fictions.

Such a prolific invention of gods and goddesses might cause us to wonder if we should regard the various gods and goddesses worshipped today as fictions, too. But it might also lead us to wonder if an obscure intuition of some reality motivates those inventions.

How might we construct an accurate (or, at least, more accurate) picture of that reality? We should start with what we know, with solid fact; we should begin with the knowledge we've collected, refined and repeatedly verified over the centuries. In other words, we should try to dispassionately infer the theological consequences, if any, of science.

But certain factors hinder a dispassionate consideration of the evidence. To name but two, the theists' attachment to the emotional comfort and security of their religion, and the atheists' feeling of aversion to religion because of the harm they feel it has done to them or the world. Such factors make an attempt such as ours difficult. Further, we see many theologians and apologists try to deduce the theological implications of science only to conclude science supports their religion but not other religions. Last, science's ongoing quest for more and better knowledge sometimes overthrows old theories, as when Einstein's theory of gravitation succeeded Newton's. So any conclusions we reach today may eventually suffer the same fate as Newton's ideas.

Undoubtedly, various perils threaten the success of our project.

We begin.

Our Goal

We hope in these pages to describe a worldview that qualifies as theistic, atheistic, neither, or both.

The theist says an eternal, all-powerful, all-loving, all-good supernatural God exists, who created the universe for us, who (eventually) rewards good and punishes evil, who gave us an eternal soul, who dwells in a place where good people go after death, who created the place where evil people go.

The atheist finds no evidence of the supernatural, and says we live in a universe largely hostile to human life and apparently indifferent to our moral virtues or failings, that when we die our body decomposes and returns to the earth from whence it came, that we cease to exist, and nothing of us remains except memories in the minds of those who knew us.

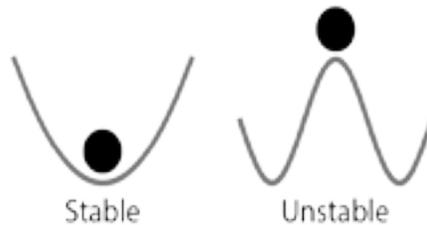
The theist's worldview satisfies the heart, which seeks the emotional assurance of a powerful Person who loves us and protects us, of eventual justice for the good that goes unrewarded and the evils that go unpunished, of the prospect of a wonderful, eternal life.

The atheist's worldview satisfies the mind, which conducts a dispassionate, clear-eyed examination of the evidence and reaches obvious conclusions.

We attempt in this book to lay the foundation of a worldview that lies somewhere between the theist and atheist worldviews.

We may imagine our worldview as the balance point of an unstable equilibrium. We learn in physics of stable and unstable equilibria. Bump a ball in stable equilibrium (a ball sitting in a cup, for example) and the ball moves but eventually returns to equilibrium. But disturb a ball in unstable equilibrium (balanced atop a mountain peak, for example) and the ball does not return to its state of equilibrium, but rolls to one side or the other.

By analogy, we picture our worldview as a ball atop a mountain peak; on one side lies theism, on the other, atheism. Thus, our worldview lies between the theist and atheist worldviews, and, to some extent, resolves the theist/atheist dichotomy.



Worldviews

Differing answers to two fundamental questions underlie the theist and atheist worldviews:

- The question of ontology: what exists?
- The question of epistemology: by what method(s) can we gain genuine knowledge of what exists?

As to ontology (what exists?), atheist and theist (and everyone but the solipsist) grant that the natural world exists. The dispute arises about whether anything exists beyond the natural world, i.e., a supernatural world of God (or gods), demons, angels, souls, etc.

As to knowledge of the natural world (epistemology), atheists and most theists agree that science gives us genuine knowledge (although some theists dispute the science on evolution, the age of the Earth, and other questions).

As to knowledge of the supernatural world, atheists deny the supernatural world exists and therefore do not believe any method can give genuine knowledge of it. Believers venerate sacred books which, they claim, contain genuine knowledge of the supernatural as revealed by prophets, saints, seers, mystics, and, sometimes, by an earthly incarnation of God himself.

To begin our resolution of the theist/atheist dichotomy we must first decide what ontology and epistemology to accept.

We accept science’s ontology.

Science’s ontology—i.e., the scientific worldview—includes the natural world, but does not include the supernatural, which science leaves to religion. In science’s view, all the events and forces that influence the universe arise from within the universe, and have natural explanations. Because the scientific worldview contains only natural entities and phenomena, scientific explanations may contain only natural causes, not supernatural ones. Thus, science explains the cause of a disease as a virus or bacteria, not sin or demons. Similarly, science explains why planets revolve around the sun by gravity and inertia, not the will of God.

Scientists call their practice of excluding supernatural factors “methodological naturalism”. Methodological naturalism avoids explanations that contain supernatural factors and it offers no opinion as to whether or not the supernatural exists. (In contrast, ontological naturalism positively affirms no supernatural entities exist.)

We accept science’s epistemology.

We accept science’s way of knowing—the “scientific method”—as well as the body of knowledge science has uncovered about the natural world.

Worldviews	Atheist	Theist
Ontology (What exists)	natural world	natural world <i>and</i> supernatural world
Epistemology (How we gain genuine knowledge)	science	science <i>and</i> revelation

Accepting science's worldview and way of knowing seems to put us in the atheists' camp in that we make no use of the supernatural, or of any "revealed" scripture. But we cannot do otherwise without favoring one religion over another, because religions have various views of the supernatural (e.g., heaven/hell vs. reincarnation) and because religions often deny the inspiration of other religions' scriptures. Because we cannot accept as valid all world scriptures, such as the Torah, Bible, Koran, Vedas, Upanishads, Tipitaka, Tao Te Ching, etc., we remain silent concerning their validity and employ none of them as a source of knowledge.

Accepting science's ontology and epistemology justifies the use of the word "science" in our title but how can we justify the use of "theology", natural or otherwise? To do theology mustn't we allow ourselves to use the word "God"? And doesn't our worldview rule out use of that word?

Not if we can validly define in our worldview what we mean by "God", which we attempt after discussing monism, dualism, and a few philosophical terms.

Monism

We may describe the theist/atheist dichotomy in terms of dualism and monism.

Dualism

To the theist, all existence divides into two domains: the natural and the supernatural, with the supernatural superior and occasionally intervening and altering the natural course of events. Thus, the natural world proceeds according to its own internal laws unless the supernatural miraculously intervenes to raise someone from the dead, or divide a sea's waters, or stop the sun in the sky. Thus, theists have a dualistic (i.e., natural/supernatural) view of the world.

Ancient philosophy once held a dualistic view of existence. Persuaded by Aristotle, philosophers divided the universe into two domains: the terrestrial domain and the celestial domain. Four elements—earth (soil), water, air, and fire—composed material things on Earth, i.e., in the terrestrial domain. A fifth element, the aether, composed the moon, planets and stars, embedded in concentric spheres in the celestial domain. Aristotle's teachings embody a type of dualism where earthy things and celestial things each have their distinct substances: earth, water, air, and fire for the earthly domain; aether for the celestial domain. Because different substances

composed the two domains, ancient philosophers had no reason to expect what they learned about mundane things would apply to the heavens, too.

Some two millennia later, Newton said the same force that pulls an apple to Earth also keeps the moon and planets in orbit. Newton's theory of gravitation implicitly denies the dualism of Aristotle. Instead, it assumes the physical laws we see on Earth rule the heavens as well.

Newton's theory expresses one of science's bedrock principles, the uniformity of nature. To illustrate, suppose we observe the spectroscopic signature of neon in the light of a star a billion light-years distant. We conclude the star contains the element neon (or, more precisely, contained neon a billion years ago when it emitted the light). We know that on Earth, today, neon has that spectroscopic signature. But the star lies a billion light-years from Earth and the light we observe left the star a billion years ago. At that distant time and place, might not nitrogen or carbon have emitted light with the signature we observe? What ensures that the signature neon had a billion years ago, in a part of the universe a billion light-year distant, matches the one it has today? The principle of the uniformity of nature.

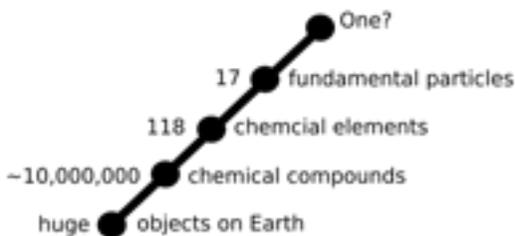
Monism

Uniformity of nature suggests, but does not prove, the philosophical position of monism, the view that a single entity or substance ultimately comprises all material entities. In other words, monism logically implies the uniformity of nature, but the uniformity of nature doesn't necessarily imply monism. (For instance, if the chemical elements were irreducible, the uniformity of nature might still obtain.)

Another line of thought suggests monism.

Consider what science tells us about material objects. Let's call the number of physical objects on Earth N_1 . Now imagine the number of distinct chemical compounds that comprise all those physical objects; we call it N_2 (about ten million, by one estimate). We know N_2 is less than N_1 , because, for instance, N_1 includes millions of individual grains of salt but N_2 has just one entry, sodium chloride. Now imagine the number of elements which comprise all the different chemical compounds; we'll call it N_3 . As of this writing, N_3 equals a hundred and eighteen. Next, imagine all the subatomic particles that comprise all the chemical elements; we call it N_4 . As of this writing, N_4 equals seventeen.

Given the trajectory of N_1 to N_2 to N_3 to N_4 —of huge, to less huge, to a hundred and eighteen, to seventeen—we might imagine an endpoint of one: we might imagine that a single physical entity ultimately comprises all physical objects. In fact, some people view energy as the physical entity that comprises all physical objects (while others view it as a useful theoretical construct but refuse to call it the ultimate basis of all the physical universe)



Although science does not explicitly affirm monism, a monist view of the universe apparently accords with science. For instance, one description of the big bang says initially only one thing existed, energy, but as the universe expanded and cooled, energy condensed into protons, neutrons, electrons, and, eventually, us.

Our fundamental assumption: monism

In later chapters we assume a monist view of the universe. We'll regard each and every natural entity as a manifestation of a single, fundamental entity. Our assumption has many consequences, as we'll see.

But does monism bring us any closer to a definition of God, and if so, how? We need to explore a few philosophical ideas before answering that question.

A Philosophical Approach

If we cannot base our idea of God on some supernatural revelation or miracle then we must base it on the natural world. In this chapter we introduce several philosophical concepts through which we can view the natural world. Then we extrapolate from those concepts to a concept of God. (The reader unacquainted with, or uninterested in, philosophy may at first find this chapter dry and difficult, and may wish to read it more than once. With some familiarity, the concepts become simple and obvious.)

We find in the universe a multitude of things, most of which possess components, parts. Even water, apparently pure and simple, possesses parts: one part oxygen and two parts hydrogen. Thus, we might begin by analyzing component things, i.e., things that possess parts. But “thing” implies a physical object while “entity” suggests anything (a table, a word, the act of spinning, etc.). So we begin with component entities.

Component entity (preliminary)

An entity that has components, parts. For instance, a table has parts: a top and four legs. A printed word has parts: its letters. A water molecule has parts: one atom of oxygen and two of hydrogen.

Open-ended question: (A question we won't pursue further) Do concepts such as, for example, number,

have parts? We might argue that “number” implicitly contains the concepts of similarity and dissimilarity. For example, recognizing four apples depends on similarity (we recognize them all as apples) and dissimilarity (we recognize them as distinct from each other). If we had a comprehensive taxonomy of concepts we might find a hierarchy of concepts, with a single concept at the top. Or perhaps not.

The existence of a component entity may require more than the existence of its parts: its parts may also need to maintain the proper relation to each other. For instance, we need more than parts for a table to exist: the parts must maintain a certain relation. If we disassemble the table, then its parts still exist but the table does not. Just as if we disassembled an automobile and placed all its parts in a heap, we’d no longer have an automobile. The table and the automobile exist only while their parts exist and maintain a certain relation.

To take another illustration, a word exists only while its components, its letters, maintain the proper relation. Consider the English word “are”. If we alter the relation among components, then “are” disappears and “ear” appears.

Relative existence

If an entity exists only while its parts maintain a certain relation to each other, we say the entity possesses relative existence: its existence depends on one or more relations.

Does every component entity possess relative existence? Apparently. A table exists only when its parts maintain a specific relation—four legs attached to the top, one at each corner, all four pointing down. A heap of sand exists only when its grains are in close proximity, a vague relation

but a relation nonetheless. If we separate each grain by a meter, then the heap ceases to exist.

So it does seem that component entity implies relative existence. So we amend our definition.

Component entity

An entity that has components, parts, in a certain relation to each other. Destroy the relation and you destroy the component entity, even if the parts persist.

The component entity and relative existence concepts implicitly contain the idea of dependence because the entity's existence depends on its parts maintaining the proper relation. Our next two concepts make the idea of dependence explicit.

Dependent existence

If something depends for its existence on something else, we say it has dependent existence. For instance, the table's existence depends on its components and on the continuing act of components maintaining the proper relation. In general, the existence of a component entity depends upon its components continuing to maintain the proper relation. Thus, component entities possess dependent existence.

Ground of existence

Because the table's existence depends upon the existence of its components (its top and four legs), we say the components "ground" the table's existence, that its components constitute the table's ground of existence. Ground of existence indicates dependent existence; for instance, the top and four legs can exist without the table

existing, but the table cannot exist without its top and four legs existing.

Motion

“Entity” applies to actions, too. For instance, consider a spinning coin. We think of the coin as an object, an entity, but we can also regard the spinning motion itself as an entity. Of course, we cannot have spinning without having something that spins. Nonetheless, we can recognize spinning as an entity in its own right, and disregard the spinning object, just as the physicist defines angular velocity in terms of the spinning motion itself, making no explicit reference to the object in spin.

Act

“Motion” applies to spinning, running, jumping, etc. But “act” may indicate a relation statically maintained through time. For instance, we may think of a fist as a thing, but we more accurately think of it as an act, the act of holding our thumb, four fingers and palm in a certain way. For when we open our hand, “it” (i.e., the fist) vanishes. Where did “it” go? Nowhere, of course, because an act doesn’t go anywhere when it stops. It simply ceases to exist, in contrast to matter, which obeys a conservation law.

Just as a fist consists of thumb, fingers and palm maintaining a certain relation, we may recognize the table as a top and four legs maintaining a certain relation (that is, a top and four legs, each attached to a different corner, each pointing down). Thus, we may widen our concept of act to apply to components continuously in the act of sustaining the proper relation among themselves. Thinking of a fist as an act of the hand may seem natural, but thinking of a table as components in the act of maintaining a proper relation may seem odd at first.

Flow

Our motion and act concepts highlight the dynamic aspect and put the components in the background. They emphasize action over static components but don't capture the idea of components continuously changing. So, we introduce a type of motion that indicates a continual flow of components in and out. We use "flow" to indicate the type of component entity that continuously replaces its components.

For example, we can think of a whirlpool as a component entity "made" of water in a certain relation. Or we might think of it as a motion of its components, its water molecules. But "flow" seems the best characterization because the components—i.e., molecules of water—seem secondary to a whirlpool. Indeed, any liquid with a viscosity near water could create a whirlpool. Just as we can focus on the spinning while disregarding the thing in spin, we can focus on the flow and disregard the things flowing.

As another example, we can picture a candle flame as a continuous flow of candle wax drawn up the wick and transformed into energy and gas by burning. Other examples include a tornado, the spray of water in a fountain, and the human body (because food, water, and air continually enter, remain for a while, and eventually leave the body).

We discuss two more examples of a flow.

First example: the Greek historian Plutarch tells of a famous ship, the ship of Theseus, preserved over the years by replacing old, decayed wood with new. Plutarch wondered if, after all the wood had been replaced, the ship could justly be called the same ship. Later, the philosopher Thomas Hobbes introduced a complication: what if someone saved the original decayed wood and

eventually reassembled the original ship? Which ship, asked Hobbes, should we consider the true ship of Theseus? Such questions concern identity, which we discuss in a later chapter. For now, we merely note we can think of the ship as a flow, where new timbers slowly but continuously replace old. (Of course, we can think of it as a component entity, too, with its present timbers in proper relation, constituting a ship.)

Second example: scholars founded the University of Cambridge in the year 1209. So we might say the University has existed since 1209. But precisely what thing or things has endured throughout the centuries? Not any particular professor, or student, or building. (Even if some building has endured since 1209 we wouldn't call that building itself "the University of Cambridge".) Rather, a flow has endured, a whirlpool, where professors, students, administrators, buildings, textbooks and other materials, enter, remain for a while, and eventually leave.

It makes more sense to think of the University of Cambridge as a flow or process, than to think of it as a thing. Why? Because the particular flow we call the University of Cambridge has the essential property of education. That is, we regard the act of education as what makes the University a university. If one day the act of education stopped—if the professors, students, and administrators all decided to practice law or sell real estate and used the classrooms as offices—then the University of Cambridge would cease to exist, even if all its components still existed.

Motions and flows may possess properties quite different from any property of the object(s) involved. For instance, the property of "centuries-old university" applies to the

University of Cambridge but not to any of its professors, students, or administrators.

§

Corresponding concepts

The table has its ground of existence in its top and legs, which, in turn, have their ground of existence in wood, which, in turn, has its ground of existence in wood molecules, which . . . What if we apply each philosophical concept repeatedly? Do we ever reach a limit point, a point where we must stop? For instance, do we ever reach an ultimate ground of existence? If so, then “ground of existence” would possess the corresponding concept of “ultimate ground of existence”.

Alternatively, we may imagine a building. On the top floor, we find tables, automobiles, and similar items. On the floor beneath, we find components, such as table legs and tops, engines and transmissions. Beneath that, we find the wood, metal, plastic, etc., that comprise table legs and tops, automobile engines and transmissions. Next, we find atoms and molecules; on the next floor, protons, neutrons and electrons; and next, quarks. What type of concepts might we find on the ground level?

N floor	table	automobile
N-1 floor	top and legs	engine and transmissions
N-2 floor	wood, metal	metal, plastic, glass
N-3 floor	atoms and molecules	atoms and molecules
N-4 floor	protons, neutrons, electrons	protons, neutrons, electrons
N-5 floor	quarks	quarks
. . .		
0 floor	?	?

Simple entity

The concept of a simple entity—an entity that has no parts—corresponds to the concept of a component entity. Even water, an apparently simple entity with no parts, has parts: specifically, one part oxygen to two parts hydrogen. Do we ever reach a genuinely simple entity, an entity that has no components, no parts?

Absolute existence

The concept of absolute existence—an entity that possesses its existence independent of any relation—corresponds to relative existence. The table's top and legs must maintain a certain relation for a table to exist. Oxygen and hydrogen atoms must maintain a certain relation for water molecules to exist. (The two hydrogen atoms attach to the central oxygen atom in a water molecule. Let's represent that as H-O-H. If chemical laws allowed hydrogen and oxygen to attach to a central hydrogen atom like this H-H-O, then the molecule might not have the properties of water.) Do we ever reach anything that possesses existence independent of any relation?

Notice that the existence of a simple entity cannot depend on any relation between parts because a simple entity by definition has no parts, no components. Therefore, it appears that a simple entity must possess absolute existence (as just defined).

Open-ended question: some concepts imply relation. For instance, "uncle" necessarily implies a man related to a niece or nephew. But we may regard other concepts, "blue" for instance, as simple entities, lacking any parts. Should we consider some concepts as having absolute existence? Are concepts mind-dependent or do they exist independently?

Independent existence

We mean an entity that possesses its existence independent of any other entity. This concept resembles the concept of absolute existence.

Ultimate ground of existence

When we follow the chain of ground of existence, do we ever reach bottom? We'll assume we do and call that bottom the "ultimate ground of existence".

That which moves, acts, flows

We may regard a table as an act of the top and legs sustaining a certain relation as to create a table. We may regard the top and legs as atoms in the act of sustaining a certain relation as to create certain molecules of wood. We may regard atoms as protons, neutrons and electrons in the act of sustaining a certain relation. Ultimately, what moves, what acts? We might label it "the mover" but "mover" possesses unfortunate anthropomorphic connotations, so we prefer the clumsier "that which (ultimately) moves or acts" or "that which (ultimately) flows".

Concept	Corresponding concept
Component entity	Simple entity
Relative existence	Absolute existence
Dependent existence	Independent existence
Ground of existence	Ultimate ground of existence
Motion, act	That which moves
Act	That which acts
Flow	That which flows

God

We have arrived at our conception of God: we use “God” to indicate simple, absolute existence, the ultimate ground of existence, the “that which moves”, the monist foundation of the universe, the One.

We make a few points about our concept of God.

First, we use the word “God” to refer collectively to our corresponding concepts, which we found by applying other concepts repeatedly, by picturing floors of a building and imaging the ground level. But we acknowledge that concepts may not possess referents in reality: for example, unicorn, the luminiferous aether, and phlogiston. In a later chapter we explore the question of whether our God possesses real, objective existence.

Second, although our idea of God may seem strange, we can find it in the world’s religious literature. Of course, conceptions of God vary greatly among the world’s religions and even within a single religion. So we make no claim our concept of God represents majority views; merely that it can be found. Here are some samples.

Christianity

God is sheer existence subsisting of his very nature.

God is subsistent being itself. The word ‘be-

ing' applies strictly only to God . . . For all other things, ourselves included, compared to that pure and perfect Substance, are not even shadows.

Judism

'Ehyeh-Asher-Ehyeh' is usually translated as 'I Am Who I Am', or 'I AM What I Am' . . . Basically then, the Self definition of God as 'Ehyeh-Asher-Ehyeh' is understood to mean that God is a BEING - an Absolute, Immutable Being, but beyond human comprehension.

Islam

. . . Reality is independent of any creator. As such, it is the Source of all existence and must exist before every other existence. This Existence is all-embracing. Anything outside it is non-existent . . . This Existence is, therefore, the Very Person of God. All that exists in the universe exists because of His Existence.

Buddhism

There is an Unborn, Unoriginated, Uncreated, Unformed. If [there] were not this Unborn, this Unoriginated, this Uncreated, this Unformed, escape from the world of the born, the originated, the created, the formed, would not be possible. But since there is an Unborn, Unoriginated, Uncreated, Unformed, therefore is escape possible from the world of the born, the originated, the created, the formed.

[S]omeone, being liable to birth . . . seeks the unborn . . . being liable to ageing . . . seeks the

unageing . . . being liable to decay . . . seeks
the undecaying . . . being liable to dying . . .
seeks the undying . . .

Decay is inherent in all component things!
Work out your salvation with diligence! [The
last words of the Buddha on his deathbed.]

Hinduism

God alone is real, the Eternal Substance; all
else is unreal, that is, impermanent. . . . God
is the only Eternal Substance.

Brahman is the vast ocean of being, on which
rise numberless ripples and waves of mani-
festation.

It is the ground upon which this manifold uni-
verse . . . appears to rest. It is its own support
. . . eternal . . . eternally free and indivisible .
. . . Though one, it is the cause of the many. . . .
It is the one and only cause . . . It has no cause
but itself. . . . It is unchangeable, infinite, im-
perishable. . . . It . . . appears . . . as a manifold
universe of names and forms and changes.

As waves, foam and bubbles are not different
from water, so in the light of true knowledge,
the Universe, born of the Self, is not different
from the Self. [We discuss the relation of the
One and the Self in a later chapter.]

Taoism

Ultimate reality is all-pervasive; it is imma-
nent everywhere. All things owe their exis-
tence to it . . .

There was something formless yet complete,

That existed before heaven and earth;
Without sound, without substance,
Dependent on nothing, unchanging,
All pervading, unfailing.
One may think of it as the mother of all things
under heaven.

Sikhism

This Being is One. He is eternal. He is immanent in all things and the Sustainer of all things. He is the Creator of all things. He is immanent in His creation.

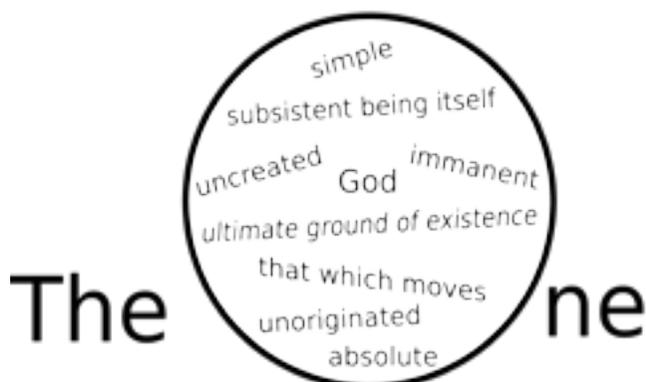
Zoroastrianism

. . . the supreme godhead of Zoroastrianism . . .
. [is] the Being par excellence . . . He is not begotten, nor is there one like unto him. Beyond him, apart from him, and without him, nothing exists. He is the Supreme Being through whom everything exists . . . He is the most perfect being. He is changeless. He is the same now and for ever. He was, he is, and he will be the same transcendent being, moving all, yet moved by none. In the midst of the manifold changes wrought by him in the universe, the Lord God remains changeless and unaffected.

Third, we reject anthropomorphic pictures of God. Religions personalize and anthropomorphize their ideas of God, as we see in some of the preceding quotations. Albert Einstein rejected anthropomorphic pictures of God, too. He wrote, “It seems to me that the idea of a personal God is an anthropological concept which I cannot take seriously.” and “In their struggle for the ethical good, teachers of religion must have the stature

to give up the doctrine of a personal God, that is, give up that source of fear and hope which in the past placed such vast power in the hands of the priests.”

Lastly, we approach our explorations of science and natural theology in an attitude akin to one that Einstein expressed as follows: “Everyone who is seriously involved in the pursuit of science becomes convinced that a spirit is manifest in the laws of the Universe—a spirit vastly superior to that of man...In this way the pursuit of science leads to a religious feeling of a special sort, which is indeed quite different from the religiosity of someone more naive.”



An Attitude of Awe

Despite all the philosophy and reasoning and science, can we credibly view the stuff that underlies dirt and rocks as God? Shouldn't we regard that view as absurd? Perhaps. But perhaps no more absurd than the thought that right now, on the other side of the earth, people and oceans hang upside down but do not fall off.

Yet we must grant that countless thinkers, modern and ancient, have regarded the stuff of the universe as “dumb” and inconsequential. For instance, the late Isaac Asimov, a celebrated scientist and science writer, seemed to hold such a view. While discussing the universe's age in *The Universe*, Asimov writes:

In a way, of course, we might argue that the energy of the universe (including matter, as one form of energy) has always existed and always will exist since, as far as we know, it is impossible to create energy out of nothing or destroy it in nothing. This implies, we can conclude, that the substance of the universe—and therefore the universe itself—is eternal.

That, however, is not what we really mean. We are concerned with more than the mere substance of the Universe.

The substance of the universe:

- has existed for about 13.7 billion years, if not forever

- constitutes the billions of known galaxies, with each of their billions of stars, with any planets around those stars, with any living beings on those planets, including us
- will constitute anything that may exist in the future
- constitutes that in which we now live and move and have our being

So we might ask: Can a person credibly view the substance of the universe as “mere”?

We answer “Yes” because the question concerns attitude rather than fact. Just as a person may regard a novel as great or poor, a food as delicious or bland, a painting as attractive or uninteresting, someone may adopt any attitude they choose towards the ultimate ground of existence.

§

Yet we may ask, why would anyone regard the basis of the universe as “dumb” and inconsequential? We’ll examine two possible reasons: the child’s natural hierarchy of entities and Aristotelian philosophy.

The Child’s Hierarchy

Imagine the world seen through the eyes of a young child. At the bottom of the hierarchy, we find inanimate, “dumb” things like walls and floors. Slightly higher in the hierarchy, we find toys (for instance, a doll), which seem to take on a personality when played with. Higher still, we find animals, which exhibit personality and feelings, and can move of their own will. Next, we find other children, who, like us, can express their thoughts and feelings verbally. Next, we find our parents, who care for us, who seem to know everything. And, if we are raised in a religious family, at the highest level we find God, who also cares for us, who really does know and really can do everything.

Thus, in the child's naïve hierarchy of entities, mere dumb matter lies at one end of a spectrum and God at the other.

The Child's Hierarchy
• God (infinitely superior in knowledge, power and goodness)
• adults (superior in knowledge and power, for example, parents)
• children (peers in knowledge and power, for example, other children)
• animals (inferior in knowledge and power)
• dumb matter with personality (for example, dolls and other toys)
• dumb, inanimate matter (walls and floors)

Matter and Form

The Aristotelian tradition, which underlies much Western thought, places God as far as possible from the “dumb matter” which comprises the universe. We offer a brief explanation of why it sees God and the universe's ultimate ground as contraries.

In Aristotelian thought, we find that form acts on matter to create an object. For example, the form of a table—a top and legs in the proper relation—“informing” wood (the matter) creates the table. Or the form of water—that is, the particular relationship between oxygen and hydrogen atoms—creates water.

Simply put, form corresponds to an object's structure and matter corresponds to its stuff.

Just as we proceeded from ground to lower-level ground, we may proceed from matter to lower-level matter. For instance, a hydrogen atom constitutes part of the matter of a water molecule yet has its own matter: an electron and proton in a certain relation. And a proton has its

own matter: quarks in the particular relationship that forms protons.

And just as we proceeded from ground to ground to reach the ultimate ground of existence, Aristotelian philosophers (though, perhaps, not Aristotle himself) proceeded from matter to matter to “ultimate matter”, that is, *prima materia*, first matter, the matter from which all other matter ultimately derives.

As ultimate matter, *prima materia* must lack all form, because “ultimate” implies we cannot decompose it into form and some lower-level matter. Thus, philosophers pictured *prima materia* as formless, lacking all structure, undetermined, a characterless non-thing waiting for form to determine it and make it one thing or another.

Aristolelian theory of matter and form				
Matter (“stuff”)		Form (structure)		Resultant substance
wood	+	form of a table (i.e., legs and a top)	=	table
protons, neutrons, electrons	+	form of a wood molecule	=	wood
quarks	+	two down, one up	=	neutrons
quarks	+	two up, one down	=	protons
<i>prima materia</i>	+	form of an electron	=	electrons
<i>prima materia</i>	+	form of a quark	=	quarks

Because it lacks all form, *prima materia* possesses infinite potential, e.g., the potential to become anything whatsoever when properly informed. On the other hand, it possesses zero actualization until some form makes it one thing or another; for instance, informed by the form of marble *prima materia* becomes a piece of marble. So form actualizes potential, makes it real.

Material objects possess a mixture of potential and actualization. For instance, a block of marble possesses actualization by the very fact of being a block of marble. But it also possesses potential, a potential realized when we carve it into one thing or another. Carve the form of a woman and you create the statue of a woman. Apply a different form, a man, and you create the statue of a man. In itself, the marble block has the potential to become one of any number of things.

But the very act of actualizing limits, i.e., it lessens potential. For example, once the form of water actualizes it, the *prima materia* becomes water and as water no longer possesses the potential to become marble. And when we carve a block of marble into a statue of a man or woman, we lose the potential of carving it into something else.

Now imagine an unchangeable entity. That entity necessarily lacks the potential to become something else. (An unchanging entity might possess the potential to become something else or something more, but an unchangeable entity cannot change because it lacks the potential to become something else.) Therefore, an unchangeable entity must be “pure act”, i.e., all actualization and zero potential. By different, more complicated arguments (which we omit) Thomas Aquinas and other Aristotelian philosophers deduced that God could contain no unrealized potential and thus must be “pure act.”

Open-ended question: Form actualizes but also limits. So, does calling God “pure act” imply limitation?

In Aristotelian thought, we have a spectrum: at one pole we have “dumb” *prima materia*, with infinite potential but zero actualization; at the other pole, God, with all actualization and zero potential. Thus, Aristotelian (and, by extension, many Western) philosophers place God as

far as possible from the “dumb matter” that comprises the universe.

But the sustained investigation of the universe called science has failed to substantiate the child’s hierarchy of entities and Aristotelian philosophy. Rather than finding a God in the heavens, science has found something it believes cannot be created or destroyed in the “earth”, in matter. Therefore, a naturalistic theology—which takes science rather than any supposed revelation as a source of knowledge—has little choice but to view what we think of today as eternal as God (if it views anything as God).

§

But what if the science we base our theology on changes? As it learns and grows, science improves its knowledge and, sometimes, changes its views. What if some future increase in knowledge invalidates our theology? Then so be it. We do not pretend to present an unchangeable revelation; merely, some views that may lie closer to the truth (hopefully, much closer!) than existing views based on century-old, or even millennia-old, alleged revelations.

Let’s approach the same point from another direction.

The reader may sometimes notice what appear as weak or awkward sentences. For instance,

We *may regard* the continual act of components maintaining a relation as a dynamic event. For instance, we *may regard* a table as continuously in the act of sustaining the proper relation between its components.

Why the tentative “may regard”? Why not simpler and more direct sentences, such as

Components *are* in the continual act of components maintaining a relation; it is a dynamic event. For instance, a table *is* continuously in the act of sustaining the proper relation between its components.

Why? Because each person experiences a world of time and space from his or her own fallible, human viewpoint. Let's imagine a spectrum, going from human to god-like statements. Statements at the human end of the spectrum acknowledge our viewpoint in space/time. For instance, we intuitively know "This ice cream tastes good" means "This ice cream *which I eat here now* tastes good *to me*" or "This ice cream *usually* tastes good *to me*". Statements at the other end of the spectrum express an almost god-like certainty, irrespective of speaker, time, or space. For example, a statement like "Two plus two *are* four" seems to claim universal validity. Indeed, the sentences express even more than god-like certainty, as if even God could not make two plus two anything other than four, because two plus two *are* four. Let's name these two viewpoints "the human viewpoint" and the "God-like viewpoint".

Statements that use forms of the verb "to be" tend to speak from the God-like viewpoint. For instance, "a table is continuously in the act of sustaining the proper relation between its components" implies the writer has looked down below the phenomenal table to the noumenal "thing-in-itself", has seen the absolute, ontological truth, and put it into words. It says the table is that way, and implies if you don't agree then you're wrong. In contrast, "We may regard a table as continuously in the act of sustaining the proper relation between its components" speaks from the human viewpoint; it says we may think of the table in that way and that the reader might choose to think otherwise. So, writing "We may regard" says we think of an entity in a certain way, without claiming God-like knowledge of what the entity *really is*.

A style of writing, called E-Prime, avoids all form of the verb "to be", such as be, am, is, are, was, were, etc. We usually follow the E-Prime style in this book. We hope what we lose in simplicity and directness we gain in accuracy and humility.

Thus, rather than pretending to offer indisputable, God-like pronouncements from on high, our writing reflects that we offer merely this author's views about science as natural theology.

Natural Theology

By now our view of the relation between science and what we call “God” should be clear, but our title mentions natural theology so a few words about that may be in order.

We may divide natural theology into two types: biased natural theology and unbiased natural theology.

The common type, biased natural theology, begins with some religion’s dogmas and beliefs, then seeks to use natural reason to prove or, at least, make more credible, those dogmas and beliefs. Thus, the Christian natural theologian tries to prove through natural reason (that is, reason unaided by “divine revelation”) the dogma of the Trinity, or the godhood of Jesus, or some other dogma. And the Jewish natural theologian tries to use natural reason to prove God awarded an ancient people some land in the Near East, while the Islamic natural theologian tries to show why Muhammed deserves the title “The Seal of the Prophets.”

In contrast, unbiased natural theology uses the evidence—the evidence we can see with our unaided senses, and the evidence we can see with our senses extended with microscope and telescope and rigorous experimentation and advanced reasoning, i.e., scientific evidence—to draw its conclusions.

By beginning with conclusions and looking for evidence for those conclusions, biased natural theology profoundly contradicts the spirit and method of science. Moreover,

to achieve its goal of confirming and defending deeply believed religious dogmas, biased natural theology aims at emotional and physiological comfort, sometimes at the expense of reason.

In contrast, unbiased natural theology pursues a quest for truth, and sometimes may yield uncomfortable conclusions.

The “natural theology” in our title refers to unbiased natural theology.

§

We did not label our book “Science *and* Natural Theology” but “Science *as* Natural Theology”. The word “as” implies connection. Can we credibly regard science as a form of theology?

Some early scientists did so. Steeped in the Christianity of Western Europe, they regarded understanding creation (i.e., the natural world) as a way of coming to a fuller understanding of the Creator. To use an analogy, they believed an understanding of the watch could lead them to a deeper understand of the watchmaker. A lucid expression of this attitude occurs in Thomas Paine’s *The Age of Reason*:

The Creation speaks a universal language, independently of human speech or human language, multiplied and various as they may be. It is an ever-existing original, which every man can read. It cannot be forged; it cannot be counterfeited; it cannot be lost; it cannot be altered; it cannot be suppressed. It does not depend upon the will of man whether it shall be published or not; it publishes itself from one end of the earth to the other. It preaches to all the nations, and all the worlds. This natural word of God reveals to us all that man needs to know of God.

Because we identify God with the universe's ultimate ground, for us watch and watchmaker do not essentially differ. Thus, we prefer another analogy: understanding sunlight (the natural universe) can lead us to a deeper understanding of the sun (the natural universe's ultimate ground of existence). Thus, for us science may be viewed as a form of theology.

We now turn to applying our worldview to some traditional theological issues.

Creation

How did the universe come to exist?

Theists have a ready answer: God created it. The creation of a universe, or countless universes, presents no difficulty for the theists' almighty God. Indeed, the book of Genesis tells of God creating by the mere act of speaking: "And God said, Let there be light: and there was light."

But how might methodological naturalists answer, whose explanations never include supernatural elements? At one time they might have answered, as Aristotle did centuries ago, "The universe has always existed, much as it exists now." But this "steady state" view came under attack in the twentieth century when Edwin Hubble discovered the redshift of distant starlight, which suggests an expanding universe. Some scientists defended a static universe by proposing that new matter continuously comes into existence as the universe expands. Others accepted expansion, and extrapolated back to a "big bang" which must have started the expansion.

For a while, the two theories competed. Eventually, the discovery of cosmic microwave radiation in the 1960s confirmed the Big Bang theory, which says our universe, as well as space and time itself, began at some point in the past, instead of existing from all eternity. As of today, scientists place the start of our universe at about 13.7 billion years ago.

So, should we think of the Big Bang as God's creation event, as described in the scriptures of various religions? Some people argue we should; they choose to view the Big Bang as creation *ex nihilo*. Others view it as creation *ex materia*.

Philosophers describe three types of creation:

- creation *ex materia* (out of pre-existent matter)
- creation *ex nihilo* (out of nothing)
- creation *ex deo* (out of the being of God)

We've already seen examples of the first type, creation *ex materia*, in our table illustration. If we take wood, fashion a table top and four legs, and assemble them, we create a table *ex materia*, out of wood.

In the 1930s Albert Einstein postulated a type of big bang *ex materia*, where the universe perpetually cycles through the stages of: big bang, expansion, zenith then reversal, collapse on itself (the "big crunch"), maximum compression, which triggers another big bang. Refinements of Einstein's theory, that is, cyclic models of the universe, exist today.

Notice the word "*materia*" in big bang *ex materia* has a broader meaning than just matter; it refers to the "stuff" that underlies all matter, energy, space, and time—the "stuff" which underlies all that comprises our universe.

Our worldview regards the creation event as creation *ex deo* because we assume only one ultimate "stuff" exists (i.e., we assume monism) and call that stuff "God. (We may also recognize our view of the creation event as a kind of creation *ex materia*, if we allow a broad meaning for "*materia*.") Thus, our answer to "How did our universe come to exist?" differs from the theist's in that the theist answers "God created it" while we answer (to put it simply) "God became it." Or, more precisely, "God becomes it, even at this very moment."

Similarly, our answer to the question, “When did the creation event end?” differs from that of the theist. In the view of the theist who accepts creation *ex nihilo*, God’s creative activity in the natural world ended shortly after the Big Bang, or at the end of the six days indicated in Genesis, or at some other time, when God stopped creating things out of nothing. Although God’s creative activity in the supernatural domain may still continue (for example, the creation of souls for newborn babies), God’s creative activity in the natural universe has ceased, and the natural universe now proceeds under its own laws (which God ordained), autonomously, independent of God (except in the case of a miracle). In contrast, we define God as ultimate ground of existence and we describe creation *ex deo* as an ever-occurring act. Therefore, for us, the creation event continues, moment to moment, right before our eyes. (The idea that God, the One, perpetual creates the universe through self-emanation occurs in various religions and philosophies; to name but two, the Indian Vedanta religion and the philosophy of the ninth-century Christian philosopher John Scotus Eriugena.)

§

Our view of the One as ultimate ground of existence raises two questions: one about objects, the other about properties.

First, how does the One become the physical objects we see around us? Granted, elementary particles ultimately compose those objects, but how does a single, simple, absolute existence become (what science today regards as) elementary particles, such as quarks and electrons?

Second, how do properties derive from the One? Accounting for properties in terms of the One seems difficult because when we successively take an entity’s grounds to arrive at its ultimate ground, we lose properties, much as Aristotelian philosophers did when

then went from matter to matter to arrive at *prima materia*. For instance, the table may be tall, short, square or round, but those properties don't apply to its wood molecules. Similarly, a molecule of wood may be oak, maple, or pine, but those properties don't apply to its atoms. Continuing, it might seem the ultimate ground of existence lacks all properties. So how can different properties ultimately derive from the One? How does the One create the different objects and properties that we see?

We'll discuss objects, then properties.

Objects

As we've seen, acts, motions and flows may possess properties different from any property of the components involved—for example, the property of “whirlpool” does not apply to water itself but to an act of water: what water does. Thus, consistent with our worldview, we might imagine quarks and electrons as an act or a motion of the ultimate ground, as if a spinning or resonance of the One creates electrons. Just as the continual flow in a fountain creates the streams, by analogy we might picture a continual moment-to-moment motion of the One as creating quarks and electrons. (Of course, the reader should understand our analogy as theology, not as quantum physics.) Once we understand elementary particles, we may understand other objects as component entities created by elementary particles in relation.

Let's examine the creation process in more detail by introducing three refinements to our component entity concept—“joined” component entities, “fused” component entities, and “said” component entities. These three refinements differ in the degree of unity between components.

Joined object

We use “joined object” or “joined entity” for an entity mechanically constructed by arranging components in the proper way, much as we create a mosaic by bringing small pieces of stone or glass into the proper relation.

Tables and engines serve as examples of joined entities: to create a table we join its top and four legs in the proper way; to create an engine, we join its components in the proper manner.

Words, sentences, paragraphs, and books also serve as examples of joined entities: given a set of typographical symbols (uppercase and lowercase letters, punctuation symbols, spaces, etc.) we may join them to create words; we may join words and punctuation symbols to create sentences; we may join sentences to create paragraphs; and we may join paragraphs to create books.

Notice that relations matter: by joining the letters “a”, “e”, or “r” in one relation we create the English word “ear”, a noun. Joined in a different relation we create the word “are”, a verb. With words, internal relations between components appear as important as the components themselves.

Similarly, the relation between carbon atoms determines whether we have soot or diamond. Here again, the relation between atoms (rather than the atoms themselves) determines important properties. Arranged one way, we have soot, which absorbs most photons of visible light and appears black. Arranged another, we have a diamond, which allow most photons to pass through and appears clear.

Fused object

We use “fused object” or “fused entity” for an entity that possesses a unity more profound and integral than that of a joined object.

For instance, consider common table salt, which chemists call sodium chloride. Chemists describe sodium as a toxic, grey, metallic element that reacts violently with water. And they describe chlorine as a toxic, greenish-yellow gaseous element once used for chemical warfare. Combine the two elements and we get a molecule of salt, i.e., sodium chloride—not grey, not greenish yellow, but white; not metallic, not gaseous, but crystalline; not toxic but essential for life.

Clearly, in salt the sodium and chloride atoms unite more profoundly than when parts mechanically unite to create a mosaic or engine. The act of chemically uniting atoms seems to endow the molecule with a deeper unity than that possessed by a joined object.

Note that the creation of molecules involves the absorption or release of a fixed quantity of energy. Similarly, in the creation of atoms from protons, neutrons, and electrons, the atom absorbs or releases a fixed quantity of energy. We can maintain our view of molecules and atoms as components objects if we recognize the associated quantity of energy as one of the components.

Apparently, the term “fused entity” applies to any living organism.

Open-ended question: Does the creation and destruction of a fused non-living entity, such as a proton, atom or molecule, always require a fixed input or output of energy?

Said Object

We use “said object” or “said entity” for an entity that possesses the weakest unity, even weaker than that of a joined entity. Often, we create a said entity by uniting components mentally rather than mechanically, as we do for a joined entity. For instance, the constellation of

Orion includes stars as close as 243 light-years and as far as 1,359 light-years. From Earth, the stars appear close to each other. So we mentally group them into the said entity known as the Orion constellation.

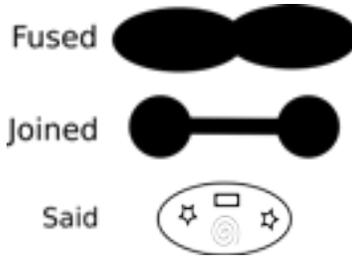
Some said objects may possess such weak unity as to make us question whether they genuinely constitute an object or entity. The stars of the Orion constellation, for example, have no natural unity except that when viewed from Earth they appear close (but are separated by as much as 1,000 light-years).

As another example, imagine a collection of objects such as some pictures, some letters, some personal effects, and some money. Can we think of that collection as a single object? For some purposes we might, as when I think of “all the things I inherited from my grandfather” as one entity.

Open-ended question: How much unity must exist for a collection to validly constitute an object or entity? Should we regard “all the things I inherited from my grandfather” as a genuine single object? What about an arbitrary collection—for example, the sun, what I had for breakfast today, my first school teacher, and the number five? Does it make sense to think of that as a single entity? George Cantor famously said: “A set is a Many that allows itself to be thought of as a One.” For our purposes, should we say “An entity or object is a Many that allows itself—and for which it makes sense—to be thought of as a One.”?

Said, joined, and fused component entities possess components but differ in the degree of unity between components. But rather than discrete, mutually exclusive categories, we recognize “said”, “joined”, and “fused” as marks on a spectrum. For instance, we can recognize a heap of sand as a said entity or equally well as a joined entity; so we might place it on the spectrum somewhere between said entity and joined entity. Thus,

on our spectrum of unity, “said” indicates entities with the weakest unity, “joined” those with a more integral unity, and “fused” those with a yet stronger unity. And we might imagine the high end of the spectrum marked by an entity of such profound, absolute unity that its components have vanished and only a simple, component-less One remains.



We have described creation in terms of said, joined and fused component entities. Similarly, we could describe the destruction of objects as when the relation between components ceases to exist, as when we disassemble a table or break a molecule into its component atoms. We now turn to properties.

§

Properties

We do not think of the One as tall, rectangular or brown. So how can we understand such properties as deriving from a One?

In the process of mentally analyzing a table as components, as wood, as atoms, etc., we lose properties. We may begin with a tall, rectangular, brown table, but we end with atoms neither tall nor rectangular nor brown. Ultimately, we arrive at the One, which possesses no particular properties. Our process appears reductive in that it analyzes a complex entity in terms of simpler, more fundamental entities. To understand

properties, we reverse the process: from simpler, component entities we built a new entity with new properties, emergent properties.

Open-ended question: Can we think of the One as possessing all properties in a latent state, rather than possessing no properties?

Emergent Property

We use the term “emergent properties” to describe a property of an entity not possessed by its individual components.

For example, consider again the set of standard typographical symbols. By creating strings of those symbols, we create sentences, paragraphs, chapters, and books. We can create an English-language textbook or a French-language novel. Yet the properties of English, French, textbook and novel do not characterize the individual symbols themselves but emerge from the symbols’ relations to each other.

Similarly, we can start with components (e.g., wood, metal) that individually do not possess the property of table, tennis racket, or automobile, and assemble them into components entities which do possess those properties.

As another example, consider salt’s properties. From the union of a toxic, gray, and metallic element (sodium) with a toxic, greenish-yellow, and gaseous element (chlorine), the white, crystalline, life-supporting properties of salt somehow emerge, but how? Salt’s properties do not in any obvious way derive from its component atoms.

Can we explain salt’s emergent properties in terms of the relation between its atoms? Not in the simple way we described the textbook and novel as emerging from the relation between symbols. For how can a mere spatial relation between atoms create salt? (“Move the sodium

to the left of the chlorine, back a bit. There, we've got salt.") Can we find another way to describe how salt's properties emerge?

We used our motion and flow concepts to describe how elementary particles might arise from the One. Let's use them to describe by analogy how salt's properties emerge. In the analogy, let the motion of moving in a circle correspond to sodium's properties. And let the motion of moving left and right correspond to chlorine's properties. Now imagine combining the two motions—for instance, imagine the center of the circle moving left and right—and we get an elliptic or oval path, vaguely analogous to understanding how sodium's and chlorine's properties combine to create salt's properties.

As another example, imagine a straight-line motion, like the motion of a moving bicycle. And imagine a circular motion, like the motion of a point on a rotating wheel. Now, imagine the two motions combined, like the motion of a fixed point on the wheel of a moving bicycle. The fixed point traces a path that mathematicians call a cycloid.



In a vaguely analogous way, if we think of atoms as acts, as motions, then we may understand sodium chloride as the result of combining two separate motions. Understood in that way the distinctive, emergent properties of salt may seem less counterintuitive. (In contrast, when we regard atoms as distinct “substances” with their own inherent properties, then the union of sodium and chloride to form salt seems mysterious, as mysterious as taking, say, a brick and a dog, placing

them “in the proper relationship” and somehow getting a hat.)

§

The static and dynamic view

We may view entities statically or dynamically or both. For some entities, the static view suffices. For instance, we can recognize the word “ear” as three letters in a static relation. For other entities, a dynamic, functional view seems sufficient. For instance, we define a doorstep dynamically, in terms of what it does—hold a door open—rather than in terms of what it “is”. Thus, a brick, rock, hammer, old appliance, wood wedge, or my uncle Joe may “be” a doorstep, in that he may hold a door open.

Often, we find a mix of both views useful. For instance, we may understand an engine’s weight statically, in terms of the sum of its components’ weights. But to understand the engine’s torque, power, and compression ratio, we need to understand what it does, that is, understand it dynamically. Often, one view serves better than the other. For instance, we may think of a fist in terms of components—fingers curls into a palm—but thinking of it as an act or motion of the hand seems more natural.

The static view allows us to think of the components as separately existing. For example, the pieces of stone or glass exist independent of the mosaic. The dynamic view, on the other hand, may lead us to think of the entity as an integral whole. For when we imagine an act, we may find it impossible to think of components existing independent of the act. For example, we cannot think of a seller and buyer independent of the act of selling. (We can think of a would-be seller, but no seller exists without the act of selling.) Moreover, an act may appear transformative: that is, although the person—the would-be seller—exists before the act of selling, the

seller comes into existence only when the act of selling occurs.

Static concepts presume the existence of independent entities. For instance, component entity presumes the existence of components, and dependent existence presumes the existence of an “other” that the entity depends upon. But our fundamental assumption of monism says that a single entity, the One, ultimately grounds everything else; that assumption precludes the existence of genuinely independent entities. Therefore, we used dynamic concepts to explain fundamental particles and emergent properties.

By extension, we might picture the entire universe dynamically, as a motion, as perpetually in the act of being created, as a continual act of God. To illustrate, we might imagine the universe as a fountain and the One as the water. Or we may imagine the universe like moving images on a monitor or screen, and God as the light. (Remarkably, people sometimes report an epiphany of seeing the universe in that way, as a manifestation of an eternal light, an emanation from a single Source.)

For later reference, we use the “movie analogy” to refer to the view of the universe as images on a screen and God as the light that creates the images. The analogy gives literal meaning to the Christian belief that “we are made in the image of God”. We use the analogy in a later chapter when we discuss people who claim experience of God.

We thus arrive at a view of the physical universe as a motion, a continual act, of the One.

We turn next to our place in the universe.

Our place in the universe

We once thought of the stars as tiny points of light in the “dome” of heaven. We saw the sun and stars revolving around us, and came to the natural conclusion the universe revolves around us, too. We saw we had abilities—in tool-making, thought, language, etc.—that exceeded those of other animals. The facts seemed to say we ranked above all other animals, indeed, constituted the “pinnacle of creation”. We found the idea that God made it all for our benefit flattering.

We’ve learned much since then. What do the facts say today? We’ll review the facts from the big bang till now, using the current estimate of the time since the big bang as 13.7 billion years.

At about 1 second after the big bang, energy condenses to form fundamental particles, such as electrons, photons, and quarks, which in turn form protons and neutrons.

At about 3 seconds, protons and neutrons form nuclei of hydrogen, helium and lithium

To put times in perspective, we add an hour-minute column, squeezing the time from the big bang until now into a 24-hour day, the “cosmic day”.

Years ago	Elapsed years	Cosmic day hh:mm	
about 13.7 billion	10,000	0:00	remnant of radiation from this time period still detectable as cosmic microwave background radiation
about 13.7 billion	380,000	0:00	nuclei of hydrogen, helium and lithium capture electrons and so become complete atoms
13.4 billion	300 million	0:31	under influence of gravity some hydrogen gas clouds condense and ignite to form stars and, eventually, galaxies
		?	the explosions of supernovae create complex atoms such as oxygen, carbon, nitrogen, calcium, iron, gold, silver, lead, and uranium

About nine billion years after the big bang, between lunch and dinner of the cosmic day, our sun begins to form, with its planets. Astronomers classify our sun as a G-type main-sequence star, also known as a yellow dwarf. By some estimates, the number of stars in the known universe (on the order of 2×10^{1023}) exceeds the number of grains of sand on the beaches of Earth (on the order of 1×10^{1022}).

After Earth acquires an atmosphere that blocks the ultraviolet sunlight which kills living cells, life develops soon. But primates and humans do not appear until almost midnight.

Science As Natural Theology

Years ago	Elapsed years	Cosmic day hh:mm	
4.7 billion	9 billion	15:45	our sun and its planets begin to form
3.7 billion	10 billion	17:31	Earth develops an atmosphere
3.6 billion	10.1 billion	17:41	life in the form of simple cells develops
3.4 billion	10.3 billion	18:02	bacteria photosynthesize light into chemical energy
2.4 billion	11.3 billion	19:47	great oxygenation event, caused mass extinction
2 billion	11.7 billion	20:29	complex cells (eukaryotes)
1.2 billion	12.5 billion	21:53	sexually reproduction
1 billion	12.7 billion	22:14	multicellular life
600 million	13.1 billion	22:56	simple animals
500 million	13.2 billion	23:07	fish and proto-amphibians
475 million	13.23 billion	23:10	land plants
400 million	13.3 billion	23:17	insects and seeds
360 million	13.34 billion	23:22	amphibians
300 million	13.4 billion	23:28	reptiles
252 million	13.45 billion	23:33	Permian-Triassic extinction event
230 million	13.47 billion	23:36	dinosaurs
200 million	13.5 billion	23:38	mammals
150 million	13.55 billion	23:44	birds
130 million	13.57 billion	23:46	flowers
66 million	13.63 billion	23:53	Cretaceous-Paleogene extinction event of dinosaurs

60 million	13.64 billion	23:53	primates
20 million	13.68 billion	23:57	the great apes
2.5 million	13.69 billion	23:59	first humans

The universe begets humans during the last minute of the cosmic day, out of the commonest elements in the universe. Scientists list the most abundant elements in the human body in descending order as: hydrogen, oxygen, carbon, nitrogen. And they list the most abundant elements in the universe in descending order as: hydrogen, helium, oxygen, carbon, nitrogen. The elements match, aside from chemically-inert helium, one of the “noble” gases, which combines with other elements only with difficulty, under unusual conditions.

Most abundant elements in the universe (descending order)	Most abundant elements in the human body (descending order)
1. hydrogen	1. hydrogen
2. helium	-
3. oxygen	2. oxygen
4. carbon	3. carbon
5. nitrogen	4. nitrogen

Humanity has existed for less than 0.02% of the time since the big bang. In terms of the cosmic day, we arrived 16 seconds ago (2.5 million years ago). All our historical records describe events which occurred within the last second.

Years ago	Date	Cosmic day, seconds ago	
2,500,000		16	first humans
1,700,000		1.26	humans leave Africa
200,000		1.26	anatomically modern humans
40,800	-38786	0.26	earliest known cave painting at El Castillo
15,014	-13000	0.09	migration across Bering Straits into Americas
10,014	-8000	0.06	agricultural settlements; cities
4,644	-2630	0.03	first Egyptian pyramids built
3,614	-1600	0.02	writing of the Bible begins
2,565	-551	0.02	Confucius
2,514	-500	0.02	Buddha
2,214	-200	0.01	Eratosthenes estimates Earth's diameter
2,114	-100	0.01	Julius Caesar
2,014	0	0.01	Jesus
1,444	570	0.01	Mohammed
522	1492	0.0033	Columbus discovers the Americas
466	1548	0.0029	Giordano Bruno says stars are other suns
371	1643	0.0023	Isaac Newton
205	1809	0.0013	Charles Darwin
85	1929	0.0005	astronomers discover the existence of galaxies other than the Milky Way
54	1960	0.0003	big bang theory confirmed by cosmic background radiation

Today, we know the sun numbers one among billions upon billions of stars in the visible universe. And we know that for nine billion of our universe's 13.7 billion years, our sun did not exist. And because we've found

planets orbiting other stars, we expect Earth numbers as one of billions upon billions of planets in the visible universe.

We know that after the Earth acquired a life-protecting atmosphere, life arose a mere 10 minutes later in the cosmic day. It seems probable the universe abounds with life, even as we know the Earth does. If only one star in a billion has a life-bearing planet, the number of planets with life would still exceed a billion.

And we see life persisting and adapting even after several worldwide extinction events that occurred on Earth in the past. We see life manifesting in myriad forms, with our form not arriving until a mere 16 seconds from midnight on the cosmic day. And rather than a special “pinnacle of creation”, we see our bodies made of the commonest elements in the universe, built on a DNA backbone, like all other life on Earth, surpassing other forms only in our mental abilities. And we see Earth dominated by dinosaurs for 165 million years (230 to 65 million years ago), while we have been here only 2.5 million years.

Given the evidence, we may reasonably conclude we number as one of a gigantic number of life forms, which the universe has spawned and continues to spawn, on Earth and elsewhere. It seems the universe would not miss us if Earth and all life on it somehow perished.

§

Yet some theists find the flattering, comforting “pinnacle of creation” view of humanity difficult to abandon, especially because that view has found its way into scripture. So some theists maintain it purely on dogmatic grounds, and reject science, evolution in particular, and insist on the accuracy of scripture. Other theists use “designer arguments” to deny evolution and deny, by implication, the view that the universe

used purely natural processes to create humanity. Designer arguments date from, at least, the eighteenth century when clergyman William Paley in his book *Natural Theology* argued that just as the complexity of a wristwatch demands a designer the complexity of the human body demands a designer, i.e., God. Paley's famous "watchmaker" argument lost much of its force after Charles Darwin's theory of evolution explained apparent design in terms of random mutation and natural selection.

Designer arguments exist today in the form of intelligent design. For instance, some proponents of intelligent design claim that evolution cannot adequately account for the complexity of some life forms (for example, the bacteria flagellum). They say the "irreducible complexity" of those life forms indicates intelligent design.

Scientists widely reject the idea of irreducible complexity and offer explanations as to how the bacteria flagellum might have evolved. Yet even if true, the irreducible complexity argument would prove an Intelligent Designer but not a benevolent Designer. That is, if the Designer designed the bacteria flagellum then the Designer also designed the bubonic plague bacterium which to date has killed an estimate 200 million people, including perhaps half of Europe a few centuries ago, and the malaria protozoan which even today kills a child somewhere in the world every sixty seconds.

The "fine-tuning" argument instantiates yet another version of the watchmaker argument. Theists claim, correctly, if certain physical constants had different values, then life could not exist on Earth. But they then make the added claim that if those values differed slightly, almost infinitesimally, life couldn't exist and thus a Fine Tuner, i.e., a Designer, must exist.

Not all scientists accept the fine-tuning argument but even if they did, the argument does nothing to show some Designer fixed the values for *human* life. Indeed, because human life did not exist until the last 16 seconds of the cosmic day, it appears the fine-tuning argument shows the Designer did not have human life foremost in mind when designing the universe.

Of course, some theists accept evolution but choose to see God's "guiding hand" in it. It appears an inflated view of humanity provides a hard-to-resist measure of psychological comfort.

First Reflection

We reflect on some points previously made, before venturing into new material.

We mentioned earlier that unbiased natural theology may not always yield comforting conclusions. We've just seen an instance: based on what has occurred since the big bang we concluded that the universe would not miss us if Earth and all life on it somehow perished—possibly an uncomfortable conclusion for those attached to the “pinnacle of creation” view of humanity. We reached our conclusion not by consulting any revelation but by examining evidence, using science's epistemology, its way of knowing. That is, we tried to dispassionately reflect on data to reach our view of humanity.

Had we lived a few thousand years ago and reflected on the data of the day—that the sun and dome of heaven revolved around the earth, that humanity was superior to the animals—we might have adopted the “pinnacle of creation” view. This illustrates a virtue and, what some people consider, a weakness of science's way of knowing.

Because science's way of knowing allows correction and improvement, it does not bind us to old, outmoded beliefs. We consider science's ability to grow, change, and improve, one of its strengths.

However, because investigators may at any time uncover new facts, facts that contradict established views, science's way of knowing can only give us tentative conclusions, conclusions subject to change when we

uncover new knowledge. To cite a familiar case, by 1900 Newton's theories had given the West unmatched technological superiority. Newton's theories seemed not merely useful, but eternally true. Yet a few years later, scientists had developed new theories that contradicted Newton's views of space, time, light, and gravity.

Had science a different way of knowing that allowed revelation, had Newton's theories found their way into science's revelation, scientists might have condemned the new theories. Thus, we might still accept Newton's theories as true, and not understand much that relativity and quantum mechanics explain.

People who desire the security of eternal, unchanging truth may find science's lack of a divine, eternal truth, its tentative, purely human conclusions, a weakness. However, compared to religion's way of knowing, that is, its reliance on supposed divine revelations, and the result—contradictory beliefs among religions and even among denominations of the same religion—we conclude that, though not perfect, science's way of knowing appears superior to any other known epistemological method.

§

In general, science advances when researchers dispassionately reflect on the data and reason, as best they may, to reach conclusions. This book records the conclusions and opinions of one individual. But if someday a group of investigators develops that does unbiased natural theology in the spirit of science, if that group eventually forms a school of thought and reaches consensus, then we might judge their school of thought a branch of science.

And if such a group eventually came to recognize a few, or even most, of our conclusions as wrong, but if they found value in our approach to the subject, if they embrace the method of dispassionately reflecting on the world science sees to reach theological conclusions, then this book will have served its purpose.

We now turn to another delicate question: what happens to me after death? We begin by exploring identity in general and then turn to personal identity.

Identity

“What is God?” and “What happens after I die?” surely rank among important questions thought unapproachable by science. We’ve already addressed the first question by defining God within our theology. (Later, we address the related question, “Does God as we’ve defined it really exist?”) But a mere definition cannot answer “What happens after I die?”

Can we answer that question by drawing on material we’ve already discussed? For instance, science’s ontology includes the natural world but does not include the supernatural. So, if we rule out souls and reincarnation, it appears only one possible answer exists: the “natural answer”; that is, I cease to exist at death, when my body ceases to function.

What more can we say? Much. First, before we can discuss its ultimate fate we need a clear idea of what constitutes the “I”. Yet notice the natural answer identifies the “I” with the body and/or the body’s functioning:

I cease to exist at death, when my body ceases to function.

But it also speaks of the body as a possession:

I cease to exist at death, when *my body* ceases to function.

“Body” may constitute me, or may constitute one of my possessions—but not both. (Notice, we have the same problem if we answer, “*I* cease to exist at death, when *my brain* ceases to function”.) Clearly, we need a better

idea of what constitutes the “I”—of what constitutes our identity, our self—before speculating about its fate.

We postpone discussion of answers other than the natural answer until the next chapter. In this chapter we explore the idea of identity in general. We discuss three types of identity: other, singular, and said. Then we revisit the natural answer in light of what we’ve learned. In the next chapter we examine other answers to the question “What happens after I die?”

We begin by informally introducing some ideas about identity in a dialogue.

§

A: As a child I had a pet cat called “Snowball”. Where is Snowball now?

B: He’s dead and gone, unfortunately.

A: “Dead” isn’t a place; “gone” says he’s not here. I know he’s not here, but my question is “Where is Snowball now?”

B: He is nowhere; he has simply ceased to be.

A: Acts can simply cease to be. When I stop singing the act of singing doesn’t go anywhere: it simply ceases to be. But Snowball had a physical body. In fact, unless animals have eternal souls, Snowball *was* a physical body. Conservation laws apply to physical bodies. Once we thought there were two conservation laws—“matter can neither be created or destroyed” and “energy can neither be created nor destroyed”—but eventually we learned matter may be converted into energy and vice versa. So now we know there is only one conservation law: “matter/energy can neither be created nor destroyed”. So Snowball must still exist, in some form or other.

B: Well, yes, the atoms that composed Snowball's body still exist, certainly. When Snowball died his body's atoms eventually returned to Earth's biosphere. Some of Snowball's atoms are in the ocean; others in the atmosphere; others in people and things we see around us.

A: So Snowball is still here, all around us?

B: Not really. Even while Snowball lived atoms continuously entered his body and eventually left. So we shouldn't say Snowball was a physical body. That is, we shouldn't identify Snowball with any set of atoms. Rather, Snowball was an act.

A: I don't understand.

B: It's as if Snowball was a whirlpool. In a whirlpool the water continuously enters and leaves but the act, the flow—the spinning of the water—persists and is what we call a whirlpool. When the flow stops, when the act of turning stops, the whirlpool simply ceases to exist. Similarly, when Snowball died the “flow” that was Snowball simply ceased to exist. True, the particular atoms that comprised Snowball at that moment still existed. But when Snowball lived, the atoms weren't Snowball; rather the flow was. So when the flow stopped, Snowball died. And the particular atoms that comprised Snowball at the moment of death still existed, and still exist, although the Earth has reclaimed them and now they form parts of other flows, of other people and things.

A: So Snowball is really gone? Snowball has just ceased to exist?

B: Yes. Snowball was an act, a continuous flow, a whirlpool of atoms, and when the flow ceased to exist, Snowball ceased to exist—unless he had some sort of eternal soul that now resides in some cat heaven.

§

We now begin our investigation of identity in general, postponing discussion of answers other than the natural answer until the next chapter.

Other identity

“Other identity” denotes the identity of two or more distinct entities, for example, when we say, “Take any seat, they’re all the *same*.” Of course, two distinct entities always differ in some way or we wouldn’t call them distinct. We use the term “other identical” when we judge any differences inconsequential. Thus, the foundation of other identity consists of relevant common properties (i.e, common properties that we judge relevant).

As an example, consider two coins differing only in that one lays face up and the other, face down. Most people would judge that other identity holds for two coins. Or consider electrons and atoms. Scientists judge other identity holds for electrons and atoms when they speak of *the* electron and *the* hydrogen atom. That is, although atoms may differ by isotope and electrons may differ by spin, they judge that nothing fundamentally differentiates one hydrogen atom from another, or one electron from another. (In effect, they judge isotope and spin as accidental properties; we discuss accidental properties below.)

Of course, what one person judges as inconsequential, another may not. So other identity involves judgment. For example, a man says, “Your socks don’t match.” A comedian responds, “They do; they’re both cotton.”

As another example, imagine a machine that creates a perfect atom-for-atom duplicate. We duplicate a table and judge the two tables as other identical. Then we duplicate Leonardo da Vinci’s famous painting, the Mona Lisa. (Or, rather, we duplicate the painting as it exists today, a descendant of da Vinci’s original Mona

Lisa. “Descendant” because today’s Mona Lisa differs from what da Vinci painted: pigments have aged, colors have faded, etc. We say the descendant has “historical continuity” with what da Vinci painted.) Yet although the duplicate matches atom-for-atom, a reasonable person might not judge them as other identical. Rather, a person might judge the duplicate as different from and inferior to the descendant. An art collector would probably value the descendant more than the perfect atom-for-atom duplicate, because the collector regards historical continuity as part of a painting’s identity.

Thus, when we judge the two tables other identical we implicitly judge that relevant properties do not include historical continuity. But for the painting, we implicitly judge that relevant properties do include historical continuity.

Singular Identity

“Singular identity” indicates the sameness or changelessness of a single entity over time, as when we say “I want the *same* seat I had yesterday.” For other identity, we may or may not include continuity as one of the relevant properties. But for singular identity, some type of continuity seems integral and implicit.

For a nonphysical entity, such as a concept, continuity means an unchanging definition of the concept. For a physical entity, such as a seat, continuity means the same “stuff”, i.e., that the same matter constitutes the seat today as yesterday.

(Singular identity seems to capture the idea of personal identity; of an enduring, personal “I”; of a constant, unchanging kernel that exists now, identical to what existed at birth, when my body had a small fraction of its present mass, when I had a vastly different personality, different emotions, different memories, different mind.)

Can anything satisfy the definition of singular identity? That is, can we name an entity that possesses perfect changelessness, perfect continuity? Some concepts appear changeless. For instance, mathematical facts like the Pythagorean Theorem or relations like “more than” seem to continuously exist unchanged (although some philosophers use “subsists” to describe concepts and reserve “exists” for entities in space/time). Thus, some concepts may possess singular identity.

Can any physical entity possess singular identity?

A component entity will satisfy singular identity as long as its components do so and the relation between components remains unchanged. For example, a table will satisfy the definition if:

- 1) each of its components—its legs (let’s call them A, B, C and D) and its top—match atom-for-atom now with yesterday’s components,
- 2) and if the relation between components remains unchanged; if, for example, no one switches legs A and B.

Thus, we see a component entity’s singular identity depends upon its components.

When a physical entity matches atom-for-atom now with an earlier version of itself, we say it possesses “continuity of matter”. We may question if continuity of matter ever obtains on Earth for any length of time. For instance, an atom-for-atom match for the table will fail if a stray carbon-14 atom in the table spontaneously decays. In metals free electrons migrate from atom to atom, destroying an atom-for-atom match. Moreover, the sun shoots billions of neutrinos through each cubic centimeter of Earth each second, so even when we have an atom-for-atom match we may still judge that overall the “stuff” now doesn’t match before, so that singular identity does not obtain. But we might suppose elementary particles, like quarks, possess singular

identity because (as far as we know today) they possess no components.

What about the One? Does it possess singular identity? If we regard it as “that which acts” then some sort of change seems implied. Yet, on the plane at which it exists, nothing else exists. (That is, if we assume monism, then at the ultimate level only the One exists.) Thus, the One cannot differ from itself. So we may judge that the One does possess singular identity regardless of what it does, just as we consider a person the same person regardless of what they do. As we recognize an actor playing a role still himself, we recognize the One as still itself, regardless of what it does.

If we recognize the One as the constant, unchanging kernel existing now identical to what existed at the birth of our present universe, we may call it the “self of the universe” or simply the “Self” (with a capital “S”). So we regard “the One” and “the Self” as synonymous.

A final point: suppose electron A created now differs not at all from electron B created ten years ago. That is, suppose other identity applies between electron A and B. Then we might suppose electron A of ten years hence would not differ from electron A as it exists now. So we could conclude electron A possesses singular identity with itself. Thus, the other identity of electron A and B implies the singular identity of electron A with itself.

Essential and accidental properties

Before discussing the last of our three types of identity, said identity, we explore a framework used by philosophers over the centuries to analyze questions of identity: essential and accidental properties.

Philosophers long ago developed a workable definition of identity based on a distinction between essential and accidental properties. They call a property an “essential

property” if that property makes the thing what “it is”. More precisely, if an entity in all its possible states of existence has a property then we call that property an essential property. On the other hand, philosophers call nonessential properties—properties an entity can gain or lose and still remain the “same” entity—“accidental” properties. Thus, as long as something retains all its essential properties, it retains its identity.

To illustrate, the number of protons constitutes an atom’s essential property; thus, a carbon atom in all its possible states of existence has six protons. A carbon atom cannot gain or lose a proton without losing its identity and becoming a different element (nitrogen or boron). On the other hand, the number of neutrons or electrons constitutes accidental properties, so ions and isotopes preserve an element’s identity.

As another illustration, the ability to provide light constitutes a lamp’s essential property; the lamp’s color, height, and weight constitute accidental properties. If a lamp can’t light then it can’t function as a lamp, but we can change its height and it remains a lamp. A home’s essential properties include the ability to provide shelter; its accidental properties include its exterior wetness and color. So we recognize a home after a rainstorm or one we’ve painted as the “same” home.

The essential/accidental definition of identity allows us to regard a thing that has changed as the same thing, but it seems to presume that essential and accidental properties exists in an ontological sense, i.e., in reality, independent of our judgment. To us, a home’s essential properties include the ability to provide shelter, but termites might consider the ability to provide food an essential property. As another example, if we use a lamp as a paperweight then we no longer regard it as a lamp, and no longer regard the ability to provide light as an essential property.

We make a property essential or accidental by judging it so. Thus, essential and accidental properties do not inhere in the entity; rather, someone judges which properties “make the thing what it is” and which properties can change. So instead of using an essential/accidental definition of identity that seems to assume an implicit judgment, in our theory of identity we have judgment play an explicit role.

Said identity

Only a few entities—concepts; possibly elementary particles and the One; probably not any complex physical entity for any length of time—satisfy singular identity. Yet we routinely identify things today as the same things we saw yesterday, although people and buildings we see today have changed, perhaps imperceptibly, and therefore do not satisfy the definition of singular identity. Our concept of singular identity appears too strict for most uses. Can we define a more useful type of identity? Might relaxing the requirements of changelessness and perfect continuity yield a more reasonable concept? We might try allowing historical continuity; we might allow tiny changes yet still regard the entity as the same entity, in some sense.

Allowing tiny changes often seems sensible. For instance, after a single uranium atom decays we may sensibly call the table the same table. And a concept may change, often as a response to better knowledge, yet we consider it the same concept. For example, astronomers once defined “planet” as a heavenly body which revolves around Earth. Later, they realized planets revolve around the sun and refined “planet”. Eventually, they refined “planet” yet again so as not to include Pluto. Thus, when astronomers discuss planets today, they do not speak about the same thing as before; thus, singular identity does not obtain between present and earlier meanings of “planet”. But if we allow

historical continuity (instead of perfect continuity) then astronomers do speak about the same thing. (However, we must use caution because logical fallacies such as “no true Scotsman” or “moving the goalposts” rely on shifting definitions.)

Notice, historical continuity involves an element of judgment, specifically our judgment if a lack of perfect continuity negates identity or not. It also involves a judgment as to whether a change qualifies as tiny or not. We’ll find it convenient to drop the “tiny” qualification. Therefore, we’ll call two distinct entities, or a single entity at two different times, “said” identical when we judge any dissimilarities or discontinuities as inconsequential (that is, when we judge sufficient similarity and continuity exists before and after the change to regard the entity as the same entity). So, two entities qualify as said identity simply when we judge them as said identical, despite any ontological differences.

Said identity seems to capture the ideas of “identity” and “sameness” as commonly used.

(Notice that because other identity involves judgment, we may regard it as a variant of said identity. Singular identity involves judgment, too, but in different way. With other and said identity, we agree ontological differences exist but must judge whether the differences matter or not. With singular identity any ontological differences matter if they exist, but we must judge if differences exist or not.)

Let’s discuss said identity in relation to acts, motions and flows.

For acts or motions, we must judge if/when a break in continuity invalidates said identity, where continuity may mean continuity of matter or historical continuity.

As to continuity of matter, if person Y recognized the ship of Theseus as an act (or component entity), then they might judge the original and the updated ship not said identical because the updated ship lacks continuity of matter with the original ship. They might argue that when a component of a component entity changes, the entity changes and so cannot be called identical. Further, if they save the original, discarded timbers of the ship of Theseus and after two decades use them to construct another ship, they might say continuity of matter (i.e., using the original components) makes it the same as the original ship.

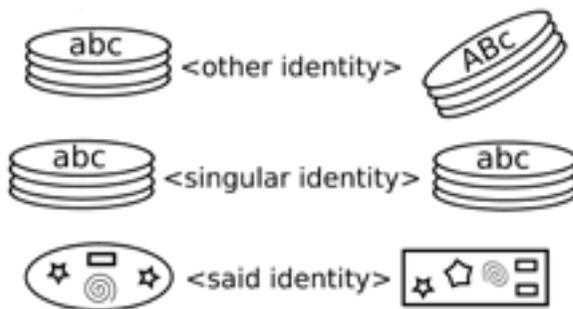
As to historical continuity, if I make a fist with my hand, open my hand, and remake the fist an hour later (and, assuming for the sake of argument, my hand's atoms don't change in the meantime), have I made the *same* fist? The answer depends on our judgment. Similarity, when we regard a table as an act (the act or motion of components maintaining the same relation to each other through time), then if we disassemble the table and later reassemble it in the exactly same way (and again assuming identical atoms) we must judge if the reassembled table possesses said identity with the earlier table or not.

Because flows never have continuity of matter, we must judge only if/when a break in a flow's historical continuity invalidates said identity. To illustrate, if person Z recognized the ship of Theseus as a flow, where new components regularly replace old components, they would regard the updated ship as said identical with the original. (If person Z recognizes the ship as a component entity but allows historical continuity then they would also regard the updated and original ship as said identical.)

As long as a flow like a flame continuously burns or a whirlpool continuously turns, we may judge them said

identical with themselves. But what about breaks in continuity? For instance, if we extinguish the candle flame now and relight the candle in a minute, do we have the same candle flame? What about a day later? Or two years? If we stop a whirlpool today and restart it tomorrow, can we say we have the same whirlpool? Can we judge a restarted version as identical to the original version? If we wish. Or we might decide the break in continuity makes the restarted version a different entity.

We have a similar choice concerning the claim that the University of Cambridge has existed since 1209. Recall, we picture the University as a flow, an educational process. But the flow stopped for two years when the plague of 1665 closed the University. (During that period, Isaac Newton did some of his most outstanding work.) So, like the restarted whirlpool and candle flame, we can judge today's University sufficiently continuous with that of 1209 and call it said identical—or not.



Revisiting the natural answer

Let's now revisit the natural answer, which identifies the "I" with the body. Does identifying the "I" with the body make sense? Not to theists, who regard their soul (Christian) or atma (Hindu) as their true self. But the nontheist often does identify "I" and body. But if I identify "I" and body, and if my search for an "I" means

a search for my singular identity, then either 1) matter, specifically atoms, somehow comprise my “I”, or 2) no “I” truly exists.

Certainly, atoms—mostly hydrogen, oxygen, carbon and nitrogen, as we’ve seen—comprise my body. But where did those atoms come from? All except hydrogen come from the belly of a supernova. And how old are those atoms? Perhaps billions of years. But how can atoms existing from long before my birth somehow become me for a while, cease to be me when they leave my body (and become me again if they return)?

But atoms do leave and enter my body, continuously. Our body changes with each breath, and over seven years replaces each atom; so even if my body now has some atoms it had at birth, it hasn’t possessed them throughout. So how can my singular identity rest on the continuous flow of atoms that comprises my body? Evidently, it cannot.

What type of identity can a flow like a whirlpool or the human body support? As the candle flame now descends from the flame of the past, our body now descends from our body of the past—that is, it possesses historical continuity with our earlier body. But over time, what can we find that persists in the body, that we can point to and say “That comprises our enduring, unchanging singular identity”? Nothing material.

Regarded as a material entity, we possess only said identity—we possess identity merely because people commonly say we have one. So, if we accept the natural answer then we possess no singular identity, no true “I”, even from moment to moment, much less over a lifetime.

Yet, we don’t feel we lack identity. Rather, we feel at some level we are the same person we were when we were born. Certainly, our body changes, our personality

changes, in fact, almost everything about us changes, but we feel that, somehow, underneath it all an unchanging kernel that is “I” persists.

But if our body does not constitute the foundation of our “I”, the foundation of our personal identity, then where might that foundation reside?

Personal Identity

We normally identify the person today with the person yesterday, and with the person of years ago. Pete points to a picture from four or forty years ago and says, “There I am. That’s me.” Pete feels that something exists, his “I”, which endures throughout his lifetime, although Pete’s body today may differ greatly from the body in the picture. Someone asks Pete, “When were *you* born?” and Pete gives the age of his body, although his present body differs a lot from his birth body.

As a said entity, the “I” certainly exists. We undoubtedly have said identity and historical continuity with the person of years ago. But do we have a singular identity? Does “I” today refer to something in us perfectly continuous and changeless? Does the “I” today possess singular identity with any entity that existed a week ago, or even a second ago? Or does our “I” possess only said identity and historical continuity with some past entity?

In this chapter, we try to find the enduring “I”. We explore these questions:

- In all the universe, only I am I. What makes me a unique individual, different from any other individual? What constitutes the foundation of my unique personal identity?
- Beneath changes in body, personality, memory and thought, what constitutes the unchanging kernel signified by “I”?

- What constitutes “I” in contrast to my possessions? As logically prior, the “I” must exist before it can have any possessions. Therefore, the “I” and its possessions do not intersect. We can have a possession but we cannot “be” a possession.
- In my life I have played roles such as schoolboy, friend, college student, spouse, professional, and writer. But just as we can ask of a play “Who is playing Macbeth tonight?” we may ask “Who or what is the ‘I’ behind my roles?”
- Something exists here and now that makes me, me. How can we describe that something?
- What constitutes my identity, my self?
- What makes me, me?

Answering one of the questions, it seems, would answer them all. So we refer to them in the singular, as “the question of personal identity”.

We discuss some answers.

No true, unchanging identity

As we’ve shown, if our body constitutes our “I” then we have no unchanging identity, not even over a single lifetime. Such a view may seem antithetical to religions’ views of us but at least one religion, Buddhism, has a similar view.

Buddhists recognize the “I” as a component entity consisting of body, sensation, feeling, thought and consciousness. Upon death, the components dissipate and the “I” ceases to exist. Thus, Buddhists have the doctrine of “*annata*” (of “no self” or “no soul”) which says no enduring “I” exists which survives death, or that exists unchanging from moment to moment. The “I” of a moment ago and the “I” now, Buddhists say, resemble

the relation between the candle flame of a moment ago to the flame now.

Because no enduring identity exists, Buddhists, strictly speaking, don't accept reincarnation. But they do accept rebirth. Just as the "I" of now possesses historical continuity with the "I" of a moment ago, they believe the "I" of the next life has some sort of continuity with the "I" of this life—likening the process to the candle of this life lighting the candle of the next, so that the flame possesses historical continuity.

Buddhists ultimately aim for "Nirvana", a state that extinguishes the candle, so that no further rebirths occur.

Mind (Descartes)

If we possess an enduring "I" but cannot ground it in matter, then some sort of nonmaterial foundation must exist. René Descartes, noted mathematician and philosopher, famously grounded the "I" in the mind.

Descartes arrived at his conclusion by initially setting out to rebuild philosophy on an undoubtable foundation; he began by doubting everything he could possibly doubt. Do Earth and sky exist for certain? No, said Descartes, for possibly an evil demon creates their appearance in my mind. And possibly the same demon creates the appearance of animals and other people. Possibly the demon creates the appearance of the entire external world. (Philosophers have since replaced Descartes' evil demon with a mad scientist who connects a "brain in a vat" to wires that stimulate the senses, creating the illusion of an exterior world. At least one popular movie uses the "brain in a vat" idea as a premise.)

Descartes could doubt the existence of the entire external world. What could he not doubt? Himself. "Cogito ergo sum", declared Descartes. Often rendered "I think,

therefore I am” but better render as “I am thinking, therefore I must exist”, Descartes’ dictum describes the starting point of his philosophy: his own existence. Thus, according to Descartes our mind (which he considered roughly equivalent to our soul) constitutes our “I”.

Open-ended question: “I am happy, therefore I am” or “I am in pain, therefore I am” seems as valid as “I think, therefore I am”. Don’t experiencing emotions, such as happiness, or physical sensations, such as pain, also prove I exist?

Open-ended question: Doesn’t the first word of “I think therefore I am” assume the conclusion? Does not “I think” gratuitously assume the idea of an “I” who exists and thinks? Shouldn’t we begin with “thinking exists, therefore something exists” or, even better, “consciousness of phenomena exists, therefore something exists?”

After some deliberation Descartes satisfied himself that the external world exists too and arrived at a dualistic view of the natural world where only two “substances” exist: mind and matter.

We briefly digress to discuss the idea of substance.

In Descartes’ time, philosophers usually thought of substance as the bearer of properties. Substances exist independently while properties exist dependently. (Roughly, we may think of “substance” as corresponding to “noun” and “property” as corresponding to “adjective”.) Thus, we can imagine a tall, tan, heavy lamp existing independently, but we cannot imagine accidental properties such as tall, tan, or heavy existing independently. Some thing, some substance—in this example, the lamp—must exist in which the tall, tan, heavy properties inhere.

Descartes regarded matter’s essential property as extension in space, and mind’s essential property as

thought or thinking. So, he considered any material property, except occupying space, as an accidental property, and any mental property, except thought, as accidental.

Of course, extension in space implies the existence of space itself, but perhaps Descartes considered space an emptiness and not a substance. In contrast, the ancient Greek philosopher Democritus explicitly recognized the existence of space, which he called “the void”. Democritus painted a materialistic view of the world where only atoms and the void in which they moved exists. About a century after Descartes, Immanuel Kant described space and time as “forms of intuition”, thereby making them a function of the mind, of something the mind imposes on its perceptions rather than substances existing independent of the mind.

End of digression.

Many philosophers who accepted Descartes’s dualistic mind/matter view of the natural world sought to justify and defend it. For instance, the famous philosopher Gottfried Leibniz, who with Newton discovered calculus, tried to prove we cannot regard mind as a property of matter. In his mill argument, Leibniz asks us to imagine the mind as a huge mill of such size that we can enter it and look around. What will we see? Gears and levers and other material entities; but nowhere, said Leibniz, will we see a thought, nowhere will we find a gear or lever that thinks. Thus, concluded Leibniz, we cannot regard mind as a property or attribute of matter. Therefore, mind must exist independent of matter, as an independent substance.

But philosophers wondered how two independent substances like mind and body could communicate. For instance, if I decide to raise my arm, how does my mental decision affect my material body and cause my arm to rise? Or if I step on a pin, how does my body

communicate pain to my mind? Indeed, why should my body communicate pain to my mind at all if the two exist as independent substances? Philosophers labeled such problematic questions the “mind-body problem”. Defenders of Descartes offered answers, sometimes farfetched answers. For instance, Nicolas Malebranche, a French priest, claimed mind and body could not communicate but that when the thought arises in our mind, God takes notice and causes our arm to rise. Similarly, when we step on a pin God causes our mind to feel pain.

Mind (Contemporary)

Today, researchers don’t define “mind” as a substance that has the essential property of thought. We may describe contemporary usage of “mind” as that which:

- receives the reports of sense data or sensations, caused by the five senses reacting with the external world
- creates its own sensations when dreaming or hallucinating
- forms perceptions (Sensations and perceptions differ. To illustrate, in an optical illusion sensations correspond to external reality, but what the mind makes of those sensations, that is, the perceptions it creates, may not.)
- experiences emotions such as happiness
- forms thoughts and beliefs
- stores and retrieves memories
- comprises our personality: our temperament plus our interests and talents. (The English word **personality** suggests this mix comprises the foundation of personal identity.)

A great deal of evidence indicates an intimate connection between “immaterial” mind and material brain, so much so that many researchers reject the idea

of immateriality and describe the mind as simply “what the brain does”. (Notice that this view of mind implicitly denies Descartes’ two substance, mind-matter dualism, and resolves his mind-body problem by making mind a function of matter. Notice, too, that “what the brain does” corresponds to our idea of an act: that is, we might say “the mind is an act of the brain” just as “a fist is an act of the hand.” Thus, we might regard mind as an emergent property of matter.)

We review four types of evidence for an intimate mind/brain connection, evidence for the view that “the mind is what the brain does”:

1. the effect of intoxicants and medications on the mind
 2. modern passive imaging techniques (e.g., EEG, MRI, fMRI, PET, NIRS, MEG) that show what parts of the brain “light up” during certain functions
 3. active electrode stimulation of parts of the brain
 4. behavioral changes when accident, disease or surgery damage a portion of the brain
-
1. We need not describe the well-known effects of caffeine, nicotine, alcohol, marijuana, cocaine, LSD and heroin on the mind, effects which demonstrate an intimate link between body chemistry and mind. In recent decades antidepressant medications have transformed the personalities of many people, implying personality does not constitute the unchanging foundation of personal identity.
 2. As an example of imaging techniques, PET scans show that violent criminals have less frontal brain activity than normal (frontal activity dampens emotions such as rage so less frontal activity implies an inability to suppress rage).

3. As to electrodes, stimulation of the temporal lobes provokes vivid recall of long-forgotten songs or childhood memories; stimulating one part of the amygdala creates feelings of fear and panic, while stimulating another part creates warm, friendly feelings. Stimulation of the temporal/limbic system may produce intense feelings of joy and even a sense of God's presence.
4. As to brain damage:
 - after surgery removed a tumor and some surrounding brain tissue a man lost his ability to feel emotion
 - after a brain injury a farmer lost the ability to recognize faces; a man with a similar condition once passed his mother on the street and didn't recognize her. A 66-year-old woman had the opposite problem: she mistook strangers as her ex-lover and his girlfriend in disguise, trailing her; a CAT scan showed a stroke had damaged her cerebral cortex
 - a woman with a damaged hippocampus could not remember anyone for more than a few seconds so her physician would reintroduce himself several times each visit
 - a frontal lobe tumor apparently triggered obsessive, abnormal sexual interests in a 40-year-old man, who returned to normal once the tumor was removed. When the interests later returned, his doctor discovered the tumor had regrown
 - in 1966, a churchgoing, ex-Marine, charity worker climbed a university bell tower and over the next 96 minutes randomly killed 13 people and wounded 30 others. An autopsy found a walnut-sized tumor pressing on his amygdala causing his amygdala "to fire in a way that would normally only occur in situations of great danger, threat or challenge"

Such evidence supports the view that "mind is simply what the brain does". If we accept that mind equals "what the brain does" equals "I", then we get a version

of the natural answer which says I cease to exist at death, when my brain ceases to function.

Consciousness

Can we find for our theology some enduring foundation for our personal identity? Or can we find no answer but the natural answer?

On first sight, the prospect doesn't appear promising. Today, science's worldview acknowledges four fundamental forces: gravity, electromagnetism, the weak nuclear force, and the strong nuclear force. None of them in any obvious way can support personal identity. Further, the universe appears "causally complete"—every physical effect has a physical cause if it has a cause. (We say "if it has a cause" because quantum mechanics describes some behaviors with merely statistical, not deterministic, laws. For example, it describes the decay of radioactive atoms statistically, in terms of half-life, but does not specify whether a cause exists for why *this* atom decays rather than another. Some interpretations of quantum mechanics say no immediate cause exists for the decay of a particular atom; others interpretations, ex., Bohmian Mechanics, theorize an underlying cause.)

As an illustration of causal completeness, imagine I decide to drink some water. What causes my arm to grab the glass? Contraction of the muscles. And what causes muscle contraction? Electrical impulses from my brain. And what causes the electrical impulses? Motor neurons firing, caused by . . . caused by . . . As far as we can determine, a physical cause always precedes the physical effect. Nowhere in the chain of causes do we find consciousness or immaterial mind, nowhere do we find *my mental desire* to drink water as a cause of anything physical like my arm moving.

The uninitiated reader may find that unbelievable, so let's say it again: no currently-known scientific law

can account for how a conscious immaterial thought or desire to drink causes my body to take a sip of water. Causal completeness does not allow consciousness or thought to impact the physical world. (On occasion, news stories appear such as “paralyzed patient moves prosthetic arm with thoughts alone”. In actuality, the prosthetic arm senses electrical impulses in the brain, but no one understands how the patient’s thoughts can trigger electrical impulses.)

Our experience seems to contradict causal completeness: from my point of view, my conscious thought or desire to drink initiates the chain of cause and effect that ends with my drinking. But how can a conscious thought initiate a chain of physical causes and effects? No known law of physics allows my thought itself (as opposed to my brain’s electrical signals) to move one atom, much less cause macroscopic changes in my body such as arm movement.

In the 19th century, many scientists considered science’s knowledge of the world essentially complete. Mechanics, thermodynamic and electromagnetism explained almost all known phenomena. (Thus, the story that in 1874, a physicist professor advised 16-year-old Max Planck not to study physics because “in this field, almost everything is already discovered, and all that remains is to fill a few holes”.) Filling “holes” such as the ultraviolet catastrophe, the photoelectric effect, and the Compton Effect, led to quantum mechanics and relativity and revolutionized our understanding of the natural world.

Today, consciousness seems to constitute a hole in science’s understanding of the natural world, a mystery many philosophers and scientists acknowledge and work to solve. We’ll call this mystery of how our conscious thoughts and desires interact with the body, the consciousness-body problem. (It bears an obvious similarity to Descartes’ mind-body problem.)

The consciousness-body problem suggests a deeper problem still: how can consciousness itself exist? How can unconscious matter ground consciousness?

Descartes begins with the mind, so the problem of how the mind can exist does not arise. But if we update Leibniz's argument, we might imagine shrinking ourselves to microscopic size and witnessing what occurs inside a human body. We would see muscle contractions and chemical reactions and electrical signals and neurons and synapses, but we'd never see consciousness or emotions or thoughts. Or going further, we'd see atoms, or protons and electrons, or quarks; or gravity, electromagnetism, the weak nuclear force, and the strong nuclear force—none of which, in our current understanding, can support or ground consciousness.

So we arrive at our “fundamental question of consciousness”: does consciousness somehow emerge from matter, or should we consider it a separate element, similar to Descartes' dualistic view of mind as a separate substance?

To dramatize the fundamental question of consciousness and make its issues concrete, philosophers ask, “Can a philosophical zombie exist?” Unlike the mindless, undead zombies of fiction, the philosophical zombie (or simply “zombie”) duplicates atom-for-atom a normal person but lacks the inner experience of mind and consciousness.

For instance, imagine an atom-for-atom replica of Aunt Sally, a zombie Aunt Sally, who behaves normally in every way but who lacks inner experience. Can such a being exist? If matter grounds consciousness, then no, because atom-for-atom matching would imply all material properties match, too. But if consciousness constitutes a separate entity (Descartes would have said “a separate substance”), then yes, a zombie might exist.

We can think of zombie Aunt Sally as an extremely capable and sophisticated robot, constructed not of computer chips and motors, but of flesh and blood, who has the consciousness of a robot—that is, none. Although she (or “it”?) may seem bizarre, the zombie Aunt Sally would violate no known scientific law. Zombie Aunt Sally appears consistent with science’s worldview because that worldview contains no hint that consciousness exists. We have the idea of consciousness only because we have it ourselves. (One interpretation of quantum mechanics does speculate that consciousness “collapses the wave function” but the interpretation doesn’t answer how consciousness arises.)

If consciousness does indeed constitute an entity independent of matter, separate and outside known scientific laws and principles, then conceivably it could continue to exist once our material body devolves and fades back into its elements. When we finally understand consciousness we might find in it a foundation of personal identity which survives death.

Does any evidence exist for consciousness existing outside a causally complete universe, independent of matter? Some people claim evidence such as:

- people sometimes have an impaired or even missing portion of their brain (i.e., grave hydrocephalus, where an abnormal quantity of cerebrospinal fluid replaces brain tissue), yet function normally
- children are sometimes born with amazing and inexplicable knowledge of a past life, supporting the idea something survives death and can reincarnate
- hospital patients sometimes fall into a near-death state and, when revived, accurately report what occurred when clinically unconsciousness, which support the idea consciousness can sometimes exist independent of the body

Much work lies ahead before we understand consciousness as thoroughly as we understand, for example, electromagnetism. Yet, we understand consciousness well enough to recognize various problems with accepting it as the foundation of our personal identity:

- our consciousness waxes, wanes, and, in dreamless sleep, seems to leave us entirely. Indeed, a few days of continuous forced consciousness (sleep deprivation) threatens our mental health and even our life. So how could something we cannot bear continuously for more than a few days constitute our real self?
- if we agree, “consciousness is what the brain does”, we liken it to an act. But an act cannot possess a singular identity.
- or we might model consciousness as an emergent property of the brain, in which case it could not survive the death of the brain.
- even if we think of consciousness as existing independent of the material universe, it seems like a light illuminating the “room” which contains our mind, specifically, our sensations, perceptions, emotions, thoughts, beliefs, memories, personality. Thus, we might reasonably identify our personal identity with the mix of entities that constitute our mind, rather than the impersonal light illuminating it.

Undoubtedly, we have much to learn about consciousness. But given our present state of knowledge, we cannot confidently answer the question of personal identity with consciousness.

Soul

Because we accept science’s ontology, our theology can’t include a supernatural soul. But let’s for a moment assume soul exists and ask, “Could soul answer the question of personal identity?” Some thoughts.

First, we need an idea of what “soul” means. Although we hear phrases such as “my soul” and “your soul”, speaking of soul as a possession doesn’t make sense. A possession may suffer some unfortunate fate which leaves me unharmed, as when a fire damages my home. At the moment, a fire may be burning a shirt in my closet, and I wouldn’t know it or feel any pain. Theists may sometimes speak of soul as a possession, but they don’t think of it as such. Their concern about the eternal fate of “their soul” demonstrates they consider the soul not a mere possession, but some or all of “what they really are”.

For a definition of soul we’ll use “the immaterial, spiritual, immortal entity that comprises our enduring ‘I’”. But this definition puts us on the horns of a dilemma. The question of personal identity asks what makes me, me, as I exist here, in time and space, now and in the future. But if we take soul as immaterial and spiritual, as completely outside the universe of space and time, then it cannot comprise any part of what I am here, now, at this moment. On the other hand, if soul somehow comprises part of what I am here and now, then at least some portion of soul must exist in the here and now, in space/time—that is, soul and what I am as a material being must intersect. But this contradicts the “immaterial, spiritual” part of our definition of soul. Thus, it appears soul as we’ve defined it cannot answer the question of personal identity.

A theist might easily dispute our brief analysis of soul and personal identity. First, perhaps a different definition of soul would lead to different conclusions. Second, perhaps the supernatural in some mysterious way penetrates or upholds the natural, which would allow soul to manifest in the here and now. Third, although our body exists in space/time, the theist could say the “real me” does not, but it exists as an entirely spiritual being—a soul.

So let's grant the theists' conclusions and assume that soul "is what we really are". Let's assume that I am a spiritual, immortal soul, destined to spend all eternity with God; let's assume that soul constitutes my singular identity, my unchanging essence, which exists forever. And let's examine consequences of those assumptions.

Forever me?

We change throughout our lives. Our bodies, personalities, beliefs, attitudes, talents, abilities all change. We acquire virtues and faults and, sometimes, lose them. Which of the various "I"s that I have been throughout my life exist in my soul? Which of the various "I"s go to heaven, and which eventually cease to exist?

To illustrate, let's imagine Aunt Sally lives a checkered life and passes away at age ninety. We imagine her as a sweet, innocent schoolgirl, a vivacious and vigorous twenty-something, a caring, responsible mother, and a loving grandmother who indulges her grandchildren.

What parts of Aunt Sally's personality inhere in her soul and accompany her to heaven? Which do not? Let's assume Aunt Sally has some characteristic faults, as everyone does. Suppose she gossips, envies, and sometimes acts unkind. We may suppose she often feels hate for some people, or has an addiction. Do these faults vanish at heaven's gate? If so, can we identify the Aunt Sally who lived on Earth with the sanitized version of Aunt Sally who lives in heaven? If half of Aunt Sally's personality characteristics vanish in heaven, then doesn't a new person come into existence in heaven? If so, hasn't the Aunt Sally who lived on Earth ceased to exist? If so, isn't the promise of eternal life for the Aunt Sally who lived on Earth unfulfilled?

We can ask a similar question: supposing we get a body in heaven, which body does Aunt Sally get? Her

schoolgirl body? Her twenty-something body? Her ninety-year-old body?

Another question: after Aunt Sally reaches heaven, can she still change and grow?

If we answer “no”, then we condemn Aunt Sally to an eternity of existing as a sanitized, but limited being, with the limited interests and knowledge she acquired on Earth. But if she exists as a limited, finite being *for all eternity*, why would we call that heaven? (Imagine the child who dies at age two. Will the child through all eternity remain a child in personality, emotional maturity, and knowledge? That hardly seems a desirable fate.)

If we answer “yes”, then Aunt Sally in heaven can change and grow. Can she learn quantum mechanics or analytic philosophy if she wishes?

Let’s suppose Sally can change and grow. Now imagine that when she passes at ninety, she leaves a great-granddaughter, Nancy, of ten. Nancy also lives to ninety and for eighty years looks forward to meeting Aunt Sally again in heaven. But when Nancy arrives, does she meet the sweet, old great-grandmother she remembers? Or does she meet someone who has the vivacious body of a twenty-something, who lacks any of Aunt Sally’s characteristic faults, and who understands algebraic topology?

Again we meet the problem of personal identity: can we identify the being Nancy meets in heaven with the Aunt Sally who lived on Earth? Or has the Aunt Sally of Earth in actuality ceased to exist?

Moreover, suppose Aunt Sally can grow in knowledge, wisdom and power. Can she eventually grow to rival the highest angels? If so, it appears eventually she would hardly differ from God. As such, the heavenly Aunt Sally would possess historical continuity with the earthly

Aunt Sally, but singular identity would not exist. The earthly Aunt Sally would no longer exist. Therefore, the salvation offered by many religions fails to achieve its goal: eternal life for the “I” which exists here and now, on Earth.

Eternal life allays fear of death and annihilation; at first sight, it seems wonderful and reassuring. But it implies we must endure some sort of limited, less-than-God existence, for all eternity. Of course, many people would gladly give up their personal identity now for the opportunity to evolve over time into a godlike creature. But on reflection even a theist might wonder, “Do I really want to be me *forever*, eternally me, eternally distinct and different from God?”

§

It appears we can find nothing but the natural answer in our theology. Notice, the natural answer accords with our fundamental assumption of monism, because if we admit a single, ultimate ground of existence then my “I” must cease to exist somewhere down the ontological chain. That is, a table must cease to exist *as a table* as we descend the ontological chain to molecules, to atoms, to quarks, to the One. Similarly, “I” must cease *as me* as we descend the ontological chain, because at the ultimate level only the One exists. Thus, monism precludes the existence of an eternally existing “I”, an eternal soul, separate from God.

So even if someday we find something in us that survives death, monism rules out it surviving forever. For instance, suppose one day we understand consciousness and discover it can somehow survive the death of the brain and body. Suppose we verify that children sometimes recall past lives because, in fact, they lived them. Then we’d have to modify our view of personal identity, but not fundamentally. Whether the “I” ceases to exist after one life or after a hundred, it

must (according to our view) eventually cease to exist because on the ultimate level only the One exists.

The “I”

We have found no answer to the question of personal identity except the natural answer, which says I cease to exist at death, when my brain ceases to function. Indeed, we’ve gone beyond the natural answer to the further conclusion that I have no genuine, singular identity even from moment to moment, that I possess only said identity. (For simplicity, from now on “natural answer” refers to both conclusions.)

The natural answer says I did not come into the universe but out of it. That the universe creates me out of itself, just as it creates the stars, planets, and other animals. That when I die, I return whence I came, back into the earth and, when the sun becomes a red giant, back to the stars. It denies the “pinnacle of creation” view of humanity, and says at death we suffer the same fate as the other animals.

Our answer does not accord with the intuition of some theists (and nontheists), who would find our answer troubling and inadequate. Troubling, because they find death and annihilation a horrible, frightening prospect. Inadequate, because annihilation destroys the possibility of justice: the good die unrewarded, the evil die unpunished. Indeed, they might see our answer as a *reductio ad absurdum*, a proof of the invalidity of our assumptions and reasoning, because our answer

denies what Descartes took as the undeniable, bedrock foundation of his philosophy: the existence of the “I”.

§

Generally, two paths exist for resolving a problem: solving and dissolving. The first path accepts the problem as stated (“Where can I find the Fountain of Youth?”) and tries to solve it. We’ve tried that path. The second path examines underlying assumptions (“Somewhere a Fountain of Youth exists.”).

Proving an assumption false may dissolve the problem, in effect, solving it. Let’s examine how belief in an “I” may have originated even if no enduring “I” exists.

Origin of the “I”

How might we understand the compelling, visceral feeling that an “I” exists? We point out two factors which reinforce the idea of an enduring “I”: society and evolution.

As to society, at birth my parents give me a name and as a young child I learn to identify with the name; I learn that my name names *me*. My name stays with me throughout my life (usually) so I naturally assume it refers to something that exists throughout my life, too.

As we’ve seen, a said identity involves judgment. So, we might equally well judge that certain points in life mark the death of an old “I” and the birth of a new one. Indeed, some societies have initiation rituals that mark when a boy becomes a man, or a girl, a woman. Such rituals emphasize a break in continuity, a transformation, a death of the old self. Monks and nuns often take a new name when joining a religious order, also emphasizing a death of the old self. Both processes emphasize the death of one “I” and the birth of another.

Therefore, unless a person—let’s call him Dave—undergoes an initiation ritual or becomes a monk, he probably thinks of the word “Dave” as indicating a self that has existed since birth. And other people use “Dave” in the same sense. So Dave might naturally come to believe such a self really exists. (For similar reasons, people often accept their society’s predominate deity as actually existing.)

That society names us and acts as if we possess an enduring self may explain our idea of an enduring “I”. But what of the strong, visceral feeling that an “I” exists? That probably results from evolution.

As an organism becomes more complex, it becomes more aware. For instance, bacteria or plants have some rudimentary awareness of environment, as demonstrated, for example, by a sunflower turning towards the Sun. More complex organisms such as the squirrel or cat demonstrate (probably a subconscious) idea of self when they flee predators. And some animals more complex than squirrels and cats demonstrate they possess a conscious idea of self by passing the mirror self-recognition test (MSR test, for short).

In a simplified version of the MRS test, researchers place a mark (for example, a red dot) on the forehead of a sleeping or sedated animal. The animal awakes, looks in the mirror and sees the dot. The animal who touches their forehead demonstrates they recognize the animal in the mirror as themselves, and passes the test. Chimpanzees, gorillas, Asian elephants and, of course, humans (of about age two or older) pass the test.

Of animals possessing a sense of self, we’d expect those possessing a strong, visceral feeling of “I” to fight more forcefully for their survival, or to more desperately flee from threats, than animals that possesses but a faint feeling of “I”. Thus, a visceral sense of “I” would contribute to our survival and give us an evolutionary

advantage. Perhaps, seeing death as horrible and frightening helped us survive so evolution hardwired that view of death into us.

§

We now discuss how the idea of an enduring “I” leads to other ideas, some of them religious, some of them also tending to reconfirm our idea of an “I”.

Fear

Once we possess the idea of “I”, we see ourselves as something different and separate from the world. So long as the world seems safe, we may find no reason to fear. But when we encounter the world’s threatening side, we may fear for the safety of our self, our “I”.

Primitive humanity found much in the world to fear. Wild animals and other tribes threatened, sometimes attacking, carrying off livestock, killing or abducting tribe members. At times, poor hunting or failed crops caused people to go hungry. Anyone who lived long enough witnessed suffering, disease and death. Sometimes, even the heavens themselves shook with fury, lightning and thunder.

A tendency to fear grants an obvious survival advantage. Although a fearful animal may needlessly run from a harmless, rustling sound, it gets to live (and fear) another day. But the unfearful animal that doesn’t run eventually gets eaten by the predator whose footsteps it mistakes for a harmless sound.

The animal with no ability to reflect probably forgets its fear when danger passes. But humans, with their memory and higher thinking facilities, can remember and fear threats even in absence. During a bright, sunny day, primitive humanity could recall when lightning and thunder filled the sky. Even with a full belly, it could recall when crops failed and people went

hungry. Even when healthy, it could fear disease. (And today, how often does fear motivate our behavior and our country's political decisions?)

Even when no immediate dangers exist, we may fear for the long-term safety of our "I". But fear takes a toll, and fearful people crave psychological security. We want to feel safe and secure, not for the present but for the future, too. How may we obtain a state of psychological security?

Question: if our "I" causes us to feel separate from a sometimes fearful and threatening world, how or where can we obtain protection? Answer: from the "I" that controls the world, that is, from God or gods.

An anthropomorphic idea of God easily follows from what primitive humanity observed. Our ancestors made stone tools like the arrow head, the hand axe, and the scraper; shelters like tents and huts. So "I made this stone ax and that hut, but who made the mountains and the sky?" must have seemed a natural question. "Someone like me made the mountains and the sky; someone like me but much more powerful." seems a natural answer. Thus arose a trinity of "I", world and God.

Open-ended question: Might the moment when the thought of "I" first arises in the infant plant the seed of an anthropomorphic picture of God? At that moment, when the infant first comes to feel him or herself as separate from the world, the idea of the "other" arises: the other, superior being who provides food, comfort, and emotional security. Eventually, the infant recognizes their parent as the "other". But, perhaps, the experience leaves them with a tendency to later imagine God similarly, as a kind of "super-parent".

360 degree security

Given the following four elements, what might we expect?

- a sometimes threatening world
- a separate, vulnerable, fearful “I”
- the idea of a God or gods who control the world
- a need for psychological security, for something to ease our fears

We might expect a group of people to arise who claim to know God, God’s name and personality, how God wants us to live, what deeds God approves and recommends, what deeds God detests and forbids. The group would function as religious leaders, as intermediaries between us and God.

But how do religions’ leaders obtained their “knowledge” of God? What method, what “way of knowing” do they use? Usually, they trustingly accept the words or writings of some charismatic seer or prophet—a method that has led, as we might expect, to the birth of an untold number of religions, with different, even contradictory, views of God, of what God wants and of what God does not want. Even the few surviving religions today teach different and sometimes contradictory views about God.

If we take an evolutionary, “survival of the fittest” view of the competition among religions, we can ask, “Why would one religion survive; why would one religion win over another?”

We speculate.

When two religions compete, we expect the one to win which better satisfies the need for psychological security. For instance, a religion that teaches an angry and vengeful God might lose to a religion that preaches a good, loving, parental God. (After all, what do we gain by replacing fear of the world with fear of an angry and vengeful God?) And if two religions teach a loving,

parental God, the religion that teaches God loves us so much as to become human and die for us might win over the religion that teaches a more distant God.

The thought of a loving, parental God who rules the world addresses our fear of this world. But we see people die, even if after a long, satisfying life. The prospect of our eventual death engenders the “great fear”—that we shall someday cease to exist, that our “I” will undergo destruction and cease to be.

So, we might expect the religion that promises us life after our body’s death—preferably, a wonderful, eternal life in the company of a loving, all-good God—to win over a religion that makes lesser promises. And, indeed, to address the great fear (many) religions assure us that indeed we do live forever, that an eternal life of bliss awaits us, if only we do the right thing. Christianity shores up our ego by telling us the God who created the universe loves us and, in fact, died for us. And at least one religion offers its followers the opportunity of eventually becoming gods and ruling their own worlds.

To complete our feeling of psychological security we might want to know where we came from and have the assurance of a special place in creation. Thus, religions might devise creation myths to tell us how and when God created the universe. And they might (and do) say that humanity occupies a special place in creation, in fact, constitutes the pinnacle of all creation.

Explaining suffering

After religious leaders paint a picture of a world created for us, by an all-good, loving, parental God, who shall soon welcome us to an eternal life of bliss, they must answer an obvious question: whence suffering?

Believers sometimes suffer misfortune, pain, and disease. So naturally the believer looks to their religious

leader—who knows God so well—for an explanation: why does an all-loving Parent let me suffer?

Religious leaders often provide two time-honored answers; they describe misfortunes, pain and suffering as: 1) part of God plan, meant for our ultimate benefit and good; and/or 2) God’s punishment for our (or our ancestors’) misdeeds and sins.

The first answer—suffering meant for our good—suggests a sentiment that some religions explicitly teach: that God never gives us more than we can handle. In an obvious way, the sentiment reinforces psychological security in the face of threats and suffering. And by challenging us to overcome suffering, it gives us an opportunity to strengthen our “I” and make it more resilient.

Although somewhat unfashionable today, the second answer—suffering as punishment for sin—possesses a long history. Two examples:

Religious leaders explained the pain of childbirth as God’s punishment for the sin of Eve. So, in 1847, when Dr. James Simpson discovered that chloroform could ease the pain of childbirth, the Scottish Calvinist Church declared: “What a Satanic invention! What a shame upon Edinburgh! To all seeming, Satan wishes to help suffering women but the upshot will be the collapse of society, for the fear of the Lord which depends upon the petitions of the afflicted will be destroyed.”

Religious leaders explained disease as God’s punishment for sin. Thus, in 1795, when Dr. Edward Jenner discovered the smallpox vaccine, religious leaders denounce his discovery as “defiance to Heaven itself, even to the will of God.” And in 1885, a smallpox epidemic arose in Montreal, Canada. Said one priest: “If we are afflicted with smallpox, it is because we had a carnival last year, feasting with the flesh, which has

offended the Lord; . . . it is to punish our pride that God has sent us smallpox.” Catholic Bishops opposed vaccination, advised increased prayers, especially the rosary, and organized a special procession in honor of Mary.

Self-preservation (ego)

Once we possess an “I”, a sense of self, an ego, we naturally feel a concern for its protection and preservation: we know we exist now and wish to exist forever, in some form or another. The natural answer frustrates that wish. It says we consist of an ever-changing body/emotion/mind complex that possess only said identity; that we possess historical continuity with our complex of a moment ago, or a year ago; that no singular identity exists, that no unchanging kernel persists.

Other answers better satisfy the ego’s wish for permanence and eternal existence. For instance, some religions teach a soul which exists for all eternity, ultimately in one of two places: heaven or hell. Other religions teach reincarnation (though some of them teach a distant, eventual reabsorption in the absolute which negates individuality). And the Buddhist idea of rebirth, as we’ve seen, grants historical continuity over different lives, where the candle of this life lights the candle of the next, so that the flame of ego possesses continuity. Each of these answers satisfies the ego’s wish for permanence, to some degree or another.

Monism denies us an eternal self distinct from the One. And science’s ontology does not accept reincarnation or rebirth. So must the ego’s wish for permanence remain unsatisfied in our theology? Yes, unless we accept a line of flawed reasoning which we call “the Two Self argument”.

The Two Self Argument

Let’s call our ego together with our ever-changing body/emotion/mind complex our “self” (lowercase). And we call “Self” (uppercase) the self of the universe, i.e., the One. As such, both “self” and “Self” concepts make sense: we accept both as valid. However, we might (invalidly) reason as follows:

My “self” has its ultimate ground of existence in the One, the “Self”. Thus, *I possess* two selves: an ever-changing phenomenal self and an eternal, unchanging Self identical with the One. Although my *self* changes and may one day cease to exist, my *Self* shall exist forever. Thus, to use the Hindu phrase, “Tat Tvam Asi” which translates “That thou art” or “You are that”, meaning “You are the One.”. So, in the deepest sense, I am the One, or, more simply, I am God.

The conclusion of the Two Self argument—I am God—leads us to suspect flawed reasoning but where lies the flaw? It lies in the phrase “*my* Self”.

Imagine a wave reasons as follows. “I move. I change. But *my* foundation consists of the ocean, the vast, might ocean. Therefore, in the ultimate sense *I* am the vast and might ocean.” “No”, we respond. “Although a flow of the ocean creates you, you are not the vast and might ocean. When the ocean ceases to act, it remains but you do not: you vanish like a fist when a hand opens.”

In other words, the problem with Two Self Argument lies in the phrase “*my* Self”, i.e., the problem lies in claiming the One for our own. We do not possess the One. If anything, the One possesses us because it creates us, because its image makes us.

Thus, we do not deny our ultimate foundation rest upon the One; we deny only that the One can comprise any part of our unique personal identity.

We may express the same point in another way, by comparing it to what some theistic religions teach. In some theistic religions, each soul differs from the next and comprises a person's own unique identity. In such religions my unique soul can constitute my unique identity. Therefore, if God somehow switched the souls of John and Pete, then John would become Pete, and Pete would become John. For monists, on the other hand, such an experiment would have no effect at all because the One does not comprise any part of my unique personal identity, because "my" ultimate ground of existence differs not a whit from yours. So, calling it "my" ultimate ground of existence doesn't make sense: the One creates me so, if anything, I belong to the One rather than vice versa. The wave belongs to the water, but the water does not belong to the wave.

So we shouldn't say "I am the One, the ultimate ground of existence", which theists might misinterpret as the blasphemous claim "I am God". (We'll see some tragic results of such misinterpretation when we discuss mystics.) It makes more sense to say "God, the One, the ultimate ground of existence, creates me" or "I am an image of God".

Self-preservation (religion)

We've speculated that the successful religion satisfies our need for psychological security, and that the religion which better satisfies our needs will generally win over the religion that does not. But doesn't the view of suffering as punishment for sin contradict that view? Doesn't it decrease our psychological security? Wouldn't we find it more comforting if religious leaders said God immediately forgives and forgets all our faults and sins?

We probably would. But religion must satisfy its own needs too, specifically its need for self-preservation: the need to retain its followers and win other religions' followers.

Let's imagine two religions which teach a creation myth and a loving fatherly or motherly God who protects us, who will grant us eternal life in paradise. But imagine Religion Y says everyone, despite what they do, will enter paradise. And imagine Religion Z says only people who behave as God wishes shall enter paradise, and everyone else shall suffer an eternity of torture. Further, Religion Z teaches that God wishes everyone to believe and practice Religion Z.

So religion Y teaches in effect that God forgives and forgets and everyone goes to heaven, where religion Z teaches God does not forgive at least one "sin", the sin of not believing in religion Z.

Which religion will win? Let's imagine John follows Religion Y. On occasion, John worries he may suffer torture for all eternity, as Religion Z teaches. If John switches to Religion Z, he gets a payoff: the assurance that no torture awaits. And John doesn't lose paradise because Religion Y says everyone gets eternal life regardless of what they do or believe.

But suppose John follows Religion Z. John gets no payoff for switching to Religion Y, because each religion offers the same benefits. But John suffers the penalty of losing some peace of mind, because switching opens the possibility of eternal torture.

Which religion should we expect to more effectively retain its followers and win followers from other religions? Which religion should we expect to survive and grow?

Second Reflection

Barn Raising

We seek to present a worldview somewhere between the theist and atheist worldviews, a worldview that to some extent resolves the theist/atheist dichotomy. Yet, the worldview we've described so far lies much closer to atheism than theism. For it accepts a natural ontology with no angels, demons or eternal souls; it accepts a natural epistemology and accepts no writings as revealed by God; it considers humanity not the "pinnacle of creation", but merely as one among innumerable life forms (although we acknowledge humanity as the dominant life form on Earth—at present); it regards the human person as lacking an enduring identity that persists beyond death.

True, casting our discussion in a theological framework compelled us to define some conception of God. But the atheist probably finds our concept of God comfortably abstract and philosophical, and can probably tolerate it without much discomfort. The theist, on the other hand, may find our conception of God too philosophical, too abstract, too remote from anything they care about.

For centuries, people have built barn walls on the ground and then had a "barn-raising" event to move them into their proper place. We've built our worldview mostly on the grounds of atheism. To move our worldview into its proper place, we turn to a new topic: the real, objective

existence of the One and the possibility of experiencing the One in an immediate, nonmediated manner.

Experience of God

Mystics claim direct experience of God, usually a person God such as Jesus or Krishna. Science's ontology does not include person Gods so science must either avoid speaking about the experiences of the mystics or consider such experiences delusion or hallucination. Our ontology accepts science's ontology but adds an element: the One, the ultimate ground of existence. Therefore, we might describe purported experiences of some person God as in fact unrecognized experiences of the One. But experiencing the One requires that the One exist as more than a concept; it requires the One exist as an objective entity.

Sometimes ideas correspond to something in the real world, sometimes they do not. Ancient Greek philosophers created the idea of the atom but for centuries no one knew if atoms existed. In 1667 Johann Becher's investigations into the nature of heat led him to create the idea of phlogiston, the "element" which comprises heat. And in the late 19th century, physicists trying to understand the nature of light advanced the idea of the luminiferous aether, the medium through which light travels. Ideas such as component entity and relative existence led us to the idea of the One.

We know today that atoms exist and have the same kind of real existence as a tree or a rock; we can even create images of atoms. But we also know that phlogiston and the aether don't exist. (Each exists as an idea, of course, and always shall, but does not correspond to anything

in the real world.) The One exists as an idea, but does it correspond to anything in reality?

We know trees and rocks exist because we can directly experience them. We experience electricity in an immediate, nonmediated manner when we touch a live wire. Can we verify the existence of the One in a similar way? Can we show the One possesses real, objective existence? Can we show it exists as more than an idea?

§

Genevieve Foster, a Jungian psychiatrist in her forties, had an unusual experience. Raised Protestant, she had read about mystical experience as an English major in college, without much effect. But for five days in the spring of 1945:

[t]here was light everywhere. . . . [T]he world was flooded with light, the supernal light that so many of the mystics describe . . . [T]he experience was so overwhelmingly good that I couldn't mistrust it. . . . [G]lory blazing all around me. . . . I realized that some of the medieval poems I had been so innocently handling were written to invoke just such an experience as I had had. (That stuff is still alive, I tell you.)

Writing forty years later, at age 82, she says her experience was

. . . so far from anything that I had thought in the realm of the possible, that it has taken me the rest of my life to come to terms with it.

The French mathematician and physicist Blaise Pascal experienced something similar. He saved a record of his experience on a parchment sown into his doublet, keeping the memento always close to his heart. Upon his death, a servant discovered the parchment and read, around a drawn figure of a flaming cross, these words:

From about half past ten in the evening until
half past twelve

FIRE

God of Abraham, God of Isaac, God of Jacob,
not of the philosophers and savants

Certitude. Certitude. Feeling. Joy. Peace.

Foster describes a supernal (i.e., of or from the divine) light that mystics experience, which suggests experience of God. Pascal describes an experience of FIRE (light? heat?) and explicitly calls it an experience of God. The topic of experience of God brings us into the field of mysticism, which (in its proper sense) concerns direct experience of God or ultimate reality. (We often see “mysticism” improperly used to refer to the nonrational, pseudoscientific, or paradoxical, but we do not use it in that sense.) And we use “mystic” to refer to someone who claims to have had an experience of God (not someone who claims to foretell the future or speak to the dead).

Can we say anything meaningful about the experiences mystics describe? At first sight, prospects appear unpromising because methodological naturalism avoids discussion of the supernatural while mystics claim “supernatural” experiences—of person Gods like Yahweh, Jesus, Krishna, or Allah; of nonperson supernatural entities like the Buddhists’ Clear Light of the Void; and of entities who rank below gods, like angels, or demons, or the Virgin Mary.

But should we accept something as supernatural simply because some people label it such? Long ago, religious leaders called lightening a supernatural tool of God’s punishment. So when Benjamin Franklin invented the lightning rod in 1749 religious leaders called it “the heretical rod” and described it as “attempting to control the artillery of heaven”. In 1755 Massachusetts pastors explained an earthquake as God’s punishment for the use of lightning rods in Boston. Today we understand electricity and lightening as natural phenomena.

Until we know the full extent of the natural universe we cannot with confidence label anything supernatural, as existing above and beyond the natural universe. Therefore, until proven otherwise we may treat any and all phenomena as natural phenomena.

Moreover, shouldn't any theology consider the possibility of direct experience of its God a valid theological question?

In this chapter we seek to explain experiences like those of Foster and Pascal in terms of our theology; in other words, we propose a monist account of mystical experience, a monist account of experience of God.

Let's give our theology a name. We'll call it "SaNT theology", a natural name for a theology described in a book with the title *Science as Natural Theology*.

Experience of God

What do we mean by the phrase "experience of God"? The phrase usually indicates an experience of a religion's deity, for example, a person God such as Yahweh (Judaism), Jesus (Christianity) or Krishna (various Hindu sects). However, in SaNT theology the One grounds *all* entities. So we can consider any experience an experience of the One, as an experience of God. However, using the term "experience of God" to indicate any and all experiences would rob its utility. So in what follows we'll reserve "experience of God" to mean experience of the One *as the One*, not as any creation of the One.

But how might we describe experience of the One as the One? Because the One underlies all that exist, we might imagine such experience as a feeling of oneness with the universe, a feeling that our relation to it resembles child to parent, that we arise out of the universe and will one

day merge back into it when our body's elements return to the biosphere.

But many mystics describe their experience another way, as experience of light, not ordinary light, of course, but "light" of a different kind. For instance, Saint Augustine writes:

I beheld with the eye of my soul . . . above my mind, the Light Unchangeable. Not this ordinary light, which all flesh may look upon, nor as it were a greater of the same kind, as though the brightness of this should be manifold brighter, and with its greatness take up all space. Not such was this light, but other, yea, far other from all these.

And Symeon (often called "Symeon, the New Theologian") a monk of Eastern Orthodox Christianity and one of its most respected mystics, goes so far as to identify God with Light:

God is light, a light infinite and incomprehensible . . . one single light . . . simple, non-composite, timeless, eternal.

and

God is light, and those whom he deems worthy of seeing him see him as light; . . . Those who have not seen this light have not seen God, for God is light.

We may understand such statements in terms of our movie analogy: the idea that entities resemble images projected onto a movie theatre screen and God corresponds to the light which creates the images. Recall in that analogy, the light underlies rocks and people and even Gods—the light underlies any object at all. We may call anything we see on the screen "an experience of light." But imagine becoming conscious of

the projected white light which underlies all images—we use “experience of God” to refer to that. We use “experience of God” to refer to experience not of any image, but of the underlying Light.

The movie analogy gives literal meaning to the idea that humanity “is made in the image of God.” Further, because SaNT theology classifies any person God or nonperson God—anything other than the One—as an image of the One, an experience of Yahweh, Jesus or Krishna (if we assume for the moment they exist) would *not* qualify in SaNT theology as an experience of God, as experience of the One *as the One*. Rather, it would qualify as an experience of a creature, as an experience of an image of the One, fundamentally no different than experience of a rock. (Aside: our idea of the One resembles the Godhead in older theological literature, such as the *Theologia Germanica*. Our idea of image resembles what such literature calls “creatures” although such literature would not consider Yahweh a creature.)

Of course, we need not presume an either/or situation, where, for example, we experience the rock or we experience the One but not both. Rather we may imagine a spectrum where mixed experience of creature (i.e., image) and One occur. Let’s imagine purely mundane experience on the left side of the spectrum and pure, “unitive” experience of the One on the right.

- On the left we have purely mundane experience, experience of a tree simply as a tree. Everyone but the habitual mystic experiences the world this way most of the time.
- Moving toward the right, we imagine experience of mundane objects in a “spiritual” way. For instance, in churches some people find that the purely mundane elements of stone, marble, stained glass, and icons invoke a “spiritual” feeling. We might imagine the person dimly sensing the One in the

stone/marble/glass/icon image. Or we might describe a nonreligious person having a special experience—of falling in love, or the birth of their child, or on a clear spring day in the forest or by the seaside—as dimly sensing the One behind the images.

- Next, we have a more pronounced experience of the One, as in Foster’s account.
- Next, we might imagine yet more pronounced experience, where the One occupies the foreground and the mundane world falls to the background. We may speculate Pascal experienced the One in this way.
- Next, we might imagine pure experience of the One (perhaps as a supernal light) where we lose all consciousness of world and self and experience only the One. If we experience a loss of sense of self, then we may imagine the experience as the One experiencing itself (the unitive experience which we discuss below).

More accounts

Foster and Pascal experienced something outside themselves. Foster sees a supernal light shining in the world. Pascal identifies what he experiences not with any part of himself, but with an external person God. Yet the One underlies our mind and consciousness no less than the external world. Therefore, we might experience the One interiorly, shining within our consciousness, even as Augustine’s account suggests.

In fact, Symeon believes our mind possesses an innate ability to experience God interiorly. He writes:

Our mind is pure and simple, so when it is stripped of every alien thought, it enters the pure, simple, Divine light . . . God is light—the highest light.

and

. . . if nothing interferes with its contemplation, the mind—the eye of the soul—sees God purely in a pure light.

So it seems that we may experience the One exteriorly, with the “eyes of our body”, as light shining through the world, as did Foster. Or we may experience the One interiorly, within in our consciousness, with the “eyes of our soul”. Or we may experience the One in both ways; writes Symeon:

But, Oh, what intoxication of light, Oh, what movements of fire!

Oh, what swirlings of the flame in me . . . coming from You and Your glory! . . .

You granted me to see the light of Your countenance that is unbearable to all. . . .

You appeared as light, illuminating me completely from Your total light. . . .

O awesome wonder which I see doubly, with my two sets of eyes, of the body and of the soul!

Further, Symeon leaves no doubt of the experience’s immediate and experiential character:

If a man who possesses within him the light of the Holy Spirit is unable to bear its radiance, he falls prostrate on the ground and cries out in great fear and terror, as one who sees and experiences something beyond nature, above words or reason. He is then like a man whose entrails have been set on fire and, unable to bear the scorching flame, he is utterly devastated by it . . .

But the prepared individual finds the experience transformative:

It illuminates us, this light that never sets, without change, unalterable, never eclipsed;

it speaks, it acts, it lives and vivifies, it transforms into light those whom it illumines.

Because it suggests transformation into God, Symeon's claim that "it transforms into light those whom it illumines" presents a problem for theistic religions and a danger for the religions' mystics. Theistic religions picture God as the supreme Person, as one person among many, and picture us as having a soul eternally distinct from God. Such religions may classify a mystic's claim of being transformed into light (that is, transformed into God) as blasphemous and treat the mystic accordingly. For instance, the Islamic mystic, Hallaj, also known as Mansur, said:

I am The ONE REAL!

In another instance, someone knocking at Hallaj's door asked "Who is there?" Hallaj responded:

I am the Absolute . . . the True Reality . . .

The Islamic orthodox convicted Hallaj of blasphemy, cut off his hands and feet, and sent him to the gallows.

Yet Hallaj, apparently, claimed identity not any theistic God but with the One. Hallaj's claim seems to rest on the "Two Self" argument, which we consider bogus. For we can indeed recognize ourselves as "images of light", as constituted by the One, but we've seen how we cannot justify claiming the One as part of our self, as part of our distinct personal identity, as Hallaj seems to. We may understand Hallaj as having realized "his" ultimate ground of existence, which in no way belongs to Hallaj, which in no way differs from "our" ultimate ground of existence. But we should not understand Hallaj (as apparently the Orthodox did) as claiming identity with some supreme person God separate from creation. Indeed, the monist believes we can become some theistic God as little as she believes we can become a rock. But each of us can become more aware of the One, of "our" ultimate ground of existence; each of us possesses the potential to experience the One.

Unitive experience

We may have already gone beyond what the skeptical reader will accept but we should not leave the topic of mystical experience without discussing unitive experience, the claimed experience of being united with God, of being one with God, in a sense, of “becoming God”. How should we understand such claims?

Theistic religions—which picture God as a person separate from other persons—cannot accept that an ordinary human being can become God. In such religions claiming identity with God constitutes blasphemy of the worse kind. Yet great mystics even in theistic traditions sometimes claim an intimacy with God that comes within a hair’s breadth of union—or even explicitly claim such union.

Mystics describe unitive experience as transcending the triad of experiencer, experience, experienced, or (equivalently) the triad of knower, knowing and known. We may analyze most of our experiences in terms of the triad. For instance, in the experience of seeing a tree we may differentiate the person (experiencer), the seeing (experience) and the tree (experienced). Or if someone recalls a fact we have the person (knower), the act of recollection (knowing), and the memory (known). The triad applies to mystical experience, too, when the mystic experiences something less than unitive experience. For instance, in Foster’s case she experiences a Light suffusing the world as something ultimate and profound but nonetheless as something other than herself. In her experience, there exists a triad of experiencer (her), experienced (light), and experience.

But imagine a conscious wave becoming conscious of the water that constitutes it. Or imagine a conscious person (i.e., image) on a movie screen becoming conscious of the light which constitutes him or her. Now imagine the wave losing all consciousness of itself until there remains

only water conscious of water. Or imagine the person losing consciousness of self until only consciousness of light remains, of light conscious of itself.

But the One cannot experience itself as object because if it did, at that moment there would exist at least two: the One as experiencer and the One as experienced. So, we might imagine a unitive experience where the mystic loses their separate self and for that moment only the One exists. Rare mystics describe exactly that experience.

The Hindu mystic Ramakrishna likened such unitive experience of the Eternal to a salt doll dissolving in the ocean. His followers claim that Ramakrishna himself experienced this state; one follower described the state as follows:

Beyond the realm of thought, transcending the domain of duality, leaving [the world] with all her changes and modifications far behind, . . . shines the glory of the Eternal Brahman, the Existence-Knowledge-Bliss Absolute . . . Knowledge, knower, and known dissolve in the menstroom of One Eternal Consciousness; birth, growth, and death vanish in that infinite Existence; and love, lover, and beloved merge in that unbounded ocean of Supreme Felicity. . . . Space disappears into nothingness, time is swallowed up in Eternity, causation becomes a dream of the past, and a tremendous effulgence annihilates the oppressive darkness of sense and thought. . . . [O]nly Existence is. . . . His illumination is steady, his bliss constant, and the oblivion of the phenomenal universe is complete.

(Ramakrishna's followers consider him exceptional and claim a person usually does not return from such vision,

that absorption remains unbroken and after a few days the body dies.)

With unitive knowledge, our tree illustration fails. No possibility exists for a person, in any sense, to transcend the triad and unite with, become one with, a tree. There is, however, an apt Hindu analogy. The mystic who aspires to less than unitive experience of God is like someone who wants to taste sugar. To enjoy the taste of sugar, the taster must remain distinct from sugar. The mystic who seeks unitive experience of God, on the other hand, is like someone who wants to become sugar. That mystic seeks actual and literal union, until separate selfhood dissolves and only the One remains.

Alternative explanations

We've developed a monist explanation of mystical experience, an explanation consistent with SaNT theology, where we accept that some people genuinely experience deity and we explain their experience as (possibly unrecognized) experience of the One.

Of course, alternative explanations of mystical experience exist, as do obvious doubts concerning our explanation. We'll discuss two doubts and three alternative explanations.

Doubt one: Do people really experience deity? Can we better explain their experience as delusion or hallucination? This doubt leads us to our first alternative explanation where we describe any purported experience of deity as delusion or hallucination, as caused by some mental illness or chemical imbalance. We'll call this the null explanation.

We can make two points in support of the null explanation. First, methodological naturalism avoids discussion of Gods and other supernatural entities so we shouldn't accept any purported experience of some

person God. Second, our explanation depends on the possibility of direct experience of the One, of direct experience of something below the level of the atom, of the proton, of the quark. How can we think such experience occurs, even if only in rare instances?

What reasons can we give to doubt the null explanation?

We might point out that many mystics in many different places and times report strikingly similar experiences, although they had no contact and had different religious views. We could then argue similarity of report indicates the existence of some objective reality that they experience. But a skeptic might respond that just as similar reports of alcoholics in delirium tremens don't prove the objective reality of the snakes or insects that they hallucinate, similar reports of the mystics don't prove the objective reality of what mystics claim to experience. In other words, mystics might have experienced some similar sort of delusion or mental disorder.

We might also claim that the lifelong aftereffects which mystics (such as Foster) experience seem to indicate some sort of objective experience, but the skeptic might respond that perhaps hallucination can have lifelong effects, too.

Last, we might ask: how can we think of direct experience of the One as *not* possible? In SaNT theology the relation of a person to the One resembles the relation of a wave to the ocean. How (we might ask) can a wave not experience the water of which it consists? How could a conscious iceberg not directly experience the water that constitutes it? The possibility of direct experience of the One seems to naturally derive from our theology's premises. If we accept those premises then understanding how we can avoid experience of our ultimate ground of existence becomes problematic.

Probably in the last analysis we cannot prove or disprove direct experience of the One as a real, objective fact. So we must leave the ultimate judgment to the reader and the future; so the null explanation remains a feasible alternative explanation.

Now, moving on to doubt two: why accept our explanation as the best? Even if we could prove the mystic experiences some objective reality, we would still need to address doubt two. After all, most mystics don't describe their experience as experience of the One. Rather, someone describes an experience of Yahweh, another person, of Krishna, yet another person, of light. Pascal reports experience of FIRE which he interprets as experience of the person God Yahweh. And although Symeon says "God is light" he also calls it "the light of the Holy Spirit" not "the light of the One". So with what justification do we describe any genuine mystical experience as experience of the One, possibly encased in a mind-created person God? By what rationale do we impose our explanation on someone's account, an explanation possibly foreign to the mystic who wrote the account?

The questions lead us to two intermediate explanations that lie between the null explanation and our explanation. If we want to accept mystical experience as genuine (but not as experience of the One) then we either accept it as genuine experience of a select one or few Gods, or we accept as genuine experience any God.

Our first intermediate explanation accepts that someone can have a valid experience of a particular religion's God(s), but says that people who experience a different God experience delusion or hallucination, caused by mental or chemical imbalance (or satanic deception). For instance, someone might judge Moses's experience on the mountain or Pascal's experience as genuine

experiences of the person God Yahweh, but deny the validity of any claimed experience of Krishna.

Believers often choose this rather narrow-minded explanation although it not only denies the validity of most other Gods humanity has worshiped in the past or worships today, but also denies the validity of other Gods worshipped anywhere in the universe at any time. This explanation seems profoundly contradictory to the nature and spirit of the scientific enterprise, which seeks to uncover universal laws and phenomena.

Our second intermediate explanation says that people of different religions may validly experience their religion's God(s). Although more accepting and universal than the first intermediate explanation, this explanation seems to contain an internal contradiction. For if multiple different Gods exist then we may ask if any one of them possess power over the others, i.e., omnipotence? If no, why call them Gods? If yes, wouldn't that make the omnipotent God the true God? So this explanation seems to lead logically either to the first intermediate explanation (in the case of one omnipotent God) or to the null explanation (in the case of several less-than-omnipotent pseudo-Gods).

Because our ontology does not accept person Gods, we cannot accept either of the intermediate explanations as valid. We are left, then, with only the null explanation and our explanation, which we'll restate.

Our explanation: the explanation we have offered, that regards God as Light, as Godhead, as true God, and classifies all other "Gods" as manifestations of the One, and explains mystical experiences as (possibly unrecognized) direct experience of the One.

Notice our explanation has the advantage of not favoring one person God over another, or of favoring one religion over another. It allows the possibility of mystical

experience in any and all religions. For example, we might understand a report of seeing the God Shiva surrounded by blinding light and clouds of glory as an unrecognized experience of the blinding light of the One encased in a mind-created image of some person God. Thus, SaNT theology allows us to accept a claimed experience of Yahweh and a claimed experience of Shiva as possibly unrecognized experiences of the One. Other theologies might force us to deny the validity of one experience or the other.

Further, if humanity ever contacts intelligent extraterrestrials who look like, say, rabbits or spiders, the extraterrestrials might feel as averse to acknowledging a human-like person God as God as we would feel to acknowledging some rabbit- or spider-like person as God. But we might agree to recognize the One as God.

A working hypothesis

Our discussion leaves us with two feasible explanations: the null explanation (no true experiences of deity) and our explanation (mystic experience as direct experience of the One). If we cannot prove or disprove either explanation, how should we proceed? We might accept one of the explanations as a working hypothesis. But which explanation should we accept?

The choice seems clear. Our book concerns theology. But the null explanation removes mystical experience from the domain of theology and puts it into the domain of psychology. That is, if we classify mystical experience as delusion or hallucination then the psychologist, rather than the theologian, should study and explain it. Accepting the null explanation closes an avenue of investigation for us. On the other hand, our explanation says mystical experience belongs primarily in the domain of theology, and opens that same avenue. So we should accept our explanation as a working hypothesis

and see where it leads, and attempt to derive various consequences of our explanation. (However, we acknowledge our conclusions may one day prove empty or false if the null explanation proves true).

Theoretical constructs

Our reason for accepting our explanation instead of the null explanation might seem to reduce to “We like our explanation and it opens an avenue of inquiry”. Can we offer a better reason to accept our explanation as a working hypothesis? Science’s usual treatment of theoretical constructs might give us such a reason.

We digress concerning theoretical constructs.

Science’s ontology includes observable physical entities such as trees, people and electromagnetism. We know such entities exist because we can see and touch them, or measure them. Science’s ontology also accepts observable nonphysical entities such as logical facts (for example, “If A implies B, and B implies C, then A implies C.”) and mathematical facts (for example, the Pythagorean Theorem) which we “observe” not through our five senses but via a type of direct mental insight analogous to seeing, an insight which sometimes requires extensive education to develop. For instance, we need a course in calculus before we can “observe” that the derivative of x^2 equals $2x$. Last, science’s ontology also includes unobservable entities, i.e., theoretical constructs. We mentioned some theoretical constructs above, for example, phlogiston, the luminiferous aether, and the atom.

A theoretical construct begins life as a concept, as when ancient Greek philosophers created the idea of an indivisible a unit of matter called the atom. But any armchair philosopher can create an idle concept. Science demands of its theoretical constructs that they do useful work in the form of explanatory or predictive

power. Thus in the early 19th century John Dalton reintroduced the atom as a theoretical construct to explain various chemical reactions. Similarly, in 1964 Peter Higgs proposed the theoretical construct known as the Higgs boson, which helped physicists predict several phenomena, which they eventually verified experimentally.

Yet supporting evidence notwithstanding, until we observe a theoretical construct the possibility persists that it corresponds to nothing in the objective world. Humanity once worshipped numerous gods and goddesses recognized today as lacking real existence, i.e., as imaginary. Science eventually found that several of its theoretical constructs (phlogiston, the luminiferous aether) correspond to nothing in the real world.

Therefore, science takes it as part of its mission not to let something forever remain a theoretical construct: it seeks to prove or disprove its real, objective existence. For instance, an international team of over ten thousand scientists and engineers constructed the 27 km (17 mile) circumference Large Hadron Collider in the hopes of (among other aims) verifying the existence of the Higgs boson. Even disproving the objective existence of a theoretical construct can lead to eventually success. For instance, failure to prove the existence of the luminiferous aether led directly to Einstein's discovery of the theory of Relativity.

End of digression. Now let's apply what we've seen to the One.

We initially introduced the One as an idea. We've seen the idea has explanatory power: we used it to explain the creation of this universe and to explain mystical experience. But until we verify the real objective existence of the One, SaNT theology remains a conceptual edifice with possibly no grounding in the real world; the One remains a conceptual God of the

type created by “philosophers and savants”, not a real, empirical reality such as Pascal experienced.

So how might we determine whether the One possesses real existence? We might accept our explanation as a working hypothesis and try to prove or disprove it. For if it proves true—if it can be shown that some people genuinely experience the One—then we would also show the One possesses real objective existence, which in turn would transform the status of the One from an unproven, possibly non-existent, theoretical construct into an objective reality.

But how can we verify that people can have direct experience of the One? Of course, just as many people live their lives without directly observing that the derivative of x^2 equals $2x$, many people live their lives without directly observing the One. But if we can demonstrate that some, even if only a few, people have experiences best understood as direct experience of the One, we would have reason to accept the One as really existing.

But how and who can possibly demonstrate that?

As to the “who”, experimentalists—psychologists, physicians, and other investigators—would have to devise experiments to test the hypothesis, because an armchair theorist, that is, a theologian, can only present the idea and use it to explain existing phenomena.

As to the “how”, we must leave that question to the experimentalists.

Of course, we admit the prospect of proving or disproving that some people directly experience the One (as the One) may seem daunting, even hopeless—but once the prospect of understanding lightening, the orbit of the planets, or the history of the universe may have seemed equally hopeless.

§

We wished to prove the real, objective existence of the One as something mystics experience, because that would prove SaNT theology contains not merely a bloodless, cerebral concept of God, but a vibrant, living Reality, a reality so immediate and intense that some mystics have accepted torture and death willingly, and even joyfully in some cases, rather than deny or renounce their experience. Unfortunately, we cannot prove it. The true ontological status of the One—real objective reality? or idea with no real referent?—remains an open question. But for reasons we discussed, we take the real, objective reality of the One, as well as the possibility of direct experience of it, as working hypotheses.

But we have shown that some people (e.g., Hallaj and Ramakrishna; also Foster and Pascal?) regard the One as an empirical Reality. Thus, we may regard SaNT theology as more than a mere conceptual framework; rather, SaNT theology possesses the possibility of becoming a genuine, deeply held religious worldview.

SaNT theology lies between the atheist and theist worldview: classify the One as an empty concept and fall to one side, to atheism; anthropomorphize the One as a person, a Supreme Person, and fall to the other side, to theism.

Third Reflection

We began with the aim of developing a theology based on, and harmonious with, current scientific knowledge. We went outside the bounds of science only in our assumption of monism (which we used to define God, a central entity in any theology) and our working hypothesis that a human may directly experience God. We call our theology SaNT theology.

So what can we say about SaNT theology? What virtues and shortcomings does it possess? How does it compare with other theologies?

SaNT theology (we hope) surpasses other theologies in its single-minded devotion to truth, in consciously grounding itself in our best current knowledge of the world, and in its rejection of wishful thinking and emotional-motivated dogma. We consider these traits virtues.

SaNT theology claims no divine, unchangeable revelation or dogma. It therefore has the freedom to adapt itself to a changing world and grow as we discover new knowledge, traits that we regard as virtues. But those traits imply it does not embody eternal, unchangeable truths, and may sometimes need to modify or jettison old views, which some people may regard as a shortcoming.

SaNT theology regards humanity as but one of innumerable life forms in the universe. It does not grant humanity a special status, or posit some wonderful destiny for the individual, and it even denies the

existence of an unchanging personal identity. In short, it paints an uncongenial theological landscape that does not conform to our wishes or our needs, and, moreover, makes no effort to do so. These traits many, perhaps most, people could regard as a shortcoming, even a fatal shortcoming.

Prehistory humanity sometimes found itself in an uncongenial physical landscape, threatened by food shortages and extremes of weather, wild animals and other tribes. It could imagine a paradise, where such threats didn't exist. But only by frankly facing the threats and squarely facing the real world did it eventually construct the world we live in, a world tuned for human survival and comfort.

Can we do something similar with SaNT theology? No, because we cannot change reality. But we might with SaNT religion. We elaborate.

Earlier we defined natural theology and described two types: unbiased and biased. But we didn't define theology itself or describe how it differs from religion. We'll do that now: we regard theology as the study of ultimate reality. Theology addresses the questions "what ultimately exists" and "what do we know about it?" (The questions reduce to "what do we know about God?" for a theology that assumes God's existence.) Of course, the sciences investigate reality, too; nuclear physics and cosmology, perhaps, come closest to studying ultimate reality. But theology (for us) explicitly takes ultimate reality as its field of study. Thus in our discussion of science as natural theology we discussed the ultimate ground of existence, the ultimate origin of this universe, etc.

How does religion differ from theology? We regard religion as addressing how the ultimately real impacts the human condition. In other words, religion begins with theological statements and answers the question

“so what?” Thus, religion addresses questions such as “how should the ultimately real impact my life?” and “how may I live my life in harmony with it? as well as questions of morality and ethics.

So we did theology when we discussed the history of the universe since the big bang, but when we mentioned the “pinnacle of creation” view of humanity we mentioned not a theological but a religious doctrine. Similarly, when we concluded that “the universe would not miss us if we and the Earth somehow vanished” we drew out implications of reality for humanity, and thus made a statement of religion, not theology.

Thus, we cannot modify theology to conform to our needs and desires because we cannot change ontological reality. But perhaps we can adapt to that reality just as we adapted to our physical environment.

Of course, the huge complexity of the human condition makes it unlikely that any book or series of books, by one author or a team of authors, could comprehensively address all the implications of the ultimately real to the human condition. We can do little more than offer a few thoughts, a few tentative ideas.

So, we reach the end of *Science as Natural Theology*. We hope in the future to write a book of thoughts on the subject of SaNT religion, a book with a title something like *First Steps toward a SaNT Religion*. Of course, anyone who digests the material in this book might write an equally valid, or even superior book.

Notes

Prologue

Anuket: Goddess of the Nile River

Astarte: Ancient Phoenician goddess

Atlas: Titan who holds up the sky, namesake of the Atlantic (i.e., sea of Atlas) Ocean.

Dyeus: Chief proto-Indo-European deity

Freyja: Norse goddess of love and beauty

Gaia: Primal Greek goddess, mother of the universe

Isis: Egyptian goddess later worshipped in the Roman Empire

Ixcacao: Ancient Mayan fertility goddess; goddess of cocoa and chocolate

Izanagi: Japan god of creation

Kali: Hindu goddess

Kichigonai: Mayan creator god of light

Lakshmi: Hindu goddess of wealth and prosperity

Mat Zemlya: Oldest Slavic deity

Olorun: African king of the universe

Pangu: Chinese creator of all

Quetzalcoatl: Ancient Mesoamerica god

Ra: Egyptian sun god

Tengri: God of central Asia

Thor: Norse hammer-wielding god

Toci: Ancient Aztec goddess

Venus: Roman goddess of love

Viracocha: Inca creator god

Xi Wangmu: One of China's oldest goddesses

Zeus: Ancient Greek king of the gods

God

“God is sheer existence”, Aquinas [1966] section Ia,44,1

“God is subsistent being”, Saint Bruno, Carthusian order, Anonymous [1962] p. 101

“‘Ehyeh-Asher-Ehyeh’ is usually translated”, Judism, Nigosian [1986] p. 19

“Reality is independent”, Islam, Allana [1973] p. 337

“There is an Unborn”, Goddard [1966] p. 32-3

“Liable to birth”, Horner [1954] p. 206

“The last words”, Bush [1982] p. 118

“God alone is real”, Nikhilananda [1977] p. 81-82

“Brahman is”, Paramananda [1981] p.107

“It is the ground”, Shankara [1974] p. 71-2

“As waves, foam and bubbles”, Shastri, [1961] p. 6

“Ultimate reality”, Anonymous [1986] XXXIV, p. 36

“There was something”, Waley [1934] XXV, p. 174

“This Being is One.”, McLeod [1968] p. 163

“the supreme godhead of Zoroastrianism”, Dhalla [1972] p.19-20

“It seems to me”, Einstein [1930]

“In their struggle”, Calaprice [2010] p. 153

“Everyone who”, Calaprice [2010] p. 152

Attitude

“In a way, of course”, Asimov [1966] p.184

Natural Theology

“The Creation speaks”, Paine [1794]

The “I”

White [1896], chloroform, smallpox

Personal Identity

“At least one popular movie”, The Matrix, 1999,
Directed by the Wachowski Brothers

“As an example of imaging techniques, PET scans
show that violent criminals have less frontal brain
activity,” [Carter] p. 93

“As to electrodes, stimulation of the temporal lobes
provokes vivid recall,” [Carter] p. 27

“stimulating one part of the amygdala creates
feelings of fear and panic; stimulating another
part creates warm, friendly feelings,” [Carter] P.
90

“stimulation of the temporal/limbic system may
produce intense feelings of joy and even a feeling
of God’s presence,” [Carter] p. 129

“after surgery removed a tumor,” [Carter] p. 81

“after a brain injury a farmer lost the ability,”
[Carter] p. 118-119, 123

“a woman with a damaged hippocampus,” [Carter]
p. 95

“a frontal lobe tumor apparently triggered
obsessive.,” [Carter] p. 74

“in 1966, the churchgoing, ex-Marine,”, [Carter] p.
92

“Thus the story that in 1874, a physicist professor
advised the 16-year-old Max Planck . . . “, <http://youtu.be/SCUnoxJ5pho>,
retrieved January 6,
2015

“Do any grounds exists for believing consciousness
might originate . . . “, [http://youtu.be/yosn_](http://youtu.be/yosn_GHYiR4)
[GHYiR4](http://youtu.be/yosn_GHYiR4), retrieved January 6, 2015

Experience of God

“[t]here was light everywhere”, [Foster] p. 43-44

“. . . so far from anything”, [Foster] p. 36

- “From about half past ten”, [Cohen] p. 137-8
- “Lightning rod”, White [1896],
- “I beheld with the eye of my soul”, [Augustine] Bk. VII, Ch. X
- “God is light, a light infinite and incomprehensible”, [McGuckin] p. 138
- “God is light, and those whom”, [Lossky] p.121
- “Our mind is pure and simple”, [Kadloubovsky and Palmer] p. 132
- “... if nothing interferes”, Kadloubovsky and Palmer] p. 137
- “But, Oh, what intoxication of light”, [deCatanzaro] p. 24-25
- “If a man who possesses within him”, [Kadloubovsky and Palmer] p. 113
- “It illuminates us, this light that never sets”, [Lossky] p.121
- “I am The ONE REAL!”, [Al-Ghazzali] p. 106
- “I am the Absolute”, [Schimmel], p. 66
- “Salt doll”, [Nikhilananda] p. 103
- “Beyond the realm”, [Budhananda] p.153

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