Naturalistic Theories of Life After Death

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ABSTRACT: After rejecting substance dualism, some naturalists embrace patternism. It states that persons are bodies and that bodies are material machines running abstract person-programs. Following Aristotle, these person-programs are souls. Patternists adopt four-dimensionalist theories of persistence: bodies are 3D stages of 4D lives. Patternism permits at least six types of life after death. It permits quantum immortality, teleportation, salvation through advanced technology, promotion out of a simulated reality, computational monadology, and the revision theory of resurrection.

1. Introduction

A *soteriology* is a theory which asserts that human persons can overcome death in some personally significant and positive way. Perhaps our minds survive the deaths of our bodies or perhaps our abstract mental or biological patterns are somehow instantiated again after their earthly instances end. Are there any *naturalistic* soteriologies? One way to answer this question is to define naturalism and then to sort soteriologies into those which satisfy the definition and those which do not. Sadly, since there is no widely accepted definition of naturalism, this define-and-sort strategy can only end in conflict.

A less contentious approach evaluates the *degrees of naturalness* of various soteriologies based on various marks. On this approach, soteriologies are theories, and theories are more or less natural. Here are some plausible marks of naturalness for theories: all the predicates in the theory are taken from the sciences (including the formal sciences); the theory can be formulated in the language of mathematics; the theory involves universally binding laws; the theory is consistent with our best science; the theory is justified by arguments whose premises include only either observations or principles of reason.[1] The soteriologies considered here are evaluated relative to these marks.

Most traditional soteriologies are dualistic: they treat human persons as soul-body composites, and say that the soul is an immaterial thinking substance. Since the soul is a substance, it persists by enduring. This means that it remains self-identical even though its properties and relations change. All dualistic soteriologies agree that, when the body dies, the soul continues to exist without it. One type of dualistic soteriology states that, after the body dies, the soul remains disembodied forever. Another type states that, after the body dies, the soul eventually attaches to other bodies. This second type includes all dualistic reincarnation and resurrection theories. Since almost all naturalists strongly reject immaterial substances, they almost always reject dualistic soteriologies.[2] Consequently, dualistic soteriologies are not considered here.

2. Patternism

Naturalists tend be materialists about human persons. They typically affirm that human persons are identical with human bodies. However, this materialism is compatible with a metaphysical view known as *patternism*. Patternists affirm that living things, such as human persons, are composed entirely of material parts. However, patternists are mainly concerned with the ways those parts are organized. They are primarily concerned with the *forms* or *structures* of living bodies. Any living thing is a set of material parts (such as atoms) which stand to each other in some system of relations. This system of relations is the pattern of the living thing. Patternists focus on the pattern.

Early patternist ideas are found in Aristotle, who focused on the forms of bodies when he talked about life and mind. Early patternist ideas are also found Hobbes, Locke, La Mettrie, and d'Holbach, when they compare bodies to machines like watches.[3] Thus bodies are arrangements of functionally interacting parts. Locke used these mechanical ideas to argue that the persistence conditions for living things differ from those for inanimate objects. He argued that the persistence of an inanimate whole requires the invariance of its material parts. If those parts change, the whole does not persist. However, the persistence of a living thing does not require such invariance. The persistence of a living thing requires instead the continuity of its organization. A living thing persists if, and only if, the arrangement of its parts (its pattern) changes in a biologically continuous way.

After these early mechanists, patternism really takes off with the development of the modern sciences of information.[4] The founder of cybernetics, Norbert Wiener, defines the persistence of living things as pattern-preservation.[5] Bodies are no longer thought of as watches; now they are thought of in computational terms, as finite state machines. Every body has some finite set of possible biologically distinct *states*; it has some finite set of possible biologically distinct *inputs*; it has some finite set of possible biologically distinct *outputs*; and it has some set of *dispositions*. Each disposition is described by a rule which looks like this: if the body gets an input when it is in some state, then it produces an output and changes to a new state. The quadruple (inputs, states, outputs, dispositions) is the *program* running on the body. Now the pattern is the program.

Since the relations encoded in dispositions are said to be functional relations, patternism then becomes widely known among philosophers as *functionalism*. Functionalists like Putnam, Block, and Adams use computational ideas to further develop patternist theories of mind, as well as patternist theories of personal persistence. Biologists like Farmer & Belin, and Korzeniewski, use computational ideas to develop patternist theories of life. Patternist theories of life and mind now develop rapidly among writers inspired by computer science, such as Fredkin, Moravec, Dennett, Tipler, Kurzweil, and Bostrom.[6]

Although patternists say that persons are identical with material machines (such as their bodies), patternism does not rule out the existence of the soul. Aristotle said the soul is the form of the body.[7] La Mettrie and d'Holbach likewise suggest that the soul is the organization of the body. Patternists, such as Barrow and Tipler, agree that the soul is the

form of the body. But now the soul is to the body as software is to hardware; bodies are finite state machines running souls as their programs; and human body-programs can run across many physically distinctive computational substrates.[8]

3. Persistence

At any moment, a material thing occupies some three-dimensional (3D) region of space. But the theory of relativity treats time as a fourth dimension, along which material things persist. Modern physics therefore suggests that persistent things are both extended along the three ordinary dimensions of space and the fourth dimension of time. They are four-dimensional (4D) *space-time worms* which can be temporally divided into three-dimensional (3D) *stages*.[14] Since naturalism demands consistency with our best science, and since four-dimensionalist theories of persistence appear to be most consistent with the theories of relativity, it is fair to say that the most natural theory of human persistence is some four-dimensional theory. Many naturalists, such as Quine, Lewis (in "Survival"), and Armstrong, adopt four-dimensionalist theories of persistence.

Since our physical terms can be applied either to worms or stages, there are two types of four-dimensionalism. The first type, *worm-theory*, states that physical terms apply to 4D worms. So persons are 4D worms composed of 3D person-stages, and bodies are 4D worms composed of 3D body-stages. The second type, *stage-theory*, states that physical terms apply to 3D stages. So persons are 3D stages which constitute 4D person-processes, and bodies are 3D stages which constitute 4D body-processes. Naturalistic accounts of human persistence can use either worm-theory or stage-theory. However, stage-theory has two advantages. The first is that natural languages have words (like "life" and "career") that refer to 4D human processes. The second is that stage-theory directly coheres with the logical analysis of tensed expressions. So stage-theory is used here.

Stage theorists say that a human life or career is a 4D process composed of 3D persons. For the materialist, these persons are bodies. So every 4D career divides into 3D bodies. But stage theorists, like all four-dimensionalists, reject identity through time. Stages at distinct times are not identical. A young body naturally changes into an old body, but they are not identical. The young body is *not* the same body as the old body; on the contrary, they are distinct. Rejecting identity through time, stage-theorists instead affirm *persistence* through time. Your present body persists both by having past bodies at earlier moments in your career and by having future bodies at later moments in your career. However, the bodies in your career are distinct; there is no identity through time.

Stage theorists say that all the stages in any process are *counterparts*. They adopt this term from the modal logic of David Lewis. Hence stage theory is also known as *temporal counterpart theory*.[15] Temporal counterpart theory provides a logically rigorous analysis of tensed statements. Your presently existing body is its own counterpart. You *are* your present counterpart. Any body in your career which exists before your present body is one of your past counterparts. Statements in the past tense are made true or false

by facts about your past counterparts. To say you *were* sad means that you have some *past* counterpart who *is* sad. Any body in your career which exists after your present body is one of your future counterparts. Statements in the future tense are made true or false by facts about your future counterparts. To say that you *will be* happy means that you have some *future* counterpart who *is* happy. And you *will* live again after you die if and only if you have some living future counterpart who exists after your death.

Stage theory is compatible with patternism. Patternists tend to say that a 4D process is a computationally continuous series of 3D stages. Thus a *career* is computationally continuous 4D series of 3D bodies.[16] Computational continuity requires the movement of the same pattern (the same soul) from past to future bodies. Hence a career is a process in which each earlier stage transmits its pattern to its later stages, and each later stage receives its pattern from its earlier stages. But the pattern is a program which transforms each earlier stage (along with its environmental inputs) into some later stage. Computational continuity ensures the continuity of all the information-processing going on in every cell in the body all the way down to the molecular level. It ensures the continuity of the information-processing going on in the brain, the whole nervous system, the immune system, and the genetic networks in cells. It ensures psychological continuity.

Computational continuity requires informational continuity. Every process (hence every career) is a channel through which information flows. Each later stage in any career must carry information about its earlier stages. Since *accidental replicas* never carry any information about anything at all, they cannot continue careers. For example, Swampman is an accidental replica of Davidson; but Swampman does not continue the career of Davidson.[17] But computational continuity does not require causal continuity. The flow of information requires only the lawful dependence of the receiver on the transmitter, and not causality.[18] Thus careers may span causally isolated universes.

4. Quantum Immortality

Patternism involves four-dimensionalism. Many of the features of four-dimensionalism are nicely illustrated by *quantum immortality*. Quantum immortality is motivated by the *quantum suicide* thought experiment, in which a person plays a game of quantum Russian roulette.[19] We can refer to this person as the *Player*. Player holds a pistol, whose revolver has five chambers loaded and one empty. But Player changes into *Spinner*, who randomly selects one of the chambers for firing by rotating the revolver. Of course, for four-dimensionalists, Player and Spinner are not identical. On the contrary, they are distinct 3D bodies. Stage theorists say they are distinct temporal counterparts.

Now Spinner changes into *Gambler*, who pulls the trigger. Once more, this change negates identity. And when Gambler pulls the trigger, the many-worlds interpretation of quantum mechanics entails that the universe fissions into six futures, one for each chamber in the gun. As the universe fissions, so does Gambler. Thus Gambler divides into six distinct future bodies, each in its own quantum branch. These six bodies can be

referred to as *Winner*, along with *Loser-1* through *Loser-5*. Of course, Winner, who is alive, corresponds to the branch in which the empty chamber was selected. But the five Losers, each of whom is dead, lie on branches in which loaded chambers were selected.

Four-dimensionalists say there are six overlapping 4D processes here. One of these processes is (Player, Spinner, Gambler, Winner), while the other five are (Player, Spinner, Gambler, Loser-1) through (Player, Spinner, Gambler, Loser-5). Each 4D process contains four distinct 3D bodies. Earlier bodies change into later bodies; but these changes negate identity. Stage theorists say all these bodies are temporal counterparts, and they use temporal operators, such as *was* and *will be*, to indicate their relations. Stage theorists, like all four-dimensionalists, take tense seriously. Thus Player *will be* Spinner, and Spinner *was* Player; however, Player *is not* Spinner, and Spinner *is not* Player. Likewise Spinner will be Gambler, and Gambler was Spinner; but those two are not the same.

The many-worlds interpretation of quantum suicide entails that Gambler has six future counterparts: five dead, one alive. Gambler *will be* each one of them. But Gambler *is not identical* to any of them, and they are *not identical* to each other. It is true that Gambler will be dead. Gambler will be dead because Gambler has five future counterparts (namely, the Losers) who are dead. And it is also true that Gambler will be alive. Gambler will be alive because Gambler has a future counterpart (namely, Winner) who is alive. Since Gambler will be alive, Gambler *will survive* the game of quantum Russian roulette. Here care must be taken with the use of tensed expressions.[20] Although Gambler will be alive and will be dead, it is false that Gambler will be *both* alive *and* dead. After all, Gambler does not have any future counterpart who is *both* alive *and* dead. When Gambler pulls the trigger, Winner hears a click. By changing into Winner, Gambler survives into Winner.

Advocates of quantum immortality argue that, since almost every change in life has some chance of death, almost every change is analogous to pulling the trigger in the game of quantum Russian roulette. As another illustration of quantum survival, Lewis (in "Schrödinger's Cat") offers the *quantum walk*. You stagger out of the bar shortly after closing time. After wandering a bit, you decide to cross a busy highway. As you walk, each passing car resembles a bullet which may miss you or may hit you. Your drunken steps and the reactions of the drivers are all random variables. And, with every throw of these quantum dice, the universe fissions. On almost every branch, your future counterparts get hit by cars and die. But on some small percentage of branches, your future counterparts survive. Smiling at your good luck, you finally reach the safety of the other side. You took your chances – you always take your chances – and one of your future selves always survives. So while most of your future life-branches will end in death, at least one of them will persist forever. At least one path through the endlessly ramified tree of quantum alternatives contains your endlessly long 4D human life.

Should you hope for quantum immortality? Lewis (in "Schrödinger's Cat") argues that you should not. He argues that quantum survival entails *quantum torment*. Suppose that, during your quantum walk, the universe fissions into one thousand branches. On nine

hundred of these, you get hit and die; on one hundred, you survive. Of these hundred survival branches, five involve not getting hit by any car; ten involve collisions giving you minor injuries; twenty five involve moderate injuries; but sixty involve severe injuries. So most of your survival branches will involve considerable misery. As time goes by, this misery accumulates. Your continued survival leads you ever deeper into quantum hell. However, Aranyosi argues you need not fear quantum torment. He says Lewis has failed to make an important distinction: Lewis fails to distinguish between survival with awareness and survival without it. On most of the branches in which you sustain injuries, you also lose consciousness. Hence it matters little that most of your survival branches involve moderate or severe injuries. You will be injured, but you will not suffer.

It may be immediately objected that there are no clearly understood ways to define these probabilities. At best, both Lewis and Aranyosi are making educated guesses. To avoid problems with quantum torment, it would be more useful to argue that survival and suffering are not based on chance alone. To this end, Forrest has proposed several intriguing versions of quantum immortality, in which undesirable branches are quickly pruned. Although his versions of quantum immortality seem to involve agents with unnatural powers, it may be that his ideas can be naturalized. Perhaps the undesirable branches could be culled by some deep natural law. This law, sensitive to objectively defined intrinsic value, would act as a kind of *naturalistic providence*. The Law of Karma has often been offered as a deep natural law which operates providentially. Perhaps quantum branching follows karmic principles. At present, however, this is mere speculation.

Quantum immortality involves a purely naturalistic ontology. Based on natural laws, it has natural necessity and universality. Still, the physicist Tegmark ("Many Worlds") objects that quantum immortality is based on very weak analogies. He says processes of dying are not really analogous to processes involving quantum fission. More seriously, it may be objected that the many-worlds interpretation of quantum mechanics is highly speculative. So perhaps quantum immortality has no physical basis. Nevertheless, it does illustrate the four-dimensionalist concept of a tree of branching careers.

5. Many Lives in One Career

On the one hand, any earlier stage in any process has the *active potency* to have its form projected *by itself* into some later stage in some process. If this active potency is not frustrated, the earlier stage produces some later stage under its own causal power, and it continues or persists into that later stage. A process is *self-sustaining* when and only when each earlier stage in that process has its form projected by and only by its own causal powers into the later stages of that process.[24] A *life* is a self-sustaining 4D process composed of 3D bodies. Each earlier body in any life has its form (its soul) projected by its own causal power into the later bodies in that life.

On the other hand, any earlier stage in any process has the *passive potency* to have its form projected *by some other thing* into some later stage in some process. Copiers exploit this passive potency: they use their own powers to abstract the forms of stages and to project those forms into new stages. If some god makes a replica of your body, then your body does not continue into that replica as the result of its own power. On the contrary, it continues into that replica due to the intervening power of the god. More naturally, if some machine makes a replica of your body, then your body continues into that replica due to the intervening power of the machine.[25]

Some careers contain one life while others contain many. As an illustration of a career containing two lives, consider the career of Bob. His earthly life is a self-sustaining process which persists, say, for forty years. But then Bob *teleports* to Mars.[26] Teleportation begins with transmission: Earth-Bob steps into the transmission booth on Earth; his body is destructively scanned; his total body-pattern (including his soul) is abstracted. Strictly speaking, teleportation *kills* Earth-Bob. His earthly life *ends* in the transmission booth. Nevertheless, his pattern is transmitted by radio waves to the receiver on Mars. The receiver involves a 3D printer which uses the pattern of Earth-Bob to build an exact replica. This replica is Mars-Bob, who now begins his Martian life. His Martian life is a self-sustaining process which lasts, say, for another forty years.

For patternists, teleportation makes one computationally continuous process which contains both the Earthly and Martian lives of Bob. However, this process is not biologically continuous. It is one eighty-year-long career which contains two lives separated by death. Since Earth-Bob and Mars-Bob are separated by death, patternists say that Earth-Bob is *resurrected* into Mars-Bob.[27] Mars-Bob lives after Earth-Bob dies. If teleportation is naturalistic, then this is a naturalistic example of life after death. Mars-Bob and Earth-Bob are temporal counterparts.[28] Specifically, since Mars-Bob is a future counterpart of Earth-Bob, Earth-Bob can truly say: "After my death in the transmitter, I will live again on Mars." Likewise Earth-Bob is a past counterpart of Earth-Bob. Thus Mars-Bob can truly say: "Before I was resurrected on Mars, I used to live on Earth."

Teleportation permits *multiple replication*. Perhaps there are compelling reasons to make many copies of Earth-Bob on Mars. Maybe he has expertise that is needed in several new Martian outposts, so that his superiors (who run the teleporters) want him to have replicas in all those places. Fortunately, the pattern of Earth-Bob can be beamed to many receivers, which produce Mars-Bob-1, Mars-Bob-2, and so on. Multiple replication is an example of fission, which causes many problems for advocates of identity through time.[29] However, fission causes no troubles for four-dimensionalists. Earth-Bob *will be* each of these replicas. He *will be* Mars-Bob-1, and he *will be* Mars-Bob-2. Of course, these Martian replicas are not identical to either Earth-Bob or each other.

Teleportation provides the key concepts for many other naturalistic soteriologies. Many naturalistic approaches to life after death involve careers containing many lives in many relatively isolated contexts. They involve the exploitation of the passive potencies of the body by machines, superhuman agents, or deep natural laws. Hence they resemble

teleportation. They involve the abstraction of the soul from the body and its reinstantiation in some other medium in our own or in some other universe.

6. Technological Soteriologies

Assuming patternism, there are four main technological soteriologies.[30] The first states that advanced medical technologies will slow or halt aging and cure all disease.[31] The second states that, as your organs fail, they will be replaced with artificial parts. As your organs are replaced, you will turn into a highly durable cyborg.[32] Of course, to preserve your soul, and therefore at least your computational continuity, these artificial parts will be functionally equivalent to your original organs. It is usually argued that these medical treatments and organ replacements also preserve biological continuity. If that is right, then these soteriologies entail that your career contains one very long life.

The next two technological soteriologies aim to reinstantiate your old body-program in some improved medium. The third technological soteriology is *cryonics*.[33] It promises that, when you die, the pattern of your brain or body can be preserved by freezing. After cures for aging and disease have been discovered, your brain or body can be thawed out and revived. It will then be repaired and rejuvenated. The continuity from your dying body to your revived body is informational but not biological. Your soul will be reinstantiated by your revived flesh. Cryonics is a kind of resurrection. Your career contains two lives: the first ends when you are frozen; the second begins when you are revived.

The fourth technological soteriology is *mind-uploading*.[34] Scanners will accurately map your brain tissue. But this scanning destroys your brain – it kills you. Nevertheless, mind-uploading promises you life after death. After your brain tissue has been mapped, an equivalent brain-pattern will be installed in some new robotic or software body. Mind-uploading is like having your brain teleported into some robotic or software body. As with teleportation, your career consists of two lives, one which ends when your brain is scanned and the other which begins when your brain-pattern becomes active in its new robotic or software body. Mind-uploading is a kind of resurrection. Of course, your new body won't suffer from the diseases or defects of your old carbon-based flesh.

Mind-uploading, like teleportation, permits multiple replication. Suppose *Organic* is a life that starts with ordinary conception and ends with death in the scanner. The last stage of Organic is *Fallen*. But now the people who control the uploading machinery decide to install the brain-pattern of Fallen into many cybernetic bodies. Thus Fallen will be *Risen-1,* Fallen will be *Risen-2,* and so on. Multiple uploading entails that there are many careers which have Organic as their first life. The *n*-th career consists of Organic followed by the *n*-th uploaded life. If Fallen is multiply uploaded, then her careers are defined by two rules. The *initial rule* states that Fallen has one initial life as an organic process (a life which ends with her). The *successor rule* states that, for every way the life of Fallen can continue, if that way satisfies the will of her superiors (who control the

uploading machinery), then she has a cybernetic body which will continue her life in that way.

The ontologies of these technological soteriologies are purely naturalistic. However, at present, they are all science fiction. And, even if they do become real in the future, they suffer from a fatal soteriological flaw: they do not involve any natural universality or necessity. They do not produce afterlives for everybody as the result of the operation of natural laws alone. On the contrary, they all rely on the good will of some godlike persons, namely, the doctors or roboticists who will change your dying flesh into some new artificial body. And only a few lucky people will have afterlives. The lack of universality and necessity counts against the naturalness of these soteriologies.

7. Simulism and Promotion

Some patternists (following Bostrom) endorse *simulism*. It states that our universe runs on some *Great Computer*, which was built by some engineers in some larger universe. Simulism entails that all lives, like all physical processes in our universe, are software processes in the Great Computer. But the Great Computer itself is purely physical; hence all its software processes are purely physical, so we are all purely physical things. And the engineers, while probably superhuman, are not supernatural.

Simulism permits an afterlife via *promotion*.[35] Let *Original* be an earthly human life from conception to death. The Great Computer has perfect knowledge of Original. When Original dies, this perfect digital biography survives. Now the engineers decide to bring Original into their higher-level universe by installing that biography in some higher-level body. This higher-level body will not suffer from the diseases or defects which troubled Original. The result is *Promoted*. Original continues computationally, but not biologically, into Promoted. Since Original and Promoted are two distinct lives, which are both 4D parts of some larger 4D career, Original is resurrected into Promoted.[36] And promotion, like teleportation and uploading, permits multiple replication.

Simulism can be iterated: if it is arguable that our universe is running as a simulation in some higher-level universe, then it can equally be argued that the higher-level universe is running in an even higher-level universe. Thus Bostrom (253) says simulism permits an infinite sequence of nested universes. This nested series of ever greater universes can be defined by two rules. The *initial rule* states that our universe is the lowest level universe (it contains no simulations of other universes). The *successor rule* states that every universe is running as a simulation inside of some higher level surrounding universe. The lower level universe is running on some higher level computer which was designed and created by some higher level engineers in some higher level universe

Iterated simulation, coupled with multiple promotion, entails that any earthly life can serve as the root of an infinitely ramified *tree of lives*. Every tree of lives is defined by two rules. Assuming that our earthly universe is the initial universe in the series of

simulations, the *initial rule* states that every earthly life is the initial life in its tree. The *successor rule* states that, for every way any lower level life can continue, if that way satisfies the will of the higher level engineers (who control the promotion machinery), then that life continues into some new higher level life in the higher level universe. Bostrom (253-4) suggests that the engineers use some moral criteria to determine which lives are worthy of continuation in which ways. Perhaps no lives continue endlessly. Nevertheless, continuation is always possible. A career is a linear series of lives in some tree of lives.

Simulism involves a purely naturalistic ontology. Nevertheless, promotion is not the result of natural laws. It is the result of the good will of some godlike engineers, who may or may not choose to promote you. This lack of natural necessity counts against the naturalness of promotion. Nor is it clear that the godlike engineers will promote everybody. Perhaps they will promote only the lucky few. This lack of universality counts against the naturalness of promotion. Simulism has some empirical support. It can be supported by atheistic versions of the Design Argument.[37] As a proof of concept, Lipson and Pollock have implemented a simple version of promotion. But simulism remains highly speculative.

8. Computational Monadology

Simulists say our universe runs on a Great Computer, which was built by some engineers. But perhaps no engineers are needed. For Leibniz, our universe is made of monads. One way to naturalize his monads is to treat them as computers (and Leibniz himself may have thought of his monads this way). On this view, nature is ultimately computational. All physical structures supervene on subphysical informational processes. These ideas are later taken up by Royce, who regards the basic objects of his idealism as recursive functions over the natural numbers. More generally, computers include all mathematical elaborations of Turing machines. They can have any degree of transfinite complexity.

According to the *computational monadology,* our universe is ultimately a system of harmonized computing machines. Each machine runs its own program, which directs its operations on its tapes. Each machine has an input, state, and output tape. Every human person is a machine running its soul as its program. Our input tapes include all the physical inputs to our bodies; our state tapes include the physical states of our bodies; our output states include the physical outputs of our bodies. By engaging in the computations which transform our inputs and current states into our next states and their outputs, we generate our 4D physical life-processes. All our physical relations of dependency or interaction point to other machines which are coordinated with our bodies.

As it runs, each machine generates a 4D computational process. Machines halt when their programs terminate. However, some programs, including all human souls, are intrinsically endless. Death does not really terminate any human computation. Following Leibniz (248-53), when any human person appears to die, in fact it merely ceases to be coordinated with its surrounding phenomenal swarm of simpler machines

(which made up its body and its environment). But every person continues to compute both through and after its death (a computation which is not biologically continuous). After some person dies, they may gain some new phenomenal body (they undergo *metamorphosis*). From the perspective of the person, this looks like death and rebirth. Patternists may generalize these Leibnizian ideas so that any human computation may undergo multiple deaths and rebirths.

If this naturalized Leibnizian theory is correct, then you have at least one computationally continuous career which is composed of many biologically continuous lives. The updated Leibnizian theory permits your future lives to climb through ever higher levels of glory. Perhaps after death, you will become coordinated with a swarm of superhuman machines. As you become coordinated with those superhuman machines, your own computations will shift into superior modes. Perhaps you will be reincarnated by generating new types of transfinite physical embodiment in new types of universes.

The computational monadology permits fission. Leibniz himself describes the branching careers of Sextus (305-7). Thus your careers may split over and over again, producing an infinitely ramified tree. Here the computational monadology resembles the other branching soteriologies. Deep natural laws (rather than the wills of some godlike agents) determine the ways that careers fission. And, as with mind-uploading and promotion, your branching tree of careers is defined by initial and successor laws. But, following the axiarchism of Leibniz (as discussed by Rescher), the updated monadology permits value to play a decisive role in these laws.[38] For example, an optimistic successor law entails that every life in every career will be improved in every possible way. Alternatively, some Law of Karma may regulate the way earlier lives in some career define the later lives in that career.

Since the computational monadology involves only computers, which can be described in purely scientific terms, it has a purely naturalistic ontology. Although the laws behind the computational monadology are deeper than any physical laws, they remain natural laws, definable purely mathematically. Many recent scientific writers have argued that our universe ultimately rests on computational foundations.[39] Of course, it may turn out that physics cannot be built up from computations. Computational monadology may fail on empirical grounds. At present, it remains highly speculative.

9. The Revision Theory of Resurrection

A line of patternist inspiration runs from Royce to the resurrection theory developed by John Hick.[40] For Hick, a human career is a series of increasingly excellent lives. Each life is bounded by events like birth and death; distinct lives inhabit distinct universes; it is a natural law that the end of each previous life causes the start of the next life in the next universe.[41] Dilley modifies Hick's theory by arguing for multiple resurrection: every life is surpassed by a plurality of better lives. Thus every life is the root of an endlessly ramified tree of ever better lives. Hick's theory is further naturalized by treating the lives

as 4D processes and using temporal counterpart theory to link their stages. The full naturalization of Hick's theory yields the *revision theory of resurrection*.[42]

The revision theory of resurrection (the *RTR*) is based on some ultimate natural laws. These laws, which are deeper than any merely physical laws, define the contents of nature in terms of intrinsic value (so hereafter *value* means intrinsic value). Following patternism, value is defined using computational complexity.[43] The laws that define nature in terms of value are *iterative*. They define nature as a hierarchy of increasingly valuable processes. An *improvement* is some minimal increase in value. A *progression* is an infinite series of ever more valuable processes. An improvement of a progression is some process that is minimally more valuable than every process in the progression.

The ultimate natural laws behind the RTR are the initial, successor, limit, and final laws. The *initial law* states that there are some initial minimally valuable processes. The *successor law* has two parts. Its first part states that there are always some ways to improve any process. Its second part states that, for any process, for every way to improve it, there exists some successor process which is improved in that way. The *limit law* also has two parts. Its first part states that there are always some ways to improve any progression. Its second part states that, for every progression, for every way to improve it, there exists some limit process which is improved in that way. Every limit process is infinitely valuable. The *final law* states that *nature itself* is the class of processes defined by the first three laws.

Your present earthly life is a natural process which sits at the root of an infinitely ramified tree of later superior versions of itself. Every life in your tree will surpass itself in every possible way. Your future better lives will be more intrinsically valuable. Since your life runs in our universe, the future better versions of your life will run in future better versions of our universe. Of course, your present life does not continue biologically into your future lives. But the iterative laws of resurrection ensure that, within any series of lives in your tree, the earlier lives transmit their entire biographies to the later lives, and the later lives receive their entire biographies from the earlier lives. Hence your careers are all computationally continuous. Temporal counterpart relations therefore link all the stages in any career. Thus you will always live again, in many ways, after you die. The iterative laws always act on your biographies by improving them. Since your biographies include your soul, your future lives instantiate better versions of your soul.

The RTR involves a purely naturalistic ontology. The iterative laws are natural laws, which ensure that the RTR satisfies naturalistic demands for necessity and universality. All will be resurrected. Several arguments provide some empirical justification for the RTR. These arguments are complex and can only be pointed to here. Gödel makes an argument from the rationality of nature to life after death. His reasoning can be adapted to support the RTR. Shade makes an argument from the rationality of morality to life after death. His reasoning can also be adapted to support the RTR. Evolutionary arguments, inspired by the atheistic writings of Dawkins, can be made for the iterative

conception of nature which underwrites the RTR.[44] All these arguments are highly speculative.

Axiarchic arguments also support the iterative laws of nature and hence the RTR. For axiarchists, the ultimate sufficient reason for all concrete things is some natural principle which essentially involves value. Rescher and Leslie develop axiarchic principles which entail that nature is maximally filled with value.[45] Both Rescher and Leslie give empirical arguments for their principles.[46] But the best way to define any maximal totality is to use the techniques developed in mathematics. Mathematicians use iterative rules to define the maximally long line of ordinal numbers and to define the maximally rich hierarchy of sets. Therefore the best way to define nature is to use the four laws of iterative axiarchism. Of course, this reasoning is extremely speculative.

10. Conclusion

A series of soteriologies has been developed here. Most of these soteriologies say that you have at least one career which contains a plurality of lives. Many of them say that you have many careers which overlap to form a branching tree. And, finally, the RTR says that these careers run into the transfinite, so that your tree of life is an infinitely ramified tree of many lives in many universes. The RTR entails that every life is surpassed in every greater way by some greater version of itself. If the laws behind the RTR are fully generalized (as the axiarchists urge), then every part of nature is surpassed in every greater way by some greater version of itself. Every life, family, society, species, ecosystem, and universe is surpassed in every greater way by some greater version of itself.

If every part of nature is surpassed in every greater way by some greater part of nature, then nature is the self-surpassing surpasser of all; but Hartshorne said that "God is the self-surpassing surpasser of all" (20); hence nature resembles God. And if every part of nature is surpassed in every greater way by some greater part of nature, then nature is that than which no greater is possible; but Anselmians say that God is that than which no greater is possible; hence nature resembles God. At this point, *pantheists* will just identify God with nature. But this identification can be challenged: since nature does not satisfy the theistic definition of God, and since that theistic definition is so deeply entrenched, referring to nature as God may be little more than confusing. Avoiding the term "God", religious naturalists may simply declare that nature is *divine*. Nature is that in which we live, move, and have our being. And, if every part of nature is surpassed in every greater way by some greater part of nature, then nature is also that in which we have our salvation.

Notes

[1]Many naturalists unfortunately seem to adopt versions of positivism or verificationism which were refuted long ago. Salmon provides an account of justification which avoids the problems with old-fashioned positivisms and verificationisms.
[2]Fales discusses the naturalistic rejection of substance dualism, while Lamont provides excellent naturalistic criticisms of traditional dualist soteriologies.
[3]Hobbes argues that bodies are analogous to machines in the Introduction to his *Leviathan*. Locke uses mechanical analogies in his discussion of the persistence of living things in *Essay* II.27.5. La Mettrie argues that human persons are machines. d'Holbach discusses his mechanistic understanding of human persons in *System* chs. 6 through 18.
[4]Bawden, writing in 1908, is inspired by nineteenth-century work in biology to develop an early patternist theory of persistence. He is an early functionalist. He also uses his patternism to develop a naturalistic theory of life after death.
[5]Wiener inspires Mouton. Mouton develops a patternist theory of personal persistence, which he applies life after death. Mouton later inspires Hick.
[6]Writers like Fredkin, Moravec, Dennett, Tipler, Kurzweil, and Bostrom,whose ideas are so deeply influenced by computer science, can be referred to as *digitalists*. For digitalist metaphysics, see Steinhart, *Your Digital Afterlives,* chs. 2-3.
[7]See *De Anima*, 412a5-414a33.
[8]Following Putnam and Block, many patternists embrace functionalist theories of the mind. More generally, as Barrow and Tipler report (659), the soul is to the body as software is to hardware. Tipler writes that the soul is "a specific program being run on a computing machine called the brain"(1-2). Bodies are finite state machines running souls as their programs. Burks argues that every body is a finitely complex machine. Tipler writes that a human body is "a finite state machine and *nothing but* a finite state machine" (31). For substrate independence, see Bostrom, sec. 2.
[14]Hales & Johnson use relativity to support four-dimensionalism.
[15]Temporal counterpart theory is based on modal counterpart theory. For developments of temporal counterpart theory, see Sider and also Hawley.
[16]Adams uses computational concepts to analyze personal persistence.
[17]Davidson says that *Swampman* is his accidental double, generated from the random assembly of atoms once in some tree. According to Rosenberg (27-8, 91), quantum mechanics implies there is some very small but non-zero probability of your *Boltzmann double* appearing out of a random quantum fluctuation. Tegmark (in "Parallel Universes") argues that you have infinitely many accidental doubles scattered throughout the vastness of space-time. Since they instantiate your soul, these accidental doubles are your counterparts. However, you do not send your pattern to them and they do not receive their patterns from you. Since they do not carry any information about you, they are not your *future* counterparts and they do not provide you with any life after death.
[18]Dretske (26-39) shows that the flow of information does not require causality.
[19]Moravec (187-90) and Price (221-2) discuss quantum Russian roulette.
[20]The use of tensed expressions parallels the use of modal expressions. You *might* be rich (because you have a counterpart in some possible world who is rich) and you *might* be poor (you have a counterpart who is poor); but you *cannot* be both rich and poor (you have no counterpart in any possible world who is both rich and poor).

[24]For self-sustaining processes, see Zimmerman ("Immanent Causation").
[25]Wiener (96-102) is an early patternist who talks about using a kind of fax machine to make replicas of human bodies.
[26]Parfit (in *Reasons and Persons,* 199-201) provides the classical discussion of teleportation. Parfit there also discusses multiple replication.
[27]Teleportation is a naturalistic example of *resurrection by reassembly,* which according to Bynum was the dominant theory of resurrection until the late Middle Ages.
[28]Mars-Bob is not identical with Earth-Bob. van Inwagen uses this lack of identity to try to refute all patternist (or Aristotelian) theories of life after death. But for patternists, who reject identity through time, this lack of identity is not relevant.
[29]Parfit (in "Personal Identity") introduces the problems fission raises for identity through time. Lewis (in "Survival") presents the classical four-dimensionalist approach to fission.
[30]A fifth technological soteriology is the Omega Point Theory of Tipler. It argues that all earthly lives will be resurrected in some Great Computer (the Omega Point) which will emerge at the end of time. Oppy shows that the Omega Point Theory suffers from many apparently fatal problems. It is almost certainly false.
[31]See de Grey & Rae.
[32]See Kurzweil.
[33]See Ettinger.
[34]The first discussion of mind-uploading is in Moravec (ch. 4). Kurzweil (chs. 3 & 4) talks about the technicalities involved in mind-uploading. For a survey of mind-uploading, and its associated metaphysics, see Steinhart, *Your Digital Afterlives,* ch. 4.
[35]The first discussion of promotion is in Moravec (152-3). Promotion is further developed by Bostrom (254). For a survey of promotion, and its associated metaphysics, see Steinhart *Your Digital Afterlives,* ch. 5.
[36]The concept of an afterlife via promotion is highly similar to the theory of resurrection by particle-fission developed by Zimmerman in "Falling Elevator".
[37]For simulism as an atheistic interpretation of the cosmic design arguments, especially the fine-tuning arguments, see Harris (73) and Dawkins (98-9).
[38]Axiarchism says that reality is ultimately ruled by value. Leibniz's axiarchism is found in his doctrine of the striving possibles (171, 188, 191, 206). While some axiarchists, like Leslie, use non-natural theories of value, Rescher uses natural value.
[39]For arguments that our universe ultimately rests on computational foundations, see Fredkin, Schmidhuber, and Zeilinger.
[40]Hick develops his resurrection theory in *Death and Eternal Life* (chs. 15 & 20). Hick was inspired by Mouton (295 fn. 8), who was inspired by Wiener. And Hick was directly inspired by Wiener (281-3). But Wiener was a student of Royce. Apart from Hick, several Christian writers have used patternism to develop quasi-naturalistic resurrection theories. See Reichenbach (27), Polkinghorne (180-1), and Mackay.
[41]Hick says distinct lives are bounded by birth and death (456); they inhabit distinct universes (279); they are joined together by natural laws (287).
[42]Steinhart (in "Revision") develops the revision theory of resurrection.
[43]For an analysis of intrinsic value in terms of computational complexity, see Steinhart, *Your Digital Afterlives,* ch. 6.

[44]Evolutionary arguments for the RTR are made by Steinhart in "Revision" and in *Your Digital Afterlives,* ch. 6.

[45]Rescher and Leslie develop axiarchic principles which assert that nature is that than which no better is possible, or, equivalently, that it is maximally filled with value. Rescher develops these principles in *Riddle* (43) and "Optimalism" (815). Leslie develops them in *Value and Existence* (secs. 11.21-22) and *Infinite Minds* (6, 135-6, 148-9).

[46]Rescher gives empirical arguments for axiarchic principles in *Riddle* (chs. 1, 3, 5), while Leslie gives them in *Value and Existence,* chs. 6-8.

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