FROM CHAOS TO QUALIA
AN ANALYSIS OF PHENOMENAL CHARACTER
IN LIGHT OF PROCESS PHILOSOPHY AND SELF-ORGANIZING SYSTEMS

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CHAPTER 1

INTRODUCTION

Overview

I propose that qualia – typically considered to be the purely subjective, qualitative elements of experience – can be characterized as what Alfred North Whitehead calls *actual entities*. Whiteheadian actual entities are discrete processes with both subjective and objective aspects supporting both internal and external relations. Given my understanding of the nature of Whiteheadian actual entities, I will go on to suggest that such entities are the kinds of entities that tend to self-organize. Thus, in effect, I will end up proposing that the actual world may, in fact, be a self-organizing web qualia. That is to say, a system of interdependent discrete entities whose dynamics can, upon close analysis, be seen as underlying the highly complex structured nature of conscious experience, including the organization of what we understand as the physical laws of nature postulated by science. Because Whiteheadian actual entities have intrinsic natures that ground the subjective/phenomenal aspects of experience and exhibit extrinsic relations capable of grounding physical properties,¹ we find that qualia – normally associated with the purely mental – can be understood as the metaphysical ground of both

¹ David Chalmers – famous for his characterization of "the hard problem" – does not explicitly address Whiteheadian metaphysics in his most well-known work, *The Conscious Mind*, he does briefly refer to an approach similar to the one taken here. On this approach, which he views as a version of idealism, the world "consists in a vast causal network of phenomenal properties underlying the physical laws that science postulates." See David Chalmers, *The Conscious Mind: In Search of a Fundamental Theory* (New York: Oxford University Press, 1996), 155.
mental and physical properties. In general I will go along with Leopold Stubenberg in saying that "qualia are not properties of matter; they are what matter is made of."²

To help frame the discussions to follow, let us begin by considering the question: "Why should anyone seek a philosophical or scientific understanding of the qualitative nature of experience?" Like most people, I adopt what Philip Robbins and Anthony Jack call a "phenomenal stance"³ toward a great many living creatures. To adopt the phenomenal stance toward some entity is to understand it as a phenomenal system, that is, to regard the entity as a locus of phenomenal experience. We do this routinely in daily life. We generally do not believe that rocks or clouds have phenomenal experience, but most of us suppose that human beings, dogs, and probably squirrels do. Concerning bees, mosquitoes, earthworms, and single-celled creatures, we are generally uncertain. The possibility of intelligent robots in our near future could expand the grey areas considerably.

The importance of all of this hits home when we consider the role of the phenomenal stance to our emotional and moral lives. Taking a phenomenal stance toward something involves accepting it as a subject of special emotional and moral concern. As Robbins and Jack point out:

Phenomenal states, and phenomenal consciousness in general, have moral value for the observer. We care about what others are experiencing, and we care about it for its own sake. For example, part of what it is to regard something as a locus of experience is to treat it as something that one ought to shield from harm.⁴

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⁴ Ibid., 70-71.
We are emotionally inclined and morally obliged to take the experiences of other beings into consideration, so, for anyone with a philosophical disposition, it seems natural to wonder what is this "phenomenal stuff" that we are so concerned about?

Another consideration can be offered in terms of what is sometimes said to be the dehumanizing impact of prevailing mechanistic/materialist metaphysical assumptions inherited by modern generations. Standard reductive materialism enjoys the default status of being seen as the most rational and scientifically supported approach. Reductive materialism assumes that the fundamental elements studied by physics consist of purely objective particles whose behaviors are completely governed by external laws. Many people assume that issues of free will and meaning require leaps of faith and flirtations with irrationality that are not required on the standard materialist account. What these folks may not realize is that materialism, as a form of metaphysics, is itself highly speculative and arguably beyond reason.

We know from our own experiences that experiences exist, whereas we can only infer the existence of fundamentally non-experiential, purely objective elements of reality. As Berkeley pointed out, our immediate experience provides only two meanings of 'to be': (1) to perceive and (2) to be perceived. For seemingly obvious logical reasons, we simply cannot experience things that are, in their essence, beyond experience, or completely independent of experience. So why should we think it is more rational or more scientifically astute, to believe that the world is made of purely objective little chunks of stuff than to believe that all things are, in some way, intrinsically experiential?
I'm not claiming that we ought to become idealists; I'm simply pointing out the dangers of uncritically assuming that standard materialism has earned the right to be seen as the default rational approach. Materialism is a metaphysical position, not a scientific theory. Scientific data does not favor materialism over the non-materialistic alternatives. For the most part, science is silent on metaphysical positions, but it is certainly interesting that nowadays our best fundamental theory of physics does not even allow us to talk about the position of an elementary particle between measurements. This doesn't prove Berkeley right, but it certainly encourages us to think deeply about the fundamentally interactive nature of measurement and possibly the role of experience in the world.

Along these same lines, I want to emphasize the intimate link between consciousness and value. I submit that a major reason why the phenomenal nature of consciousness seems to defy purely physical explanation comes down to this: The very concept of consciousness implies an ability to take a phenomenal stance, which links us directly to concepts of value and morality. Rational thought presupposes value, and thus cannot explain value. When all is said and done, some phenomenology of valuing must be assumed before any sort of physicalist explanation can even get off the ground.

Put simply: it is plausible to suggest that qualitative experience is fundamental to reality, and to suspect that the phenomenology of human experience might provide clues to certain primordial aspects of reality. If the proposal to be offered in this thesis is on track, then we don't have to build a theory of consciousness by starting with an explanation of how qualia emerge from the relatively simple, objective particles and forces of physics. Instead of the materialist's "hard problem," we will have a "chewy
problem" – the need to explain in what sense electrons are experiential without embracing the intuitively odd notion that they are somehow a little bit conscious. This is still a difficult problem, but I submit it is the right problem to tackle.

The truly grand questions of life and consciousness will not be answered in this thesis. Simply explaining what it means to claim that the actual world is a self-organizing system of qualia is an enormous task in itself and will be more than enough for our current project. Further endeavors, such as drawing out the possible aesthetic, moral, and spiritual implications of this claim will not be attempted here, except to the limited extent that such discussion helps to illuminate the claim itself. The same can be said for the monumental task of defending this thesis from all angles of attack. My goal is simply to inspire interest in the proposal because I believe that this approach to understanding the nature of experience and consciousness holds great promise for further development and is worthy of considerable contemplation, even if, in its present form, it ultimately fails to survive the onslaught of attacks that will surely be launched against it.

To adequately conceive of the actual world as a self-organizing system of qualia – where the nature of qualia is to be cast in terms of Whiteheadian actual entities – we will need to grapple, to some degree, with several of the most difficult and perplexing challenges facing philosophers and scientists. The term 'qualia', for example, is closely tied to what has become known as "the hard problem of consciousness." The hard problem is called the hard problem precisely because, (according to those who believe that there is a hard problem), qualia are not simply unexplained by modern science; they seem unexplainable by standard scientific means. Qualia are, as David Chalmers says,
"metaphysically baffling" (Chalmers 1996, 4) insofar as we seem unable to reduce them to fundamentally physical elements. As Chalmers puts it: "One can image all the physical facts holding without the facts about consciousness holding, so the physical facts do not exhaust all the facts" (Chalmers 1996, 131).

Although I will not attempt to entirely untangle the mysteries of consciousness here, I will suggest ways in which the Whiteheadian approach taken here offers its own agenda to the debates over consciousness. If qualia are Whiteheadian actual entities, then there is no "hard problem" of figuring out how the subjective, qualitative character of experience arises from purely objective matter because, on Whitehead's account, there is no such thing as purely objective matter. For Whitehead, every actual entity is an inherently "di-polar" self-creative process, which is to say, it is essentially physical and conceptual. The challenge then becomes twofold: The first problem is simply to explain what it means to equate qualia with actual entities. How can "the blueness of blue" be understood as a self-creative process? How can it be inherently subjective and objective? How can it contribute to causal chains in the physical world?

In Whitehead's organic philosophy, all actual entities are experiential, but the vast majority of them are not conscious, which brings us to the second major problem, namely: How exactly do we explain the distinction between conscious and unconscious experience? If atoms and molecules are not conscious, then how does the fact that they are experiential in some sense help us to explain consciousness? Even upon accepting Whitehead's metaphysics, we still lack a full theory of consciousness that allows us to
look at a particular physical system and say whether this system does or does not consciously experience the world.

In this thesis I will discuss the first problem (how can we equate qualia with actual entities) in some depth, but I can only touch upon the second problem (the nature of consciousness, in contrast with a more general notion of experience). I hope to show that, unlike the hard problem of deriving a plausible theory of consciousness from traditional materialism, the problem of deriving a plausible theory of consciousness from Whiteheadian process philosophy seems more manageable. We do not need to build the world from intrinsically simple, purely objective "vacuous actualities." Process philosophy does not give us a full-blown theory of consciousness, but it does provide good metaphysical ground upon which to approach the question.

If we are to understand qualia in terms of Whiteheadian actual entities, then we must accept the notoriously difficult challenge of understanding Whitehead's process philosophy. I will focus on only three of Whitehead's central concepts, but given the systematic and web-like structure of his organic philosophy, we will need to explain numerous other Whiteheadian ideas as well. It is also worth noting that Whitehead was greatly inspired by the early formulations of quantum mechanics. Following Whitehead's inspiration, we will be led into a brief but challenging confrontation with quantum theory. No math will be required, but we will need to contemplate the idea that mere possibilities are real, even though they do not actually exist.

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On the approach taken here, the interdependent nature of actual entities, and thus their self-organizing behavior, depends on the reality of mere possibilities. Whitehead says: "The fact of incompatible alternatives is the ultimate fact in virtue of which there is definite character." Quantum mechanics gives us a way to deal, mathematically and scientifically, with the reality of non-actual events. Conscious experiences are always actual events, but the subjective aspects of experience – precisely those aspects that are so metaphysically baffling – owe much of their fundamentally unpredictable, initially private nature to non-actualized reality. In short, I will suggest that qualia have fundamentally subjective aspects precisely because the world must choose, on the basis of some evaluative criteria, from a range of pure possibilities.

A preference structure applied to this realm of pure possibilities can be thought of as providing probabilistic rules for the actualization of the world. Discrete, interconnected entities spontaneously expressing their individuality in relation to the whole are the kinds of things that tend to self-organize. If I succeed in equating qualia with actual entities, then the self-organization of actual entities becomes, in effect, the self-organization of qualia. This holds out the promise of someday being able to model the emergence of consciousness using cellular automata or neural networks. In light of all of this, we will take a brief look at the heady realms of chaos, complexity, and dynamical systems. Virtually no math will be required to deal with the basic principles, but our powers of imagination will be heavily exercised.

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6 Ibid., 241. Later we will come to understand definite character in terms of positive and negative prehension, or self-defining limits.
In short, this thesis interweaves four of the most deeply perplexing realms of thought available to modern thinkers. Here – very briefly, and in the broadest of possible brush stokes – is how I see all of these difficult ideas fitting together:

1) We avoid the standard hard problem of consciousness by positing that the subjective, qualitative aspects of experience are fundamental, roughly in accordance with Whitehead's philosophy of organism.

2) We avoid traditional forms of panpsychism, idealism, and Cartesian dualism by identifying qualia with Whiteheadian actual entities, which are fundamentally experiential, but generally not conscious. Here I will also draw on the work of Leopold Stubenberg, who attributes to Herbert Feigl a position he calls "the other identity theory." According to Stubenberg: "Everyone is familiar with the slogan of the mainline version of the identity theory: the mind is the brain. The slogan for the other identity theory might read: the brain is made of qualia" (Stubenberg 1998, 300).

3) We can shine some light on what some consider to be the "spooky" and "irrational" realm of the "non-physical" by coming to understand it in terms of the real-but-non-actual realm of pure possibilities. Since this realm has been successfully incorporated into the theoretical structure of quantum mechanics, our concept of qualia need no longer be cursed with the belief that it must forever remain unscientific due to its supposed "non-physical" nature.
4) Incorporating the principles of self-organization into our discussion allows us to naturalize the choice-making process, if we wish. Those who have faith in a divine creator are certainly welcome to envision God as the ultimate evaluator, but if one accepts the principles of self-organization as brutishly fundamental, then one need not embrace any traditional form of theism in order to account for the complex structured nature of the empirical world.

While analyzing and interweaving the four difficult concepts mentioned above, it may be useful to keep in mind a trio of themes that will run throughout our discussion. Still keeping our brush strokes very broad, these three major themes can be labeled as follows:

1) Being vs. Becoming
2) Monistic Reality vs. Pluralistic Actuality
3) Conscious vs. Unconscious Processes

Let's take a brief look at each of these major themes.

**Being vs. Becoming**

Experience is often thought to be a process (a becoming) that *happens to* a being, or is a *property of* a being. The proposal offered in this thesis radically re-writes this way of conceiving the world. Instead of experience understood as *happening to* a being, we
have "being-ness" (always implying a sense of potential otherness and objective existence) emerging from intrinsically experiential components; indeed, we will try to understand experience itself as largely composed of a dynamic web of internally-related subjective feelings as objectively given, which is to say, as an intrinsically dynamic web of qualia. The apparent objective otherness of other entities, on this view, derives from their given-ness as the initial constituents of the becoming moment. I perceive Cleopatra as "other," because she is given as an initial constituent of the present moment. She is a particular subject who is repeated in the present moment as an object, which is to say, as a given constituent out of which I am constructed. Her being-ness is her given-ness as an initial constituent of the present moment. Thus her being-ness is not a self-contained absolute – it is not an independent "this-ness" – rather, her being-ness is an emergent relation, specifically, her role as a given component in the construction of various subjects in various moments.

Monistic Reality vs. Pluralistic Actuality

The internal nature of relations between qualia can be understood as grounded in the monistic nature of reality. Reality as a whole is a single process – Whitehead’s “extensive continuum” – and is thus monistic in the sense that every act is ultimately an act of the World, albeit the World as self-limited. The self-limiting aspect of the World gives rise to actuality, which is genuinely pluralistic; actual entities are discrete entities, each one limited and unique. Reality is monistic in the sense that each and every moment of decision, no matter how trivial, is a process in which the actual world-as-a-whole (as
given in the initial phase of the process) transcends itself by actualizing possibilities that
had not previously been actualized, keeping in mind that the process of actualizing a
possibility can be characterized as manifesting a self-defining limitation. The important
point is that the World's "creative advance into novelty" (Whitehead 1978, 222) is not an
advance made by an isolated individual within the world (indeed, the actual individual, as
such, emerges within the process, and thus does not actually exist until the process is
complete), but rather, the advance is made by the World Itself — the monistic whole of
Reality as repeated in (given in, or self-presented in) the initial phase of the moment. Notice that, for brevity, I will often refer to the "world-as-a-whole" as the "World" with a
capital 'W' to remind us that we are thinking of a genuine unity that is, in an important
sense to be discussed later, more than a mere heap of parts.

Due to the interplay of monistic reality and pluralistic actuality, the World does
not advance temporally like a string of pearls, with one and only one actuality following
from a given state. The World is a highly complex set of vectors, which is to say, that any
given moment can be thought of as an entire history pointing in infinite directions toward
possible futures. The World, in any given moment of creative advance, is comparable to
an organism giving birth not to a single offspring, but to an infinite family of
contemporaneous offspring — an infinite litter of siblings. Each of these siblings is a
unique actuality, which is why we say that the actual world is genuinely pluralistic. But
with each litter, the boundaries of the whole expand, so that now the new generation of
offspring constitutes the new world-as-a-whole. But, as we will see, this new whole is not

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7 See Whitehead 1978, 83, for an example of Whitehead discussing the world as given to an entity, and thus limiting itself.
merely a collection of individuals that can be *conceived of as* a whole. Despite the plurality of actual entities, reality itself remains a *genuine, seamless unity*. And when this new unity gives birth, it gives birth to another genuine plurality of actual entities that once again form a genuine unity. This *one-many-one* cycle endlessly repeats.

*Conscious vs. Unconscious Processes*

Reality is experiential to the core, but this does not mean that every process is conscious. Indeed, even processes within the mind or brain are often unconscious.\(^8\) Whitehead is often interpreted as a panpsychist, but I will not adopt this interpretation here. On the current proposal, a potential for consciousness will be understood as intrinsic to the world, but we will *not* say that an electron is "a little bit conscious" or "conscious to some minuscule degree." An electron will be understood as intrinsically qualitative and thus *experiential* in some basic sense, but not conscious in any sense. Paraphrasing Feigl, I will say that there are some small regions of the world (i.e., brains) that are "illuminated by the inner light" of consciousness.\(^9\) Panpsychism, in contrast, assumes that the “illumination” pervades *all* of reality.

We will not adopt a phenomenal stance toward electrons, but we will explore the idea that the *World* may be thought of as conscious in some brute sense – not necessarily conscious of Itself as a whole, but conscious *as a whole* in every individual conscious

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\(^8\) See *Process and Reality*, 85, for example, where Whitehead says: "Mental operations do not necessarily involve consciousness."

moment. This is an important and subtle point, so let me reiterate: I will not claim that every actual entity is conscious, but I will suggest that if an individual entity is conscious, it is, in a sense, the World that is ultimately conscious in this moment. We still need to understand how to conceive of unconscious experience, and explain how it relates to consciousness. This problem will be addressed, but not ultimately solved, in the pages ahead.

These three major themes – being vs. becoming, monistic reality vs. pluralistic actuality, and conscious vs. unconscious experience – will emerge in many different contexts throughout this thesis. The basic idea is that, despite the obvious sense in which the world can be said to be composed of a collection of causally interacting individual entities, the possibility of consciousness as we experience it may be rooted in an underlying monism, which is to say, the-world-as-a-whole or reality understood as a fundamentally unitary, eternal process composed of both actual occasions and pure possibilities. The fundamental elements doing the processing are not inanimate objects, nor are they low-grade conscious entities. They are unconscious particular subjective feelings repeated as the objectively given initial conditions out of which any particular moment of existence is constructed; they are, as Whitehead says, "drops of experience" (Whitehead 1978, 18).

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10 Whitehead himself seems to encourage this sort of thinking, for example when he says that an actual occasion "…is the whole universe in process of attainment of a particular satisfaction" (Whitehead 1978, 200).
Before moving into the heart of Whitehead's process philosophy, I want to further set the stage by offering some general remarks on the phenomenological nature of experience, explain my slightly unconventional use of the word 'qualia', and outline my reasons for wanting to identify qualia with Whitehead's actual entities. I will not offer any detailed arguments against those who say that there are no qualia, but I will indicate my reasons for thinking that qualia do exist and why their nature stands in need of explanation.

Phenomenology

The term 'experience' is such a common word in everyday conversation that we generally don't stop to consider what a strange and amazing concept it is. I suggest that the central mystery of existence is not just that there is a world, but that there is conscious experience of a world. A world without conscious experience would be no mystery at all, since there would be no one to feel the sense of bafflement or the flush of excitement that characterizes a confrontation with the unknown or paradoxical.

But what is conscious experience? If we are cognizant enough to understand the question, then we already have some intuitive understanding of the answer. The problem is to characterize this intuition carefully enough so that we can deal with it in the context of a more or less formal theory. I cannot give a rigorous, fully-satisfying definition of consciousness here, but for my present purposes I will say this: A conscious entity is a society of Whiteheadian actual entities that anticipates possibilities, contrasts these possibilities with the given actual world, and is complex enough to engage in self-
referential behavior directed toward *internally-constructed goals*. Thus, expectation, categorization, and evaluation are key aspects of consciousness that will concern us here.\(^{11}\) Phenomenologically, what all of this boils down to is an indexical "me-here-now" form of experience.

But we might still wonder: What *is* conscious experience? First of all, I want to chime in with Chalmers in saying that "consciousness is not an explanatory construct, postulated to help explain behavior or events in the world. Rather, it is a brute explanandum, a phenomenon in its own right that is in need of explanation" (Chalmers 1996, 189). How we *feel* about the world – our sense of who we are, what we are, and our role in the world – is an important factor in human life and human behavior, even if science forever fails to explain exactly how it all works. Scientific explanation, after all, is not the be-all and end-all of knowledge and wisdom. Conscious experience is probably a brute reality of life, but if I am right in suggesting that qualia are processes, then a great deal may still be learned about the nature of consciousness, brute or otherwise.

What we immediately know to exist are the contents of our immediate *experiences*. We owe this line of thinking to Descartes – a philosophical approach often referred to\(^{12}\) as "the Cartesian turn," and what Whitehead characterized as the invention of the *subjectivist principle*. Whitehead accepts the subjectivist principle to some extent, but offers an important modification. From the fact that our knowledge of the world is based on our experiences, it does not follow that our *experiences* stand *between* us and

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\(^{11}\) Whitehead discusses consciousness on page 188 of *Process and Reality*, saying that "…a felt ‘contrary’ is consciousness in germ. When contrasts and identities of such feelings are themselves felt, we have consciousness."

\(^{12}\) See, for example, Richard Rorty in Kline 1963, 134.
the world. Descartes correctly saw the importance of immediate experience, but he assumed that these experienced qualities are *externally* related to the world, which is to say, he supposed that, at least in principle, the physical world could be what it is with or without experience, and experience could be what it is with or without the physical world. What we call “the physical world” could just be a dream, or a figment of our imagination. An alternative to Descartes’ approach is to suppose that our experiences and the world are *internally* related, which is to say, mutually interdependent. Experience is what it is because of the world, and the world is what it is because of experience; neither can exist without the other.

My proposal is this: When I perceive a chair, it is *not* the case that my experience is nothing but a brain-based process triggered by an ontologically independent via light waves hitting my retina, and so on. It would be better to say that the chair, my brain, and the light are all made of qualia. The qualia composing my brain allow the qualia composing the chair to present themselves in a *subject-seeing-a-chair* process. My brain *filters out* a great deal of what it determines to be *not-chair*, thus allowing the chair to emerge as a portion of my conscious experience. We might clarify this concept of filtering as follows: Starlight enters our eyes even in the daytime, when we are not aware of it *as* starlight. One might say that when the sun sets, the earth acts like a “filter” that removes the sunlight so that the starlight can be recognized *as* starlight. Analogously, the very *existence* of a chair means it is constitutive of *all* of my experiences, even when I am not consciously aware of the chair. Everything that exists is a constituent of every
experience. A brain is essentially a World-process by which certain constituents of the World are filtered out so that others can be brought into the foreground, so to speak.

Qualia, Consciousness and Subjectivity

Experiences are complex. When talking about experiences in terms of the assorted elements that contribute to qualitatively identifying the experience as the particular experience that it is, philosophers find it convenient to use the word 'quale' – the plural of which is 'qualia'. The term 'qualia' was introduced by C. I. Lewis\textsuperscript{13} to indicate the "recognizable qualitative characters of the given." For examples of qualia, Lewis used red, blue, round, and loud. Of course these words are often used to refer to properties of physical objects, but Lewis emphasized that qualia are not properties of physical objects; they are the properties of what is directly given in experience. Notice the assumption that the things directly given in experience are not properties of the world.\textsuperscript{14}

A quale, as I wish to employ the term, is a discrete constituent element of experience. When holding an apple, for example, the feeling of smoothness in my hands is an example of a quale. My experience of holding the apple would not be this particular experience if it were not for this particular feeling of smoothness. As it happens, the term 'qualia' has greatly evolved over the decades, and is now used by many different people in many different ways.\textsuperscript{15} Despite the plethora of uses, the word still evokes a core

\textsuperscript{13} See Lewis 1929, 121.
\textsuperscript{14} A convenient introductory discussion of qualia, including Lewis’ distinction between qualia and properties can be found in William S. Robinson's web essay, *Qualia Realism*, at: http://host.uniroma3.it/progetti/kant/field/qr.htm
\textsuperscript{15} Tim Crane provides a helpful overview of the different uses of the term 'qualia' in his essay *The Origins of Qualia* (See Crane 2000, 169).
concept that I believe is worth noting. This core concept, inspired by the Cartesian turn, is simply *that which is directly experienced*. I also accept Thomas Nagel's\textsuperscript{16} characterization, such that qualia are *what it is like* to have a given experience. This characterization of qualia does not force us to accept that there are non-physical or mental entities *apart* from the physical constituents of the world. I want to avoid building dualistic metaphysics of any sort directly into the meaning of 'qualia'.

What I *do* want to do is to simply keep in sight the seemingly unavoidable mystery of conscious experience, including the profound mystery of subjectivity, and I believe that using the term 'qualia' is one way to help keep this mystery at the forefront of our minds. I want to know why certain physical systems become *consciously aware of the world* — a qualitative awareness that, in human consciousness, seemingly always involves some degree of a "me, here, now" feeling, along with a feeling that there are objects apart from the "me-who-is-here-now." My desktop PC is a complex physical system that takes inputs and generates outputs, but I do not take a phenomenal stance toward my computer; I don't believe that it *notices* the blueness of blue; I don't suppose that there is anything *it is like to be* my computer. But why not? Are there certain processes that engineers could, in principle, add to my computer that would make it "wake up" and *feel alive*?

I have identified qualia as being the fundamental constituents of experience, but I have not stipulated that all qualia are necessarily the constituents of *conscious* experience. If there can be unconscious experiences, then presumably there must be

\textsuperscript{16} As found in *What is it Like to Be a Bat?* (See Block 1997, 519-27)
qualia serving as the fundamental constituents of them as well. If we allow the term 'qualia' to pick out the fundamental constituent elements of both conscious and unconscious experience, then we must explain the difference between conscious and unconscious experience in such a way that the one-and-same constituent elements can compose both. All of this presumes, of course, that we can make sense of the notion of "unconscious experience" in the first place, so let me say a few words about this.

One minute ago I was not thinking of bananas. I've eaten plenty of bananas, and I know a lot about bananas, but a minute ago the qualia constituting my experience in that moment masked the "banana-like" qualia. Some might say that the banana-like qualia that partially constitute my conscious experience right now, simply did not exist a minute ago. I, however, am proposing that these one-and-same banana-qualia did, in fact, exist a minute ago, but because my brain failed to filter out the non-banana qualia in a banana-revealing way, I was not consciously aware of banana qualia.

I wish to refer to unconscious choice-making processes as experiential because the elements constituting these processes are essentially no different than those that make it into the focal awareness of consciousness. A fish that gets caught in a net is not fundamentally different than a fish that does not get caught; it's just that their histories differ. Where qualia are concerned, these historical twists are part of a World process (not just a brain process) by which something qualitatively new is added to the actual world. If we equate qualia with Whiteheadian actual entities, then the ultimate role of a quale is not just to be what it is, but also to contribute to the ongoing emergence of the World. Qualia beget qualia.
Let me take a moment now to say a few things about subjectivity. According to Whitehead, actual entities have both a subjective and objective aspect. If we accept subjectivity as fundamental, then we excuse ourselves from having to explain why it exists (one is not committed to explaining the existence of brute facts – they "just are"), but we still have to be as clear as possible about *what it is*. According to Whitehead, the subjective aspect of an actual entity "is nothing else than what the universe is for it, including its own reactions" (Whitehead 1978, 154). I want to highlight the last six words of this quotation because I believe they get to the heart of subjectivity.

Let me begin with the word 'for'. The notion of the universe as it is *for* some entity implies that the entity has a perspective. Here I will focus on just the idea that an entity being something *for* something implies the embodiment of a subject in the context of a world. Entity B cannot be something *for* entity A, unless both A and B already exist in a web of interrelated meanings, i.e., a World. If we generalize the concept of "B as it is for A" in such a way that A does not have to be a conscious person, then we arrive at Whitehead's root concept of subjectivity. The world is always the world *for* an entity. In its most generalized form, this is just the concept of perspective. In this generalized form, the concepts of 'subject' and 'world' imply each other. One simply cannot have a world without subjects, or a subject without a world because the world just is a complex web of interrelated subjects and subjective perspectives.

Now let us consider the closing words in the above quotation. The subjective aspect of an actual entity is nothing else than what the universe is for it, "*including its own reactions.*" This introduces an interesting self-referential aspect to the concept of
subjectivity. Not only is the world presented for a subject, but the subject itself (or, at least, some part or aspect of the subject) is presented as it is for itself. Thus, an intrinsic aspect of being a subject is to present itself, to itself, as something for itself. Thus a subject must be both "toward others" and "toward itself as other," and this logically-grounded duality becomes the foundation for what we commonly refer to as 'subjectivity' and 'objectivity'. Subjectivity and objectivity are inextricably intertwined, but for the purposes of everyday language, subjectivity ends up referencing the "toward-itself" (as-object) aspect, while objectivity end up referencing the "toward-other" aspect of the logical duality. In light of all of this, I want to point out how absurd it is to try to derive subjectivity from what is imagined to be a purely objective physical world. There simply is no "purely objective" reality out of which subjectivity could arise.

Qualia are integral to the "for-itself/for-others" duality because qualia just are the contents that supply the meaningful lived feeling of the "for" in each case. If we say that B presents itself as other for A, and then we ask: "But what exactly is the nature of this presentation?" then we immediately introduce the concept of qualia because qualia – as the fundamental phenomenal elements of experience – constitute what is presented when we say that something is presented for A as other. And this is true, no matter if the presentation is "other-as-other" or "self-as-other."

As I use the term, a quale is a discrete constitutive element of an experience that serves as the basis for our ability to individuate experiences. I am adopting a radically
empirical approach to understanding the nature of the world.\textsuperscript{17} If I claim that an apple has the property of being gravitationally attracted to Jupiter, the phrase "is gravitationally attracted to Jupiter" would have no meaning to me if I could not, in some sense, imagine an apple moving – or "wanting" to move – toward Jupiter. This understanding is connected with my own embodied sense of movement – moving, being moved, and wanting to move.

Phenomenally, there is something that it is like for me to move, and what this is like for me is essential to my understanding of an abstract concept such as gravitational attraction. I should also acknowledge, in passing, that in the debate over "phenomenal intentionality," I side with Galen Strawson, Katalin Farkas, Brian Loar, and others\textsuperscript{18}, who claim that intentional terms such as 'desire', and 'believe' are intrinsically phenomenal, which is to say, there is something that it is like to "desire X" or to "believe that X is true," to "understand X," and so on. Whitehead himself refers to understanding as a "special form of feeling" (Whitehead 1978, 153) and calls intellectual belief a "way of feeling the proposition" that "presupposes imaginative feeling" (Whitehead 1978, 187), thus I think he would look favorably upon the flurry of recent arguments in favor of phenomenal intentionality. There are many deep and complex issues involved with phenomenal intentionality, but I will not discuss them in detail here; my goal at the moment is just to identify this as one of my many biases.

\textsuperscript{17} Not unlike Whitehead, who says there is "no element in the universe capable of pure privacy." (Whitehead 1978, 212)
An underlying theme of this thesis will be that conscious experiences and unconscious experiences depend on each other. It is not uncommon to find people claiming that consciousness depends on unconscious processes, but if mutual interdependence is correct, then unconscious experience depends on conscious experience as well. For any given moment of consciousness, we can suppose that the World anticipated, in some sense, the possibility of this moment prior to the actualization of the moment, and the qualitative nature of this anticipation played a role in determining the nature of the unconscious processes by which the conscious nature of the moment emerges. The future is not actualized, so nothing from the future can literally reach back to affect the past, but possible futures are nevertheless real and the World is sensitive to these possibilities, so the actual world can spontaneously strive to actualize some possibilities in favor of others.

At any given moment we can suppose that a flurry of unconscious subjective, qualitative activity spontaneously chooses to actualize conscious experiences because of what these conscious experiences are anticipated to feel like. This unconscious activity is goal-directed, and the metaphysical ground of this goal-directedness is the unconscious anticipation of the possibilities of what can be consciously experienced. The key point at the moment is that all of this is grounded, most generally, on the World's sensitivity to possibilities.

To summarize: The World is primarily composed of unconscious qualitative processes. The World is sensitive to possibilities and chooses some possibilities over others. The intricately-patterned nature of conscious experience suggests that the World's
choice-making processes are not purely random, but indicate some form of valuation (which I will later suggest can be modeled as spontaneous dynamic "rule-following"). Each and every moment of conscious experience suggests that the predominantly unconscious World may have anticipated and positively evaluated that possibility prior to its actualization. Hence, the spontaneous activity of the World's primarily unconscious processes depends, to some extent, on the qualitative nature of the conscious elements that are later actualized.

I’ve proposed that the world is fundamentally composed of qualia, most of which are not conscious in any given moment. Concerning the nature of qualia, such that some are within the focus of consciousness, while others are not, I will roughly follow the lead of Riccardo Manzotti\(^{19}\) in saying that what distinguishes conscious from unconscious qualia is a certain type of context – more specifically, the way that a process "ends." The stone in my driveway actually is grey whether anyone consciously perceives it as grey, or not; the color, when it is consciously experienced, is not just "in my head," although processes in my brain make a necessary contribution to the context that accounts for the transition from unconsciousness to consciousness. Specifically, the processes in my brain categorize the qualia from a perspective, and in doing so, they may trigger the actualization of indexical qualia. I will suggest that a process complex enough to trigger indexical qualia is a process complex enough to be conscious, and indeed it will be a conscious process if the indexical qualia are actualized. Since a great many aspects of this

thesis are inspired by – and may serve as extensions to – the works of Whitehead, let us now turn our attention to his philosophy of organism.
CHAPTER 2
THE PHILOSOPHY OF ORGANISM
Overview and Terminology

Whitehead offers us a speculative metaphysical system inspired by the implications of modern physics. He calls it the "philosophy of organism" because it is cellular in the sense that the postulated fundamental elements are not static objects; they are, instead, dynamic – almost "lifelike" – discrete entities. This approach is also known as process philosophy because it is based on the concept of fundamental processes, in contrast to the more commonly-held forms of metaphysics based on the concept of fundamental substances. The roots of process philosophy are ancient – going back to the pre-Socratic Greeks as well as to various forms of eastern and middle-eastern mysticism – but in modern western philosophy the term 'process philosophy' is most generally associated with the work of Whitehead in the first half of the twentieth century.

I will focus on just a handful of major concepts, but given the intricately interwoven nature of Whitehead's philosophy of organism, we will need to deal with numerous other Whiteheadian terms and concepts along the way. Whitehead's metaphysics has a weblike structure, so that one must have some grasp of the whole before the individual terms make much sense.

Let us begin with a very broad brush stroke. One could trace Whitehead's central theme back to Heraclitus, who believed that "all things flow." As we shall soon see, however, it would be far too simplistic to take this comparison between Whitehead and
Heraclitus at face value. Whitehead's metaphysics is also said to be *atomistic* (Whitehead 1978, 67) in that he conceives of the world as composed of a vast number of microcosmic entities. But here again we must be wary of overly simplistic categorizations. Atomists are generally *materialists* – they imagine atoms to be tiny bits of a more or less law-abiding inanimate substance – entities thought of as enduring objects with "accidental adventures" (Whitehead 1978, 78). Many properties of a substantial entity can change while the entity remains essentially the same. Whitehead, however, offers an "organic philosophy" in which each of his "atoms" – which he calls *actual entities* or *actual occasions* – is like an organism in the sense that it is conceived, grows, and perishes but does not endure change in the sense that a material atom endures change. How can this be?

The key to understanding this apparent paradox lies in Whitehead's *epochal theory of time* (Whitehead 1978, 283). The growing or self-constructing phase of an actual occasion does *not* take place *in* time, but is the *creation of* physical time (and space).20 Our best physical theories indicate that time is not continuous, and Whitehead is essentially indicating the same thing. The world is made of moments, and between moments there is no "passage of time." The self-creation phase of an actual occasion is not extended insofar as physical time is concerned, but the completed occasion – the actual entity – is, in some sense, temporally locatable because the *completion of the process* just *is* an element in the temporalization of the world. In my view, this should not be construed as saying that the actual entity occupies one and only one specific moment

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20 See Whitehead 1978, 69, for some preliminary discussion of this.
in physical time; the passage of time is not simply a string of actual entities. As we shall see later, a single actual entity is capable of contributing to the "now-ness" (or to the "here-ness") of many different entities at many different times (or at many different locations) in the physical world.

The actual entity, as I have indicated, can also be referred to as an actual occasion, which emphasizes the dynamic notion of an event or a process. This process is called concrescence, which can be thought of as making-concrete. It is the process of self-creation that I referred to above. The terms 'actual entity', and 'actual occasion' are often interchanged rather randomly, but I will try to stick to the convention that the actual entity is the completed process, whereas the actual occasion is the entity under construction – that is to say, in the process of creation/self-completion. When a distinction between entity and occasion is not required, I will default to the term 'actual entity'.

On the interpretation of Whitehead that I shall adopt, the term 'actual occasion' is somewhat tricky. Technically, the occasion, as such, is not a full-fledged member of the actual world until it is completed. The process of becoming is real, but it is not technically actual until it is complete. Thus the term 'actual occasion' could be more accurately thought of as "a real occasion of actuality-in-the-making." It is important to keep in mind, however, that this distinction between “occasion” and “entity” is merely an abstraction for our purposes of analysis. In reality, the essence of the actual entity is

21 Thanks to David Odell-Scott for this suggestion.
equally both its concrescence and it outcome (Whitehead 1978, 84).\textsuperscript{22} This duality is at the heart of much that seems paradoxical in Whitehead's system.

A related distinction that introduces new terminology is the distinction between the occasion as a \textit{subject} and the entity as a \textit{superject}. The superject is the subjective feeling of the occasion as objectified for other occasions. The completion of concrescence is the \textit{publication} or \textit{objectification} of the entity. It is easy, here, to slip into a subject/object dualism in which one supposes that the subject is one "kind of stuff" – a private mental/spiritual sort of stuff that is only known first-personally in the moment of becoming, while the objective presentation of the subject (i.e., the superject) is a "different kind of stuff" that is, in some fundamental way, epistemologically divorced from the subject \textit{qua} subject. This erection of an epistemological barrier between subject and superject is difficult to avoid and terribly misleading. As mentioned earlier, the process of becoming is called \textit{concrescence}, meaning, becoming concrete. There is, however, no temporal span between subject and superject as there is between wet and dry concrete. The terms 'subject' and 'superject' assist in our abstract thinking, but they do not identify ontologically distinct, temporally-separated phases. An actual entity is always already both a subject and a superject.

On my interpretation (following Jorge Luis Nobo), the superjet is the \textit{particular-subject-as-repeated}. The process of concrescence starts out as a unified network of feelings, which are teased apart, sorted out, re-categorized, and then re-harmonized in such a way (Whitehead 1978, 165) that, upon the completion of the process, something

\textsuperscript{22} This point is emphasized by Judith Jones in \textit{Intensity}. (See Jones 1998, 26.)
new is actualized – a unified, novel feeling. From this point on, this new \emph{feeling} can be \emph{repeated} in the concrescence of other entities. Whitehead's own writings often create confusion on this topic insofar as he talks of the subject \emph{perishing} – as if to be \emph{replaced} by a superject. On my interpretation (again following Nobo), the process – and thus the subjective feeling – does not literally "perish" upon completion, but rather, this terminology is just our way of re-characterizing the entity as \emph{repeatable} within the concrescences of all subsequent occasions. In other words, it is \emph{not} that the particular process perishes and is then duplicated for the pleasure of other entities (as if, say, Da Vinci's painting of the Mona Lisa was destroyed, but viewers could enjoy seeing an exact replica). Rather, the particular process itself is repeated (as if the one-and-same painting were brought from one museum to another for patrons to view). The repetition of the past into the future serves as Whitehead's way of accounts for causation. As Whitehead says: "this transference of feeling effects a partial identification of cause with effect, and not a mere representation of the cause. It is the cumulation of the universe and not a stage-play about it" (Whitehead 1978, 237)/

\emph{Repetitions} of the process can be usefully characterized as being numerically distinct from one another, but they are nonetheless the one-and-same process in each instance. What this implies is that the one-and-same feeling presents itself in numerically distinct repetitions of the feeling. Also, of course, it means that the one-and-same particular subject/superject presents itself in numerically distinct instances. Thus there is no subject/object dualism, and no ontologically-grounded epistemological barrier.
The business of entities being repeated in other entities is associated with an important term that we will come across often in process philosophy. The term is 'prehension.' The entire prior world of actualities and possibilities is given as the initial phase of concrescence, and the entity (which, at this point, just is the World) must choose to either keep an element or reject it. Prehension is not a matter of simply noticing that other entities exist; it is an active process by which an actual entity carves itself out of the given world. But we must also keep in mind that all of this is based on feelings, so prehension can be thought of as feeling the feelings of another (Kraus 1979, 32), which emphasizes the profoundly intimate nature of prehension, such that it is not a mere grasping-hold-of or perceiving; it is a constructing-oneself-out-of.

Whitehead distinguishes between physical prehension, which is the prehension of other actual entities, and conceptual prehension, which is the prehension of eternal objects. An eternal object is Whitehead's term for a pure potential (Whitehead 1978, 149), so conceptual prehension is essentially the mechanism by which actual entities are sensitive to possibilities. Conceptual prehension thus establishes the world's ability to compare and contrast what is with what is-not, but could be. Conceptual prehensions are not generally conscious, but the role of consciousness in the world is intricately tied to the world's sensitivity of possibilities, and thus conceptual prehensions will need to be at the heart of any discussion of consciousness. Although Whitehead does not explicitly offer a satisfactory theory of consciousness, I suggest that such a theory may someday be developed from Whitehead's system, if we can fully come to terms with the notion of an actual occasion's sensitivity to possibilities. We can easily imagine how the present might
be composed of the cumulative past, since elements of the past have been actualized. *Possibilities*, however, have not yet been actualized – they do not actually exist – so exactly how do actual entities prehend them? The answer to this question is what I am suggesting could form the heart of genuine theory of consciousness.

Another distinction is made between positive prehension, which is the act of incorporating, and negative prehension, which is the act of rejecting. In either case, the prehended entity contributes to the concrescence. Technically, in Whitehead's terminology, only positive prehensions are called *feelings*. When an actual occasion feels what another feels, *and incorporates* some part or aspect of this feeling into its completed, determinate form, then it has positively prehended the given entity. Positive prehensions are thus in the foreground, so to speak, but as we shall see, negative prehensions are very important as well.

The doctrine of prehension leads us into the concept of *internal relations*. For an actual occasion to *prehend* an entity is, in essence, *to be internally related to that entity*. Since the concept of internal relations will have an important role to play in the discussions to follow, a few preliminary comments are in order. An internal relation between entity A and some other entity, B, can be understood as a relation such that the identity of B depends on its relation to A. In other words, if B’s relationship to A is necessary to the existence of B, then this relationship is internal, from B’s perspective. If, on the other hand, B’s relationship to A is merely contingent to the existence of B, then this relationship is external, from B’s perspective.
Let me begin with a brief lesson in how not to interpret the concepts of prehension insofar as internal relations are concerned. Suppose that Bert is Albert's son, and one believes that Bert would not be the person that he is if he were not Albert's son, then one would have to accept that Bert's being the son of Albert is an internal relationship that Bert has to Albert. But presumably Albert was Albert long before he became Bert's father, so the relationship such that "Albert is Bert's father" is not a necessary relationship as far as Albert is concerned. In summary:

1) "A is B's father" is not necessary to the identity of A, and is thus external from A's perspective.

2) "B is A's son" is necessary to the identity of B, and is thus internal from B's perspective.

Translating all of this into the language of actual entities and prehension, we might be tempted to say this: If A and B are actual entities, and the relationship is "B prehends A," then B could not be the entity that it is if it did not prehend A. Thus B's prehension of A is an internal relationship, from B's perspective. Entity A, however, presumably would have still been A, even if B had not prehended it, thus B's prehension of A is external from A's perspective. This way of thinking about prehension and internal relations is misleading.
If we were limiting our discussion to merely positive prehension, then the comparison between prehension and the father/son relationship could be useful. But the concept of prehension is not limited to just the positive dimension. Although B is not an actual entity at the time that A is in concrescence, it is, nevertheless, a possibility, and thus A must prehend "B" as a possibility. A is thus partially composed of "B", despite the fact that B does not actually exist. The identity of A is necessarily dependent upon its constituent elements, and "B" (in potential form) is a constituent of A, therefore A is internally related to "B" from A's own perspective, even though B does not actually exist.

An entity's position within an infinite web of relations that Whitehead refers to as the extensive continuum determines its identity. Any change in position along any one of the innumerable dimensions constituting the continuum picks out a different entity. A's prehension of "B", even though B is a mere possibility, is a dimension by which we triangulate A's position in the continuum, and therefore it is essential to A's identity. Whether A prehends B positively or negatively does not matter to the identity of A, but that A prehends B in one way or another is essential to the identity of A. In other words, the particular decision that A makes regarding B is, in some sense, external to A, and it is external to B as well. But that A has to make a decision, one way or another, stems from an internal relation between the entities.

In the history of philosophy, idealism is associated with the idea that all relations are internal relations. Whitehead allows for both internal and external relations, and thus for this reason (and for other reasons) he is not an idealist. His allowance of external
relations leaves room for a genuine form of pluralism in the actual world, despite an underlying monistic aspect of reality.

I will have more to say about many of the concepts briefly outlined above, but this quick peek at a handful of key Whiteheadian terms should give us some basis for discussing the rest of this thesis. In the following sections, I will take a closer look at three of Whitehead's major concepts. Since *actual entities* are the basis of Whitehead's metaphysics, I will turn to them first, and discuss them in some detail. I will then go on to discuss *eternal objects*, which will lead into a discussion of *God*, which is Whitehead's secular version of a non-temporal, primordial actual entity serving as the grounds of explanation for the order – or lawful nature – of the actual world.

**Actual Entities**

In Whitehead's metaphysics, actual entities are the ultimate fundamental entities constituting the world (Whitehead 1978, 18). An actual entity is, just as the term suggests, an entity that actually exists. This stands in contrast to eternal objects, which are entities that *really* exist, but *do not actually* exist. As I pointed out earlier, Whitehead refers to his system as "the philosophy of organism" because actual entities can, to some extent, be compared to the cells composing a living creature. Every living being "is what it eats" and something similar can be said for the actual entity, whose "diet" consists, to some extent, of other actual entities that have "perished." Of course these are merely rough metaphors. A biological cell can be understood as a process, but it is generally understood as a process composed of material components – chemical molecules that are
composed of atoms, which are composed of even more fundamental particles. Actual entities, on the other hand, are not composed of elementary particles.

Whitehead refers to actual entities as "drops of experience," (Whitehead 1978, 18) but how are we to think about a "drop of experience?" Actual entities need not be conscious, and it is not immediately clear in what sense a non-conscious "drop of experience" is an experience at all. We can begin by simply noting that actual entities are essentially qualitative. They are not simply units of objective physical matter – they are not traditional substances that we can come to fully understand by objectively studying their behaviors under a microscope or by following their paths as they zip through a physicist's cloud chamber. We should also note that actual entities are not necessarily microscopic. Actual entities provide the basis for physical and temporal extension, but the concepts of physical size, per se, and duration, per se, do not apply to actual entities in the way that they apply to physical objects, which are made of actual entities.

So far I’ve emphasized the subjective aspect of actual occasions, but they also serve as the roots of objectivity. The essential otherness of what we commonly think of as the objective, physical world – can be found in the given aspects of our own individual natures, that is to say, the given constituents out of which we carve our own determinate, individual characteristics. When we study the other, we are, in fact, studying the fundamental constituents of our own subjective, experiential selves. A particle in a physicist's cloud chamber may be thought of as an actual entity, or a society of actual entities, but in proposing this we are radically reformulating the way in which we typically think of physical entities such as "particles of matter" or a "quanta of energy."
We are not looking at the traditional "other" – we are looking at a new concept of other, specifically, a concept of other such that the other is a constituent of our own essence.

An actual entity is both third-person observable (as a “superject”) and a first-person subject of experience. We typically think of subjective experience as unique and private, in stark contrast to objective experience, which is seen as repeatable and public. Most materialists adopt a "never the twain shall meet" attitude about private qualia and publicly experienced properties, but this is precisely the attitude that Whitehead rejects. As he sees it, an actual occasion is a process of making private (by privately making) what is public so that it can be re-publicized.23

On this way of thinking, public and private are interdependent concepts – each only has meaning in light of the other, and what is known publicly can only be known because it has been privatized, which is to say, it can only be known publicly because it has, at some point, been made into a set of subjective, qualitative feelings. The process of privatization is what determines the qualitative character that then becomes publicized as a repeatable, observable property. One might say there is a symbiosis between the private and the public. Suppose one asks: Why does a publicly observable property such as being red feel this way ("like red") rather than some other way? My answer would be: Because the world at some point constructed the "redness of red" (via a process of an occasion's concrescence, wherein a contribution to the world's creative advance into novelty is made) and our experience of the "redness of red" is our way of feeling, to some extent,

23 This phraseology adopted from Elizabeth Kraus. (See Kraus 1979, 132)
what that entity originally felt} in the moment of its satisfaction (the culmination of its concrescence).^{24}

The qualitative characters of your current experience – "what it is like to be" the person that you are at this moment – depends to a great degree upon the unique, private creative advances made by the innumerable actual entities that you have incorporated into your own constitution in the creation of this private moment of your own experience. If those other actual entities had not privately felt what they felt, you would not feel what you feel right now. You transcend their experiences in your own private way (your own unique contribution to the world's creative advance into novelty), but you nevertheless depend on their created-in-private-then-publicized feelings as the basic raw materials of your own self-construction.

Let us now take a brief tour of the structure of actual entities, and reinforce our understanding of Whitehead's terminology. In very general terms, concrescence is a process whereby many become one, and the "one" that is created is greater than the mere sum of its parts. In this case the "many" are the previously publicized feelings that were privately invented by other actual entities, and the "one" is the privatization process leading to a creative advance, which, upon completion, is re-broadcast as a publicized event – thus contributing to the many feelings available for future entities.

As mentioned earlier, concrescence can be thought of as a non-temporal process of becoming concrete. A particular instance of a particular "becoming" is a unique, technically unrepeatable event. I say the process is technically unrepeatable because it is

^{24} See Whitehead 1978, 166, 212.
the one-and-only instance of this particular process in this particular universal context, but in actuality it is repeatable in the sense that this same process can be repeated as a constituent in the construction of other moments.

It is important to note that an individual actual occasion, as such, is not the experience of an individual subject that occurs during the process of concrescence because during the process of becoming there is no individual subject to do the experiencing. Self-organization, as it is to be understood here, should not be understood as an organizing activity performed by a pre-existing subject; it is better thought of as the emergence of a subject. During the initial phase of concrescence, the World Itself finds Its limited to a particular position in what Whitehead calls the 'extensive continuum'. In this initial step, the actual occasion's real individuality takes the form of a "place" where things can happen, which can be roughly thought of as a partially determinate set of possibilities. Its position somewhat defines and thus limits its possibilities to some extent, and to this extent it can be thought of as real and minimally determinate, but it does not yet actually exist.

Aside from being a metaphysical "place where things can happen," the actual occasion, during its initial phases, has almost no determinate properties. At this point, it can be thought of as an empty theater. Many different events are possible in this place, but no actual event has yet occurred. Whatever event eventually does take place here will be identifiable as the particular event that it is because it takes place here. In terms of our theater metaphor, we can describe the life of an actual entity as follows: The World, so to

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25 Whitehead contrasts himself with Kant on this point. (See, for example, Whitehead 1978, 156)
26 This is inspired by Nobo's interpretation of Whitehead.
speak, squishes its entire real essence into a particular theater, and thus provides the initial raw materials out of which an actual event can be constructed. The world in this moment comes complete with a rough initial blueprint – a preliminary "vision" – for the creation of the event, but this blueprint is vague and ambiguous in many ways. At virtually every step in the process, a decision must be made as to how to interpret the blueprint. Each decision has to be made in light of the materials initially provided, the various actual decisions that have already been made, and a general intuitive sense about what overall result the blueprint was meant to accomplish. The event ends up being self-creative, where self-creation is best understood as self-completion (Nobo 1986, 157) or self-limiting. Due to the initial vagueness and ambiguity implicit in the original blueprint, there are many possible ways in which the event itself can unfold, thus, exactly how the event unfolds depends on choices to be made along the way. Once the event is completed, it can be repeated in the form of that which is given in the initial stages of other events.

It will be useful here to point out that the concept of limit is generally underappreciated. I've talked about the creation of actuality as a process of self-limiting, thus hinting that the end of one thing makes room for the birth of another. Let's take a moment to make this point more explicit. We typically react to the word 'limit' in more or less negative emotional terms, such as a place where something comes to an end – as in "every creature's life span is limited" – or as a boundary that prevents further progress – as in "there are limits to what we can accomplish." But for our purposes here we are well-
advised to think of a limit as a point where something can *begin to be what it is*. An entity's limits are, ultimately, internal to its identity. Without its self-composed limits, an actual entity would not be what it is, which is to say, it would not be anything at all. During concrescence, an entity works within its limits, but more importantly, it works *with* its limits. By defining its limits, it ultimately creates itself. Limitation is the foundational principle of pluralism, and pluralism is the foundational principle of actuality. The World's limitations are the essential tools of its self-creation, which is to say, the birth of actuality, as such.

To be an actual individual is to exist *for* oneself in a process of self-creation. Any entity is an entity insofar as it exists *in* itself, but only actual individuals exist *for* themselves. To say that an entity exists *in* itself is just to say that there are boundaries of some sort on the basis of which we can distinguish this entity from other entities. To say that an entity exists *for* itself is to say that the entity is what it is because it is playing, or has played, an active role in the creation of its own boundaries. An individual is a goal-seeking *agent* that begins as (i.e. is *thrown* into existence as) a set of given conditions – conditions that are partially determined, and partially undetermined – then out of these conditions it completes the undetermined aspects according to its own subjective preferences. This, for Whitehead, is the basis of what we call free will and moral responsibility.

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27 Nobo makes this point, saying: “Actual entities, God excepted, are finite things, and finitude involves exclusion; thus, 'decision' means a cutting off, or exclusion, of the potentiality for being 'that', in order to realize the potentiality for being 'this'” (Nobo, 1986, 153).

28 This is a variation of a theme found in James P.Carse's *Finite and Infinite Games*. 
Although we talk of many actual entities and many different ways of being, it is important to keep in mind that there is really only one process that, for the purposes of intellectual analysis, we divided into spatiotemporally distinct moments. A process of concrescence does not occur "in time" or "in space" as we understand it. For conceptual convenience we may wish to imagine a concrescence happening over a span of time, and in some sense this is true. Indeed, I will later suggest that many "moments" of concrescence can be thought of, from our perspective, as consisting of considerable spans of time – even astronomically vast expanses of time. The key point, however, is that temporality, as we experience it, emerges from these processes. The movement from phase to phase within the process of concrescence is "not in physical time" (Whitehead 1978, 283).

Earlier I mentioned that actual entities are not necessarily microscopic. One might say that, with actual entities, it is not size that matters; what really matters is the entity's function or role in the overall scheme of things. This is the role of constructing novel feelings. An actual entity is the World Itself as it gathers Itself – taken as a plurality – into a unique unity and, in so doing, creatively advances into novelty. This novelty is essentially a unified feeling, so an actual entity is, in effect, that which we refer to as a quale, which is to say, actual entities are the qualitative building blocks (the "raw feels") out of which the moments of subjective experience are constituted. The essence of an actual entity just is the set of subjective/qualitative properties that emerge when the world takes a unique new perspective upon itself. Once this perspective is taken, it becomes endlessly repeated – serving as raw material for the construction of all future actual
entities. These moments of creative advance, though generally not conscious in themselves, are nevertheless experiential in such a way that they can contribute to the qualitative nature of conscious moments, whenever such moments emerge.

Eternal Objects

In anticipation of our later discussions, I think it may be best to approach Whitehead's eternal objects by starting with Aristotle. Aristotle made a fundamental distinction between actuality and potentiality. For our purposes, the main idea is that an actual entity is a determinate entity that can have many capacities insofar as it exists for (or is objectively given to) other actual entities, but which capacity will be fulfilled is indeterminate. Actuality is the specific fulfillment of a potentiality, but this potentiality itself initially depended upon an actuality. There are three important things to notice about this metaphysical set-up.

1) Actuality and potentiality are both real, which is to say that they are both ontologically significant, but only actuality is "actual," which is to say, only actual things have a power or capacity to cause change by adding novel new feelings to the world.

2) Actuality and potentiality go hand-in-hand. For Aristotle, there must always be some determinate actuality that explains any given potential. There is a form of priority here, but it is not ontologically based; it is a priority only in terms of explanatory value. The
actual can explain the potential, but the potential cannot explain the actual. There are no actualities without potential.

3) For any given actuality, the set of potentials for this actuality is a *subset* of all potentials. What the potentials *are* for a given actuality depends on the nature of the actuality, and given the nature of actuality, some possibilities are more *probable* than others. This asymmetrical limiting of potentials, resulting in a probability structure, is the basis for self-organization. If every actuality fully manifested its capacity for every potential, and all potentials were equally probable, then there would be no basis for order of any sort. Without limitations on potentiality, we would have mere "chaos" in the everyday sense of "sheer disorder;" we would *not* have chaos in the mathematical sense of a disordered-but-interconnected system of entities capable of self-organization.

Whitehead draws a distinction between actual entities and eternal objects. Like Aristotle, Whitehead is treating potentialities as *real* – they don't *actually* exist, but they are *ontologically significant* nonetheless. As Michael Epperson\textsuperscript{29} points out, this approach takes on considerable significance in current debates over the interpretation of quantum mechanics. Warner Heisenberg, in his interpretation of quantum mechanics, insists upon the ontological significance of potential states.

In *Physics and Philosophy*, Heisenberg says:

One might perhaps call it an objective tendency or possibility, a “potentia” in the sense of Aristotelian philosophy. In fact, I believe that the language actually used by physicists when they speak about atomic events produces in their minds similar notions as the concept “potentia.” So the physicists have gradually become accustomed to considering the electronic orbits, etc., not as reality but rather as a kind of “potentia.”

Heisenberg was, in effect, resurrecting Aristotle's ontology of actualities and potentials. Indeed, one can interpret the amazing success of quantum mechanics as, in effect, offering powerful empirical support for theories granting ontological significance to potential states. Whitehead followed the birth and early development of quantum mechanics with great interest, and his theory of eternal objects is very much in tune with Heisenberg's resurrection of Aristotle.

An eternal object is a "pure potential" (Whitehead 1978, 149) that does not actively cause anything to happen, although it can serve as a "lure for feeling." We must be careful to note that this "luring" is *not* an active process on the part of an eternal object; rather, it is an aspect of the concreting actual entity. Like Aristotle's *potentia*, eternal objects are more than purely abstract statements of possible future states; they imply a positive aptitude *in the present moment* for the realization of certain future states. Aristotle uses the example of a block of marble, which has an aptitude to receive the shape of a statue. This aptitude is *real* because it *makes a difference*, and its reality is rooted in the actual nature of the marble. Many other substances simply do not have the

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same aptitude. One can carve Michelangelo's statue of David from a block of marble, but one cannot carve it from a spoonful of mayonnaise.

In quantum mechanics, the ontological significance of potentia hits home in the form of interference patterns in the behaviors of subatomic particles. In effect, what "does not happen" is revealed in interference patterns that simply would not be seen if potentia were not, in some sense, real.\(^\text{31}\)

I am going to suggest that we think of eternal objects in terms of descriptive rules. A descriptive rule (in contrast to a prescriptive rule) is not a pre-existing pattern that explains why an entity follows one path rather than another. Entities do not "obey" or "follow" a descriptive rule in the sense that they are forced or encouraged to act in any certain way. Rather, the entities spontaneously do what they do, and as a matter of after-the-fact statistical analysis one may find that their spontaneous activity consistently manifests a rule. A descriptive rule, in other words, is internal to the nature of the entity that exhibits the rule.

In a game of chess, the rules in some sense exist prior to the game, but notice that even in playing chess the players are not actually forced to follow the rules; rather, the players voluntarily manifest the rules in their behavior because they want to do so. For the chess players, it is "in their nature" to sit in front of a checkered board and push game pieces around in conformance with the prescribed rules of chess. From a level of description focused just on the chess pieces, the game is played (prescriptive rule-

\(^{31}\) Some philosophers and physicists do not buy the idea of potentia, and opt instead for a "many worlds" interpretation, but in any case, the basic point is that fundamental reality is composed of "things" that exist in some sense, but are not "actual" in our world (either because they are "potentia" or because they are "actual" in "a parallel universe."
following), but from a higher level of description that takes the players themselves and their worldly context into account, the game is not played, but rather, one might say that the game spontaneously plays itself— or perhaps somewhat more accurately, the World spontaneously manifests chess-playing behavior (descriptive rule-following).

A descriptive rule is revealed only through a large number of spontaneous events, and I am suggesting that eternal objects be thought of as descriptive rules. An eternal object is basically a way that the world can spontaneously behave. There is no pre-existing "higher realm" that exists outside of the world and directs the world to conform to certain patterns of behavior; the world does not literally follow pre-existing rules. Rather, the constitutive components of the world spontaneously behave in accordance with what we find can be usefully described in terms of rules. The elements that manifest the rules are not following rules; they are in some sense making them. But why are they making these rules rather than some other rules? Isn't there still some sense in which the rules are "out there" waiting to be made, and perhaps luring the makers to make them? No; the rules are real, but they are not "out there" luring the makers to make them. The rules are intrinsic to the actual entities that exemplify them. More specifically, the rule is in the experiential nature, or feeling, of making a decision. Entities "do what they want" and, given a statistically significant sample of entities, the rules emerge.

If what I am saying is correct, then it is not quite right to think of an actual entity "choosing to manifest an eternal object," as such. It would be more accurate to say the actual entity chooses to spontaneously manifest an anticipated feeling and in so doing it ultimately contributes to the form of an eternal object. The entity is drawn to the way it
feels to spontaneously behave in a certain way, and this way of behaving results in patterns that can later be described as "following a set of rules."

The rules or principles leading to self-organization are intrinsic natural tendencies – external expressions of *inner dynamics*; they cannot be prescriptive rules imposed in any way from outside because then we would no longer be dealing with genuine self-organization. Thomas Aquinas spoke of nature as being a set of internal rules, divinely inscribed – as if a shipbuilder could magically give the wood some power to move by itself and take on the form of a ship. The current proposal could be compatible with this view, but my point is that we do *not* need a *prior* intelligence – a shipbuilder – to magically impart the rules, as such. All that we need is an ultimate *unity of reality* – or a holistic network of internally related entities – in order to account for the connectivity needed for self-organization.

Actual entities and eternal objects can be thought of as two primary aspects of reality in the sense that they are two fundamentally different ways of characterizing real events. Actual entities are the fundamental constituent elements (the "raw feels") of the *actual* world, and, as such, they are our way of discussing *that which can generate patterns of experience*. Eternal objects are potential *patterns* of experience, and as such, they can be either actualized or not actualized. The essence of an eternal object does not change just because it has been actualized, thus, although it sounds odd to say, it is nevertheless the case that an actualized possibility is, in some sense, still a "pure possibility."
Eternal objects are not dynamic, and thus they are not self-organizing, but as we will soon see, there is a sense in which we can say that eternal objects are interrelated and can be collectively thought of as a vast *structure* of possibilities. The reason that they are interrelated can be traced back to the primordial evaluating activity of a non-temporal actual entity, namely, God. Whitehead says: "By reason of the actuality of this primordial valuation of pure potentials, each eternal object has a definite, effective relevance to each concrescent process" (Whitehead 1978, 40). So, next we will take a look at Whitehead's notion of God.

**God**

In drawing the distinction between actuality and potentiality, I have repeatedly emphasized that potentialities are real, even though they are not actual. It is time, now, to dig more deeply into the meaning of this, since it has a direct bearing on my claim that qualitative experience self-organizes. The general idea is this: The actualization of possibilities is rooted in *envisagement*, which is, one might say, a form of sensitivity inherent in the actual world, specifically: *sensitivity to possibilities inherent in the structure of reality*. “Structure” is built in to the very concept of actuality, given that an actuality is determinate due to its limitation. Since possibilities always depend on actualities, the World's sensitivity to possibilities is, in fact, a form of sensitivity to its own structural nature.

Envisagement (Whitehead 1978, 189) is the power of the world to *feel* possibilities, which is to say, it is the power to qualitatively *anticipate* and *evaluate*
possible futures. In short, envisagement accounts for the existence of dynamic rules underlying the chaotic interconnectedness of real possibilities, and it is this interconnectedness that accounts for self-organization of what we eventually come to know as conscious experience. Without envisagement, there would be no reason for the world to change from one moment to the next, and even if it did change, the changes would be utterly blind, which is to say, they would be purely random and disconnected. The actual World creatively advances into novelty because, ultimately, the one-and-same World anticipates and evaluates each possibility and, on account of what it feels like for the World to do this in each and every moment, the new moments arise in unpredictable, but non-random ways. As we shall see, the function of envisagement is rooted in the nature of what Whitehead refers to as God.

An entity is real if, in some way or other, it can have an effect upon something that actually exists. How can something that does not actually exist have any effect on the actual world? We must be very careful here. Possibilities are real, but they are not ontologically independent of actualities. Possibilities are, as I emphasized earlier, inherent in – and dependent upon – the structural nature of actuality. The power of a possibility to affect the actual world derives from its internal relations to the structural nature of the actual world. In short, the power of a possibility can be said to rest in the possibility, as such, only insofar as we understand the explanatorily derivative nature of possibility. Actual entities cannot get "pushed around" by non-actual entities, nor can they "receive signals" from non-actual entities. The activity – the doing – always ultimately inheres in the actual world. Each moment is different from the last because
each moment ushers in a new set of *actualities* (advancing into novelty), and intrinsic to this new set of actualities, there is a new set of possibilities to be anticipated and evaluated. Thus when I say that the actual world is sensitive to possibilities, I am *not* suggesting that the world "picks up vibes" from a realm of pure possibilities. Whitehead wisely uses the term 'envisagement' to account for this sensitivity because this term encourages us to attribute the power correctly. Envisagement is spontaneous activity initiated by the actual world.

At the risk of waxing overly poetic, I will suggest that envisagement is the "act" in *actuality*, which is to say, it is the ultimate ground of dynamism – the metaphysical basis in *actuality* for our concept of physical energy. Speaking in loose, anthropomorphic terms, we might say that the world changes because it *wants* to change – it is *seeking* something. What the actual world seeks is, obviously, something that does not actually exist at the moment of seeking. The world endlessly seeks to *make actual* things that are implicit in the nature of the actual but which are *not actual*. Mechanists will want to avoid the anthropomorphic terminology, but they cannot plausibly avoid the general concept of the world systematically actualizing that which is not actual. In any case, the question that arises is this: *Why* does the world seek to actualize that which is not-actual? Physics must stop here and simply write down empirically testable equations that describe the world's behavior. Speculative metaphysics can go a step further.

In an effort to answer this question, Whitehead sought to generalize the concept of *value*. The actual world changes from one moment to the next because, in some sense, it "values" a *way-of-being* that it cannot attain unless it progresses to a *new* physical state.
This generalization is *not* meant to imply that the world is necessarily a conscious entity that values things in the way that humans value things. We are simply applying a series of suggestive metaphors in order to understand the natural world. We *could* interpret the concept of 'value' as a purely technical term – a *mere* metaphor – with no real connection to our everyday conception of value. It is not entirely clear, however, that we *should* entirely discount all connections between human experiences of value and physical state evolution.

If we wish to view ourselves as examples of nature rather than as exceptions to nature, then it seems reasonable to suggest that there may, indeed, be some significant continuity between our human sense of values and the tendencies of the natural world. Taking this approach would *not* force us to say that atoms are conscious and have desires. It only implies that the human experience of desire may be seen as an example of that which explains atomic motion. The spontaneity in an atom's behavior and the spontaneity in human behavior may, if the proposed continuity is correct, have their roots in the same soil, but this does not imply that electrons are attracted to protons because they literally feel any kind of sensuous desire for them. In any case, let's take some time to think about the implications of applying a concept of value to all levels and types of change in the world just to see where this can lead.

What if *values* (in some generic sense – not necessarily conscious or human) account for the relentless dynamism of the natural world? Thermodynamically, it would appear that nature values high entropy, since, on a grand statistical scale, it is constantly "seeking" states of higher entropy. But the world also seems to value order. Examples of
natural order are easy to find: the formation of crystals, galaxies, and patterns at all levels of existence, including, of course, the amazing patterns of living systems right here on earth. We might wonder, however, if the world really values entropy per se, or order per se. It seems possible that these values are just the means to acquire some more general value, but what might that be? One could suggest that physicists in search of a "theory of everything" are, in effect, seeking to discover nature's most fundamental value – the value that explains all other values. Whitehead suggests that intensity of experience (Whitehead 1978, 105, 249) or beauty (Jones 1998, 190) might be the ultimate value. It is fascinating to speculate on what the highest value may be, but for the moment I am not so much concerned with discovering the ultimate value as I am with contemplating the process of valuing. This process, in itself, is deeply intriguing.

Change occurs because the actual world values something that is not actual. But how can something that actually exists place any value on something that does not actually exist? The actual world can only value a mere possibility if, in some sense, it can anticipate or envision the possibility. How can we best characterize this power of envisagement? I believe we can only understand envisagement in terms of the qualitative nature of subjective experience. The world changes because it is sensitive to – in some sense it feels – the reality of mere possibilities, and it values some of these possibilities over others.

Earlier I suggested that we think of eternal objects (i.e. pure possibilities) as descriptive rules. What these rules describe is the spontaneous, but nevertheless orderly, evolution of the actual world. The spontaneity of the world suggests that there are no
overarching *prescriptive* rules actively *directing* the evolution of the world's physical states – no deterministic set of rules; no designer with a blueprint; no grand puppeteer.

We are starting from the assumption that the world is best described as being what mathematicians call a chaotic system, which is to say, a plurality of discrete but dynamically interconnected elements. For the purposes of modeling, we impose rules upon the system, but if *that which* we are modeling is taken to be a *spontaneous* system, then our act of imposing rules in order to study the system's evolution should not be taken as evidence that the rules themselves are *guiding* the actual system. But if the rules are not guiding the system, then how do they come to be manifest in the system's behavior?

I've been suggesting that the rules are, in some sense, implicit in the actual, spontaneous natures of the discrete actual entities that compose the system, and now my further suggestion is that the ultimate origin of the rules can be traced back to the underlying monism of reality, via the qualitative – or "feeling" – nature of the World.

I'm suggesting that the rules implicit in our mathematical models are just our abstract, analytic way of referencing the *qualitative feelings* that are implicit in the *World's nature as a unitary process*. Each actual entity, in effect, spontaneously does what it *feels* like doing, but since each actual entity is a manifestation of the *World's* creative advance into novelty, the net result is a set of internally related qualitative elements capable of interconnection and, thus, self-organization. The net result is a system that we experience as the natural world because what we experience is implicit in the feelings of the actual entities composing the world. Each moment of human experience essentially is what the World feels like in that moment, and what the world
feels like in that moment has a lot to do with the possibilities inherent in that moment. Let me try to clarify this claim: I am not claiming that all entities in the world experience what humans experience; I am claiming that humans experience what, in certain contexts, the World experiences. Not every one of the World's experiences is like a human experience, but every human experience is the World's experience.

This brings us to the question: How did the World come to have the values that it has? Given that the World can anticipate multiple possible futures, why should it prefer one path rather than another? Again I am not concerned, at the moment, with discovering specifically what these values are – although that would certainly be interesting and useful to know – I am, instead, focusing on the process of acquiring these values, whatever these values may be. Whitehead's answer involves something he calls the primordial nature of God (Whitehead 1978, 343-351).

If the World anticipates possibilities A and B, then the World must be sensitive to some distinction between these possibilities. This is a capacity for distinguishing what Whitehead calls conceptual feelings. The World anticipates (i.e. feels) that, say, possibility A would feel like this, if it were to be actualized, and this would feel better, or worse, than what it would feel like if possibility B were to be actualized.

Since we are talking about anticipation, there is room for error. The World could be wrong about what it would be like to actualize an anticipated possibility but, right or wrong, this anticipation is an actual feeling that is felt by an actual entity. The possibility for error, however, is deeply interesting in itself. What exactly is this

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32 Although I won't be discussing it here, I want to point out that the possibility for error provides some metaphysical ground for the possibility of evil. (See Whitehead 1978, 223 for a hint of this.)
possibility for error? Simply put, it is one aspect of the freedom inherent in the self-
formation of actual entities. Any given anticipation could turn out to be wrong because
until the process of actualization is complete there is no fact of the matter as to exactly
how the process will turn out. The World anticipates how an actualization will turn out –
that is just what it means to say that the World is sensitive to a mere possibility – but it
does not pre-determine the results of any given actualization. The actual moment of
actualization may take surprising twists and turns.

Each and every actual moment constituting the actual world is a process of
concrescence – a self-completing process that begins with the entire infinite real world as
a whole. This is the inheritance – the givenness – which ultimately turns out to be the
ground of what we conceive of as the feeling of otherness implicit in our concept of
objectivity. We objectify the world, and indeed, we can even objectify our own
experiences; our own qualia; our own sense of self; because we begin each and every
moment of our conscious existence in a state of thrownness – the entirety of the world-
as-inherited from the previous moment. This inherited World is always divisible
(abstractly divisible, but never actually divided) into two broad categories. On the one
hand there is the collection of all actual entities that are "past oriented" – feelings
concerning how things were – and on the other hand there is a collection of all actual
entities that are "future oriented" – the inherited feelings of anticipation and evaluation.
The combination of these two fundamental types of actual entities constitutes the vector
nature of actuality. Mathematically, a vector is as a quantity indicating direction. The
inherited world can thus be thought of as qualitative, holistic mass of actual feelings coming from somewhere on the way to somewhere else.

The first category – the baggage full of memories – accounts for our sense of efficient causation, whereas the second category – the envisagement – ties in to a form of causation that has been mostly buried under the weight of modern science, namely, final causation. Efficient causation is, essentially, our ordinary mechanistic sense of cause and effect, whereas final causation involves the pursuit of a goal or fulfillment of a purpose. For Whitehead, the primordial nature of God is the function by which all eternal entities are envisaged, and stemming from this envisagement, every actual entity is born with an initial "subjective aim."

All possibilities are real because the World's feelings about possibilities actually do exist, but each and every particular instance of actualizing a particular possibility is an instance of a process of creative self-formation that may or may not meet the World's expectations, for better or worse. The net result is that the world's advance is orderly but not predictable in detail. Final causation is not destiny, nor is it the guiding hand of a supernatural supreme being. Final causation is essentially the function of the present world (as of any given moment) as it anticipates and evaluates the possibilities that are inherent in the moment.

The World's act in any given moment of envisioning every possibility is the primordial nature of God (Whitehead 1978, 31). I emphasized the words "in any given moment" in order to discourage the image of God performing this act of evaluation at some point in the distant past. In Whitehead's view, God is a non-temporal actual entity.
Since this will be of some importance to our current project, let me say just a few more words about this. We can think of the Whiteheadian God as an on-going creative process, but since God is non-temporal, this can be misleading. We should not think of the Whiteheadian God as an on-going process in the same sense that, say, Darwinian evolution is an on-going process. Hosinski makes the point this way:

An actual entity is a quantum of time, but does not itself experience the passage of time; it is the "living present." In conceptualizing God as an actual entity, Whitehead is apparently conceiving God's "quantum" of becoming as all of time. That is, God's concrescence extends over all of time; it is "everlasting." (Hosinski 1993, 194)

I suggest that we compare the "everlasting" concrescence of God to the perspective of a photon (a "particle" of light) according to Einstein's Theory of Special Relativity. Since a photon always travels at the speed of light, there is no passage of time, or movement through space from the perspective of a photon. From our perspective as human observes, a given photon may be said to have traveled for millions of years from some distant galaxy before hitting earth, but from the photon's perspective, all of time is a single moment, and all of space is a single point. We might be tempted to say that, since the photon did in fact travel for millions of years, the photon's perspective must be a mere illusion. But according to Relativity, the photon's perspective is just as valid as our own. Obviously, if Special Relativity is correct, then our ordinary conception of time is deeply flawed. We might never be able to make intuitive sense of this in terms of our everyday experience, but for our present purposes, the important point that I want to make is this: from God's point of view, the concrescence of every actual entity (throughout all of time
and all of space) is happening "right here" and "right now." This way of thinking may give us some glimpse of the sense in which God is omnipresent and eternal.

Concerning God's creativity, it is worth noting that the Whiteheadian God did not create the world in a single, trans-temporal act. Whitehead does not posit an absolute beginning of the world – an initial act by which the world was created out of nothing. The philosophy of organism lends itself to viewing the creation of the world as an on-going cellular process (Whitehead 1978, 219), where the "cells" are an infinite network of finite, self-creative, actual entities. God did not create the cells, but rather, as Hosinski says: "God and the temporal actualities are co-creator of each other, employing the eternal objects (or potentialities) created by neither…." (Hosinski 1993, 215) And later: "The universe is self-creative; it has as many "authors" as the actual entities which compose it" (Hosinski 1993, 217). As I will discuss in more detail later, this conception of God lends itself to comparisons with the type of self-organizing activity modeled by cellular automata and connectionist networks. For the moment, let's take a closer look at God's role in the world.

If we accept that no actuality can ever emerge from pure possibility33, then it seems we must also accept some notion of a primordial actuality. It must be the case that some form or aspect of actuality just is. The concept of a primordial actuality does not mean a "first" actuality in a linear sequence; to be primordial is not to be confined to some distant past.

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33 This is one way in which Whitehead refers to the Ontological Principle. He says, for example: "According to the ontological principle there is nothing which floats into the world from nowhere. Everything in the actual world is referable to some actual entity" (Whitehead 1978, 244).
From our studies of dynamical systems, we know that an all-to-all system of symmetrical connections cannot self-organize. If the world does self-organize, then one might surmise that the primordial actuality must be something that accounts for limitation into the grand scheme of reality – limitation in the form of inequality or "asymmetricality." According to the current proposal, this primordial actuality is, essentially, a primordial feeling – or perhaps a core network of feelings – serving as the essential metaphysical core of each and every actual occasion. Each and every actual entity spontaneously "does what it feels like," and the core of "what it feels like" must include some aspect of the primordial actuality.

What I am going to suggest is that consciousness is a naturally emergent outgrowth of the primordial actuality. On this proposal, the primordial actuality is not, in itself, conscious, but it is, at least in principle, of-others (objective) and for-itself (subjective), in such a way that we can at least hope to comprehend the emergence of consciousness. Perhaps the principle of limitation that allows self-organization to occur just is the dual reality we describe as "of-other-ness" and "for-itself-ness."

In saying this, we need to keep in mind that we are not talking in linear terms. I am not suggesting that if you follow the evolution of the world far enough back in time you must eventually reach a point of "first feeling" out of which all future feelings arose.

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34 Whitehead equates God with the principle of concretion, which is essentially a principle of limitation: "God is the principle of concretion; namely, he is that actual entity from which each temporal concrescence receives that initial aim from which its self-causation starts" (Whitehead 1978, 244).

35 Shear in The Hard Problem: Closing the Empirical Gap, posits a primordial "void quale." He says: "This experience, in order to be remembered at all, would seem to have to have some kind of quale associated with it, even if it is nothing more than some sense of an existing nothingness – a sort of ‘void’ quale. But logically in would have to be the simplest possible quale – one tantamount to a phenomenal nothing (Shear 1997, 373).
The primordial feeling is a non-temporal brute fact of reality, and as such, it is a core ingredient in *every* moment of the world, including, of course, every conscious moment. The primordial feeling is a non-temporal actual entity, which is to say, it is fully repeated in each and every actual entity. Actual entities feel what other entities feel, and thus they can feel what the primordial actualities feel.

The dual aspect of *for-itself* and *of-others* inherent in the primordial feeling *just is* the sensitivity of the World Itself toward possibility, such that the World envisages eternal objects *as other* relative to a limited perspective – a *for-itself*. The reality of an eternal object is not self-contained; it necessarily depends upon some actual entity taking it *as other*. Presumably, the primordial combination of *of-other-ness* and *for-itself-ness* creates exactly the right kind of feeling-based limitations needed for the dynamic self-organization of the experiential world to take hold, namely, a system of discrete cells (determinate feelings, or "drops of experience") asymmetrically interconnected by varying connection strengths (positive and negative prehensions of varying intensities).

On this Whiteheadian account, creativity does not stem from a Supreme Being who looks down on the world and makes things happen by divine intervention. Instead, creativity is the energy intrinsic to the *self-organizing* nature of actual feelings.\(^{36}\) Without *organized* actual feelings there would be no useable *energy* because there would be no *real potential* for anything. The limitations giving rise to asymmetrical interconnections *just are* the feelings that initiate each and every process of concrescence in such a way that each occasion is born with a subjective aim – they are that which turns what might

\(^{36}\) This point is nicely brought out by Hosinski. (See Hosinski 1993, 210).
otherwise be a "random walk" into an experiential journey potentially leading to a form of experiential intensity we understand as consciousness.

The Whiteheadian God is an actual entity, and like all actual entities, its existence depends on the existence of other actual entities. God's conceptualprehension of the infinite realm of eternal objects is not an act ofprehension performed by an entity prior to the existence of all other actual entities. Rather, God's prehension of the totality of all eternal objects is a consequence of the fact that God is the entity existing as the holistically-given initial data for each and every moment of becoming. God just is the World Itself exploring an infinite subset of all possible ways of becoming by, so to speak, throwing Itself as a totality into each and every position in the extensive continuum, then evolving from that point into a novel definite feeling, which to say, a novel definite way of being. Like every actual entity, God transcends each and every actual entity. Furthermore, each and every actual entity transcends God insofar as each and every actual entity creatively evolves into a novel way of being. Each novel way-of-becoming (actual occasion, or individual subject) evolves into a novel way-of-being (actual entity, or individual superject) while maintaining an underlying identity, rooted in its particular position with the extensive continuum, throughout the non-temporal evolutionary process.

Prior to the 1970s, it was natural for people to assume that organizational complexity requires some sort of conscious aim – a purpose or goal of some sort – but nowadays we can see that this is not the case. Whitehead did not conceive of God as a Divine Organizer separate from the world, but as a logical ground of organization
intrinsic within the world, and thus his metaphysics foreshadowed our modern understanding of dynamical systems. The World's project of endlessly transcending Itself is not a helter-skelter approach of randomly actualizing every possibility, nor is it a matter of fulfilling some particular destiny by following the blueprint of a master planner. Rather, it is a cosmic process of self-organizing chaos. It is an endless project of spontaneously actualizing an infinite subset of possibilities via implicit "rules" that can be described after the fact, as the rules of a self-organizing system. God is "intelligent" only insofar as an infinite self-organizing system can manifest intricate dynamic patterns of unimaginable complexity. The interconnected cellular elements of this self-organizing network are, in essence, qualitative feelings, or as we come to know them ourselves through exercises in conscious introspection: qualia.

Now every actual entity, including God, has what Whitehead calls a subjective aim – a purpose, or a goal. If we wish to translate Whitehead's system into the lingo of self-organizing chaos, then what are we going to say about subjective aim? Can a spontaneously self-organizing system have a purpose? If the self-organizing elements are conceived as purely non-experiential particles of intrinsically inert substance obeying purely abstract universal laws, then I would say no; we know that the patterns arising can appear purposeful, and they can serve as the basis for adaptive behavior, but such systems have no purpose in the sense of striving toward an envisioned future. But if, on the other hand, each element constituting the process is a spontaneous moment of the-World-as-primordial-other-directed-feeling throwing itself as a totality into a process whereby an envisaged possibility is actualized, then there truly is purpose because each
moment is then a moment of the *for-itself* striving to be *other* – that is to say, the World
Itself striving to manifest envisaged possibility as subjectively immediate, qualitative
actuality.

The principle of Unity in an otherwise essentially pluralistic ontology is crucial to
the notion of purpose. A concresing actual entity canprehend other actual entities
because all individual instances of concrescence are aspects of a single process – a
particular subjective unity that is repeated in every actual moment of existence.
Whitehead says:

> It is now obvious that blind prehensions, physical and mental, are the
> ultimate bricks of the physical universe. They are bound together within
each actuality by the subjective unity of aim which governs their allied
> genesis and their final concrescence. They are also bound together beyond
> the limits of their peculiar subjects by the way in which the prehension in
> one subject becomes the objective datum for the prehension in a later
> subject, thus objectifying the earlier subject for the later subject.
> (Whitehead 1978, 308-09)

Each instance of prehension can best be thought of as an instance of the *World*
cumulatively carrying forward into each new moment. This underlying unity of process
provides the metaphysical ground of all connectivity, and connectivity is an essential
aspect of self-organization. The World is a unitary of self-organizing process that
transcends itself in each moment of creative advance. William J. Garland makes
essentially this same point as follows:

> Why is it that any actual entity, including God, prehends other actual
> entities? What is it about the universe that accounts for the presence of
these bonds of relatedness that connect actual entities with one another? I would claim that an ultimate explanation of relatedness can be given by appealing to creativity. Actual entities prehend their predecessors because they are all linked together as the particular "creatures" of a single creative process. (Ford & Kline 1983, 222)

God's subjective aim is what unifies and orders all potentiality, but this does not tell us a great deal unless we know what God's subjective aim actually is. Whitehead clearly says that order and novelty, *per se*, are not what God is aiming at. These are mere side-effects, so to speak, of the more central aim, which he identifies as "the intensification of 'formal immediacy'" (Whitehead 1978, 88). Or, as he says later: "God's purpose in the creative advance is the evocation of intensities" (Whitehead 1978, 105). Here again we must come to terms with the idea that the core metaphysical essence of change or physical energy is *feeling*. The laws of nature are not mere abstract principles governing "dead" matter; they are feelings, and feelings can be thought of as *experiential ways of being*.

Now we need to think, for a moment, about what "intensity" of feeling might actually mean. We generally think of the intensity of a feeling in terms of its power to focus our attention. A mild pain can be overlooked or forgotten for periods of time, whereas a more intense feeling of pain may be impossible to ignore. The same can be said for pleasure. So is Whitehead saying that the World is simply seeking more intense pains and pleasures? Not exactly. The aim is not for intense pain, *as such*, or intense pleasure, *as such*. Pain and pleasure, *as such*, are somewhat incidental to the central motivation, which is just *intensity itself*. 
Judith Jones points out that, early on in his career, Whitehead linked intensity to the existential presence of things as a matter of degree. She quotes Whitehead as saying: "Each thing…involves a quantity special to it, to be called its intensity. The special characteristic of intensity is that in general a thing is absent when the intensity is zero, and is never absent unless the intensity is zero."\(^{37}\) If, as I’ve been suggesting, the world is fundamentally qualitative, and if we can make phenomenological sense of the degree of presence of a quale in terms of a level of conscious focus, we may indeed be able to equate intensity with degree of existential presence. In ordinary human experiential terms we can think of intensity as, perhaps, *being there* more fully – *more consciously* – in each moment, in contrast to a more muted or vague sort of presence. The World is not seeking more intense pain or pleasure, *per se*; rather, it is seeking an ever-greater *feeling of presence*, which brings with it the potential for more vividly felt, or emotionally/cognitively enriched experiences of pains and pleasures. Again, in ordinary human terms, we might say the World is simply seeking to be *more alive* in each moment.

Although I cannot offer a specific model of the dynamic evolution of qualia, I can offer the following speculation: Perhaps if such a model could be developed, the quest for intensity of experience could take the form of "attractors" within a chaotic system. In any case, I would suggest that *primordial feelings* centered on the notion of intensity may ultimately account for the nature of the descriptive rules applicable to the spontaneous emergence of novel feelings. In other words, novel feelings emerge *spontaneously, but*

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not just randomly, because underlying each novel occasion is a monistic aspect of the World that may be characterized in terms of increasing overall intensity. This, again, may be seen as the primordial nature of God giving an overall structure to pure possibilities.

If all of this is correct, then it would seem that the primordial feelings, in effect, provide an overall sense of direction for the world – perhaps more or less what Whitehead calls God's subjective aim. Because of the primordial feelings – which are intrinsic to every moment – the World is not best described as a purely "random walk," but something more like an endless journey of "self-discovery" which, in light of the speculations offered above, may be a journey toward endlessly more alert, alive, comprehensive-yet-focusable forms of consciousness awareness.38

38 Jungians will find an affinity with their own beliefs in this regard. Indeed, what I am offering here may be taken as a Jungian slant on a Whiteheadian concept. Also, in light of this discussion, one might wonder how a Whiteheadian could deal with the overall universal increase in entropy required by thermodynamics. It would appear that, according to Whitehead's metaphysics, "heat death" is not really an option as the ultimate fate of our universe, unless the heat death of our particular physical universe is linked in some way to the greater capacity for intensity of experience on some more grand cosmic scale involving, perhaps multiple universes or "bubble" universes.
CHAPTER 3

PROCESS PHILOSOPHY REVISITED

Systems Modeling: A Brief Overview

I've made numerous references to dynamical systems and self-organization, but so far I've said very little about what these terms actually mean, or how the principles of self-organization actually lead to the intricate patterns that are apparent in the world. Let us take a few moments to become comfortable with some slightly technical concepts, including recursion, iteration, fractals, chaos, and dynamical systems.

Recursion is a mathematical term associated with the concept of self-reference and with the intricate patterns that are now commonly known as fractals. Mathematically, recursion is a way of defining functions in which the function being defined is applied within its own definition. In art we can find well-known examples of recursion in the work of E.M. Escher. Douglas Hofstadter has explored the interesting possibilities of self-reference in mathematics, art, linguistics, and even music in Godel, Escher, Bach: The Eternal Golden Thread, and other books.

A famous example of a recursive formula was developed in 1961 by Edward Lorenz, who found that a certain parameter in his weather modeling equations was a

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39 One can also find a painting called "Recursion" by Elena Filippova at http://www.curbly.com/LenkArt/posts/2301-original-painting-recursion-by-elena-filippova
function of its previous state. If we call the old value $X_0$ and the new value $X_1$, then
Lorenz’s formula for relating $X_1$ to $X_0$ looks like this: $X_1 = AX_0(1-X_0)$.

In other words, to find the new value for $X$, you plug the previous value for $X$ into the recursive equation. The value ‘$A$’ is a constant. Lorenz ran numbers through his equation repeatedly and found that as long $A$ remained small, the values for $X_1$ behaved as expected. But when $A$ approaches 3 the results become very strange. Typically, if you enter the exact same data over and over again, you should get the exact same output answers over and over again. But when $A$ is near 3, inputting the exact same values for $X$ over and over again, gives different results every time. The problem has to do with rounding errors, and the crazy results are related to what is known as the sensitivity to initial conditions in chaotic systems. With $A$ close to 3, the crazy answers tend to converge to one of two results. These are “attractors” in the system.

*Iteration* is simply the repetition of a function or process. When a recursive process is repeated a large number of times (as in the example just given), interesting patterns can begin to develop. By iterating a recursive process, one can form endless layers or levels of self-similar processes within processes, *ad infinitum*. Through recursive iteration (repeatedly applying the rules of the system to the state that resulted from the previous application of the rules), chaotic systems can self-organize into endlessly complex patterns of structure and activity. Notice that Whitehead's metaphysics is grounded on recursive iteration. The World applies itself to itself repeatedly. Actual

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40 A more detailed discussion of Lorenz’s equation can be found here: http://www.ganssle.com/articles/achaos.htm
occasions participate in an iteration of the World, such that they work together to form a finite, novel pattern. This novel pattern then becomes the input for the next iteration. The ability of the many to work together is based on their interconnectivity, which brings us to our next topic: chaotic systems.

Let's start with the word 'system.' In science and mathematics, a system is a collection of entities that are interrelated. The notion of connectedness is a major theme in complex systems. A dynamical system model is a model that changes through multiple iterations. In a dynamic model there is a stipulated “initial” state and a set of rules for changing any given state into some other state. A process is essentially a system of entities that, because of the interconnections, exhibits a more or less orderly evolution from one state to another.

Chaos (derived from the Ancient Greek Χάος) commonly refers to a state that is disordered and unpredictable. In ancient mythology, Chaos is the original void out of which the world emerged. In the Biblical book of Genesis we find this same idea at work in the primal state of the universe – described as being "without form, and void." Mathematically, and for our purposes here, the important point about a chaotic system is that is a system – meaning that the fundamental elements are not entirely isolated from each other – they are interconnected. The initial conditions may be completely random, but because the elements of the chaotic system are interconnected, the rules that govern the evolution of the system from one state to another are not completely random. Thus the key to the emergence of order from randomness is connectivity, and the rules that
govern the evolution of a chaotic system model essentially codify the nature of
connections that exist between the elements of the system.

In his "philosophy of organism," Whitehead offers us a speculative metaphysical
premise that amounts to this: the world is a system of interrelated discrete entities that, in
themselves, are processes. At the time that he offered these speculative ideas there had
been virtually no detailed investigations of non-linear dynamical systems. Whitehead did
most of his work in the first half of the twentieth century, but the mathematical concepts
of chaos, self-organization, and fractal geometry were generally not explored in detail
until the second half of the century.41 Whitehead was familiar with Einstein's theories of
relativity, and he followed with deep fascination the birth of quantum mechanics, so it is
not surprising that a great deal of his philosophical speculations were inspired by, and to
this day are largely compatible with, the concepts of modern physics. But he died in 1947
– decades before people seriously began studying non-linear dynamical systems in order
to understand natural processes. In effect, Whitehead's system of actual entities
was perfectly designed to be a self-organizing system, long before people understood the
principles of self-organization.

The Game of Life and Beyond

Let's look a bit more closely at self-organizing systems, beginning with a cellular
automata invented in the late 1960's by mathematician John Conway called The Game of

41 The concept of recursion, however, was already well understood, and served as the basis for
Kurt Godel's famous proof that any formal system, including such formal systems as mathematics and
logic, cannot be both consistent and complete.
Life. The Game of Life – which I will often refer to simply as 'Life' – is a tool that we can use to simulate any kind of computational process. In Life one has a set of elements or "cells" often simulated as dots on a sheet of graph paper. These "dots" or "populated cells" can be thought of as playing pieces in the game, and like any game there are rules by which we manipulate these playing pieces.

To begin a game of Life, one fills in a collection of cells. If one is trying to simulate a specific process, or make a specific calculation, then a specific pattern of dots will be required in the beginning, otherwise, a random pattern can be entered, just to see what happens. We will call this initial pattern "generation 0." From generation 0 our goal is to create new generations of patterns based on a few simple rules whereby we look at each cell on the paper and do one of three possible things:

1) Fill in a blank cell.

2) Erase the contents of cell that is already filled in.

3) Leave the cell alone.

In order to decide what to do with a cell, one looks only at the adjacent cells in the immediately prior generation. Using pencil and paper you can only update one cell at a time, but in principle what you are doing is simulating the pattern you would get if you updated every cell simultaneously. If, for example, you are calculating the pattern for generation 1, and you decide that a dot must be placed in a given cell, the dot that you are adding will not affect any other cell in generation 1; it can only effect what happens in
generation 2. This is the nature of a global update rule. The global update rules for Life are as follows:

(1) For a space that is 'populated' (i.e. the cell is filled in):

(a) Each cell with one or no neighbors becomes empty.

(b) Each cell with four or more neighbors becomes empty.

(c) Each cell with two or three neighbors remains unchanged.

(2) An empty cell with exactly three neighbors becomes populated; otherwise no change.

This process of applying the same set of update rules over and over again to a steadily evolving pattern is an example of a recursive process. The update rules are "global" because they are applied once to every single cell in the grid before starting over on a new sheet of graph paper. The process of applying the update rules and thus creating a new generation – is an example of iteration. Thus the Game of Life is a recursive, iterative process. Realistically, no one plays complex games of Life using actual graph paper and pencil: computers make the task much easier and faster.42

Figure 1 (see below) shows nine generations of a game of Life. The pattern seen in the grid labeled "0" is the initial pattern. (On the Bitstorm webpage listed above, this pattern is called "Small Exploder"). Upon reaching the 16th generation, this activity settles into a stable pattern that no longer evolves. Just by studying this simple example of Life, we can already we can see one way in which the game can be used to crudely model a

42 Here is a website where one can play Life and run through hundreds of generations in just seconds: http://www.bitstorm.org/gameoflife/
Whiteheadian type of process. Notice that the state of a given cell in any given generation cannot affect any other cells in the same generation. In Whiteheadian terms this is to say that contemporary cells cannot prehend each other. In causal terms we would say that there is no possibility of instantaneous action at a distance. What happens to a cell in generation 1 cannot affect what happened in to any cell in generation 0 (the past), nor to other cells in generation 1 (the present), but it can have an impact on cells in subsequent generations (the future). From one generation to the next, a given cell can only impact its eight immediate neighbors. It cannot immediately influence more distant cells. The maximum "speed of causation" in Life is one cell/generation. Life enthusiasts refer to this as "the speed of light" in Life, or one could also call it "the speed of Life."

The Game of Life is a very simple system, and I will come back to it shortly, but for the moment let's briefly take a look at a form of modeling that might be more realistic for many of our purposes. Many of those who research dynamical systems hope that someday a network model may help us to understand the nature and origins many parts and aspects of the world, including the nature of consciousness.

There are various ways to depict the connectivity of neural network, but the basic idea is that one has a population of cells – sometime called 'nodes' – that are connected to each other by hundreds or thousands of branching arms. In most models, each cell is connected to a subset of the total population of cells. So, for example, if a system has a 1000 cells, any particular cell might be connected to, perhaps, 50 other cells. In the brain, each neuron is connected to about a 1000 other neurons, but there are trillions of neurons,
so one can see that each neuron is actually connected to only a miniscule percentage of the total population of neurons.

Figure 1

Nine Generations of Life (labeled 0 through 8)
Each connection has assorted values that can vary over time. One such value is typically thought of as the strength of the connection. If you have a strong reinforcing connection between cells A and B, and A is activated, then B will probably be activated as well. If the connection between A and B is weak, then the activation of A will generally not have much influence over the activation of B. In addition to connection strength, the connecting branched can be given a wide variety of other variable values, but we won't bother with such details here.\textsuperscript{43}

Much of the unimaginably vast complexity that can arise in even simple networks might be essential for the kinds of things we want to model, but for simplicity of description and to aid in easy visualization of some of the basic principles that I want to discuss, I will back away from the complexity of networks and talk instead about comparatively simple variations on Life. Life can be thought of as a very simplistic network. Each cell is connected to exactly eight immediately adjacent neighboring cells, there are no variable connection strengths, and so on. Despite the simplicity of Life, Life-like models are nevertheless complex enough to demonstrate many of the kinds of basic principles that I wish to discuss.\textsuperscript{44}

Although the cells, or patterns of cells, in Life do not \textit{necessarily} represent particular physical objects or entities, as model-builders we have the option to stipulate

\textsuperscript{43} Some connections, for example, might be \textit{reinforcing}, while others are \textit{inhibitory}. Other types of variables might quantify the level of resistance to changes in connection strength, or the useful lifetime of a connection (a sort of “sunset law” or “timing out” or “use-it-or-lose-it” option such that a given connection only lasts for a specified time unless it is used), or a randomness factor that changes other variable of the connection for no reason. Furthermore, all of these assorted variables could themselves be interconnected in complex ways, thus vastly increasing the overall complexity inherent in the system far beyond the already mind-boggling complexity of just the yes/no connection values.

\textsuperscript{44} Mathematicians have proven that Life is a “universal emulator” – meaning that, given the right initial conditions (or “program”), it can calculate anything that can be calculated. See Wolfram's \textit{A New Kind of Science}.
that a cell or pattern of cell activity represents a physical object, or a metaphysical entity if doing so assists in our understanding of some process. We could say, for example, that each cell in Life represents an actual entity. In this case, applying Whiteheadian terminology, we might say that each cell in Life "positively prehends" exactly eight other cells. It is absurdly simplistic to suggest that, in reality, each actual entity positively prehends exactly eight other actual entities, but for the purposes of understanding some general ideas about the nature of prehension, this sort of crude modeling might be useful.

Along similar lines, we might imagine that each cell in a Life model actually represents a vast array of activity as seen from a "higher level" of organization. In other words, if we were to "zoom in" on a particular cell in our model, we might imagine finding that it is actually, in itself, a busy nest of complex activity. In a threshold type of model, it might appear that the entire, complex life-history of any particular actual entity is reduced to an absurdly simplistic digital "on/off" state, depending upon whether or not this activity crosses some sort of threshold. Or to put it another way, the publicly visible superject of each actual entity as it is prehended by other actual entities, amounts to just an "on" or "off" state for a particular cell in the grid. This is unlikely to be how the world works in any realistic detail, but nevertheless it is interesting to note some real-life processes that, at least to a very rough approximation, follow this model. In some simple models of brain activity, for example, a neuron is represented as a highly complex organic cell brimming with bio-molecular activity that, from the perspective of other neurons, amounts to nothing much other than a seemingly digital pattern of on/off activity. Even though this makes for a very crude model, one can nevertheless use these
models to glean some interesting insight in the possible nature of categorization and learning in the brain.

Thus we see that although an actual entity might be enormously complex, it is possible that the causally relevant (objectively immortal) "image" (superject) that the entity publicly presents to other actual entities could be, for modeling purposes, treated in a highly simplified manner. Thus the prospects for creating moderately realistic-yet-practical models of process metaphysics might not be as utterly hopeless at it might otherwise appear. I will not attempt to offer anything close to a complete or satisfactory model of Whiteheadian metaphysics here, and I am skeptical as to whether any such model could ever be developed. I am especially skeptical of our ability to develop a satisfactory model of agent causality – one that does not ultimately reduce to either micro-determinism on the one hand, or mere randomness on the other. But such a limitation, in itself, would be interesting to contemplate. Would our inability to model agent causality indicate that free will is ultimately an incoherent concept? Or would it represent certain hard, logical limits imposed on epistemology, due perhaps to inherently "private" aspects of qualia?

The *Game of Life*, in itself, is too simplistic to give us truly interesting models of self-organizing qualia, or brain processing. Considerable versatility can be attained by using network models, and/or mathematical models that can explore higher dimensionality. A simple three-dimensional version of Life-like cellular automata, for example, could give us some new perspectives on the concept of emergence. To get just a hint of such possibilities, let's consider a variation on Life that I will call *VLife*. In this
variation, we begin with three sets of graph paper, stacked one on top of the other so that the grid squares are all perfectly aligned. The rules of Life apply to each sheet, with one exception to be noted in a moment. On the bottom sheet, L1, the populated cells will contain dots. On the top sheet, L3, the populated cells will contain circles. Activity on L1 and L3 follows standard Life rules. Activity on L2 follows Life rules, but with an additional rule, as follows: Whenever a dot from L1 coincides with a circle from L3, a circled dot, or "cdot" populates the coinciding space on L2. Here it may be useful to imagine holding the sheets of graph paper up to a bright light. When a dot from L1 matches a circle from L3, you will naturally see a circled dot. We then imagine that this "cdot" becomes imprinted on L2, which is sandwiched in between L1 and L3. The cdots that suddenly appear on the L2 grid evolve according to their own set of Life rules. Thus, if a population of cdots were to appear in L2, then even if there is no further interference from L1 and L3 (say, for example, the patterns on L1 and L3 all suddenly disappeared in the next generation), the patterns of cdots on L2 could simply evolve according to Life rules.

The point of this little exercise it to suggest a way to model the creation of new ways-of-being (which is to say, the creation of new sets of evolutionary rules) and to provide tangible tools by which we can explore the various ways in which these different "ways-of-being" (or realms following their own rules) might interact. Given VLife as I have thus far conceived it, L1 and L3 are invisible to each other, which is to say, there is no possibility of causal interaction between them. L2, on the other hand, is causally impacted by coinciding events on the other levels. If either L1 or L3 are forever inactive,
then L2 is forever inactive. But once activity begins on L2, then L2 is no longer entirely dependent upon the other levels. Once activity on L2 has emerged, it could theoretically continue indefinitely under its own momentum, so to speak.

We should take a moment to contemplate the nature of the random events in L2. Even though the events on L1 are not random (they are patterns following deterministic Life rules), the fact that L1 and L3 do not causally interact implies that, from the perspective of L2, the sudden appearances of events governed by the coincident events in L1 and L3 may appear to be totally random. Also notice that although L1 and L3 are purely deterministic, and although the rules governing the interactions of events within L2 are purely deterministic (indeed, we've thus far stipulated that they are nearly identical to the rules governing L1 and L3), nevertheless the overall pattern-formation processes on L2 are not deterministic because of the intrusive "particles" popping up "from nowhere." The random appearances of events cause L2 to be an indeterminate system from any perspective within L2. If these random inputs are minor enough, L2 as a whole could still develop fairly stable patterns similar to Life, but complete determinism from a perspective within L2 is not an option, so long as L1 and L3 continue to be active.

Now let's consider some further variations. We might imagine, for example, allowing events in L2 to causally impact L1 and L3. This would create a previously nonexistent form of feedback within the system. In such a system, L1 and L3 might start out being causally independent, then, through the feedback from L2, a mediated form of causal interaction between L1 and L3 arises. This would be an example of the emergence of a new form of causality for all three levels.
Since the grid squares, dots, and circles of VLife are purely abstract, we can be highly imaginative about what kinds of systems it might model, and even more imaginative in drawing inspiration for new ways of looking at how the world might work. Given a complex network, for example, and a "Rosetta Stone" that allows us to interpret patterns in the model as representing patterns of matter/energy, we may find that something roughly like the emergent patterns in L2 might represent the emergence of qualia in the midst of an interactive body-environment system.

Suppose L1 and L3 are causally interactive. Perhaps L1 represent the world and L3 represents a physical organism. The direct causal interactions between L1 and L3 might then represent the relatively mundane or "mechanical" organism/world interactions. L2, however, might represent an emergent form of causation that begins to influence how the organism interacts with its environment. This new form of causation, once it emerges, could lead to a whole new way-of-being (set of rules) for the organism and its environment. Perhaps this new way-of-being could represent what we call qualitative awareness or consciousness. If so, then we would have, in effect, a model for the origins of consciousness in living systems.

One could still complain that we don't know why some new layer like L2 should "magically" arise from L1 and L3, but here we just have to remind ourselves that we are attempting to model brute reality. We don't know why any of these realms exist, or why they exhibit the rules that they do. In the final analysis, the emergence of L2 is really no more, or less, mysterious or magical than the brute existence L1 and L3 in the first place.
Notice that I am not trying to model the emergence of qualia from vacuous actualities. The patterns in our model are meant to represent the evolving *feelings* of experience, based on the ways in which various qualia are phenomenally interrelated. We do not currently have a theory of how qualia are interrelated, so I can only speak in terms of the most general principles. It seems plausible that, given all possible models, there could be one which, given an appropriate interpretation, could be seen to evolve in ways that are characteristic of experience as we know it. Indeed, given the right choices made at points in the evolution of the model (this would be a matter of pure luck, since the choices of actual entities are free, and thus not strictly law-governed), there ought to be some model that mimics the actual evolution of human culture as we know it, complete with accurate historical details. Again, finding such a model would be a matter of pure luck, and I suspect that we will never actually find such a model. Nevertheless, thinking about the principles involved in modeling the evolution of qualitative experience may prove to be of great interest.

Let's take a moment now to step back and survey the larger picture we are trying to paint. We are basically trying to imagine the world (the totality of all that exists) as a grand process that we are hoping to roughly model with help from some very simple cellular automata. An ordinary CA, like Life, is a purely deterministic system that evolves according to simple, fixed rules. For various reasons I do not see this as a promising basis for modeling the real world as we experience it. I believe we will ultimately need to consider models in which patterns following different rule-sets represent different (qualitative) ways-of-being, and in accordance with the pluralism we
find in Whitehead’s metaphysics, we may want to represent the evolution of new ways of being by allowing our model to evolve different rule-sets in accordance with meta-rules of some sort.

One way that I am suggesting we might model the birth of new rules sets is via the "L2 sandwich." Given a primordial plurality of realms (sheets of graph paper) new realms could come into being through the interactions of the “primordial” realms. Even if these primordial realms were all identical and purely deterministic (different sheets of graph paper with patterns all strictly following the rules of Life), the creation of new realms arising from their interactions could include the creation of significantly new sets of rules, which could translate into utterly new ways of being. Emergent realms could have ways of being that are utterly unlike anything that existed before. The goal is to explore the possibilities that this approach might someday allow us to model the emergence of qualia, and ultimately such high-level phenomena as consciousness, using relatively simple, although higher-dimensional, CA systems.

Qualia Revisited

In this thesis, I am proposing that qualia are not brain processes, but are instead best thought of as world processes that can be characterized as distributed self-organizing networks of Whiteheadian actual entities. I began with a placeholder definition of qualia as referencing whatever it is that serves as the basic elements of experience, such that there is something it is like to be a conscious subject. By equating qualia with
Whiteheadian actual entities, I have further characterized the nature of qualia, such that qualia are process characterized by both subjective and objective aspects.

Let's take a moment to think about the quale we refer to as 'blue' or "the blueness of blue." According to the scheme we are developing here, the blueness of blue just is the "feeling of satisfaction" that ultimately defines the objective immortality of a Whiteheadian actual entity – the self-composed limits determining the feeling-nature of the subject qua superject. Whenever we experience the color blue, we feel – to some extent – what some actual entity felt at the point that the blueness of blue became its novel contribution to the creative advance of the qualitative World. This postulated actual occasion, let's call it 'B', had a unique position in the extensive continuum, and this position determines B's identity, no matter when or where, as a superject, B is repeated. But prior to the completion of its concrescence, there was no fact of the matter as to how B would complete itself. This implies that the feeling of the blueness of blue was not determined until B completed its concrescence.

No actual entity feels the blueness of blue as B feels the blueness of blue unless B is given as a constituent in the initial phase of the entity’s concrescence. If B had made different decisions during its own concrescence, then, presumably, there would be no such thing in our world as what we experience as the blueness of blue. Or, alternatively, we might suppose that whatever B contributed to the universe would be that which we experience as "the blueness of blue." I will not try to untangle these issues here. The central point is that the qualitative nature of our lives – what it is like to be who we are at any given moment – is rooted in a combination of the qualia that other entities have
created, along with our own qualitative contribution. As an actual entity, the core of my individuality is composed of my "home address" in the extensive continuum (i.e., the thrown-ness of my being insofar as the dimensions of this thrown-ness triangulate my initial position relative to all other actual entities) along with the "qualitative shape" I have created for myself by defining the limits of my experience.

Now let us return to a point that I made earlier about internal and external relations. I said that any particular decision that an actual occasion makes regarding how it fills in the details of its own self-creation are external to its identity, considered as a subject. Although B invents the blueness of blue as the culmination of its own concrescence, this characteristic of B was, in some sense, external to B's identity until the moment of B's satisfaction. B could have still been B, even if it had chosen a different path. At the moment of satisfaction, the blueness of blue becomes internal to B. More generally, each and every decision made by an occasion during concrescence transforms the nature of some relationship from external to internal, due to the limitations imposed. This, I would suggest, is at the heart of what it means for a possibility to be actualized, and it is what it means for a subject to publicize itself as a superject. The identity of a superject is its precise position in the extensive continuum, and this precise position is not fully determined until its novel contribution to the world had been made. This novel contribution can be thought of as adding a dimension to the extensive continuum – a dimension that is unique to the creative entity as of the moment of its satisfaction. For all subsequent entities, this new dimension will be part of the given, and thus they will be forced to make a choice concerning the positive or negative prehension of the new qualia.
I have suggested that, on the model presented in this thesis, different aspects of a quale that a subject consciously experiences as, let us say, a specific shade of violet, V, might be contributed by entities that are, contemporaneously, also contributing other aspects of other qualia to other subjects widely distributed throughout time and space. Let us now begin to unpack this notion.

Qualia are sometimes thought of as Platonic universals. On this approach, V would be a possible experience that can be instantiated in many individuals, but would be what it is whether or not any individuals ever actually instantiated it. Others conceive of qualia as the particular way that a particular moment of consciousness feels. By this way of thinking, a quale is a momentary private event that can never be repeated. On the Whiteheadian account offered here, a quale is an actual entity – an individual that is born privately (qua subject/ occasion), but "lives a public life" (qua superject/entity). Thus a quale is neither a Platonic universal, nor a traditional particular entity; rather, it is – as emphasized by Nobo – a repeatable particular individual. As a repeatable particular, a quale is, in effect, a Spinozian type of substance (i.e., a self-caused individual entity) that can serve as a component element in a wide variety of individual moments of experience.

At the point of V's satisfaction – the phase of its concrescence in which something novel was contributed to the world – the novel element that V contributed to the world was the qualitative component we are calling 'a specific shade of violet'. Now let us suppose that another actual entity, Q, is a qualitative component that is essential to the construction of any actual entity is that capable of conscious awareness. We might suppose that Q is an indexical feeling such as "being me" or "being here" that remains
qualitatively the same no matter who "me" is or where "here" is. In other words, Q_i is a
particular quale – a "raw feel" – that is repeated in every conscious experience.

If some entity, let's say Cleopatra, is consciously aware of V – perhaps as she
notices the tint of a sunset – then Cleopatra must be composed of V and Q_i. Similarly, if
some other entity, let's say Barak Obama, is aware of V – perhaps as the tint of a flower –
then Obama, too, must but be composed of V and Q_i. Of course Obama and Cleopatra are
also composed of many other elements, but at the very least they hold V and Q_i in
common. We might suppose that Obama is looking at a flower growing near the White
House, and Cleopatra is enjoying a sunset over the Nile in ancient Egypt. Obviously they
are separated by vast expanses of time and space, but in this example there is no reason
that V and Q_i couldn't be contemporaneous actual entities, which is to say, they could
have achieved their moments of novel advancement in such a way that neither positively
prehends the other because neither one is given, from the other's perspective. Now there
is no reason to suppose that V and Q_i are contemporaneous in this particular example, but
the point is that they could be contemporaneous, despite that fact that two widely-
separated entities are composed of them.

Despite the spatiotemporal distance separating the American President and the
queen of ancient Egypt, many of the actual entities responsible for these different
experiences could be, nevertheless, contemporaneous from the perspective of some of the
actual entities involved.\footnote{For some, the concepts discussed in this section may sound more Buddhist than Whiteheadian. See, for example, \textit{Religion and Nothingness}, by the Buddhist philosopher Keiji Nishitani. (Thanks to Kwang-Sae Lee for suggesting that I point out these affinities. I have indeed studied Buddhism, and I see much in common between the Whiteheadian and Buddhist traditions.)} Of special interest is the notion that, since Obama and
Cleopatra were both conscious during their respective V-experiences, many of the entities composing the indexical "me, here, now" quality of their conscious experiences are actually shared.

Notice that the quale, V, is a particular actual entity, but like all actual entities, it is also a process constituted by countless other actual entities, and includes activity that can be traced back through history to a point at least as spatiotemporally distant as ancient Egypt (in this example). The "essence" of V is not just a "here and now" experiential moment isolatable to a particular brain, nor is it even unique to the whole world at a particular time; the "essence" is a distributed process interconnecting experiences and properties of reality ranging widely through vast expanses of time and space.

Furthermore, the "dynamics" of V, which is to say, the reason why it manifests in certain experiences, but not in others, is determined not by the desires of a pre-existent intelligent designer with some higher goal in mind, but by the intrinsically unpredictable, self-organizing "landscape" of a chaotic system. In the particular context of a particular moment of becoming, this V-experience presumably served as a "valley" or an "attractor" in the chaotic landscape constituting the subjective aim of an actual entity. This does not necessarily imply that the World is not intelligent or divine in some sense, but it does imply that any divine intelligence that may exist is an on-going cosmic process, and is not a pre-existent Master Architect with a set of blue-prints. A further implication is that, as conscious beings, we are not isolated minds. Rather, we are self-organizing elements of a single experiential process – the World Itself.
Obviously what we are discussing is a highly speculative worldview that radically challenges our commonsense intuitions about *what it is to be* a physical entity existing in a physical world. We traditionally imagine an ontological gap between a subject and an object – between the "I" that sees, and the "other" that is seen, or between a subject and an object. One can hardly deny that there is, indeed, an important distinction to be made between *self* and *other*; between subject and object; but this Whiteheadian approach suggests there may be better ways of understanding these relations. It seems intuitively obvious that "I am here" and "that is there" and I cannot deny a definite separation between "me" and "it." So what could it really mean to deny the classical subject/object ontological split and say "I am that?" The proposed Whiteheadian view we've been discussing may give us interesting ways to think of this.

My short, rough answer to the above question ("How can I be *that*?") could be stated as follows: Each and every experience enjoyed by every individual being throughout the whole of existence at any given moment is literally composed, to some extent, of the one-and-same set of elements. This one-and-same set of elements is repeated in each and every actual individual. And, what is extremely important – from the standpoint of trying to understand how these components are able to collectively constitute a cohesive conscious individual – these shared elements are intrinsically subjective, qualitative, and *indexical*. They are generally unconscious, but nevertheless they are *feelings*. Their *repeatability* makes them reminiscent of Platonic universals in this respect, but they are not, universals; they are *particular Spinozian-style substances*. More specifically, they are self-caused, non-temporal, discrete essences. They are not
represented in consciousness; they are repeatedly *presented* as the indexical "me-here-now-ness" underlying every conscious moment. They are among the *given* components that serve to establish the initial conditions of *every* actual entity, but in the vast majority of actual occasions they are negatively prehended, which is to say, they contribute to the essence, but are not literally *felt* as such.

The defining feature of a *conscious* actual entity is that, in such an entity, these *indexical* constituent elements are *positively* prehended, and thus are, literally, felt to some degree. In summary, then, we are "one" because each of us owes our conscious sense of "me-here-now-ness" to the one-and-same set of non-temporal primordial feelings. Ironically, that which we generally deem to be our most private, intimate, unique *sense of self* turns out to be largely composed of elements positively prehended, to some degree, by *all* conscious actual occasions.

In speaking of the unity underlying all moments of consciousness, we must be careful not to forget about the genuine uniqueness of each actual occasion. What makes each conscious moment *conscious* is that the actual entity has positively prehended the primordial indexical elements, but the contents of consciousness – what the moment actually feels like – is determined to some degree by *all* of the prehended elements, *as well as by the actual entity's own novel contribution to the creative advance of the world*. Thus, despite the underlying unity of all conscious (and unconscious) actual entities, there are, nevertheless, genuine explanatory grounds for the distinctness and uniqueness of each individual.
The underlying unity of reality, combined with the genuine plurality of discreet actual entities, set up the necessary conditions for the world as we know it. The unity of reality – grounded in the primordial and cumulative nature of Creativity – accounts for the genuine interconnectedness of all things. One might say that the actuality of the interconnectedness of all things is grounded in the reality of the mutual interdependence of all things. Thus we have the first of two aspects necessary for self-organization, namely, actual interconnectedness. On the other hand, the genuine discreteness of actual entities – each one making a genuinely self-caused, novel contribution to the creative advance of the world – provides the second necessary aspect of self-organization, namely, discrete individuals available to be interconnected via the underlying monism of process. To this duality of necessary conditions for self-organization, we can add a third aspect of interest, namely, the intrinsically subjective/qualitative nature of the interconnected elements. The result of this triple-mix is a qualitative chaos, which, I submit, is exactly the sort of system we want to have, if we want to explain the intricately patterned and highly organized nature of the empirical world, including the "inner feel" at the center of the hard problem.

Chalmers points out that functional explanations of conscious, such as the various types of neurobiological theories proposed under the wide umbrella of cognitive science, are really only addressing the "easy" problems. He complains that nothing internal to such theories explains why such and such a process is experienced. The current proposal addresses this sort of criticism head-on by building experience in at the

fundamental level. On this Whiteheadian account, the subjective and the objective are aspects of *all* actual entities, and actual entities are the ultimate constituents of the world. Based on my project of identifying qualia with actual entities, we must then say that qualia are not just mental phenomena – they are not just "in the head," they are the fundamental constituents of reality, both subjective and objective. In this light, the notion of "repeatable particulars" may appear utterly shocking. On this account, the *actual world* – the objectively real world that serves as the subject matter of the physical sciences – is repeated as *a whole* in the initial conception of each and every actual entity. The subjective phenomenal realm of experience is thus not to be understood as a mental representation of an independent physical world, but rather, the *World Itself* is the initial condition out of which each new moment of experience emerges. An electron is not blue (it is not even a little bit blue), and an electron is not conscious (it is not even "a little bit" conscious), yet, oddly enough, what we consciously experience as the *blueness of blue* may be a constituent component of every electron in existence.

With all of this in mind, let us further discuss my claim that qualia are processes that may extend over considerable expanses of time and space. For this discussion I will draw inspiration from the work of Riccardo Manzotti\(^\text{47}\), who has applied a Whiteheadian style of process metaphysics to the most recent debates over qualia and consciousness. According to Manzotti, a quale is a process that "begins in the external world and ends in the brain." Since I am allowing qualia to contribute to unconscious processes, we will

\(^{47}\) See *Consciousness and Existence as a Process* by Riccardo Manzotti, at http://www.ucl.ac.uk/~uctytho/ManzottiPdf.pdf, and further discussed in *A Process-oriented View of Qualia* in Edmund Wright's *The Case for Qualia*, 175-190.
need to cast Manzotti’s program in terms of conscious qualia. To be a consciously accessible element of conscious experience, a quale must “end in the brain.” On my proposal, “ending in a brain is a necessary, but not sufficient, condition for being a consciously accessible quale.

Notice the implication of Manzotti’s claim: the metaphysical essence of a conscious quale is such that it is not generally isolatable to any particular point in space or moment in time. Although, for the sake of simplicity, I will often speak as if a quale is extended "in" spacetime, we should keep in mind that this is a shortcut terminology. Technically, the quale itself is not actually "extended in," but rather, it is the experiential basis for our feelings of extension. So, for example, we might talk as if a quale "began," as a process, in 1999 and "ended" in 2009. This temporal extension, however, is part of the experiential nature of what is, in a deeper sense, a non-temporal process. In its current context, a quale may be experientially tied to a process that began in 1999 and ended in 2009, but due to the internal nature of the relations between the components of the quale, we may find that key components of the quale also contributed to the experiences of people in ancient Egypt.

The process constituting a particular quale that I am experiencing now could have started many years ago, and many miles away. In A Process-oriented View of Qualia (Wright 2008, 175-90), Manzotti uses an example of a dream about his grandmother, who died over 20 years prior to the dream. The processes composing the qualia that constitute the image of his grandmother include elements from other processes that (in terms of our common understanding of spatiotemporal extension) occurred decades ago and many
miles away, at a time and place when he actually perceived his grandmother. These earlier processes became constituent elements of Manzotti himself, as he slept and dreamt of his grandmother. Indeed, some of the qualia composing my experience at this very moment, as I think of Manzotti’s grandmother, were born in the same moments as some of the qualia composing Manzotti’s dream. Some of what it is like for me to be who I am at this moment depends on what it was like for Manzotti to see his grandmother many decades ago. If Manzotti had not had those experiences with his grandmother, he would not have had the dream, thus he would not have written about the dream, thus I would not have heard about the dream, and thus I would be having some different kind of experience at this very moment.

The qualia constituting my experience now are what they are due, in part, to the qualia that Manzotti experienced in his dream, but this is not to say that I am picturing Manzotti’s grandmother in the same way that he imagines her. We could be sharing qualia (we might both picture her wearing a red hat), but there is no reason to think that we are sharing qualia beyond the qualia involved in our very generalized ability to understand public terms like ‘dream’ and ‘grandmother.’ What it was like for Manzotti to have the dream can affect what it is like for me now to talk about the dream because there are causal connections between qualia. If, as a matter of fact, Manzotti and I both picture his grandmother wearing a red hat, then as a matter fact it may be true that both of our experiences are composed of a common quale (red). But this particular instance of sharing is not the basis for my ability to more generally understand the concept that
Manzotti had a dream about his grandmother. The presence or absence of a hat is not relevant to the more general form of communication that is involved here.

Many years prior to the dream - at a time that Manzotti had certain experiences that later contribute to the qualitative nature of the dream – his experiences were composed of qualia. These qualia were the culmination of various processes that started in the world and "ended" in his brain at the moment that he experienced them. But even though the experiences culminated in his brain at the moment that he experienced them, they did not entirely disappear from existence. Instead, they took on a new role, which is to say, they became the publicly available constituents of other processes that culminated many decades later, in the form of Manzotti's dream, and later in various forms contributing to my vague impression of Manzotti’s dream.

A particular quale contributing to Manzotti’s dream could be a process that includes element of his experiences of his grandmother and various thoughts about her over a period of years. This entire process just is the quale that contributes some qualitative component to Manzotti's experience while dreaming of his grandmother. Qualia associated with the dream is experienced as happening during a particular few moments in 2003 – perhaps constituting a few moments of reflection upon awakening from the dream. Although these moments of reflection feel like they happen over a period of just a few minutes, in reality the qualia constituting these few moments of reflection were forged in processes associated with events spread out over a span of 20 years. The qualia are objectified in such a way that the 20-year span is not necessarily felt as a 20-year span, but are instead experienced as being limited to a few moments in 2003. One
might say that the qualitative objectification process itself adds its own qualitative nature to overall process, causing the 20-years worth of events to seem like just a momentary event. The dream feels like it "happened just now" even though many of the compositional qualia may be associated with events that happened 20 years earlier.

At this point one might wonder how the nature of a quale can be anything other than what it is immediately experienced as. How can a quale be associated with a 20-year process if it seems to occur in a single moment? Here we need to remind ourselves of how the qualitative character of a given moment relates to the nature of the quale as a process. I've suggested that qualia are actual entities. If this is right, then our questions about phenomenology and process can be answered in Whiteheadian terms. According to the epochal theory of time, concrescence does not take place in time – it does not span any measurable length of time – but it creates temporality insofar as it creates temporal feeling via the transition from the many into the one. The "many" include the qualitative advances into novelty made by many actual entities, each of which contributes in various ways to what we experience as the span of history. An actual entity contributing a quale to a given moment of "now" is composed of actual entities that contributed to a great many different moments in the past. Depending on the formation of the quale, these constitutive elements can contribute both a sense of "now" and a sense of "long ago."

Correctly blended, this can be experienced as what it feels like to "think about the past."

Manzotti's brain is essential to the qualitative nature of his grandmother-dream, since processes in his brain are among the constituents of the process of self-organizing qualia. But Manzotti's brain does not house the totality of the qualitative process. The
process ended in Manzotti's brain, but is not limited to his brain. Manzotti's brain, alone, did not create or generate the qualia that constituted his dream of his grandmother. Rather, processes within Manzotti's brain during the time that he dreamt of his grandmother were among the many constitutive elements of the dream. According to this theory, there would be no neural correlates of consciousness in which the correlations are limited to what happens only in a given body. The qualitative character of the experience depends on its context within the World Itself. Two physically identical bodies (that is, “identical” in terms of their objectively measurable external relations) existing in different worldly contexts could have two qualitatively distinct experiences.

What we have, with qualitative experience on one hand and the material World on the other, are not two different kinds of things (mental stuff and physical stuff) but rather, a single gestalt (the World as subjective process) that probably does not "experience Itself" any more than, say, a sleeping person experiences her dreamless sleep. But since the World is in fact a Subject, the World (like the person in dreamless sleep) has the capacity for qualitative experience, and this capacity for experience is what manifests when the World-as-Subject expresses Itself through the sorts of World-modeling processes found in living brains. Just as a dreamless sleeper has the capacity to slip into dreaming or waking states, the World-as-Subject also has the capacity to slip into conscious experience. This capacity for slipping into consciousness gains expression through the process we have come to know as the natural evolution of biological brains.

Once we can come to fully understand the concept of qualia as historically-situated Worldly processes that culminate in the category-driven World-modeling
activities of living brains, we will see that there is no "hard problem of consciousness," and more importantly we can gain some vital, morally-significant insights into what it means to be the personal selves that we experience ourselves as being.

Conclusion

What one knows directly are the contents of one’s own present experience. This, in itself, does not necessarily imply solipsism because it leaves open the possibility that the contents of one’s experience are elements of the World. Along similar lines, knowledge of the past is not ruled out because the contents of present experience may be partially composed of past elements. Given our experiences of the world, and our memories, we are struck by the intricate patterns and lawfulness of nature. We generally want to attribute the organized nature of experience to some external (or "transcendental") source of experience – such as the external natural laws of an external world, and/or an external creator God. With the advent of classical physics and neuroscience, this way of thinking became crystallized in modern culture. It is now commonly believed that we can’t know the world itself directly; we can only know the world via the qualitative nature of our mental states. Everything that we experience, it seems, boils down to brain activity which presumably represents the external world in a functionally practical way. This approach engenders an epistemological crisis concerning the reality of the external world, and it leaves us wondering exactly how we experience our brain states. Nevertheless, thanks to its scientific aura, this form of metaphysics has gained a reputation for being the default rational way of thinking.
Philosophers have proposed alternative versions of metaphysics – approaches that do not encourage the assumption of an ontological split between experience, and the world that is thought to be experienced. On the Whiteheadian alternative proposed in this thesis, we start with the Cartesian reliance on immediate experiences, but then ask: Why should we assume the existence of fundamentally non-experiential sources of experience? Whitehead’s claim is that the world is composed of actual entities that are fundamentally both subjective and “superjective” – entities that are born privately, but have a public career. All such entities are interconnected via both internal and external relations. If this is right, then the intricately ordered nature of our experiences need not depend on the ordered nature of an entirely non-experiential – or purely external – reality. It could be that the direct contents of experience are self-ordering. This approach does not have to deny the existence of a physical world; it simply rejects the contention that the physical world is fundamentally non-experiential, or purely objective. From this position it would be easy to slip into idealism or panpsychism.

The key to avoiding idealism and panpsychism is the recognition that experiential does not necessarily mean consciously experienced, nor does it mean purely mental. For some actual entity, X, to be experiential means X is of a character such that it could, at least in principle, be consciously experienced. To put it another way: If X is experiential, and if CE is a conscious entity composed of X, then there is something that it is like to be CE, in virtue of the fact that it is composed of X. The fact that X is experiential does not necessarily imply that there is, in actuality, anything that is composed of X, and even if there is some actual entity, E, such that E is composed of X, it does not necessarily follow
that there is something it is like to be E. If, however, CE is a conscious entity, and CE positively prehends X, then there is something it is like to be CE on account of X, such that CE’s qualitative experience would change if X were eliminated from its constitution.

When I claim that the world is composed of qualia, I am saying that the world is composed of fundamentally experiential entities. I need not entirely rule out the possibility that there are non-experiential entities; all I really need to say is that we do not need to posit the existence of any such entities in order to construct a plausible metaphysics, and, furthermore, by not positing the existence of such entities, we can effectively avoid the sort of epistemological crises brought on by positing the existence of such entities. Whiteheadian interpreter, Lewis S. Ford, sums up this theme when he says: "Experience brings with itself the means of its own organization, and does not require the alien imposition of any transcendental machinery to render it intelligible" (Ford & Kline 1983, 307).

We can think of the proposal offered here as a variation on the idea of direct – one might even say naïve – realism. Thinking in pre-philosophical and pre-scientific terms, I might say this: The red pen that I perceive to be on my desk just is the red pen that is on my desk. In this frame of mind, I would not entertain any skeptical doubts about the reality of the pen, nor would I try to imagine any unperceived “thing-in-itself” that underlies my perception. Upon closing my eyes, I would not contemplate the disappearance of the “phenomenal” pen; I would simply assume that the red pen is still there, and it is still red. So long as I stay in this naïve state of mind, I would not bother to make a distinction between the pen “that I perceive” and the “pen itself.”
If I think about the complexity of my experience – the variety of sensations and emotions constituting any given moment – it might occur to me that I can categorize the elements of this complexity. I can assign the general term ‘qualia’ to these identifiable parts of my experience. In my naïve frame of mind, these qualia just are the properties of the world. The pen is red, so I can identify a quale that I call ‘red’, and since I naïvely assume that the pen just is red whether I look at it or not, it follows that the quale I am calling ‘red’ is red whether I perceive it at a given moment, or not.

Now let’s add a twist to my naïve story. What if it occurred to me that there is no “me” apart from the qualia composing my experiences? Like David Hume, I look for a “self” at the center of my being and find nothing but the properties of my experience – nothing but the bundles of qualia composing my experience in a given moment. Suddenly, instead of conceiving of myself as one sort of object (a “self”) perceiving an external object (“the pen”), I now see myself as essentially just the world itself in a moment of awareness. In this light, the redness of the pen is a constituent element of my experience, and I just am this experience, so it follows that I am, to some extent, literally composed of the redness of the pen, along with all of the other qualities of my experience. I might now think of myself as literally composed of qualia, and, in fact, sharing qualia with what, according to the more traditional metaphysics, would be thought of as the “purely external” world.

I do not have to see myself as limited to just the qualia composing my conscious awareness in the moment. In my naïve perception of the pen, I am happy to acknowledge unperceived properties. If I want to see the hidden side of the pen, I have to turn it over.
If I want to see inside the pen, I have to take it apart. This knowledge is, so to speak, built in to my experience in such a way that what it is like for me to perceive the pen as a pen simply includes this feeling of the need to do something if I want to see the back side or the inside of the pen. These expectations of possibilities are built-in to the very fabric of what it is like to experience objects as objects. These feelings of possibilities intrinsically include feelings of limitations concerning the extent of my conscious awareness in a given moment. These feelings of limitations and possibilities are just as much a part of the qualia composing my experiences as, say, the sensations of color and sound.

If I take my naïve direct realism and add it to my Humean insight concerning the missing self, I end up with a story in which I am composed of qualia, the world is composed of qualia, and there is no genuine difference in the kind of qualia composing me verses the kind of qualia composing the world. The red quale composing my experience of the pen just is the red quale composing the pen itself, and there is no “me” apart from the qualia constituting my experiences, so there is no ontological distinction between the “me” that perceives the pen, and the pen “in itself.” There is only a part/whole distinction, such that the qualities of the pen are only a part of the bundle of qualia that I am, and thus only a part of “me” (or the World from a self-limited perspective). This does not mean that my knowledge of the pen is complete, or incorrigible; on the contrary, my experience includes my expectations, and these expectations – thanks to their roots in mere possibilities – could be mistaken.

What I directly perceive is not a mental representation of the world, but rather the world itself, as objectified. Let me say this again: The world that I directly perceive is not
a representation, but it is an objectification. An objectification is an abstraction, which is exactly why, when I perceive the pen as a pen, I intuitively understand that I do not perceive the entire pen. I perceive parts of the pen (e.g., the color and surface textures) and I take these parts to be signs of the presence of the pen-as-a-whole. In objectification, that which I directly perceive is the object itself (even if only a part of the object itself). In a mental representation, that which I directly perceive is just brain activity, which is presumably nothing at all like the object itself, although it is thought to correlate with the object in useful ways.

The key points can be summarized as follows: 1) I do not experience brain states that represent the world; I experience the World directly, as objectified/self-limited. 2) There is no ontologically isolated "self" at the center of my experiences to which my experiences appear. There is no experiencer; there are just self-organizing qualia. 3) Qualia are not conscious mental properties; they are mostly unconscious World properties, but given their inherently subjective nature as actual entities, we are no longer faced with Chalmers’ hard problem of deriving consciousness from mere particles of matter. We still have a tough "chewy" problem, but it does not seem quite as metaphysically jaw-breaking as the traditional materialist’s hard problem.

I have been unable to give a full, satisfactory explanation of the difference between conscious entities, and unconscious entities, such that both types of entities can be composed of experiential elements. What is it, exactly, that makes an entity conscious? My suggestion has been to posit the concept of primordial indexicality. Indexicality, generally speaking, is a high-level emergent phenomena, limited to what we
commonly call brains. Brain’s are self-organizing networks of qualia that can engage indexicality (me-, here-, now-ness) because brains are capable of categorizing in such a way that this capacity for categorizing become self-referential. A brain can engage the “as-other” for itself, and the “for-itself” as other in a way that no simpler forms of systems can manage. I’ve suggested that primordial forms of this complexity exist (perhaps in the form of a primordial, non-temporal actuality that is more or less consistent with Whitehead’s notion of God) – not an entity that serves as the beginning of a chain of linear events, but an entity that is intrinsic to every moment whether or not that moment is a moment of consciousness. The vast majority of actual occasions negatively prehend the primordial indexicalities because they simply don’t have the complexity of resources needed to actualize them. As actual entities, brain’s are complex enough to positively prehend the primordial indexical actualities, although they do not always do so.

Following Whitehead, I have rejected the notion that primordial or fundamental entities are ever truly simple. Indeed, on a Whiteheadian account, the maximal complexity of the World is intrinsic to (although not fully actualized in) each and every actual entity, including any primordial actual entities that may exist. Some actual entities, qua actual, may be comparatively simple, but in reality they are no simpler than the World Itself because in reality every entity, no matter now seemingly simple it may be, is an expression of the World Itself.

I’ve suggested that "consciously experienced blue" (as, say, experienced by humans) and "unconsciously experienced blue" (as, say, experienced by trees) are composed of the same entities, but a conscious version would positively prehend certain
higher-intensity actual entities (thanks to the filtering and categorizing powers of complex brain processes), namely, certain self-referential indexical feelings, some of which are primordial, some of which are repetitions of earlier entities, and some of which are new and unique as of the moments of their actualization. “Actualization” here suggests a transition from the relatively low-intensity presence of conceptual feelings (feeling of mere possibility) to the higher-intensity presence of physical feelings (including actualized feelings of sensations and emotions). As expressed through dynamic systems modeling, we might say that the World “falls into” these higher-intensity experiences because these forms of experience are “attractors,” of one sort or another as often found in chaotic systems.

Early on I pointed out that our interest in philosophical questions about the nature of consciousness can be related to various moral, aesthetic, and emotional concerns. How we choose the ground upon which to base our various phenomenal stances can affect our sense of moral commitments, as well as our general sense of value and meaning in our lives. I won’t address the moral questions here, but I do want to close with an observation that may have moral relevance. According to the proposal offered here, our most intimate feelings of “me, here, now” could turn out to be shared by all conscious creatures. There would be aspects of individual uniqueness, but there would also be important aspects of unity – of shared experiential essence. It may turn out, upon closer analysis, that the aspects of self that really matter to us in terms of our concern for our own personal survival are, in fact, rooted not in the fleeting individuality of a given process, but rather, in the shared – and perhaps even primordial – aspects of experience.
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