

Dr. Eric Weiss, MFT

188 Lucinda Ln.
Pleasant Hill, CA 94523

eric@ericweiss.com

THE DOCTRINE OF THE SUBTLE WORLDS:
SRI AUROBINDO'S COSMOLOGY, MODERN SCIENCE, AND THE
METAPHYSICS OF ALFRED NORTH WHITEHEAD

By
Eric M. Weiss

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Committee Chair:
Brian Swimme, Ph.D.

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Eric M. Weiss

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ABSTRACT

This dissertation advances the Doctrine of the Subtle Worlds, which holds that the physical world is a small cross-section of the real world, and that the real world is composed of several different, separate but partially overlapping realms of being, each with its own unique characteristics, and each inhabited by various beings such as angels, demons, and disincarnate human beings. This Doctrine was held by all premodern civilizations, and has, in modern times, been advanced in Theosophy and in the cosmology of Sri Aurobindo. This dissertation introduces the doctrine, explores its presentation in Sri Aurobindo, and then uses elements of Alfred North Whitehead's philosophy of science and elements of his later metaphysical scheme to first outline Whitehead's revolutionary understanding of time, space and matter, and then, in terms of that understanding, to demonstrate a meaningful relationship between the Doctrine of the Subtle Worlds and the world as it is understood by modern science.

DEDICATION

This dissertation is dedicated to the one, infinite, eternal Divine Being
that each of us is,
and in whom all of us live, move, and have our being.

May the iron cage of the dark ages be dissolved.
May the light of the Divine shine on and through human beings.
May the biosphere on Earth, and all the realms of the universe
be illuminated by that light.
May all beings find their way home.
May all beings enjoy eternal bliss.

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INTRODUCTION

The writing of this essay on the Doctrine of the Subtle Worlds began on November 4 1996. At that time, I had been living out of my car, wandering around the U.S. for almost a year. I was two months into a solitary retreat at Dorje Khyung Dzong, a Buddhist retreat center in southern Colorado. I was 47 years old, and I was desperately trying to figure out what to do with my life. In one moment of peculiarly intense longing and aspiration, I received what seemed to me to be a clear and unambiguous instruction. “Work,” I was told, “where the occult and the scientific intersect.” This essay is the result of following that instruction for the past five and a half years.

When I began my research for this essay, I was already deeply immersed in the thought of Sri Aurobindo. I have found in his work an approach to theology and to spiritual practice which is entirely satisfying to the deepest parts of my being. But Aurobindo is not only a theologian, a yogi, and a spiritual teacher, he is also a great cosmologist. In *The Life Divine*, Sri Aurobindo presents an extraordinary cosmological vision which places the evolutionary physical world revealed by modern science in the context of a vast system of subtle worlds, and places that larger cosmos, comprising both the physical and the subtle worlds, in a meaningful relation to a Divine Absolute.

When I began to look at the intersection of the occult understanding (which is primarily concerned with the subtle worlds), and the scientific understanding, I tried to start with Aurobindo. “How,” I asked, “does Aurobindo actually account for the physical world?” What can Aurobindo say that might be interesting to scientists and technicians?”

“What can Aurobindo tell us about the relationship between the physical world and the subtle worlds?”

I found, rather to my surprise, that Aurobindo was not very helpful in this regard. While he does make a prominent place for the physical world in his cosmology, he accounts for it in very general terms. Aurobindo’s cosmology makes ample room for a physical world, but his attention is not on the details of that world, and he has (so far as I can tell) very little to say that adds to, or illuminates, the specifics of a scientific understanding. Further, while Aurobindo describes the subtle worlds more consistently and eloquently than any other writer in the English language, I could not find in his work a satisfying account of the specific spatio-temporal and causal relations that bind the physical worlds to the subtle worlds within which, in the occult understanding which he represents, they are situated. This left me at an intellectual impasse.

The impasse was broken when, in the Spring semester of 2000, I was privileged to audit Brian Swimme’s seminar on Alfred North Whitehead. I found in Whitehead’s work a remarkable system of abstractions which enabled me to make sense of science and of the physical world as that world is understood by science, and also of the subtle worlds as those worlds are described by Aurobindo and other philosophers and cosmologists of the occult. I began to realize that Whitehead’s metaphysical ideas provided the perfect context within which to explore the intersection of science and the occult. This essay can, in its main parts, be understood as an attempt to use Whitehead’s philosophy of science to articulate Aurobindo’s understanding of the subtle worlds. In the process of

doing this, of course, I am stretching the thought of both of these great thinkers. I like to think that both of them would enjoy the result.

Chapter One of this essay presents the idea of the subtle worlds, and tries to make that idea intelligible to someone who has received a modern, scientifically oriented, education. Chapter Two summarizes, very briefly, Aurobindo's understanding of the subtle worlds. Chapter Three sets the stage for the main part of the work by pointing to the field of experience – which, following Whitehead, we term “Fact.” Chapter Four demonstrates how the physical world, as that world is understood by science, finds its place within the domain of Fact, and Chapter Five shows how the subtle worlds also find their place in that same domain. Chapter Six adumbrates some possible implications of these ideas in the context of the current evolutionary crisis on planet Earth.

It should be understood that this essay is not a “proof” of the existence of the subtle worlds. A proof can only be offered where there is clear agreement about what exactly it is that constitutes such a proof. In other words, a proof is a gesture that operates within the context of a well established paradigm. There are, as yet, no established paradigms in the context of which we can explore the subtle worlds. Thus this essay is not a proof, but rather an invitation. It invites the reader to let go of old assumptions about the nature of the real world, to explore deeply his or her own experience, and to contemplate the possibility that the Doctrine of the Subtle Worlds may illuminate that experience in interesting and significant ways

CHAPTER ONE - THE DOCTRINE OF THE SUBTLE WORLDS

“Nature exhibits itself as exemplifying a philosophy of the evolution of organisms subject to determinate conditions. Examples of such conditions are the dimensions of space, the laws of nature, the determinate enduring entities, such as atoms and electrons, which exemplify these laws. But the very nature of these entities, the very nature of their spatiality and temporality, should exhibit the arbitrariness of these conditions as the outcome of a wider evolution beyond nature itself, and within which nature is but a limited mode.”

Alfred North Whitehead, *Science and The Modern World*, p. 93.

“As the outposts of scientific Knowledge come more and more to be set on the borders that divide the material from the immaterial, so also the highest achievements of practical Science are those which tend to simplify and reduce to the vanishing-point the machinery by which the greatest effects are produced. Wireless telegraphy is Nature’s exterior sign and pretext for a new orientation. The sensible physical means for the intermediate transmission of the physical force is removed; it is only preserved at the points of impulsion and reception. Eventually even these must disappear; for when the laws and forces of the supraphysical are studied with the right starting-point, the means will infallibly be found for Mind directly to seize on the physical energy and speed it accurately upon its errand. There, once we bring ourselves to recognize it, lie the gates that open upon the enormous vistas of the future.”

Sri Aurobindo, *The Life Divine*, p. 16.

Introduction

My intention in this chapter is to introduce what I am calling the ‘Doctrine Of The Subtle Worlds.’ Let me begin by stating in a very bald way the essential points of this doctrine.

- The physical world is part of a larger system of interlocking worlds.
- These other worlds are not physical, and they operate according to laws different from those that govern the physical world. They are, nonetheless, objectively real.
- Processes taking place in those other worlds directly impact what takes place in the physical world – whether or not human beings are aware of them.
- Human beings can consciously experience those other worlds, and can operate in those other worlds in ways that significantly affect the unfolding of events here in the physical world.

The Doctrine of the Subtle Worlds is by no means a new idea. In fact, modern Western civilization is probably the only civilization in history to construct a cosmology which excludes the subtle worlds. Anthropological research gives ample testimony to the fact that tribal people’s at the hunting-gathering stage of development are animistic and include in their cosmologies many disembodied, non-human intelligences and the worlds in which those intelligences have their abodes. Elements of this animistic belief remain

prominent in all of the classical civilizations.¹ Even as late as Dante, Western civilization operated in terms of a cosmological picture which was dominated by angelic and demonic divine and semi-divine agencies, and which was divided into a terrestrial, sub-lunar world subjected to physical laws and diverse sub-terrestrial and celestial spaces governed by entirely other principles.

The Doctrine of the Subtle Worlds did not become entirely discredited until after the Renaissance. It is probable that the discrediting of the Doctrine of the Subtle Worlds came about as part of the large-scale shift in consciousness which accompanied the discovery of perspectival space.² When people began to imagine space as what we now call a Cartesian grid, that grid spread itself out to cover not only the Earth, but all of the celestial spheres as well. When Newton, somewhat later, calculated the motions of the planets based on the assumption that they were balls of rock rather than celestial divinities, the distinction between the terrestrial, sub-lunar reality and the numinous spaces of the outer spheres entirely dissolved. Heaven collapsed into Earth. In 1678 there was a serious philosophical treatment of the Doctrine of the Subtle Worlds by the Cambridge Platonist Ralph Cudworth (1617-1688) in his *True Intellectual System of the*

¹ The first two volumes of Dr. J. J Poortman, *Vehicles of Consciousness*, 4 vols. (Adyar-Madras, India: Utrecht, 1978) provide exhaustive documentation for the prominence of this belief in all civilizations prior to that of the modern Western world.

² This position is argued in Jean Gebser, *The Everpresent Origin*, trans. Noel Barstad with Algis Mickunas (Athens, Ohio: Ohio University Press, 1985) 11-22. It is the central theme of Robert D. Romanyshyn, *Technology as Symptom and Dream* (London and New York: Routledge, 1989). See also Eric Weiss, *The Experience Of Space: Chaos Theory and the Evolution of Consciousness* (unpublished, 1999).

Universe.³ After that, however, the topic dropped out of respectable academic discourse for many centuries.

The Doctrine of the Subtle Worlds, however, did not disappear. Rather it went underground, and was kept alive in the so-called Occult traditions -- traditions such as Hermeticism, Alchemy, and Kabala. The phenomenology of the subtle realms, banished by respectable society from public, outer space, retreated into a shadowy domain that modern psychology re-discovered as 'the Unconscious.'

It is interesting to note that this doctrine, while still repudiated by official cultural authorities, is nonetheless the object of great fascination among reasonably well-educated people. An evening with television, watching alien abductions and demonic possessions on the *X-Files*, then switching over to *Star Trek* where non-material, extra-dimensional entities regularly take an interest in worldly affairs, is sufficient to show us that the notion of the subtle worlds is struggling to become more fully conscious on a popular level. But it is difficult, indeed, to find comprehensive discussions of these subjects in mainstream academia. In this chapter, I want to find a way of approaching this subject that takes it out of the realms of legend and science fiction and into the realm of serious philosophical and scientific discourse.

Our Knowledge of the Physical World

Whatever our metaphysical orientation may be, we all share the pragmatic conviction that we live in a real, external, physical world. The real, external, physical world is the common stage on which we enact the dramas of our lives. It is what we

³ Poortman, *Vehicles*, 1:62.

share with other human beings, with all other life, with the Sun, with the galaxies. It is because we share the same real, external, physical world that we know where we stand in relation to each other, and because standpoints in the physical world remain comfortingly unchanged in their inter-relationships, we can travel far and yet still find our way home.

Sane individuals can meaningfully agree when discussing events in the physical world. Measurements can be made here. Experimental conditions can be specified here, and replicated at will. Knowledge of this world is the very stuff of our science. Manipulation of this world is the very stuff of our material technology.

The physical world is, so far as everyday life is concerned, real and objective. It exists outside of us whether or not we are looking. It was there before we were born, and it will endure long after we are gone. All of our waking actions presuppose the reality of the physical world. If, in some elegant flight of idealistic logical consistency, we deny the objective reality of the physical world, we find ourselves in a "performative contradiction" – our everyday actions, which presuppose the reality of the physical world, give lie to our idealistic pronouncements.

The Doctrine of the Subtle Worlds does not deny the reality of the physical world. It is not an idealistic theory that tries to reduce all of our experience to an illusion, or a mere seeming. But the Doctrine of the Subtle Worlds does maintain that the physical world is neither all of what is real, nor all of what is objective and external. It suggests that, in addition to the knowledge we have of the physical world, there are other forms of knowledge about the real, objective world which are crucially important for human beings.

Before discussing these other domains of knowledge, however, and without questioning the pragmatic, overarching reality of the physical world, I would like to draw attention to the ways in which we come to feel the certainty that we do about physical reality. We can, without undue oversimplification, say that we know about the physical world in two ways – through our systematic scientific explorations, and through our everyday existence as physically embodied beings.

Scientific Knowledge of the Physical World

Our scientific knowledge of reality is based, of course, on scientific method.

According to the Encyclopedia of Philosophy, "the method of science is a mixture – the proportions of which vary from one [specific] science to another – of logical construction and empirical observation, these components standing in a roughly dialectical relation."⁴

In other words, scientific knowledge involves a recursive interaction that starts with the generation of hypotheses, tests those hypotheses against the ongoing data of experience, and then generates refined or new hypotheses. In general, scientific method enjoins simplicity of logical formulation for hypotheses, and insists that, in cases of conflict, the facts always have the last word, even if that makes the logic complex, inelegant, or otherwise inconvenient.⁵

The scientific method is informed by a spirit which takes a fierce and stubborn delight in reducing conceptual proliferation to an absolute minimum, and in subjecting every hypothesis that survives to an unrelenting confrontation with stubborn actuality in

⁴ *Encyclopedia of Philosophy*, s.v. "Scientific Method."

⁵ *Ibid.*

all of its messy details. The Doctrine of the Subtle Worlds which is advanced in this essay is entirely aligned with the scientific spirit and with the scientific method in this broad sense. The Doctrine of the Subtle Worlds raises some questions about the detailed application of the scientific method within the domain of the subtle worlds, but the arguments advanced here are developed with full respect for the principle of conceptual parsimony, and for the necessity of rigorous testing of any hypothesis against all of the available empirical evidence.

In the so-called 'hard' sciences, the sciences that successfully model themselves on physics and which are generally held to be in the most intimate contact with the ultimate facts of the physical world, the criteria for the formation of hypotheses, and the methods by which they are tested, are particularly narrow. In the hard sciences, a hypothesis must be expressed as a quantitative relationship among the results of measurements performed on qualitative properties⁶ of the system under consideration. In later chapters, we will examine more thoroughly the exact conditions under which measurement is possible. In any case, if I want to advance an hypothesis in the discipline of physics, I will identify the system to be studied, I will perform measurements on qualitative properties of the system (e.g., mass, momentum) and I will advance some

⁶ Scientists sometimes forget that what they are measuring are *qualitative* properties. For example, a scientist might refer to a particle as being characterized by two "quantities" – its mass and its momentum. But neither mass nor momentum is a *mere* quantity. I cannot, for example, measure mass unless I differentiate it from temperature and density, and I cannot differentiate mass from these other properties except on the basis of their respective qualities. Thus all of the quantities which we find in the equations of physics are measurements of qualitative properties.

prediction based on a mathematical analysis of the results of those measurements.⁷ The hypothesis must not only be logically parsimonious, it is allowed only one form – a mathematical expression of a quantitative relationship among measurements of qualitative properties of the specified system: e.g., $I = V/R$, or $E = MC^2$.

Furthermore, the method by which hypotheses can be tested in the hard sciences is also extremely narrow. Obviously, a quantitative prediction about the magnitude of a given property in a given context can only be confirmed or disconfirmed by performing a relevant measurement. A measurement is a procedure that assigns, in some consistent way, a numerical value to a state of a given property. Every act of measurement is, ultimately, validated by direct sensory perceptions on the part of some observer. In the final analysis, someone has to read a meter, compare the result to a standard, or somehow, through the senses, to observe the measurement.⁸ A valid measurement must be replicable. It must be possible to perform the measurement at various times with various observers and, in each case, to produce essentially identical results. A scientific experiment is the whole arrangement of observers and artifacts that results in a measurement.

⁷ The actual experimental procedure may, of course, involve more than one person – e.g. a theoretical physicist may use measurements performed by others to advance a new hypothesis, and others may derive the predictions from that hypothesis.

⁸ The actual procedure for associating a number with a property may be very complex. It may involve many individual observations and much intervening mathematical analysis – but it is always grounded in individual sensory observations by individual scientists. What we are here calling “measurement” will, in Chapter Four, be divided up into “counting” and “measurement.” That distinction is not relevant in the current context.

The method of the hard sciences produces knowledge that is largely free of individual delusion and personal prejudice, and that is, within its own limits, exquisitely accurate and almost perfectly reliable. It is important to realize, however, that the knowledge gained through the hard sciences, no matter how true it is, is also quite limited.

First of all, this knowledge is constructed using only a small subset of the data that is available to us in our everyday interactions with the world that contains us. Science uses the data available through the five senses. It extends that data in amazing ways through instruments that make otherwise unobservable phenomena (e.g., infrared and ultraviolet light) indirectly observable – but it ultimately grounds itself in the five senses. There is, on the other hand, good reason to think that human beings can quite regularly access information through channels *other* than those that terminate in the five bodily senses. This issue will be explored in greater depth later on. For now, I want to suggest that the method of the hard sciences, though having a certain ultimate finality when it comes to pragmatic analysis of the data generated (directly or indirectly) by the five bodily senses, is much less adequate when it comes to organizing the larger data set of which the inputs from the bodily senses are a small selection.

Secondly, within the scope of the data that is available through the bodily senses, the hard sciences can help us to organize only that small portion which can be expressed in numerical relationships. The hard sciences, that is, only apply to that element of our experience which can be *measured*. None of our thoughts can be directly measured, none of our feelings can be directly measured, and many aspects of our sensations cannot be

measured. Only certain clear, crisp, conscious, and highly focused elements of our sensory field actually participate in the operations of measurement. Any measurement of the more subtle aspects of our experience rests on an *a priori* definition correlating that more subtle experience with some precise, sensory marker. I might, for example, measure blood flow volume in a human being, and, by a definition, correlate that with levels of anxiety. But I cannot directly measure the diffuse and amorphous feeling of anxiety. No set of numerical relationships among measurable quantities can ever represent the full reality of any actual, felt, sensory experience.

The hard sciences generate a set of data for themselves by a very stringent process of abstraction which pulls out of the full data of life a very thin slice. Out of all the data of experience, it selects only that which comes through the five bodily senses. Out of that, it attends only to that which can be measured. The thinness of this slice does not minimize its decisive importance. But in our fascination with the crystalline clarity of the knowledge that is produced by the methods of the hard sciences, we may tend to neglect some very important patterns in the data that they exclude. We will, when we come to discuss the subtle worlds, see just how important these other patterns can be.

Finally, the hard sciences, by virtue, perhaps, of the wonderful austerity of their methods, and by virtue of the extreme accuracy and the unsurpassed pragmatic power of their discoveries, are often taken to have the greatest ontological authority of any of the sciences. When we want to know what is real, we tend to look to physics for our answers. And physicists, when they want to know what is real, look to the data from experiments.

Experiments are systems of observers and artifacts so arranged as to permit replicable measurements. When we arrange a system of artifacts in such a way that it enables an operator/observer to perform some function in a repeatable way, we usually call what we have so created an instrument or a machine (an instrument, in this sense, is a kind of passive machine, a measuring device). Thus, in every experiment, there is a machine, a mechanical device, interposed between the observer and the object of study. The physicist, qua theorist, postulates a relationship to be observed among a set of measurements. Qua experimentalist, he arranges some combination of artifacts, the operation of which is a set of measurements that specifies a set of numbers. The theory stands or falls by the agreement or disagreement between the predicted numbers and the numbers specified when the experiment is performed.

All of this is well known. But it has been insufficiently remarked that the actual data of the hard sciences is brought into being by a process of small-scale manufacturing. An experiment is, in essence, a kind of machine. The experimental result, the measurements, are manufactured for the theoretician by the experimentalist using custom-made devices. What the hard sciences deal with not the natural world in its raw, sensory presence. It is rather the totality of what can be manufactured as data by the essentially industrial process of experimental measurement.

The hard sciences underlie our technological power. They express some profound truth about the real world. But it is interesting to note that the data of the hard sciences are manufactured and, as such, are artificial. The theories generated by physics predict

the behavior of devices. It is not clear what, exactly, the behaviors of those devices tell us about the world as it exists outside of the experimental context.

The Copenhagen interpretation of quantum physics, the so-called 'standard', or mainstream interpretation, goes so far as to suggest that the properties which experiments measure do not, in fact, exist outside of the experimental context. In other words, an electron does not have a position or a momentum until and unless a measurement is performed that specifies values for those properties. In fact, we cannot even say that there is an electron which does not have properties until they are measured, because to say that an electron is, or is not, an object is actually a way of describing two different behaviors of certain relevant experimental devices.

When we refer to quantum physics to tell us about the ultimate nature of physical reality, we draw on ideas like the particle/wave duality, quantum indeterminacy, and quantum non-locality and we probe what it means to live in a world the deepest reality of which can be thus characterized. But when we ask mainline quantum physicists about the meaning of these ideas, they tell us that they are ways of characterizing the behaviors of experimental devices. Even physicists who are less stringent in their interpretation of the data, and who hold that the data do pertain to some physical existent transcending the experimental situation, nonetheless agree that human beings can only access the deepest truth about reality by doing experiments – that is, by studying the behaviors of machines that produce sets of numbers.

From a certain point of view, this whole endeavor seems quite fantastic. A civilization is born in which those seeking the most ultimate of truths about reality

manufacture, and intently consult, elaborate oracles which speak obscurely in an arcane language of number. This procedure is saved from ridicule by the immense power of its results.

An experiment is a relatively closed system. It is arranged so as to exclude the operation of as many variables as can be practically excluded. Within this artificially simplified situation, relations between variables can be isolated, discerned, and studied. Machines of all kinds, and the factories in which those machines are made, are, like experiments, artificially simplified situations. In the design of machines and factories, however, the objective is not to discern quantitative relationships among variables, but rather to use those invariant relationships to bring about specific effects in the service of larger purposes. The point is that experiments, factories, and the insides of machines are all artificially simplified environments so constructed as to minimize the number of variables that are relevantly operative, and to bring into useful prominence certain quantitative relations among those that have been so highlighted.

The hard sciences really work. With the knowledge of reality that we get from the hard sciences, we can make real things happen in the physical world. Scientific knowledge confers power on those who hold it. Scientific knowledge is so readily convertible into power because experiments turn out to be reversible. In the laboratory, they turn patterns of events into patterns of numbers. In the factory they turn patterns of numbers into patterns of events. The modern, automated factory concretizes this metaphor to perfection.

The hard sciences do give us profound knowledge of the world. These sciences have demonstrated with astounding completeness and exactitude the inextricable interweaving of the qualitative properties and the quantitative properties of sensory experiences in the world, and of certain crucial invariances within those quantitative patterns. But this particular knowledge, to be applied, requires a situation which is, more or less, as simple as is the experimental situation in which the knowledge is first gained.

We study the behavior of machines, and we use the knowledge so gained to construct more and more elaborate and effective machinery. After a while, we find ourselves living inside of our own artificial creations, protected (and isolated) from the biosphere by a vast, semi-autonomous system of artifacts that constitute a kind of “technosphere.” As this takes place, the knowledge of the hard sciences, the knowledge of the behavior of machines, becomes more and more convincing, more and more powerful.

If, under the spell of the hard sciences, we imagine that the methods of experimental science get at the most ultimately real features of the real world, then we are saying that knowledge of the quantitative relationships entwined with sensory experiences is the only knowledge that we need for predicting and controlling reality. Thus we imply that all process is quantitative, all causality is reduced to computation, and the ground of being comes to be imagined as a massively parallel computational device. It is hardly surprising, then, that we find ourselves deluged with movies and novels in

which the characters awaken to the fact that what they had thought was somehow a real world is, in fact, virtual – simulated by an impersonal process of calculation.⁹

We now know that given any set of related sensory variables we can, over some limited range of values, identify significant quantitative relations among them. We now know that we can, over some limited range, generalize from those quantitative relations and make reasonably good predictions of some future behaviors. We have learned that, in the patterns of data from the five senses, quantitative patterns are strongly, though never entirely, determinative of qualitative interactions. We now know that the world is such as to permit human beings to construct machines. Machines are predictable and controllable, their behaviors can be well understood by quantitative methods. Knowledge of the behaviors of machines interacts recursively with itself, leading to the production of more and more knowledge of more and more elaborate devices. We have learned how to turn our knowledge into an explosion of power.

But human creation is richer than machines, and cosmic creativity vastly transcends the human. Our experience is infinitely richer than anything we can express or contain in quantitative measurements. The truth of the hard sciences applies to a segment of our experience, to an artificial abstraction, to the measurable properties of that particular data which we receive through channels which terminate in the five physical

⁹ The movies I am thinking of here are David Cronenberg, writer and director, *Existenz*, (Dimension Films, 1999), Josef Rusnak, writer and director, *The Thirteenth Floor* (Columbia Pictures, 1999), and, in particular, Andy Wachowski and Larry Wachowski, writers and directors, *The Matrix*, (Warner Brothers, 1999). Two novels that explore this idea in a uniquely profound way are Greg Egan, *Permutation City*, (HarperPrism: New York, 1994), and Greg Egan, *Diaspora*, (HarperPrism: New York, 1998).

senses. If we imagine this data to be an epistemologically privileged window into an ultimate ontological reality, then we may end up suspecting that we inhabit a virtual reality, and that we, ourselves, are expressions of an impersonal process of computation.

This knowledge is not, however, the totality of our knowledge of the world. We will now take a fresh look at everyday experience, and at everyday common sense about that experience, to look for ways of enriching our sources of information about reality, and of finding ways of approaching the Doctrine of the Subtle Worlds.

Re-Examining Everyday Experience

Our knowledge of the physical world, as we said earlier, comes through our scientific explorations, and through our everyday existence as physically embodied beings. In a later chapter, we will perform a systematic analysis of the field of experience. In this chapter, our objective is just to demonstrate the initial plausibility of the Doctrine of the Subtle Worlds, by suggesting first, that the physical senses are not the only source of information that we have about the physical world and second, that the other sources of information that we do have about the physical world strongly suggest the existence of other, more subtle worlds in which human beings can and do operate.

Although, as has been suggested, we rely very heavily on our sensory experiences to tell us about the real world that we inhabit, we don't often pay attention directly to the qualities of sensory experience itself. Let us begin paying attention to the senses

themselves by observing that the sensory field is divided into channels¹⁰. These channels are the sensory modalities – sight, sound, touch, taste, and smell. We know quite clearly the differences among these channels – for example, we know what it means to see, and we know that seeing is different from hearing. The precise nature of this difference is easy to notice, though it is not easy to articulate.

Science is based on measurement. Measurement always involves sensory observation. Sensory observation takes place in a field that is divided into the five channels. Scientific work takes it for granted that all of the senses, in some measure (there is sometimes a distinction made between ‘primary’ and ‘secondary’ sensory modalities), give us information about the real, outer, objective world.

Physical Senses and Subtle Senses

There is, however, another distinction in the sensory field, one that is just as fundamental as the division into five sensory channels, but one that is more problematic from the standpoint of scientific knowledge. This distinction divides the physical senses from the subtle, imaginal senses.

There is nothing in this observation that is magical or mystical. The simple and incontrovertible fact is that, in any given moment, the information we get from our outer, physical senses is only a fraction of the total information available to us. The physical senses tell us about what is happening just here, in this particular physical place and just now, at this particular physical moment. But along with the immediate sensory

¹⁰ This way of referring to the sensory modalities comes from Arnold Mindell. See, for example, Arnold Mindell, *Working with the Dreaming Body* (Boston: Routledge and Kegan Paul, 1985).

experience that we have of the outer world, we have, simultaneously, another set of sensory experiences that parallels the experience of the outer world.

We say “I remember.” We say “I imagine”. But *how do we know* the things that we remember? How do we know that we are imagining and how do we know what it is that we are imagining? We know these things because we see, hear, feel, smell, and taste things that are not present in the physical here and now.

This can be illustrated by a simple examination of a particular act of remembering. Suppose that you are in a building, and that you are not, at this moment, in a position to look at the outside of that building. What color is that building, and how do you know what color it is? The chances are that when you read that question, you saw the building ‘in your mind.’ Now it may be that, in this particular instance, you didn’t actually see the building in your mind. Sometimes we ‘just know’ something without representing that knowledge in a sensory way. And memories vary a great deal in the specific clarity with which they are presented to our minds. But if this particular memory didn’t come with a specific visual impression, there are certainly some memories you have that are distinctly visual. In other words, you sometimes *see* things without using your physical eyes. We can apply a similar analysis to the other senses, and to imagination and to dreams.

By and large, during our waking lives, the sensations that we associate with the physical senses strongly dominate the perceptual field. During sleep, however, or in other altered states of consciousness, the balance between the physical senses and the subtle senses can change. In a dream, virtually all of the sensory experiences that we

notice come to us through the subtle channels – the same channels that we use when we remember or imagine. And when we dream, it often seems as if we are awake to a world, a world as elaborate and as detailed as is the world of our waking lives. So, when we examine the field of sensory awareness, we discover that there is a kind of doubling going on. We have a set of five senses that opens on the outer, physical world, and then we have a set of five senses that presents us with a whole other set of interesting and informative experiences.

It is quite clear, then, that our subtle senses do play an important part in our knowledge of the real world. How are we to explain the existence of these subtle senses, and how are we to interpret the knowledge that they give us? The materialistic interpretation of reality that currently dominates our culture tells us that the experiences we have via the subtle senses are not perceptions at all, but are rather elaborately processed re-presentations of experiences that originate through the physical senses. In fact, scientific theories of knowledge – relying, as they do, on the scientific method -- maintain that measurement via the physical senses is the only criterion that can assure of us of the truth of any given empirical proposition. Our culture strongly privileges the physical senses, and this discourages us from taking the subtle senses seriously at all.

Let us, however, for a few moments at least, pay close attention to these subtle senses. As a way of doing this, let us examine a few observations about the subtle senses as they operate in contrast to the physical senses. This list is by no means exhaustive. It is meant, rather, to be suggestive. It is a way of setting a background that can permit us to ask deeper questions as we proceed.

The physical senses present experiences that are generally crisp, bright, sharp and complete. The subtle senses, by contrast, operate over a wide range of conditions. Sometimes the subtle senses present vague hints of perceptions. Sometimes they present abstractions or partial representations. But, on the other hand, sometimes (as in dreams) the subtle senses present highly detailed, very vivid and very complete experiences.

The physical senses present experiences that are contextualized by a smooth, geometrical continuum. If I hold an object in my hand, I can turn it over and examine it from any angle. If I see a space in front of me, I can walk into that space, and when I am there I can look back and see the space that I came from. The subtle senses often present experiences that are fragmentary. I may, for example, remember a room with a door, but not remember what was on the other side of the door in that space. But, on the other hand, sometimes the experiences presented by the subtle senses (as in dreams) can be quite as geometrically coherent as those we have in waking life.

The physical senses present experiences that are almost entirely independent of direct volitional control. No matter how hard I try, I can't make the top of my desk look white instead of black. The subtle senses, by contrast, are sometimes highly responsive to the will. Sometimes I can visualize a scene, then change it – either totally or in detail – on the basis of my desires and my decisions. But note, this is only sometimes true. Sometimes I have a subtle vision that haunts me and that I cannot change – even when it is quite painful. Sometimes even the words that I hear in my head (and which I call 'my thoughts') take on an utterly irritating independence. And, of course, for the most part I have even less control of what I perceive in my dreams than I do over what I perceive in my waking life.

There are a few observations we might make about subtle vs. physical in the case of specific sensory modalities.

In the visual field some people, at least, notice that subtle visual perceptions tend to have a certain luminous, enamel-like texture. The flat and more gritty quality of outer perception is harder to find in inner perception. In addition, subtle perceptions seem to be illuminated without a specific source.

In the subtle auditory field, sounds are often more condensed and less articulated than in the outer field. For example, when I ‘think’, or when, in a dream, I know what someone is saying to me, I often seem to know the content without hearing the words uttered one by one. Certainly there are occasions when subtle hearing is at least as vivid and as detailed as physical hearing, but this seems to be rather exceptional.

In the field of subtle feeling, there seems to be a general absence of acute tactile contact. In dreams, I often feel the sensations that accompany emotions. But it seems to be rather unusual to have the sensation of actually touching objects in a dream.

This brief survey, then, has allowed us to focus our attention on the phenomenology of the subtle senses. Now that we have identified the phenomenon, let us return to the question of interpretation. What are we going to make of these subtle sensory experiences? The materialistic philosophy that dominates our culture gives us an answer to this question, and our next step will be to look at that answer and to see whether or not it makes sense.

The Materialistic Interpretation of the Subtle Senses

Materialism is the ontological doctrine that follows when we place our epistemological faith in the scientific method. Materialism attempts to account for all of our experiences – including the experiences that we have via the subtle senses – in terms of interactions among the artificial and abstract entities that are identified in scientific experiments. Scientific experiments are, as we have observed, grounded in observations that are made with the physical senses.

A materialistic accounting for subtle experiences works something like the following. Materialists observe that the physical senses operate by sending electrical impulses through the nervous system where they are coordinated in a complex fashion. They assume that sensory experience is a pattern of electrical activity in a nervous

system. That is, materialists assume that sensory experience *is* electrical activity in the nervous system. To the extent that materialists acknowledge the reality of consciousness, they tend to define it as nothing but a more or less epiphenomenal manifestation of nervous processes. The nervous system continues to generate electrical activity even in the absence of stimulation from the sense organs. Materialists assume, therefore, that what I am calling the experience of the subtle senses is what happens when the nervous system generates patterns of electrical activity like those that are generated by physical, sensory input, but without actually referring to the immediate operation of the senses. Clearly the nervous system, if this theory is correct, can generate these perception-like patterns in parallel with physical perception (as it does when I am awake, but thinking or remembering), or it can do so in the absence of significant physical stimulation (as it does when I am dreaming). Materialism begins with the assumption that the only real world is the one that we perceive with the physical senses. The real world is objective. It exists whether or not it is perceived, and it is public. Anyone with the proper set of sensory organs can perceive it, and all reasonable observers can agree on what they perceive. In the context of materialism, all of the experiences that we have through the subtle senses – all of our dreams, all of our memories, all of our thoughts – are assumed to be strictly private. They are not objective, not public, not fully real: subjectivity is dismissed as an epiphenomenon. And there is no new information available through the subtle senses, only re-hashes, re-gurgitations, re-arrangements of prior experiences that have come thorough the physical senses.

Is this materialistic interpretation of the subtle senses true? Is it actually the case that what we experience behind our eyes, between our ears, in our hearts and in our minds – that all of that is nothing but a private show put on by electrical activity in our nervous systems? This is a crucial question. The doctrine of the subtle worlds becomes intelligible and interesting only if our subtle senses can give us access to subtle worlds that are just as real and just as objective as the physical world that we perceive through our physical senses. Let us, then, take the time to examine the merits of this materialistic interpretation of the subtle senses.

Critique of the Materialist Interpretation of the Subtle Senses

Is it the case that what I perceive through my subtle senses is strictly a private re-arrangement of experiences that originate in the physical senses? The materialist position attempts to account for experiences that we have on the subtle channels by reducing them to patterns of electrical activity in the nervous system. But the materialist position also reduces experiences that we have on the physical sensory channels to the same sorts of electrical activity. So, within the framework of the materialist interpretation, both physical sensory experience and subtle sensory experience are nothing but patterns of electrical activity. What, then, is supposed to be the difference between them?

The difference is supposed to be that the experiences on the physical channels really come from outside, whereas the experiences on the inner channels are just highly processed echoes of those outer experiences. But how can we know that? If all of my sensory experiences are nothing but electrical activity in the nervous system, then the

entire outer world is something that I construct by processing nervous impulses. This means that everything that I think of as real – gravitation, electromagnetic forces, strong and weak nuclear forces, atoms, molecules, suns, galaxies, cells, animals, *and even nervous systems and the electrical impulses in them* – is something that I have constructed. But if even the nervous impulses themselves are a construction, how can I maintain that they are an objective reality out of which my experience has arisen?

If the materialist hypothesis is true, then my notion of the outer world is just that – a notion. It is something that I construct out of a complex stream of data. I somehow interpret those data to imply the existence of an outer world. But I can't really know that that world is there. Once I assert that my experience is nothing but a pattern of electrical impulses, then I put myself in a situation in which I can never actually know what the source of those impulses is. In other words, my entire experience of a supposed outer world could be nothing but a particularly coherent dream.

Thus, in the context of the materialistic interpretation, both subtle and physical sensory experiences are similar patterns of electrical activity. Once we stipulate that both subtle and physical sensory experiences are reducible to nervous activity, we have established that they are fundamentally of the same nature, and it becomes very difficult to establish that one is real information about an objective, public world while the other is strictly private. I can confidently assert that the physical experiences display a certain type of continuity that does not characterize the subtle experiences, but that is the only difference I can establish between them. Indeed, as we will see in Chapter Five, the data

of the subtle senses also disclose a profound order, and that order, in its own way, supports the objectivity and externality of the worlds that they disclose as well.

The Subtle Senses and Psychological Differentiation

The materialistic interpretation seemed to give us a way of accounting for the difference between physical and subtle perception. The clear and simple fact is that the experiences we get through our physical senses are, generally, clear and objective, while the experiences that come through the subtle senses are, apparently, chaotic and subjective. If we are going to maintain that the subtle senses, like the physical senses, do give us access to a real, objective world, we will have to account for this decisive difference between the two sets of perceptions. It turns out, however, that this is very easily done. The key insight here is one that comes from developmental psychology, and particularly from the works of Jean Piaget.¹¹

Piaget has conclusively demonstrated that the distinction between self and other is a developmental accomplishment. When an infant is first born he or she is immersed in a sea of sensation. There is, at first, no recognition of the difference between one object and another. There is no recognition of the difference between his or her own body and the rest of the world. Nonetheless, there is a clear experience of sensation, and the infant acts in relation to what he or she experiences.

Since most of us don't remember our infancy, it is a challenge for us to actually imagine what it would be like to have no sense of the difference between self and other.

¹¹ See, for example, Jean Piaget, *The Construction of Reality in the Child*, trans. Margaret Cook (New York: Basic Books, 1954).

One way of bringing the possibility of this experience into focus is to imagine that you only have one sense, the sense of touch. Imagine how difficult it would be, in that situation, to realize that the discomfort of hunger or sadness comes from ‘inside’ while the discomfort of cold or a sharp impact comes from ‘outside’. If we operated with the sense of touch only, the notion of inside and outside – a crucial component of the sense of separate selfhood – would be meaningless. The pre-self world of infancy must have had something of this character.

What I want to suggest is that we are, in relation to our subtle senses, rather like an infant is in relation to his or her physical senses. When we receive impressions through our subtle senses, we vaguely think of them as ‘mine’. We don’t know how to accurately distinguish self from other in relation to the subtle senses, and it is this confusion, this lack of development, that allows us to perpetuate the assumption that all of our subtle impressions are private.

In other words, our normal development quickly teaches us that there is a boundary in the physical world which separates ‘my body’ from ‘the rest of the world.’ But, after all, the physical world does not stop at the outer edge of our skins. There is one physical world, it pervades us all, and the process by which we appropriate one part of it as ‘mine’ is rather mysterious. The Doctrine of the Subtle Worlds suggests that there is also one imaginal world that pervades us all, and that in that imaginal world we have not yet learned the psychological knack of separating out the experiences that constitute ‘my body’ from the experiences that constitute ‘the rest of the world.’ This lack of

development leads us into the notion that our imaginal space is private. The Doctrine of the Subtle Worlds suggests that this notion is quite illusory.

Do the Subtle Senses Tell Us About the Real World?

Let us pause and review the steps we have taken up to this point.

- We have placed our attention on the sensory field that is the ground of all of our scientific knowledge of reality.
- We have noted that the sensory field is divided into five sensory channels.
- We have noted that the division into five sensory channels is not the only division we can point out. There is also the division between physical sense and subtle sense.
- We have outlined the materialist interpretation of the division into physical and subtle sense, and we have suggested that that interpretation is not strong enough to force us to interpret the data of the subtle senses as mere re-presentations of data from the physical senses.
- We have, finally, suggested that the difficulty that we have in clearly delineating the objects and situations that are perceived through the subtle sense can be accounted for if we assume that our level of psychological and perceptual development in relation to the subtle senses is more primitive than is our level of psychological and perceptual development in relation to the physical senses.

Is there evidence to suggest that the information we receive through the subtle senses is, in fact, actual information about realities beyond ourselves? Yes, there is. First of all, it is clear that the data from the inner senses sometimes discloses to us truths about

the outer, physical world. Our thoughts, especially our scientific thoughts, do give us information about that world, and we do not perceive the thoughts themselves via the outer senses. For example, if I have an "aha" experience in which I ascertain the equation governing the relationship among some physical variables, the equation will likely come to me first as a formless intuition, and then as an inner visual image or as an inner string of words. So here my inner senses are giving me a glimpse of a truth about the outer world.

Second, there is significant evidence about the ability of our subtle sense to inform us about the physical world that has been accumulated as a result of parapsychological research into phenomena such as remote viewing.¹² Let us look more closely at the significance of this evidence.

It is indisputable that people sometimes see subtle pictures of remote events, and later discover that those pictures were accurate. And, of course, people often see pictures of remote events which they later discover had nothing at all to do with what happened to be the case in the physical world. So the question here is one of interpretation. There seem to be two possibilities. One is that the occasional incidence of accurate remote viewing is just a lucky hit, statistically inevitable but essentially uninteresting. The other possibility is that the ability to do remote viewing is somehow latent in human beings, but only operates occasionally and under particular circumstances. Clearly remote viewing is not a regular and well developed human capacity like, for example, the ability to

¹² Dean Radin, *The Conscious Universe: The Scientific Truth of Psychic Phenomena* (San Francisco: HarperEdge, 1997), 91-110.

recognize colors or the ability to read words. Perhaps remote viewing is entirely impossible for human beings, but human beings want to believe it is possible and, therefore, cling to the occasional lucky guess as evidence to support their wishes. On the other hand, it is logically possible that the ability to do accurate remote viewing is latent in human beings, poorly developed, subject to various kinds of interference, but nonetheless occasionally operative. In this case, what might otherwise be interpreted as just a lucky guess is actually the occasional functioning of a genuine, though irregular and undeveloped, capacity.

These are both logical possibilities. The question is, how do we decide among them. The most obvious test is a statistical one. If we have a stack of cards imprinted with four different images, and we ask someone to "see" which card is being picked at a remote location, we will expect their "seeing" to be correct 25% of the time. If, over a large number of trials, the number of correct "guesses" approaches 25%, then we can surmise that there is nothing there but luck and wishful thinking. But what if, over a sufficiently large number of trials, the number of correct guesses is, by some statistically significant measure, more than 25%. Let's say, for example, that it is 33%. How would we interpret that? First, of course, we would suspect bad experimental methods, experimenter prejudice, etc. But suppose, over a long time, we were satisfied that the experiments were good and we still got these anomalous results. In that case, we would have to suspect that *something* is going on. The logical conclusion, in this case, would be that the data of the inner senses can *sometimes, and under some conditions*, give

meaningful information about the outer, objective world. This is precisely the kind of evidence that has been accumulated by decades of parapsychological research.¹³

The evidence not only supports the notion that the inner senses give us a certain amount of information about the outer world, it also suggests that our *intentions* systematically, though subtly, influence events in the physical world. A great deal of work in this area has been done at the Princeton Engineering Anomalies Research Laboratory and documented in the *Margins of Reality*, by Robert Jahn and Brenda Dunne.¹⁴ It has, for example, been quite conclusively demonstrated that people can, by their mere intention to do so, decisively influence the output of various random number generators.

Thus parapsychological research makes it clear that that the subtle senses do, in a statistically significant (though not a pragmatically reliable) manner, put us in direct touch with the real, external, objective physical world in a way that is not mediated by the physical senses.

Thirdly, it is actually quite natural for us to imagine that the subtle senses put us in touch with the emotions and thoughts of other embodied beings through the phenomena that we term empathy and telepathy. To explore this possibility, let us consider the emotional reactions that we have as we interact with the people around us.

¹³ Radin, *Conscious Universe*, 61-110. Radin statistically analyzes the results of decades of experiments in telepathy and remote viewing and conclusively demonstrates that the statistical evidence for the existence of these phenomena is incontrovertible.

¹⁴ Robert Jahn and Brenda Dunne, *Margins of Reality: The Role of Consciousness in the Physical World* (San Diego: Harcourt Brace Janovich, 1987). See also Radin, *Conscious Universe*, 127-146, 175-190.

Let's say, for example, that you are experiencing anger. How do you know that you are angry? We know our own emotional states through subtle sensory cues. Many people, for example, say that they know they are angry because they have sensation of tightness and constriction in the gut. That is a sensation on the channel of subtle feeling.

Now, how do you know whether that sensation comes from inside or from outside? The materialist interpretation tells us that our physical senses present us information about the posture, the tone of voice, and other relevant physical characteristics of the other; that we process that information and make unconscious inferences about possible threats; that the processed information from the outer senses triggers a cascade of reactions in the body; and that this cascade of reactions is what we experience as anger. That interpretation is superficially plausible, but does it actually fit the experience?

If we examine our experience dispassionately, we may notice that we often experience the emotional presence of the other as a kind of palpable force. Sometimes, for example, you might walk in on two people who have been fighting. The issue might have nothing to do with you, but you can feel the anger of their fight like a dark cloud in the room. It is always possible to construct, retroactively, a materialist interpretation of the feeling. But does this explain the phenomenon? Or does it just explain it away?

Suppose it *is* the case that there is an actual, objective, emotional interaction among people – an interaction that is as actual as is our contact in the physical world. We might imagine, for example, that each of us generates an emotional field, and that those fields interact in various ways. Suppose, in addition, that we are relatively infantile

on that level of perception, so that we have not yet learned to differentiate self from other in that subtle sensory field. This interpretation would fit the facts of our experience very well. We are constantly having emotional reactions. We do not choose to have them. They just happen. Each of us assumes that they are ‘mine’ and we try to control them as well as we can. But the fact is that they just happen and we can’t really tell whether they are coming from ‘inside’ or from ‘outside.’ It often feels as if they are coming from others. The Doctrine of the Subtle Realms strongly suggests that much of what we take to be ‘my’ emotional reactions are, in many instances, actual perceptions of the emotions of others.

Now, if the emotional reactions that we have to others are not interpretations of patterns of physical sensations, but rather perceptions in their own right, then the world is suddenly a very different place. In this new world, when we look inside, we are not looking into a private theatre, we are rather looking out into a subtle world of objectively interacting emotional fields.

When we continue to examine the field of subtle perception and we remain open to the possibility that our subtle sensations are in fact perceptions, we begin to notice other suggestive peculiarities. We can note that our subtle *feelings* seem, at least sometimes, to be induced by others. But where do our *thoughts* come from? You are thinking about a problem and then, suddenly, an idea for a solution just comes to you. Where does it come from? We can, of course, posit some sort of spontaneous neural reorganization. But the experience is that the idea just presents itself to consciousness. Often people will ‘get’ the same idea at the same time. Sometimes people report the

experience of thinking an idea just before someone else says it. Thus our subtle senses, rather than presenting re-hashed re-interpretations of information from our physical senses, may rather be presenting to us direct perceptions of the thoughts of other embodied beings.

What I am saying up to this point is close to what is said in certain schools of psychology. Modern archetypal psychology, for example, works hard to establish that not all of the processes that I find in my own mind belong to my own ego.¹⁵ Multiple personality disorder is an extreme case of this multi-personal psyche, in which we see that there is room for more than one person in ‘my’ mind. But this kind of psychological reasoning does not suggest that the egos of other embodied beings might appear as complexes in our own psyches, and that is exactly what is being suggested here.

I am suggesting, then, that the subtle senses convey information about the real, outer, objective world in three distinct ways. First, the subtle senses play an important role in memory, imagination, and thought. Second, the subtle senses give us access to information about the world through phenomena such as remote viewing. Third, the subtle senses give access to the subtle experiences of other embodied beings through direct empathy and mental telepathy.

Do the Subtle Senses Disclose True Subtle Worlds?

None of this, of course, establishes the Doctrine of the Subtle Worlds. At best it suggests that there is subtle dimension of the physical world, but not that there are actual

¹⁵ Mary Watkins, *Waking Dreams* (Dallas: Spring Publications, 1984). Mary Watkins, *Invisible Guests* (Boston: Sigo Press, 1990).

subtle worlds. The distinction between a subtle dimension of the physical world, on one hand, and actual subtle worlds on the other, is one that sometimes gets blurred. There are actually three rather different things that people intend when they speak of subtle realities or subtle worlds, and for the purposes of this essay it is important to distinguish them quite clearly.

First of all, there is just the fact of subjective experience. Each of us has an ‘inner’ experience of memory, imagination, and dream, and this inner experience might be described as ‘subtle’ by contrast to our outer sensory experience. In the past few centuries, we have come to call this realm the ‘unconscious.’ This realm has vast hidden depths, and these depths have been tentatively explored by the various branches of psychoanalysis. By and large, however, there is an assumption that each individual has a private experience of his or her unconscious, and that the unconscious is primarily a repository of memory. It is sometimes suggested that there may be a “collective” dimension to this memory – a kind of evolutionary inheritance – but the unconscious, even in this sense, remains a personal and private experience for each individual.¹⁶

Secondly, there is the notion of a true subtle dimension pervading the physical world. This is the notion that we have been exploring in this section. The idea here is that our knowledge of the physical world is not limited to what we can learn through the five senses. Rather, we have at least five (and quite possibly more than five) subtle

¹⁶ This seems to be the understanding of the collective unconscious found in Carl Jung’s earlier works. His later works seem to articulate an idea of the collective unconscious that comes close, at least, to that suggested by the Doctrine of the Subtle Worlds.

senses which give us access to direct information about situations in the physical world with which our physical senses cannot put us in touch, and which also give us direct access to the feelings and thoughts of other embodied beings.

The notion that there is a subtle dimension to the physical world does not require a very great modification of the materialist metaphysics. We might, for example, say that physical organisms beyond a certain level of complex organization are able to receive and transmit hitherto undiscovered physical energies. In this case, we might imagine that the nervous system is able to function not only as a processor of external physical impressions, but also as a transmitter and receiver of signals of a kind that have not yet been detected by any instrumentation currently in use by scientists. This is hardly implausible. After all, scientists originally thought that the only energies necessary for a proper accounting of reality were gravitational and mechanical. In the past several hundred years, we have had to add electromagnetic forces, and strong and weak nuclear forces. Perhaps there are other energies not yet discovered, and our subtle senses are tuned into those energies. If this were the case, then we would not be discovering subtle worlds, we would rather be discovering unused senses that give us expanded access to the one physical world we already share.

Now, if it is the case that human beings (and, perhaps, other living beings), have a direct psychic impact on each other, then all of the theories by which we attempt to account for human behavior in terms of outwardly observable variables would be fatally incomplete. Once we acknowledge the importance of the subtle senses, we realize that our current scientific understanding of reality is using only five senses instead of the full

ten or more that are available. It would make sense that our science would work well for inorganic systems that are insensitive to the subtle, intersubjective energies we are proposing. And it would make sense that our scientific understanding would fail us when we try to understand the living world in general and ourselves in particular, since we, more than any other entity in the known physical world, are engaged in active reception and transmission of these subtle energies.

We know, from our study of physical systems, that many interacting components can, under the proper conditions, self-organize into higher level unities. If it is the case that human beings are interacting in a field of subtle energies, it is quite likely that those energies self-organize into various interesting configurations. Without gaining some understanding of the dynamics of those subtle processes, we cannot hope to understand the forces that shape social evolution. And without developing the senses that render those energies perceptible, we have very little hope of understanding those forces. If it is the case that the subtle senses do, indeed, open out onto an important domain of objective reality, then any science that attempts to account for reality without studying the data provided by those senses will be incomplete.

But, again, to say that there is a subtle dimension of the physical world is not the same as saying that there are, indeed, subtle worlds. Even if we allow that there is a subtle dimension to the physical world, we are still granting that physical world a certain ontological priority. We are still assuming that every real thing has a physical body in the one physical world. The Doctrine of the Subtle Worlds, by contrast, maintains not just that individuals have subtle, inner experiences, and not just that there is a subtle

dimension to the physical world, but rather that there are worlds other than the physical world, and that those worlds are an important part of the reality that we experience. Those worlds operate according to laws that are different from those that obtain in the physical world, and they are populated by individual beings at various levels of emotional, intellectual, and spiritual development. It suggests, further, that many, if not all, beings who have physical bodies also have bodies in those worlds, that many of the beings living in those worlds do not have bodies here, and that some of those beings take an active interest in, and have a significant influence on, what happens here on the physical level.

Is there evidence to suggest that the subtle worlds, in this strong sense, actually exist? Again, the answer is yes. First, we have the evidence afforded by our own dreams. In dreams we experience not only the thoughts and feelings of other people, we also experience whole other worlds. Many of the beings that we encounter in these worlds seem to have no physical bodies. They are at various levels of intellectual and emotional development. If we are willing to acknowledge that the subtle senses give us information about objective realities, it is only a small step to grant objective existence to the worlds in which dreams take place, and to the denizens of those worlds.

Second, we have a large and expanding literature on lucid dreams and out of body experiences. These experiences differ from dreams primarily in that they are accompanied by a much greater coherency of thought than are normal dreams, and in that they are more clearly remembered upon the return to normal, waking consciousness. Practitioners of these arts regularly report interactions with other human beings who are

in the foggy state of normal dreaming,¹⁷ with the personalities of people who have died,¹⁸ with various non-human intelligences, and with worlds that are entirely other than from physical reality.¹⁹

Third, we have the records of various pre-modern cosmologies, all of which took these non-physical worlds for granted. We will explore one of these cosmologies, the Vedic cosmology, in the next chapter.

Fourth, we have the accumulating body of evidence which is contained in the literature on Unidentified Flying Objects (UFOs). Many, many thousands of quite sane individuals are reporting interactions with beings that do not seem to be entirely physical in nature.²⁰ Typical stories of UFO abductions often include features such as levitating and passing through physical walls –experiences regularly reported by out of body travelers. The Doctrine of the Subtle Worlds provides a framework within which these otherwise unintelligible events can be fruitfully understood. Indeed, as Richard Thompson has shown, the UFO phenomenon not only receives an intelligible explanation

¹⁷ Waldo Viera, *Projections of the Consciousness* (Rio de Janeiro: International Institute of Projectiology, 1995), p. 60.

¹⁸ *Ibid.*, 24.

¹⁹ Robert Bruce, *Astral Dynamics* (Charlottesville, Va.: Hampton Roads, 1999), 388-393.

²⁰ John Mack, M.D., a psychiatrist at Harvard University, has brought work on this phenomenon into the mainstream. See John E. Mack, *Abduction: Human Encounters with Aliens*, (New York: Ballantine Books, 1995).

in terms of Vedic cosmology, but has, in fact, been recorded in Vedic texts going back many thousands of years.²¹

Finally, we have the evidence of psychedelic research, by means of which many thousands of individuals have had experiences which provide strong anecdotal confirmation of all of the evidentiary sources just enumerated.²²

Let us, then, summarize this entire section. We have seen that our notions of the physical world are constructed out of the data which we get through the five physical senses. We have seen that there is reason to believe that, in fact, we have many sources of information about the real world other than those five senses. And we have seen that the data disclosed by the subtle senses suggests the existence of subtle worlds which are, like the physical, real and objective. It is this expanded definition of reality that is at the heart of the Doctrine of the Subtle Worlds.

²¹ Richard Thompson, *Alien Identities: Ancient Insights into Modern UFO Phenomena* (Alachua, Florida: Govardhan Hill Publishing, 1995), 199-338.

²² Stanislav Grof summarizes his exhaustive research into this subject in Stanislav Grof, *The Cosmic Game: Explorations of the Frontiers of Human Consciousness* (State University of New York Press: Albany, NY., 1998).

CHAPTER TWO – THE DOCTRINE OF THE SUBTLE WORLDS AND THE COSMOLOGY OF SRI AUROBINDO

Introduction

A decisive move towards the rehabilitation of the Doctrine of the Subtle Worlds in Western civilization was taken at the end of the Nineteenth Century by Helena Blavatsky and the Theosophical movement. While the Doctrine of the Subtle Worlds had fallen on hard times in the West, it had remained a significant part of the Vedic understanding of reality. The Theosophists were exposed to Vedic cosmology with its Doctrine of the Subtle Worlds by teachers in the East, and made a heroic effort to translate that Vedic cosmology into the terms of a scientific metaphysics²³. The original Theosophical writings were supplemented in the early part of the Twentieth Century, notably in the works of Alice Bailey and Rudolph Steiner. The ideas they introduced have been influential, though they have yet to reach mainstream academic discourse.

Sri Aurobindo, the great Twentieth Century philosopher-mystic, took the work of the Theosophists to an entirely new level. Sri Aurobindo brought to his cosmological work three major assets: he was an accomplished yogi who seems to have had personal experience of the subtle worlds; he was well versed in both the Vedic *and* the Western philosophical and scientific traditions; and he wrote in English. The works of Sri

²³ The Theosophical work along these directions is exhaustively summarized in a series of books by A. E. Powell. See A. W. Powell, *The Etheric Body* (Wheaton, IL: Quest, 1972), A. E. Powell, *The Astral Body*, (Wheaton, IL: Quest, 1972), A. E. Powell, *The Mental Body*, (London: Theosophical Publishing House, 1975), A. E. Powell, *The Causal Body and the Ego*, (London: Theosophical Publishing House, 1978), and A. E. Powell, *The Solar System*. London: Theosophical Publishing House, 1930; reprint Mokelumne Hill, CA: Health Research, 1985.

Aurobindo are the only primary Vedic sources that have ever been written in English, and thus have not suffered the diminishment of translation.

Sri Aurobindo's opus is a masterful synthesis which weaves together Vedic cosmology and Western evolutionary cosmology. In creating a framework for this synthesis, he developed a new version of Vedic metaphysics – a system which he called “Purna Vedanta,” or Integral Nondualism – which provides a context within which he can reconcile these apparently differing cosmological views. Sri Aurobindo has given us the most philosophically coherent presentation of the main outlines of Vedic cosmology that we have in the English language.

Our concern in this essay is the Doctrine of the Subtle Worlds. Therefore, in the following pages, I shall present just so much of Sri Aurobindo's ideas as are necessary to illuminate his version of that Doctrine.

The Metaphysical Background of the Doctrine of the Subtle Worlds in Sri Aurobindo

Sri Aurobindo, in common with philosophers of many other mystical traditions, holds that the ultimate reality transcends comprehension by Mind. He holds, however, that the highest conception that we can form of that reality is the notion of a unity within which three aspects can be discriminated. Those three aspects are Existence, Consciousness/Force, and Bliss. This particular characterization of the ground of being is a traditional Vedic one. Existence, in Sanskrit, is *Sat*. Consciousness is *Chit*. Bliss is *Ananda*. Thus the ultimate ground is termed Sat-Chit-Ananda, or Sachchidananda. Force, or *Shakti* is held to be inherent in *Chit*.

Let us pause to wrap our imaginations around what it is that Aurobindo is here suggesting. Sachchidananda is the ground of all manifested existence. It is infinite Existence, infinite Being. Whatever substance or form comes to arise in any possible universe has its source here. Materialists also, at least implicitly, imagine an ultimate ground of Being, but the ground that they imagine is a dark, unconscious, and automatic play of blind potentialities. Sachchidananda is, by contrast, entirely transparent to its own knowing self-regard. It is not just Existence, but it is Existence that is conscious of itself – utterly self-illuminated. And the Consciousness which the Existence has of itself is inseparable from a Force, or Will that supports and upholds the being of the Existence. Finally, the Consciousness that the Being has of itself is inseparable from a profound self-enjoyment. Thus, for Sri Aurobindo, the ground of all manifestation is an absolute Existence that *is* absolute knowledge of itself, that *is* the absolute intention to be itself, that *is* absolute enjoyment of itself. It is conscious, intentional self-enjoyment of self-existence.

This notion of the absolute has immense philosophical and theological consequences, which Sri Aurobindo works out in some detail in his master philosophical treatise, *The Life Divine*.²⁴ The question that concerns us here is this: how does this infinite, absolute Sachchidananda bring out of itself the kind of determinate universe in which we find ourselves?

²⁴ Sri Aurobindo, *The Life Divine*, 2d American ed., (Pondicherry: Sri Aurobindo Ashram, 1990).

The answer that Sri Aurobindo gives us is that Sachchidananda has the ability to manifest determinate universes through the operation of its Consciousness/Force, or Chit/Shakti. In particular, the Consciousness operates in various 'poises.' In one poise, the Consciousness knows and wills the Existence in its undifferentiated absoluteness. This is the poise of Consciousness in pure Sachchidananda, outside of manifestation. In the other poise, Consciousness picks out, discerns, or apprehends particular aspects of that Existence, particular truths of the One Truth. This is the 'poise' of Sachchidananda in manifestation. Now Sachchidananda, being 'one without a second', is entirely without any possibility of opposition. Those aspects of itself, or those truths of itself, which are discerned by Consciousness are, in the same movement, willed by its Force, and so they are manifested as determinate realities.

For finite beings such as ourselves, beings who live in a medium which appears to us as not-self, knowledge, will and manifestation are three different operations. But for a Being which is the absolute ground of all manifestation, these three operations are inseparable. What the Consciousness knows, the Will intends. What the will intends is invariably manifested. For Sri Aurobindo, then, manifested being arises when Consciousness discerns, and Force or Will intends, certain determinate aspects of the one truth of Existence.

This has, to Western ears, a rather mystical ring to it. But, as we shall see when we come to consider Alfred North Whitehead's more thoroughly Western approach to the problem of manifestation, he comes to a rather similar position. In Whitehead's mature metaphysical position, the two factors that logically precede the manifested universe are

the Eternal Objects and Creativity. The Eternal Objects correspond rather well to that factor which Sri Aurobindo calls Existence. The Eternal Objects are like Existence in the unmanifested state of Sachchidananda -- all possible forms of being are here latent, unmanifest in the One.²⁵ Creativity is that ultimate principle by means of which those ultimate finite existents that Whitehead calls “actual occasions” come into being.²⁶ Now actual occasions have two poles – a mental pole and a physical pole. These two poles correspond rather well to what Sri Aurobindo intends by Consciousness and Force. It is the mental pole of an actual occasions that discerns determinate truths of the one truth of being (as Whitehead would say, they “prehend” Eternal Objects), and it is the physical pole which enacts those determinate truths in the manifested universe. Thus what Sri Aurobindo describes as the process of manifestation has a rather strong resemblance to the process which Alfred North Whitehead calls ingression.

In any case, we have so far identified two major poises of Consciousness/Force – the poise which supports absolute Sachchidananda, outside of manifestation, and the poise which supports manifestation. This latter poise can be broken down into a number of other poises, and it is the analysis of these various poises of Consciousness/Force that supports Sri Aurobindo’s conception of the Doctrine of the Subtle Worlds.

²⁵ Especially before they are ordered by the Primordial Mind of God. In Sri Aurobindo, this ordering is accomplished at the highest level of Supermind. A full consideration of these technicalities would be far beyond the scope of this particular essay.

²⁶ A. N. Whitehead, *Process and Reality*, corrected ed. (New York: The Free Press, 1985), 21.

The Subtle Worlds As Various Poises of Consciousness/Force in Manifestation

Sri Aurobindo suggests that the relationship between Consciousness and its Force in manifestation is a variable one. Table of the Poises of Consciousness summarizes the four poises that are important for our purposes here.

POISE OF CONSCIOUSNESS	RELATIONSHIP BETWEEN CONSCIOUSNESS AND ITS FORCE
Supermind	Consciousness and its Force are differentiated, but perfectly balanced.
Mental World	Consciousness dominates Force
Vital or Life World (Theosophists call this the Astral World)	Consciousness and Force contend for domination
Material World	Force dominates Consciousness

Table 1: Poises of Consciousness

Sri Aurobindo develops a cosmology in which there is a highest level or plane of manifestation which he calls the Supermind level. At this level, Consciousness and its Force, though playing at the realization of various possibilities of being, function in a perfect harmony. At this level of manifestation, as in Sachchidananda itself, consciousness, will, and force of realization are implicitly interconnected. Here Force, though realizing determinate possibilities, is a perfect expression of Consciousness, and there is no possibility of disharmony. The notion of a Supramental level of being is quite central to Sri Aurobindo's metaphysical cosmology, but a full consideration of its properties and implications is beyond the scope of our current considerations.

The Doctrine of the Subtle Worlds, as we are developing it here, concerns itself primarily with the three levels of manifestation 'below' the Supermind level. At these levels, Consciousness and its Force play out the possibility of a variable relationship

between themselves in which one or the other may play the dominant role. At one end of this spectrum, Consciousness dominates, at the other Force dominates. Every possibility in between finds its realization in this cosmological scheme, but the spectrum can be conveniently divided in a threefold way.

Before we consider the details of the scheme, let us pause to look more deeply into the core of the idea. Common sense tells us that we live in a material world, and that our bodies are composed of material substance. There is an important sense in which we use the physical world in general, and our own bodies in particular, as a medium of expression for our desires, our volitions, and our thoughts. On the other hand, as we are well aware, the physical world is quite stubborn, and it lends itself as a medium of expression for our conscious intentions only reluctantly. To the extent that we are like inorganic entities, we are entirely subject to physical law – if, for example, in some unfortunate circumstance, we were to find ourselves falling from a great height, our momentum would be entirely determined by physical forces, and neither our fears nor our wishes would change it one iota.

However, it may be that it is not only physical matter that serves as a medium of expression for our conscious intentions. There is also the ‘matter’ of emotion and imagination. If we put aside our modern habits of thought, which see emotion and imagination as more or less epiphenomenal to material interactions, it is quite natural to understand feeling and imagination as a kind of ‘stuff.’ When we dream, we are in a world of this subtle stuff, and when we imagine, we are working to shape that stuff to our conscious will. Now the subtle stuff of the imagination is more supple and responsive to

our conscious intentions then is the gross and stubborn stuff of physical matter – but not entirely so. While we can sometimes construct fantasies that are entirely delightful, we not infrequently find ourselves overwhelmed by our own fantasies, suffering them, and caught up in their momentum in spite of our best intentions. Thus while physical matter is almost entirely under the domination of Force, in the subtle matter of the imagination there is, as it were, a more even contest between Consciousness and Force.

Finally, by the same logic which sees emotion and imagination as a kind of stuff, we can also see meaning and thought as a kind of stuff. Even here, the domination of conscious intention is not absolute – thought does offer some resistance to our intentions and it can be difficult to work with – but, by and large, it is much more supple and responsive than is either the stuff of imagination or the stuff of the physical world.

The point is that we can see, played out in ourselves, three different creative poises of Consciousness/Force. When we are thinking, we are experiencing a situation in which Consciousness largely predominates over Force. When we are imagining, there is the experience of a more even contest between them. And when we are working with our physical bodies, Force generally has the upper hand.

Vedic cosmology in general, and Sri Aurobindo's cosmology in particular, takes the notion of imaginal stuff and thought stuff quite literally. In fact Sri Aurobindo suggests that each of these poises of Consciousness/Force issues in an entire universe, a 'plane' or world of manifested existence. The world with which we are, on the surface at least, most familiar is the physical world. Sri Aurobindo, like Alfred North Whitehead, is a panpsychist. He holds that wherever there is Force (or energy) there, too is

Consciousness. But in the physical world, consciousness is “shut up . . . in the violently working unconscious sleep of material force.”²⁷ Our civilization has expended its greatest creative energies in exploring the mysteries of this unconscious physical world. We have a great understanding of how matter behaves when the consciousness within it places itself in the service of blind habit.

But Vedic cosmology holds that there is also, ‘above’ the physical, a life world. The clearest notion of this life world that most of us can form comes from our memories of dreams. Dreams by no means exhaust the life world, but they are the only portion of the life world of which most of us have memories. In dreams forms are highly mutable, they exhibit properties that would be impossible here in the physical world, and they are highly responsive to conscious intentions. Vedic cosmology refuses to consider the worlds of dreams as mere private images somehow incident on the functioning of a physical brain. Rather they consider dreams to be a cloudy window into the universe of the life world.

In this life world there is nothing that is inorganic. All of the matter there has the properties that, here in the physical world, we associate only with living matter. It is a world in which the Consciousness that is invariably associated with every movement of Force does not place itself in the service of blind habit, but rather actively pursues new and interesting possibilities of adaptation to the space in which it finds itself.

Sri Aurobindo says:

²⁷ Sri Aurobindo, *The Synthesis of Yoga*, 5th ed. (Wisconsin: Lotus Lights Publications, 1999), 449.

In this world forms do not determine the conditions of the life, but it is life which determines the form, and therefore forms there are much more free, fluid, largely and to our conceptions strangely variable than in the material world. This life-force is not inconscient material force, not even, except in its lowest movements, an elemental subconscious energy, but a conscious force of being which makes for formation, but much more essentially for enjoyment, possession, satisfaction of its own dynamic impulse. Desire and the satisfaction of impulse are therefore the first law of this world of sheer vital existence, this poise of relations between the soul and its nature in which the life-power plays, with so much greater a freedom and capacity than in our physical living . . . Moreover, it is not fixed in one hardly variable formula as physical life seems to be, but is capable of many variations of its poise, admits many sub-planes ranging from those which touch material existence and, as it were, melt into that, to those which touch at the height of the life-power the planes of pure mental . . . existence and melt into them.²⁸

Sri Aurobindo is quite clear in stating that this life world is not just some subtle aspect of the physical world, but is rather an entire world, existing in its own right. He says:

. . . each plane, in spite of its connections with others above and below it, is yet a world in itself, with its own movements, forces, beings, types, forms existing as if for its and their own sake, under its own laws, for its own manifestation without apparent regard for the other members of the great series [of worlds]. Thus, if we regard the vital [or life] . . . plane, we see great ranges of it (most of it) existing in themselves, without any relation with the material world and with no movement to affect or influence it, still less to precipitate a corresponding manifestation in the physical formula.²⁹

On the other hand, everything that does happen here in the physical world has, in some sense, been anticipated in the vital world.

²⁸ Ibid., 452

²⁹ Sri Aurobindo, *Letters on Yoga*, 3d ed., vol. 1. (Pondicherry: Sri Aurobindo Ashram, 1970), 253.

. . . the material world is really a sort of projection from the vital, a thing which it has thrown out and separated from itself in order to embody and fulfill some of its desires under conditions other than its own, which are yet the logical result of its own material longings. . . . Moreover, the life-world is constantly acting upon us and behind everything in material existence there stand appropriate powers of the life-world; even the most crude and elemental have behind them elemental life-powers, elemental beings by which or by whom they are supported.³⁰

In other words, the life world not only exists independently of the physical world, it is a world that is somehow freer, fuller and more concrete than the physical world, and the physical world exists as a kind of voluntary self-limitation of that larger world.

Beyond, or 'above' the life world, is the world of mind. What has been said of the life-world applies with the necessary differences to still higher planes of the cosmic existence. For beyond the life plane is a mental plane, a world of mental existence in which neither life, nor matter, but mind is the first determinant. Mind there is not determined by material conditions or by the life-force, but itself determines and uses them for its own satisfaction. There mind, that is to say, the psychical and the intellectual being, is free in a certain sense, free at least to satisfy and fulfill itself in a way hardly conceivable to our body-bound and life-bound mentality . . .³¹

As the life world is independent of and, in fact, transcends the physical, so the mental world transcends the life world.

Both the life-world and indirectly the material are a projection from that, the result of certain tendencies of the mental Being which have sought a field, conditions, an arrangement of harmonies proper to themselves . . .³²

³⁰ Aurobindo, *Synthesis*, 453.

³¹ *Ibid.*, 455

³² *Ibid.*

Thus Sri Aurobindo envisions first a world of pure mentality. This is a world in which the very stuff is as supple and as responsive to conscious intention as is the ‘stuff’ of our thoughts. This world is inhabited by mental beings, beings who structure their bodies out of pure thought-stuff, and who enjoy a range of perception and an a scope of power which vastly transcends our own. Then, as a voluntary self-limitation of this world of pure mentality there arises a life-world, a world of pure imagination. This world includes, quite literally, any world that we can imagine. “. . . this world contains not only the possibility of large or intense or continuous enjoyments almost inconceivable to the limited physical mind, but also the possibility of equally enormous sufferings. It is here therefore that there are situated the lowest heavens³³ and all the hells with the tradition and imagination of which the human mind has lured and terrified itself since the earliest ages.”³⁴ This world is populated by beings who possess bodies of pure imaginal stuff, or dream-bodies. There are here found the various beings that our ancestors termed angels and devils, as well as disincarnate human beings, and a host of others. Finally, as a voluntary self-limitation of this world, there emerges a physical world, the world that we inhabit.

Human Beings in the Threefold World

Aurobindo develops a model of the evolutionary process which explains it as the successive embodiment in material systems of intelligences belonging to higher and higher planes or worlds of being. The evolution begins with inorganic physical beings,

³³ The higher heavens being in the worlds of pure mentality.

³⁴ Aurobindo, *Synthesis*, 453.

almost utterly lost in the play of their own force of habit. These beings are not so lost that they do not have interaction, and by means of their interaction, they self-organize. To the extent that they self-organize, they create conditions under which intelligences from freer domains of being can become involved with them. To the extent that those 'higher' intelligences become involved with physical systems, the viability of those systems in the physical world is enhanced. Living beings are systems of inorganic matter that are involved with vital beings. Thinking beings are systems of vital beings that are involved with mental beings. And the evolutionary work of humans – of mental intelligences operating through vital and physical bodies -- is to work towards the embodiment, in matter, of a principle that offers a still fuller participation in reality than we can ever reach by thought itself.

In any case, we human beings are understood to express ourselves through three bodies, a mental body on the mental plane, a vital body on the vital plane, and a physical body on the physical plane. When we are born, we come into the world with three newborn bodies, the mental, the vital, and the physical. During childhood development, all three bodies develop. The mental and vital intelligences inhabiting the physical body are not aware of their presence in higher worlds. But, just as we originally differentiate our own bodies from the rest of the physical world, so we can, through evolution or through yogic development, differentiate our vital and physical bodies on their own levels. We then discover ourselves to be beings of much higher order of complexity than we had hitherto believed.

Aurobindo says:

Man . . . has in himself behind his physical being, subliminal to it, unseen and unknown, but very close to it and forming with it the most naturally active part of his existence, this vital soul, this vital nature and this vital body; a whole vital plane connected with the life-world or desire-world is hidden in us, a secret consciousness in which life and desire find their untrammelled play and their easy self-expression and from there throw their influences and formations on our outer life.³⁵

As we can begin to function consciously on the vital level, we come at last into conscious relationship with the vital agencies that energize and influence the individual and collective movements of living beings in the physical world. On the vital level, we experience a level of empathy and direct emotional interaction much greater than that which we experience through the medium of our less responsive physical bodies. Our senses on the vital level are keener, and reach farther, and reveal more than do our senses here. A human being with full consciousness on the vital level could bring down into the physical world, for good or for evil, a level of knowledge and power impossible to someone who confines his or her attention solely to the data of the physical senses.

Further, to the extent that we differentiate on the mental plane of reality, we discover ourselves to inhabit:

a mental or subtle body which enjoys capacities of knowledge, perception, sympathy and interpenetration with other beings hardly imaginable by us and a free, delicate and extensive mentalized sense-faculty not limited by the grosser conditions of the life nature or the physical nature.³⁶

³⁵ Ibid., 468.

³⁶ Ibid., 470

Again, it would represent a great evolutionary accomplishment to bring down into the physical world the knowledge and power available to a being able to operate consciously, and with continuity of memory, in a domain of pure thought. While human beings are, ultimately, working for the embodiment of a Supramental principle, the development of a fuller functioning of our vital and mental principles would, nonetheless, seem to be a necessary accompaniment to a further evolution.

Finally, as the crowning achievement of this developmental path, Aurobindo suggests that we will discover that the being that is expressing itself through these three bodies is an immortal soul, a being that somehow participates both in time and in a timeless and spaceless communion with the Divine on Supramental levels.

This vastly empowering vision of human actuality and human potentiality arises in the context of Aurobindo's cosmology with its Doctrine of the Subtle Worlds, which this essay attempts to articulate and to support.

Aurobindo offers us a compelling metaphysical system with which he justifies his cosmology, and the arguments presented here are a very vague sketch of that system. But Aurobindo's arguments begin with a definition of the Absolute. It may be that Aurobindo's definition of the Absolute is intellectually convincing. It may also be, as Aurobindo claims, that his definition of the Absolute is a description of a possible experience. But in any case this is not empirical evidence that most of us can access at this time. In the remainder of this essay, I will attempt to articulate a different argument that supports the Doctrine of the Subtle Worlds – one which – starts not from a definition

of the Absolute, but rather from a fresh examination of the structure of our everyday embodied existence that is inspired by the work of Alfred North Whitehead.

CHAPTER THREE – ON THE NATURE OF FACT

Introduction

There are two fundamental truths concerning the physical world which we inherit from common sense. First, the physical world is real and objective. It exists outside of us and independently of us. It was there before we arrived, and it will be there after we are gone. Second, all of our knowledge of the physical world depends, ultimately, on our subjective, personal experiences.

These two truths are a very odd couple. Either of them, taken to its extreme, negates the other. If the physical world is entirely outside of subjective experience, if consciousness is in no way intrinsic to its mode of being, then it is hard to imagine how conscious knowledge of that reality could ever arise. And yet if all of our knowledge of the physical world depends on our subjective experience, then how can we know that the physical is truly objective and independent of the consciousness of it that we have?

Either truth, taken to its extreme, negates the other – and yet we cannot make sense of our reality except by acknowledging both. What we observe here is a fundamental complementarity, somewhat akin to the wave/particle complementarity that is discussed in the context of quantum physics. Both descriptions are necessary. Each is useful in the proper context. But each seems to contradict the other.

Over the last few hundred years, our scientific and technical civilization has focused most of its intellectual energies on exploring the implications of the first of these truths – the truth of the external, objective reality of the physical world in which we live. We have been engaged in a grand and heroic intellectual adventure. We have learned

things about this physical world that no civilization before us had every imagined, and we have achieved a level of mastery in this world that is entirely unprecedented in its scope and in its quantitative majesty.

For this triumph, however, we have paid a heavy price. We have distorted and impoverished the richness and diversity of our lives, we have precipitated vast ecological devastation, and we have lost access to the intimacy with the biosphere, the nearness to the Gods, and the life-ordering power of the higher mentality that graced the less technically sophisticated civilizations of our ancestors.

Our civilization is out of balance. We have gotten so lost in the objective, outer truth that we sometimes genuinely doubt the reality, the power, and the significance of our own conscious existence. In this chapter, we are going to reach for balance by exploring some of the implications of the other great truth about the physical world – the subjective truth, the truth that all of our knowledge of the outer world is gathered from our own, seemingly internal, subjective experiences.

Because scientific truths about the objective world are of such importance to us, however, the first task of this exploration must be that of showing how our own subjective experience is connected to the real, objective, outer world – the world that we learn about from scientists. This task is an extremely important one, and one that is often neglected by those exploring this more subjective line of approach. It is sometimes suggested that since the physical world only appears in our conscious experience, it is

therefore just *maya*, an illusion, a dream.³⁷ Thus, it is held, the details explored by science are just an oddity of the particular dream we are inhabiting, and are of no fundamental importance. It is suggested that what is really important are not the quantitative details of the dream, but rather the overwhelming fact that physical reality is, indeed, a dream – in particular a rather bad dream from which we can and should strive to awaken. But this line of reasoning can satisfy us only if we are willing to turn our backs on this world, on its beauty and its mystery, and on its vital, pragmatic concerns.

Those of us who live among the technological marvels of the twenty-first century are too overwhelmingly awed by the physical world and too interested in its details to dismiss it as a mere illusion. If we are going to regard the truth of subjectivity as something more than an intellectual curiosity, fit to amuse the philosophically inclined, it is going to have to say something interesting about the physical world as that world is understood by science.

The world as science describes it is ‘smooth.’³⁸ It is a world of discrete events and precisely delineated fields, with clearly defined locations, interacting in ways that can be precisely quantified³⁹. Under the influence of science, we sometimes imagine that the world that we actually experience *is* that smooth world. But if we actually look at our

³⁷ This position is particularly associated with Shankara and his Advaita Vedanta teachings. It is also associated, though not in this language, with various idealistic schools in the West, for example, with the philosophy of Berkeley. This idea has found its way into many derivative “new age” syncretistic philosophies as well.

³⁸ A. N. Whitehead, *The Aims of Education*, (New York: New American Library, 1953), 109.

³⁹ Even the indeterminacy that characterizes the quantum realm can be precisely quantified.

subjective experience, what we find is not ‘smooth’ at all. It is rather, as Whitehead suggests,⁴⁰ a ‘rough’ world, a world of vague boundaries, of shifting foci, of discontinuous fragments; and many of our most vivid experiences – experiences of love or hatred, of moral or aesthetic value, or even of hunger and thirst – cannot be quantified at all.

What, then, is the relationship between the smooth world of science and the rough world of experience? Many thinkers have tried to account for the rough world of perception in terms of the smooth world of science. Physiological theories of perception, and the entire discipline of cognitive science, are devoted to this endeavor. Given that our bodies are made up of sub-atomic particles, of atoms, of cells and of organs, how is it that the perceptual process can be understood? Many valuable insights have emerged from this line of approach, though the ‘hard problem,’ the problem of accounting for the emergence of consciousness in a world of unconscious objects, remains unsolved by any of these approaches.⁴¹

In the following pages, we will take the opposite tack. Rather than trying to account for the rough world of perception in terms of the smooth world of science, we will start with the rough world of perception and ask how, from within that world, we can arrive at the smooth, quantifiable world of science.

⁴⁰ Ibid.

⁴¹ David Chalmers, *The Conscious Mind: In Search of a Fundamental Theory* (New York: Oxford University Press, 1996).

I want to emphasize that the purpose here is not to undercut or to invalidate the physical sciences in any way. This approach is very sympathetic to science and, in fact, it is the approach that was taken by Alfred North Whitehead in the “middle period” of his work, when he was concerned with working out a philosophical validation for the results of scientific method.⁴² The purpose, rather, is to *complement* the scientific form of explanation. Science presents us with ideas about a real, objective physical world, and in terms of those ideas we can usefully account for many of the features of our experience. The approach we will take in the following pages starts with our experience and shows how, from within that experience, we can arrive at, experientially validate, and significantly illuminate the world described by science.

As we do the work of clarifying the precise place of the physical world within the field of our own subjective experiences, we will find that our entire understanding of the physical world has changed decisively, and we will find, too, a perspective from which we can fruitfully coordinate the reality of the physical world as that world is described by science with the Doctrine of the Subtle Worlds.

The Definition of Fact

We begin with the fundamental truth, enshrined deeply in the texture of common sense and at the heart of the scientific method, that all of our knowledge of the physical world is ultimately grounded in subjective experience. Scientists, of course, tell us things about the physical world that no one can ever perceive directly through the five senses.

⁴² This ‘middle period’ of Whitehead’s work includes A. N. Whitehead, *An Inquiry Concerning the Principles of Natural Knowledge* (New York: Dover Publications, 1982), A. N. Whitehead, *Concept of Nature* (Cambridge University Press, 1964), A. N. Whitehead, “The Principle of Relativity with Applications to Physical Science,” in Northrop, F.S.C. and Mason W. Gross, eds. *Alfred North Whitehead: An Anthology*, (New York: Macmillan, 1961), A. N. Whitehead, *The Aims of Education*, (New York: New American Library, 1953), A. N. Whitehead, “Time, Space and Material; Are They, and If So in What Sense, the Ultimate Data of Science,” in Whitehead, Alfred North, *The Interpretation of Science: Selected Essays*, (Indianapolis: Bobbs-Merrill, 1961). All of these works influence the ideas presented in this chapter quite heavily.

No one has ever directly perceived an atom, an electromagnetic wave or a quark. But when we ask scientists *how they know* about atoms, electromagnetic waves, and quarks, they tell us that they know those things because they are necessary in generating explanations for the results of experiments that *were* directly perceived with the senses. In science, all valid knowledge is grounded in direct, sensory experience.

The conviction that truth is ultimately grounded in direct experience is even more binding in the context of everyday life. If I ask you how you know whether or not you are seated, or whether or not you are indoors at this moment, you refer quite naturally to the details of your current *experience* as entirely binding arbiters of truth. But while we can speak with ease about the *things that* we perceive, what can we say about *experience itself*? In order to begin any meaningful investigation, we must delimit clearly the subject of our study. What do we mean when we refer, in scientific work or in everyday life, to our *experience*? How can we be reasonably sure that we mean the same thing when we use that most obvious and most mysterious of terms?

In our ordinary, everyday intercourse with the world, we look *at* the world *through* our experience of it. But if we are going to explore the subjective grounds of our objective knowledge, we must rather learn to look *at* experience itself. Say I am thirsty and I see a glass of water. The perception involves variously shaped patches of different colors, but I do not look *at* those patches of color, I rather look *through* them *at* the actual glass and its alluring contents. For the purposes of our current investigation, I want to ask you to take a moment and to suspend the usual way of perceiving *through* the senses, to pause, and to notice the possibility of looking rather *at* the data of the senses themselves.

Examine, for example, your visual field. I invite you to forget, for a moment, about the familiar things that are usually the objects of your attention, and to notice the

visual field itself. You will notice that the visual field is roughly oval, that it has a region of sharp definition towards the center in which boundaries seem crisp, and then it fades off into areas of less and less distinct visual definition towards its outer edges. While it is clear that the visual field has a boundary – human anatomy does not permit us to see behind our heads at any given moment – it is nonetheless very difficult to discern the actual boundary of the field with any clarity. At any given moment, the field is tessellated by colored regions. There is a great deal more that can be said about this field, but my point is to draw attention to the interesting properties of the visual field itself, rather than to any of its contents. It is possible to conduct an analogous investigation for each of our senses. Although each is structured differently, each reveals itself as a complexly structured field for the activity of varying sensory impressions.

Now the fields of experience constituted by the various senses are all contained in a unifying field of experience, so that we can see, hear, taste, smell, and touch simultaneously. Furthermore, these interacting fields of sensory experience are, as a complex whole, themselves contained in a larger field of experience which embraces interactions not only among varying sensory impressions, but also among various modalities of non-sensory experiences such as emotions, judgments, thoughts, intuitions and so forth.

When I refer to the field of experience, I am referring to that which comprises this entire, complexly structured interaction of varying sensory and non-sensory impressions. I propose, following the elegant terminology introduced by Whitehead in his essay on

The Principle of Relativity,⁴³ to call this overall field of experience by the name “Fact.”

Fact is the totality of what is being experienced.

We habitually assume that the physical world transcends our experience of it.⁴⁴ By this, I mean that the being of the physical world does not depend on its being experienced, and that all experience depends on underlying physical events. But there is an important sense in which experience transcends the physical world. By this, I mean that the physical world is, for us, always contained in experience⁴⁵, and that the physical world is not, in a sense that will emerge more clearly as our exploration unfolds, the totality of what it is that we do, actually, experience.

I look down at the desk before me, and I have a visual experience of the physical world. I *see* colored patches. I *recognize* a desk. I *remember* a desk that I used to have. I *wish* this desk were different. I *imagine* a faery desk, translucent and alive with a sparkling play of color. Which of these experiences is actually an experience of the physical world? From a scientific point of view, the answer to this question is clear: only

⁴³ Whitehead, *Relativity*.

⁴⁴ The relationship of transcendence is sometimes taken to imply a radical discontinuity and separation between its relata. Thus, for Kant, noumenal reality transcends experience and, therefore cannot be experienced. In theological contexts, a transcendent Deity is one that is definitely *not* immanent. In these contexts, transcendence and immanence are opposites, rather than complementaries. I use the term transcendence in the sense that Sri Aurobindo uses the term, to imply a factor in reality that both has existence beyond that which it transcends but also contains and pervades it. Thus transcendence is not the opposite of immanence – rather what is transcendent is both immanent and something more. For a fuller exploration of this issue, see Aurobindo, *Life Divine*, 25-32.

⁴⁵ An independently existing real, physical world ‘out there’ is something that we know about only in our ideas, and ideas themselves are, in the sense we are here discussing, elements in the field of experience.

the colored patches that I see with my eyes and the simple recognitions involved in measurement count as ultimately valid information about the physical world.

I do not wish to dispute the scientists on this point. I only wish to point out an assumption that we might otherwise take for granted. We experience sensations, simple recognitions, complex perceptions, memories, imaginations, wishes, dreams, intuitions, occult experiences and mystical experiences of various kinds – but we assume, both in common sense and in scientific praxis, that only *the sensations which can be involved in measurement* connect us with any directness to the actual physical world outside of ourselves. At this moment, my visual and tactile impressions (which could, in principle, be involved in measurements) connect me to a real, physical desk, but my memories, my wishes, my ideas and my dreams are impressions of another sort, indirectly related to the physical, but not admissible as evidence in the courts of scientific truth.

In what follows, we will explore in some depth the relations among these various sets of impressions. What I want to emphasize here is the breadth and the depth of Fact. Fact comprises the measurable impressions that connect us to the physical world, the non-measurable impressions that inform us of our bodily and emotional states, the impressions that illustrate our imaginings, the impressions that inform of us of dream realities, the currents of thought impressions and feeling impressions that illuminate and color all those streams of sensation, and more.

The Elusiveness of Fact

Fact, the overall field of experience, the actual totality of what is felt and known at every moment, ought to be the most obvious of realities, and yet it is remarkably

elusive and mysterious. This is, in part, because of our habit of looking *through* experience rather than *at* it. It is also because our entire perceptual and linguistic apparatus has evolved to elicit into relevance those particular factors in our experience which are most important in assuring our physical survival. What our senses register are *changes*. Factors which remain relatively constant quickly fade into the background of our consciousness. And what we perceive and name are, in general, *things* – particular complexes of factors which stand out against a background. But Fact, which comprises all factors of experience *and* the background against which they stand out is always there and is, thus, particularly difficult to notice and to name.

Some Characteristics of Fact

We can, however, with a little effort begin to explore Fact, and when we do so, the characteristics which emerge are strangely interesting.

Fact Is a Relationship of Factors⁴⁶

Rather cryptically, Whitehead characterizes Fact as follows:

Fact is a relationship of factors. Every factor of Fact essentially refers to its relationships within Fact. Apart from this reference it is not itself. Thus every factor of Fact has Fact for its background, and refers to Fact in a way peculiar to itself⁴⁷

In order to grasp what Whitehead is getting at when he says that Fact is a relationship of factors, we need to make three observations: first, Fact is an integral

⁴⁶ Whitehead, *Relativity*, 306 – Note that Whitehead does not capitalize “Fact” as I do

⁴⁷.Ibid.

whole; second, Fact is discriminated into factors; third, Fact is intrinsically coherent. These three observations are discussed below.

Fact Is an Integral Whole. In every experience of the here and the now, the field of experience is first and foremost a unified totality. The implicit unity of the field is often obscured by our habit of paying primary attention to the discrete, clearly bounded impressions that occupy the focal center of the field in everyday experience.

To make this clear, let us confine our attention for a moment to the visual field which we began to explore earlier. If, under everyday conditions, we confine our attention to the focal region of that particular field, we immediately notice relatively discrete colored patches. Whitehead calls these patches (and the analogous phenomena in other sensory fields) sense-objects.

Now whenever we focus on a particular, visual sense-object, the rest of the field fades into obscurity. It is actually quite difficult to describe just what the non-focal regions of the visual field look like. But whenever we shift our focus to those more obscure regions, we discover in those regions other sense-objects which are, upon suitable inspection, also crisply delineated. We thus, quite naturally, form the notion that the visual field consists of a collection of discrete sense-objects, and we assume that our attention simply selects first one, then another of those objects as it moves about in the field.

This quite natural way of thinking has led to doctrines, such as those of Locke and the other Empiricists, who seek to understand Fact as a collection of discrete impressions. Hume, however, demonstrated quite incontrovertibly that such a way of conceiving the nature of Fact is philosophically disastrous. To make a long story quite short, Hume

demonstrated that once we try to understand Fact as a mere collection of discrete elements, we lose all sense of the intrinsic coherence of experience, and we find ourselves unable to locate in our experience any grounds for the indispensable notion of causality and the indispensable procedures of inductive reasoning – both of which make sense only if there is an intrinsic connection among impressions such that they regularly and reliably signify each other.⁴⁸

It is worth noting that Hume's *reduction ad absurdum* of the Empiricist doctrines was the spark that awoke Kant from his "dogmatic slumber" and radicalized the subjective turn of modern philosophy that had begun with Descartes. But Kant and his successors, while recognizing the validity of Hume's conclusions, also accepted Hume's original analysis of Fact as a collection of discrete impressions. Whitehead opens up a completely new path for the philosophical enterprise by rejecting the Empiricist analysis and by pointing to the integral wholeness of Fact. Experience does not start from discrete impressions which are, subsequently, associated with others in various collections. Rather experience starts with a whole field out of which individual elements are subsequently discriminated.

Fact Is Discriminated Into Factors. The wholeness of the field is, however, only part of the story. Quite evidently, Fact is not a monolithic whole, but a whole in which individual elements – factors – are always discriminated. This factorization of Fact is entirely evident and is the partial truth which is overly emphasized in the Empiricist analysis.

⁴⁸ Whitehead, *Process and Reality*, 130-143.

Fact Is Intrinsically Coherent. Since fact is an integral whole, and since it is nonetheless factored, it is evident that the factors of Fact are intrinsically interrelated in such a way as to form a coherent totality.

The failure to note that the integral wholeness of Fact implies the essential interrelatedness of its factors has led to much confusion in modern philosophy. To see how this is the case, let us return to the visual field and to the discrete sense-objects that occupy its focal region. Whitehead draws our attention to the fact that these sense-objects never manifest themselves in isolation. Rather, whenever there is, in Fact, a visual sense-object, that sense object appears within the larger visual field, against a background of other, less clearly discriminated visual impressions, and in necessary relation to a perceiver. It is this whole, complexly structured visual field that is the actual visual fact. Visual sense-impressions are always elements of that visual fact, but they never, ever, manifest themselves in isolation from the full context of visual experience.⁴⁹

The mistake which the Empiricists make is what Whitehead, in his later works, calls “the fallacy of misplaced concreteness.” When we analyze the visual field we can, for certain purposes, abstract out of that field the crisp visual impressions that occupy its focal region. But to claim that those impressions have any ontological priority, to claim that they are in any sense ultimate, self-existing, atoms of experience, is to assign to those elements a concrete reality that belongs only to the field as a whole. These elements only exist as elements of the total field in which they are embedded. As Whitehead says,

⁴⁹ The visual field itself is, of course, only a factor within the larger, concrete reality of Fact.

“Every factor of Fact essentially refers to its relationships within Fact. Apart from this reference it is not itself. Thus every factor of Fact has Fact for its background, and refers to Fact in a way peculiar to itself”⁵⁰

Fact Is Active

While Fact, in some sense, remains a constant background against which all differentiated experiences can be apprehended, all finite experience is experience of change. While Fact itself may be constant, the functioning of Fact is an activity of differentiation. It is process.

Fact Is Inexhaustible

We can appreciate the inexhaustibility of Fact in several ways. First, no matter what particular factor of Fact occupies the focal region of our consciousness, there are always other factors of Fact beyond it and contextualizing it. Secondly, whenever we recognize several factors of Fact, the relations among those factors are also factors of Fact, thus the more factors we recognize, the more factors there are for recognition. Finally, Fact itself does not enter awareness in the same way that its factors do. All other factors of Fact enter awareness by virtue of their contrast with other factors. But Fact, as the all embracing context, cannot enter into the relation of contrast.⁵¹

Whitehead tells us:

⁵⁰ Whitehead, *Relativity*, 306.

⁵¹ Whitehead, *Relativity*, 306.

Fact enters consciousness in a way peculiar to itself. It is not the sum of factors; it is rather the concreteness (or, embeddedness) of factors, and the concreteness of an inexhaustible relatedness among inexhaustible relata.... Thus inexhaustibility is the prime character of [Fact] as disclosed in awareness; that is to say, [Fact] (even as in individual awareness) cannot be exhausted by any definite class of factors.⁵²

The point here is that Fact, the overall field of experience, can always be factored, but no particular way of factoring Fact exhausts the richness of possibility which Fact presents. Whitehead here rejects any possible reductionistic analysis of Fact.

Suppose, for example, we look once again at the analysis of Fact performed by the hapless Empiricists. Empiricists identify “impressions” as the fundamental type of factor, and want to explain fact as a collection of these factors. But then what about the notion of “collection” and the operation of “collecting.” That notion and that operation themselves must be factors of Fact, but they are not, themselves, impressions. Fact cannot be exhausted by any combination of factors. Fact is a *relationship* of factors, but it cannot be reduced to the sum or collection or set of any particular class of factors that can be found within it.

Whitehead between East and West

Hume performed an invaluable service for the Western tradition by demonstrating that a reductionistic approach to the analysis of Fact yields a description of experience which fails to find a suitable basis for our indispensable belief in causality and inductive

⁵² Whitehead, *Relativity*, 306. (Whitehead, in the original text, substitutes the word ‘factuality’ for Fact in this particular passage. Reproducing that here would not serve clarity of exposition.)

reasoning, and which, thus, fails to find a suitable basis for the entire edifice of common sense and scientific thought.

Whitehead, in the service of science, undertook a fresh examination of the field of experience, and came to the conclusion that Fact, the overall field of experience, is *an inexhaustible, intrinsically coherent, active relationship of factors*.

Whitehead's aims in performing this analysis were modest. He was simply trying to describe Fact in such a way that the roots in raw experience of the fundamental truths of common sense and science could be laid bare. Quite remarkably, however, Whitehead has, in this analysis, adumbrated some of the most profound root notions of Eastern metaphysics.

In the next chapter, we will observe some important relationships between Whitehead's fundamental metaphysical categories and those of Sri Aurobindo. But this connection between Whitehead's thought and Eastern thought can be seen especially clearly if we look at the relationship between the fundamental characteristics of Fact and some of the fundamental notions of Buddhist philosophy.⁵³

Eastern philosophy in general, and Buddhism in particular, has focused its primary attention on a deep exploration and analysis of the field of experience. F.S.C. Northrop, in *The Meeting of East and West*, identified this field of experience as one of

⁵³ A number of writers have commented on the deep connection between Whitehead's ideas and those of the Eastern traditions, but most of those commentators have focused on the relationship between the speculative metaphysical system which Whitehead developed in his later work and the speculative ideas embodied in certain Eastern metaphysical systems. See, for example, Steve Odin, *Process Metaphysics and Hua-Yen Buddhism*, (Albany: State University of New York Press, 1982).

the most important notions in Eastern thought. He defined it as “the totality of the immediately apprehended” and went on to say “This is the aesthetic component of all things in its entirety, with nothing neglected or abstracted. It is more accurately described as the differentiated aesthetic continuum.”⁵⁴ This is exactly what Whitehead calls “Fact.”

The early (for example, the Theravada) schools of Buddhism, like modern Empiricists, were engaged in analyzing Fact into fundamental factors. They called these factors *dharmas* which, in this context, roughly translates as “point-instants of experience.” These early Buddhists were quite aware that these *dharmas* never arise alone and, in fact, that the arising of any particular *dharma* is fundamentally dependent on the preceding and concurrent arising of other *dharmas* in certain systematic patterns. They called this the truth of interdependent origination – one of the fundamental tenets of all Buddhist teaching. Thus these early Buddhists would have been quite comfortable with Whitehead’s characterization of Fact as a relationship of factors.

The middle (Mahayana) schools of Buddhism came to feel, however, that the reductionist analysis of the field of experience into determinate *dharmas* did not do full justice to its depth and richness. They came to recognize that any analysis of the field of experience into determinate *dharmas* was itself a phenomenon arising in the context of interdependent origination, and could not be deemed the ultimate truth. In other words,

⁵⁴ F.S.C. Northrop, *The Meeting of East and West* (New York: Collier Books, 1962), 447

Mahayana Buddhists realized what we have here called the inexhaustibility of Fact, and they called this “the open dimension of Being”, or *Sunyata*.

Finally, the later (Vajrayana) schools of Buddhism, working to comprehend and to master the miraculous appearance of coherent worlds of experience out of the inexhaustible richness of the open dimension of Being, developed the symbolism of the *mandala*. The mandala principle is that factor in existence which is responsible for the intrinsic and meaningful coherence of the differentiated aesthetic continuum.

Thus, when Whitehead describes the field of experience as *an inexhaustible, intrinsically coherent, active relationship of factors*, he is saying something very much like what Vajrayana Buddhists are saying when they describe experience in terms of the mandala principle.⁵⁵

This is not, by any means, to say that Whitehead has exhausted the insights of Buddhism. Buddhism, and the other Eastern schools of thought, are based on highly sophisticated meditative techniques that, in Whitehead’s language, involve systematic suspension of the activity of “thought” in order to deepen, broaden, and magnify the underlying “awareness” out of which thought grows.⁵⁶ It is claimed that these techniques bring about experiences and insights capable of opening up radically new epistemic horizons and, thus, of totally transforming the entire texture of experience. I do not want to suggest that Whitehead was aware of these possibilities.

⁵⁵ Chogyam Trungpa, *Orderly Chaos: The Mandala Principle* (Boston and London: Shambhala, 1991), 15-16.

⁵⁶ We will define “thought” and “awareness” more precisely in Chapter Four.

Nonetheless, it is highly significant that, in generating a description of Fact which does justice to causality, to inductive reasoning, and to science, Whitehead generated a description which is also consonant with some of the fundamental metaphysical notions of the East. The metaphysical systems of the East usually support cosmologies which feature the Doctrine of the Subtle Worlds.⁵⁷ It will not be entirely surprising, therefore, that we will find that Whitehead's description of the field of experience also allows for at least the possibility of the that doctrine.

In any case, as we proceed with our task of locating the physical world within the domain of Fact, we will also be making a contribution to the reconciliation of Eastern and Western modes of knowing.

⁵⁷ This is exhaustively documented in Poortman, *Vehicles*, vol. 1.

CHAPTER FOUR - ON THE NATURE OF THE PHYSICAL WORLD

Introduction

In previous chapters, we have:

- Outlined the Doctrine of the Subtle Worlds, and advanced some informal arguments in its favor
- Sketched out a traditional understanding of the Doctrine of the Subtle Worlds as that understanding is expressed by Sri Aurobindo
- Suggested that the structure of our cosmos is not just a physical world, but a physical world, a vital world (or life world), and a mental world.
- Pointed out the reality of Fact, as the total field of experience.

In this chapter, I shall demonstrate how, within Fact, we can identify that system of factors which comprise the physical world and thus set the stage for a fruitful coordination of the reality of the physical world, as that world is known to us in common sense and in science, with the Doctrine of the Subtle Worlds.

In the type of explanatory discourse with which we are familiar in our scientific and technical civilization, we are in the habit of starting with some understanding of the outer, physical world, and then of generating explanations of our experience in terms of that understanding. This mode of explanation begins with a set of abstractions, with hypothetical entities such as atoms and electromagnetic waves that (while thought about) are not, in fact, found in direct experience, and then works from that starting point back

towards an accounting for the concrete experience that we actually have. I will call this mode of discourse “explanation from abstractions.”

In what follows, we will be engaging in a rather different mode of discourse. Rather than starting from abstractions, we will start with the full, concrete reality of experience, and then attempt to identify, within that experience, those factors out of which we can abstract the entities which, in our more usual mode of proceeding, we take as the starting point of our explanations. I will call this mode of discourse “explanation from the concrete.”

It is impossible to give a short description of the physical world as that world is known by common sense. Common sense is too rich, too inconsistent, and too complex to be easily systematized. I can only leave it to my reader to decide whether or not his or her common sense is satisfied by the accounting offered here. Science, on the other hand, gives a description of the physical world which is, in its broad outlines, fairly easy to state. Briefly, science posits the physical world as a spatio-temporal framework in which something more or less material (particles, waves of energy, or fields of probability) adopts variable configurations over time according to mathematically expressible laws. Furthermore, for theoretical physics, what is actually real is the particular configuration of this material throughout the expanse of space at the current instant of time. The principal task of the following pages will be to show how this material world postulated by scientific reasoning can be found within Fact.

The Primordial Factors of Fact

Fact, as we have seen, is the total field of experience, and must be understood as *an inexhaustible, intrinsically coherent, active relationship of factors*. There are many ways in which we can work with Fact. The great yogis of the East, and the mystics, artists, and prophets of all traditions have cultivated ways of working with Fact that rely on various ethical, aesthetic, and intuitive faculties intrinsic to human being. The current exercise, however, is an exercise in thought. We are not cultivating a direct experience of Fact, but rather we are thinking about Fact in order to open up certain possibilities for human understanding and human action.

Thought, by definition, cannot capture and define the ineffable. Thought works only when it has found and grasped factors of Fact with which it can grapple. Accordingly, we begin this analysis by identifying three primordial factors of Fact, in terms of which we will account for all the other factors with which we are concerned. These factors are determinate possibility, consciousness, and force. Whitehead himself does not identify these factors in this way. In *Process and Reality*, Whitehead identifies Eternal Objects and Creativity as metaphysical ultimates. In order to emphasize the analogy between Whitehead's ideas and those of Sri Aurobindo, I will refer to Eternal Objects as determinate possibility (this is a shorthand for determinate possibilities of Existence, or *Sat*). Also, Creativity, as we have seen earlier, eventuates in the manifestation of Actual Occasions with their mental and physical poles, and thus is roughly analogous to Consciousness/ Force as that term is used by Sri Aurobindo.

Therefore, in this particular adaptation of Whitehead's ideas, we will speak in terms of three primordial factors of Fact: consciousness, force, and determinate possibility.

Consciousness is, of course, intrinsic to Fact. This follows from the very definition of Fact as the field of all *experience*. Consciousness has two functions. It is that factor by virtue of which Fact has that indefinable transparent luminosity which gives it its subjective vividness. It is also that factor of Fact by virtue of which there is choice and variable emphasis on one factor or another. As we proceed in this analysis, we will have occasion to identify "awareness" and "thought" as subsidiary factors within consciousness.

Force is that factor of Fact by virtue of which determinate possibilities enter into dynamic actualization. The word Force here emphasizes the connection with Sri Aurobindo, and with the intrinsic connection between Consciousness and Force which his ideas illuminate. We might also use the word 'process.' Every operation of consciousness is a process or a happening, and every happening in Fact involves consciousness. Thus, in Fact, these two factors (consciousness and force), though distinguishable, are inseparable.

Determinate possibility is that factor of Fact by virtue of which there are coherent choices for consciousness to make, and determinate characteristics which can be taken by the differentiated operations of force.

It is hard to think about Fact without recognizing at least these three factors as operative in it.⁵⁸ Experience is a process, thus there must be some factor within Fact which is dynamic – and that is force. Fact is an experience, and thus there must be some factor which makes it an experience rather than a ‘vacuous actuality’, and that factor is consciousness. Finally, given that Fact is a relationship of factors, given that those factors are different one from another and that, by virtue of the intrinsic coherence of Fact the differences are significant of one another, there must be some scheme of lawfulness governing the possible differentiations of factors, and that factor is what I am here calling determinate possibility.

General Factors Intrinsic to the Dynamic Functioning of Fact

Consciousness, force, and determinate possibility are intrinsic to Fact. Sri Aurobindo, and the great yogis of the past suggest that it is possible to experience these factors in a state of quiescence, a kind of intrinsic knowing of all possibilities of Fact in which no choices are made and no particular possibilities are differentially realized. This poise would correspond to that poise of being which Sri Aurobindo calls Sachchidananda.

It is also, they suggest, possible to experience these factors in a state of dynamic realization in which the knowledge of particulars co-exists perfectly with the knowledge

⁵⁸ A fuller metaphysical analysis would have to recognize at least one more primordial factor, that of value or satisfaction. As we have seen in chapter two of this essay, this is what Sri Aurobindo calls bliss, or *Ananda*.

of the unmanifested Sachchidananda. This state would correspond to that poise of being which Sri Aurobindo calls Supermind.

Our purpose in this chapter, however, is to identify the physical world as a system of factors of Fact in our ordinary experience. We can, therefore, ignore those more radical yogic possibilities, and focus on the poise of being which Sri Aurobindo associates with the three-fold world of human existence. Here, we experience Fact as a dynamic process of ongoing, finite realization.

Within the world of our everyday experience, we can identify three differentiations of consciousness.

Awareness is that factor within Fact by virtue of which there is consciousness of differentiated factors. Consciousness, if the yogis are to be believed, need not function in a way which singles out any factor in particular. When, however, there is such a singling out, that operation of consciousness is termed awareness.

Because of the intrinsic coherence of Fact, awareness of a specific factor does not exclude awareness of the remainder of Fact. Rather awareness of a specific factor organizes the awareness of Fact into a system of relations centered around the factor in question. Thus awareness is of two kinds – awareness by adjective and awareness by relation.⁵⁹

Awareness by adjective is that awareness which attaches to the central factor which an act of awareness singles out. It is active awareness of some factor for its own

⁵⁹ Whitehead, *Relativity*, 308.

sake, or for the sake of what it can make of the rest of Fact. In awareness by adjective, the particular character of the factor is dominant in consciousness.⁶⁰

Awareness by relation is the awareness of the rest of Fact when some particular factor has been singled out by adjective. It is awareness of those factors of Fact without which the factor singled out by adjective would not be what it is. Awareness by relation need not include an awareness of any particular features of those factors which it implies. If, for example, there is an awareness of red, that awareness would not be what it is if it were not for the existence of the factors of orange, yellow, green, and so forth. But the awareness of red in any given particular experience does not require an explicit awareness of those other factors. Or, there may be awareness by relation of factors which only informs us of them as a 'bare it'. In being aware of a spherical object, for example, I may be aware by relation that there is something at its center, but I may have virtually no knowledge of its particular characteristics.

It may also be the case that the two forms of awareness are simultaneous. For example, at the focal region of the field of attention, I may be aware of a factor by adjective, and also be aware of its significant relations. This introduces a new factor of Fact, which we will call "*full awareness*."⁶¹

⁶⁰ Ibid.

⁶¹ Whitehead, *Relativity*, 309. Note that 'full' in this context does not mean complete or total. It rather refers to the kind of distinct awareness of a factor that we have when we say, for example "I was fully aware that the light was green."

Thought is a further differentiation of consciousness. Thought is “consciousness of factors prescinded from their background of Fact.”⁶² In thought, factors that have been singled out in awareness by adjective are separated off from the other factors to which they are intrinsically related, and are thus experienced as individual. Thought accomplishes this individualization of entities by “limiting consciousness to awareness of the contrast of factors.”⁶³ A factor which is thought about will be called an ‘entity.’ While factors are intrinsically interrelated, entities stand out with a kind of apparent self-existence.

This contrast between awareness and thought is one of the most distinctive features of a Whiteheadian approach to the analysis of Fact. Whitehead’s Empiricist predecessors, Berkeley, Locke, and Hume, were also engaged in attempting to ground human knowledge in direct experience, but they made the crucial assumption that experience consists of discrete impressions. Thus they assumed, for example, that sensory experience begins with discrete patches of various colors, discrete sensations of pressure, of temperature, and so forth, and that thought and other perceptual operations are built up by customary associations among these more primitive elements.

Whitehead grounds his philosophical reasoning in a re-examination of the field of everyday experience. He points out that discrete entities emerge in consciousness out of

⁶² Whitehead, *Relativity*, 306. Note, that what I (following Whitehead’s usage in Whitehead, *Concept of Nature*) am calling ‘thought,’ is called ‘cogitation’ in Whitehead, *Relativity*.

⁶³ Whitehead, *Relativity*, 306

a background that has already been, in awareness, pre-cognitively differentiated into a system of interrelated factors. Thought emerges out of and is grounded in awareness.

This is important because in awareness the intrinsic coherence of Fact has not been lost. In awareness, factors are discriminated, but they are not yet separated. In Whitehead's words: "For awareness all relations between factors are internal and for [thought] all relations between entities are external."⁶⁴ In other words, in awareness, the consciousness of a factor is not separate from the consciousness of the total environment in which that factor is found. Whatever individuality attaches to the factor is just its particular place in its network of relations. In thought, however, because consciousness is focused on the contrast which separates this factor from its environment, the factor takes on the aspect of self-existence by virtue of which we term it an "entity." Its relations are relegated to the background of consciousness, and thus they come to seem external, or extrinsic to its being. Since, for thought, Fact appears as a collection of entities without intrinsic interrelations, "the unity of consciousness lies in this dependence of [thought] upon awareness."⁶⁵

Now the earlier Empiricists, in grounding their reasoning in discrete impressions, failed to penetrate below the level of thought. They took *entities* as primitive, rather than *factors*. It is this error that led them into the difficulties which Hume so ably demonstrated. Because relations among entities are external, there is no way to understand the intrinsic relations among them and, therefore, no ground for causal

⁶⁴ Ibid.

⁶⁵ Ibid.

reasoning or for induction. By pointing to the grounding of thought in awareness, Whitehead has articulated an empiricism which avoids Hume's *reductio*, and which permits us, as we shall see, to find the physical world within the domain of Fact. This intrinsic relationship of factors to each other by virtue of which we can reason from one to the other is called by Whitehead the doctrine of *significance*. Thus we will say that factors are significant of one another, and we will have occasion to study this relation of significance in more detail as the exposition unfolds.

When there is full awareness of a factor conjoined with thought about that factor as an entity, then a new factor is introduced – that of *perception*.

While perception of a factor presupposes full awareness of it, thought about that factor does not. Thus given a system of factors disclosed in awareness, it is important to note that only some of those factors will be discerned in awareness by adjective, and only some of those so discerned will be discerned with full awareness and perception. Those factors that are disclosed in perception will be significant of other factors that may, like certain scientific objects that will be discussed later, be imperceptible, but are nonetheless part of the system of factors which sense-awareness discloses.

It is thought, as was pointed out earlier, that articulates the factorization of Fact with which we are concerned in this exercise. Thus consciousness, force, determinate possibility, awareness, perception, and thought itself are all entities for thought.

The Ideal vs. the Sensory

At this point, we introduce another factorization of Fact, one that, as it were, cuts at right angles to those which we have discussed so far. This new factorization operates

at the level of awareness, and differentiates the awareness of what Whitehead terms the ‘ideal’⁶⁶ from the awareness of sense.

It is impossible to define these factors other than by a direct appeal to the contrast between them. Whitehead says: “divest consciousness of its ideality, such as its logical, emotional, aesthetic, and moral apprehensions, and what is left is sense-awareness.”

What is particularly important about this distinction in our current context is that, according to Whitehead, nature is “the system of factors apprehended in sense-awareness.”⁶⁷ As we shall see, there is a distinction between ‘nature’ and the physical world.⁶⁸ There is an important sense in which the physical world is *less* that the system of factors apprehended in sense-awareness, and this qualification will prove of decisive importance to our understanding of the subtle worlds. Nonetheless, this definition is an important step.

We have seen that Fact is stratified, as it were, into awareness, thought, and perception. But, as common sense tells us, the physical world is first and foremost that element of what is real that is disclosed through the physical senses. This idea is not only enshrined in common sense, but is fundamental to the scientific method, which insists that all scientific hypotheses must, ultimately, be verified by experiment; that all

⁶⁶ Ibid., 309.

⁶⁷ Ibid.

⁶⁸ Whitehead, himself, came close to this realization in his essay “Uniformity and Contingency” in Whitehead, A. N., *Science and Philosophy* (New York: Wisdom Library, 1948). In that essay, he realized the importance of separating out the physical world from the world of dreams. He still, however, made the assumption that “nature” is “the physical world.”

experiments must culminate in operations of measurement; and that the act of measurement is always grounded in awareness, by some scientist, of factors disclosed in through the physical senses. If, then, we are going to come to a further understanding of the place of the physical world in Fact, we must look more closely at the operations of sense-awareness.

Events and Objects

What science and philosophy deal with is not so much sense-awareness, as sense-perception. Sense awareness, in its purity, is incommunicable. “[T]he factors discriminated in sense awareness cannot be explained, since thought follows awareness. They seem to be given and ineffable; given because thought arises from them and ineffable because they cannot be explained.”⁶⁹ Our awareness of any given factor is, as we shall see more fully later on, part of a complex of interrelated factors which includes quite prominently our own awareness. It is this which makes our perceptions private, and it is precisely this private particularity that is dropped in the transition from awareness to thought.⁷⁰ Sense perception is a hybrid of sense-awareness and thought. The element of thought in sense perception brings a degree of abstraction that makes communication, and thus science and philosophy, possible. Thus, while the physical world is “a certain

⁶⁹ Paul F. Schmitd, *Perception and Cosmology in Whitehead's Philosophy* (New Jersey: Rutgers, 1967), 42.

⁷⁰ Ibid.

definite assemblage of factors within fact,”⁷¹ what science and philosophy actually deal with is the system of *entities* disclosed in sense-perception.

Thought, attending to the entities disclosed for it by sense-perception, further factors those entities into *events* and *objects*.⁷² This factorization is another of the unique and decisively important features of Whitehead’s analysis of Fact.

Remember that we began with a short description of the scientific understanding of the physical world, and that understanding was framed in terms of space-time and materiality. Now neither space-time, as that is understood by science, nor materiality, is disclosed in sense-awareness. Scientific space-time is a measurable, smooth, continuum – whereas, as inspection will easily verify, “sense-time and sense-space are discontinuous and fragmentary.”⁷³ And the difficulties involved in finding anything like objectively existing material in the field of perception have driven generations of philosophers to wildly counter-intuitive theories of actuality. So if we are to account for the physical world from within Fact, we cannot begin our reasoning from these categories.

Whitehead suggests rather that we begin by factoring entities into *events* and *objects*. Events are the fullest, most concrete factors that are disclosed in sense-awareness. They are happenings. Nature, as Whitehead tells us, “presents itself to us as essentially a becoming, and any limited portion of nature which preserves most completely such concreteness as attaches to nature itself is also a becoming and is what I

⁷¹Whitehead, *Relativity*, 310

⁷² Events and objects are both factors of Fact discerned in awareness, and they are both relevant to perception, but only in thought are they recognized as entities.

⁷³ Whitehead, *Aims of Education*, 139

call an event.”⁷⁴ Events happen only once, and the relationship that they each have to the totality of other events disclosed in sense-awareness are unique and fixed.

This morning, I picked a flower in my backyard. That particular picking of that particular flower in that particular place is an event. Like all other events, it happens only once. Events, however, need be neither of short duration nor of small extent. The life of the Earth, for example, from its initial formation to its final extinction, is an event. Events ‘extend over’ one another. Thus the life of the Earth extends over any particular century of that life. Any given century extends over the life of any individual living in that century. The life of the planet on this particular day extends over this particular moment. The life of this particular moment extends over the event that is my body, over the event that is my computer, and over the event that is my typing of this sentence.

Nature is the system of factors disclosed in sense-awareness. Perception reveals these factors to thought as a system of events – as full, concrete, unique happenings which have the property of extending over, or of including, one another. Those factors of Fact by virtue of which events can be discriminated one from one another are called ‘objects’. The particular adjective involved in any ‘awareness by adjective’ is an object. Whereas events take place only once, and are spoken of as being ‘apprehended’, objects are such that they can take place more than once, they can ‘be again’, and are spoken of as being ‘recognized.’⁷⁵ Thus this red flower, which I picked this morning, is a unique

⁷⁴ Whitehead, *Relativity*, 310

⁷⁵ C.I. Lewis, “The Categories of Natural Knowledge.” in Schlipp, Paul Arthur, ed. *The Philosophy of Alfred North Whitehead* (LaSalle, Illinois: Open Court, 1951), 720

event and can never be repeated. But the red, which characterizes the event of this flower, is such that it can be again in any number of flowers, or in any number of other events.

The relationship between events and objects is termed ‘ingression.’ When an event is characterized by a certain object, we say that that object is ingredient in, or has ingressed into, that event. Events are the expression of the primordial factor which we identified as force. Objects are the expression of the primordial factor which we identified as determinate possibility. Ingression involves an interaction of all three of the primordial factors. We will explore this interaction in more detail later.

In our everyday thinking, we have a tendency to conflate events and objects. I might say “I see a cup sitting on my desk.” But what I actually see is an event, lasting for the duration of the that particular perception. Ingredient in that event is a particular object – the cup – which I can, in subsequent glances, perceive again. The particular event which figured in my ‘cup perception’ a few moments ago will never be repeated. Nonetheless, I can see ‘the cup’ again and again.

This distinction is not one that we generally make. “Objects and events are only waveringly discriminated in common thought. Whatever is purely matter of fact is an event. Whenever the concept of possibility can apply to a natural element, that element is an object.”⁷⁶

It is important to note that Whitehead is not pointing to some transcendent realm of forms which exist on their own, outside of reality. He is rather pointing to objects as

⁷⁶ Whitehead, *Principles*, 64

those factors of Fact that endure through time, which can be repeated, to which the concept of possibility can apply, and which we can, without undue difficulty, discriminate in our own experience.

Sense-awareness, then, reveals itself to perception and to thought as a complex texture of events and objects. Events and objects are factors of Fact, elements of experience. If we can succeed in accounting for the physical world, as that world is known by common sense and by science, in terms of events and of objects, we will have demonstrated the fruitfulness of this mode of “explanation from the concrete” that we are exploring, we will have laid bare the roots of scientific knowledge in actual experience, and we will have built a significant bridge between Western scientific knowledge and the meditative wisdom of the East.

Time, Space, and the Structure of Events

Common sense presents us with the vague intuition that time and space are a kind of neutral container within which the play of events unfolds. But, as we have seen, both perception and what is perceived are events; events are fully concrete slices of nature; and no event can be construed as a mere “neutral container.” Thus there is no way that this neutral container can be *experienced*, and so it cannot be a factor of Fact. The question before us is this: what are the factors of Fact in terms of which we can account for time and space as those entities function in common sense and in scientific work.

Let us begin our exploration of this question by noting that within Fact, “there are happenings, and apart from happenings there is nothing.”⁷⁷ The name that we have given to these happenings is “events.” We will see that space and time, when considered as factors of Fact, reveal themselves to be abstractions which can be derived from an examination of the structure of events.

Nature, the system of factors revealed in sense-awareness, can be factored into the ‘discernable’ and the ‘discerned.’ As Whitehead tells us, “The discerned is comprised of those elements of the general fact which are discriminated with their own individual peculiarities. It is the field directly perceived. But the entities of this field have relations to other entities which are not particularly discriminated in this individual way. These other entities are known merely as the relata in relation to the entities of the discerned field.”⁷⁸ The discerned, as the immediate presentation of sense-awareness, always discloses itself as only a part of the discernable. As Whitehead says “nature as perceived always has a ragged edge.”⁷⁹

At this moment, my visual awareness is confined to the room in which I am writing, and yet I know that this room is part of this house, and the entities which I perceive within this room would be unintelligible if it were not for their implicit reference to entities completing the entire world around me. That larger system of factors impinges on the world in this room in the form of subtle factors such as sounds, smells, and the

⁷⁷Whitehead, *Concept of Nature*, 66

⁷⁸ *Ibid.*, 49. Note that the discernable is known by its relations to the discerned. But factors within the discernable, itself, can be known both by adjective and by relation

⁷⁹ *Ibid.*, 50

faint pressure of breezes, each of which refers beyond the immediately discerned to the vast reaches of the discernable.

Further, those factors disclosed by any particular sense refer to possible factors disclosed by other senses. For example, I see the chair across the room, and I wonder what it would feel like if I were to touch it. That is, I know from the visual disclosure that there is something ‘there’ for touch, even though I do not know what that particular tactile feeling might be.

Thus events are *significant* of other events, even when those other events are not directly discerned.⁸⁰ Events are not only significant of other events spatially, but also temporally. That is, the events which I discern in this room at this moment are significant of events which happened in the immediate past (when I arranged the furniture, for example), in the more distant past (when the furniture was manufactured), and in the various ranges of the future.

The point is that those events that we discern immediately disclose themselves as significant of other events in a larger system of events (the ‘discernable’). The most important relationship among events constituting this systematic structure is ‘extension.’ That is, every event includes, or extends over, other events and is, in turn, extended over, or included in still other events. Thus our common sense intuition of a containing spatio-temporal framework can be understood not so much as a neutral, pre-existing container in

⁸⁰ Note that events can signify objects, and objects can signify each other. In this context, however, where we are considering the structure of space and time, we are primarily concerned with the mutual significance of events.

which events unfold, but rather as an embracing texture of events out of which the immediately discerned arises.

Common sense demands that every event should be contained in a larger context. Under the influence of several centuries of classical science, we imagine that context to be a neutral container. But this common sense intuition is entirely satisfied if the larger context is not a neutral container, but rather an indefinitely extended structure of containing events, stretching off to the limits of what can be discerned.

Time and space, however, though related, are not the same thing. Thus, we introduce another factorization of Fact, that which identifies those events that “share the immediacy of the immediately present discerned events. These are the events whose characters together with those of the discerned events comprise all nature present for discernment. They form the complete general fact which is all nature now present as disclosed in that sense-awareness.”⁸¹ In other words, although events disclosed in sense-awareness are implicated in an indefinite system of events stretching off into the past and the future, we recognize that those events of which we have awareness by adjective have a particular immediacy, and we recognize, too, that there is a set of events which, though not themselves discerned by adjective, shares immediacy with those that are. Whitehead calls that system of factors which shares immediacy with those that are disclosed by adjective a *duration*. “A duration is discriminated as a complex of partial events, and the natural entities which are components of this complex are thereby said to be ‘simultaneous with this duration’. Also in a derivative sense they are simultaneous with

⁸¹ Ibid., 52

each other in respect of this duration. . . A duration is a concrete slab of nature limited by simultaneity which is an essential factor disclosed in sense-awareness.”⁸²

This notion of a duration is another important way in which Whitehead’s empiricism differs from that of his predecessors. A duration is *not* a mere instant. It is rather a ‘specious present’. It is an *event*, which is to say that it is extended both in space and in time. A duration retains temporal thickness, and thus it comprises within itself other durations.

It is in the recognition of durations that we introduce the distinction between time and space. Space grows out of the mutual relations of events within a given duration. The relations of other events to this duration form the texture of time.

We have now shown that the systematic relation of events is adequate to account for our common sense intuition of space and time as an environment, and also for our common sense distinction between time and space. In order to account for the demands of science, however, we will have also to show that we can meaningfully speak not just about durations, but about instants, and that we can account for the relationship between space as it is experienced and space as it is theoretically depicted in geometry and theoretical physics.

The importance of this requirement deserves some discussion. I have more than once referred to the type of scientific reasoning that begins with some notion of space, time, and material ‘out there’, and then proceeds to account for experience on that basis. The space and time that are ‘out there’ is invariably described in terms of its geometry.

⁸² Ibid., 53

So, for example, Newtonian space is a three-dimensional Euclidean space, and Newtonian time is one dimensional. The space-time depicted in Einstein's version of relativity theory is curved, and assimilates time and space into a unified, four-dimensional continuum. Nonetheless, it is described according to the axioms of geometry. Now the axioms of geometry are a logical specification of the relations between 'points' and 'lines.' *But points and lines are not among the factors of Fact that are disclosed in sense-awareness.*

In fact, one of the main reasons that we consider space to be 'out there' is that the space of science, which we imagine to be the 'real' space, is a smooth geometrical manifold, while the space that we actually experience in sense-awareness is confused, fragmentary, and discontinuous. There is no obvious way to connect the two spaces.

The problem of connecting these two spaces is closely related to the problem of correlating the wisdom of the East with the wisdom of the West. Both the East and the West have been concerned to explore, in their own ways, the intrinsic coherence of Fact. But they have gone about this exploration in very different ways. F. S. C. Northrop, in *The Meeting of East and West*,⁸³ characterizes these two approaches by suggesting that the East has tended to work in terms of "concepts by intuition"⁸⁴ – i.e., in terms of concepts which are immediately discernable factors of Fact, (e.g., green, cool, soft) – whereas the West has tended to work in terms of "concepts by postulation"⁸⁵ – i.e.,

⁸³ Northrop, *Meeting*.

⁸⁴ *Ibid.*, 447.

⁸⁵ *Ibid.*

concepts which are not immediately discernable factors of Fact but which take their meaning from the system of concepts in terms of which they are defined (e.g., point, atom).

The meaning of this distinction becomes immediately clear if we look at Euclid's *Elements*. The significance of that work for the Western tradition can hardly be overestimated. And yet the most basic entities treated in that work – points and lines – are abstract entities that are never, in their abstract purity, observed in sense-awareness. Thus, in the system of the *Elements*, points and lines are concepts by postulation. But there is no attempt in that work to find concepts by intuition that correspond to points and lines as they are postulated.

Whitehead is not directly concerned with this issue of bridging East and West, but for him, the contrast between geometrical space, on one hand, and the space of experience, on the other is one of the factors which has contributed to what he calls “the bifurcation of nature.” Many modern epistemologies feature a distinction between an abstract, more or less noumenal reality which we discover, if at all, by reason (concepts by postulation), and a subjective, phenomenal reality which is ‘in our minds’ but only imperfectly correlated with the noumenal reality of which it is an indirect expression (concepts by intuition). Whitehead is at pains to overcome this bifurcation, but in order to do so, he must, among other things, demonstrate the relevance of geometry to the structure of experienced events from which, as he holds, space and time are abstractions.

What Whitehead needs to do is to demonstrate that the notion of an instant of time and the notion of a point in space are both intelligible in terms of the actual structure of

experienced events. He does this by “the method of extensive abstraction.” The details of this method are rather intricate, and they involve a number of crucial assumptions about the way in which events extend over one another. In enumerating these assumptions,⁸⁶ Whitehead is essentially giving logical expression to certain, obvious features of our experience of the relationship of extension in the physical world. It will not be necessary for us to consider these assumptions in detail here, though we will return to them in Chapter Five.

Leaving aside these details for the time being, the idea of the method of extensive abstraction is quite simple. We start with a perceived event, and then we imagine a series of events nested within that event like an infinite set of Chinese boxes, one inside the other. The converging end of this series becomes arbitrarily small. The series of boxes is infinite, and thus it converges to nothing, but measurements of certain properties of the events so indicated do approach definite limits.

If, then, we apply this method of extensive abstraction to time, we begin with a duration. As we have noted, any given duration extends over other, smaller durations. We can, by suitable logical constructions, stipulate a series of smaller and smaller durations, each of which extends over the smaller members of that series. When the members of this set are sufficiently small, they approximate to an instant as that concept appears in mathematical physics. If, then, we desire to measure the properties of some system at some time t , we can identify, in Fact, a duration within which that time is

⁸⁶ Whitehead does this in *Principles*, 101-103 and in *Process and Reality*, 294-301.

included, and confine our attention to smaller and smaller durations within that original duration. Assuming we have suitably chosen the property we want to measure, the measurements will approach a definite numerical limit as the series converges.

Whitehead's contention is that this series *is what we actually mean* when we refer to some given system, or to the entirety of the physical world, as existing at an instant.

Whitehead further demonstrates that, with suitable logical definitions, it is possible to identify a serial order among the instants so defined.⁸⁷

Having elaborated this procedure in full, he says:

What the abstractive set is in fact doing is to guide thought to the consideration of the progressive simplicity of natural relations as we progressively diminish the temporal extension of the duration considered. Now the whole point of the procedure is that the quantitative expressions of these natural properties do converge to limits though the abstractive set does not converge to any limiting duration. The laws relating these quantitative limits are the laws of nature 'at an instant,' although in truth there is no nature at an instant and there is only the abstractive set. Thus an abstractive set is effectively the entity meant when we consider an instant of time without temporal extension. It subserves all the necessary purposes of giving a definite meaning to the concept of the properties of nature at an instant. I fully agree that this concept is fundamental in the expression of physical science. The difficulty is to express our meaning in terms of the immediate deliverances of sense-awareness, and I offer the above explanation as a complete solution of the problem.⁸⁸

He then turns his attention to space, and by a quite analogous application of the method of extensive abstraction to the events that can be discriminated within the instantaneous spaces that he has already derived, he identifies points. A small modification of the same procedure enables him also to identify lines. Thus Whitehead

⁸⁷ Whitehead, *Concept of Nature*, 63-65

⁸⁸ *Ibid.*, 61

demonstrates that thought, operating on factors of Fact disclosed in sense-perception, can also find instants, points, and lines as factors of Fact. This does not yet tell us what, exactly, the geometrical properties of the space of the physical world are. Exactly how the points and lines that he has identified coalesce into a geometrical system remains to be discussed. Nonetheless, he has now created a firm connection between the fluid world of moment-to-moment experience, on one hand, and the smooth geometrical manifold of scientific space-time, on the other. Whitehead has demonstrated that geometrical space does not have to be conceived as a noumenal reality outside of experience, nor does it have to be conceived as a form of intuition (as Kant suggested). Rather it can be understood as a property of the system of events revealed in sense awareness, a property that can be identified in thought by a process of abstraction.

Objects

We have sketched out a way in which time and space, as they are understood by common sense and as they are understood by science, can be exhibited as factors of Fact. We turn now to a consideration of objects. Objects, as we have said, are those elements in the physical world which do not pass, which can ‘be again,’ and to which the notion of possibility has some relevance.

Whitehead makes a distinction between the “apprehension” of events and the “recognition” of objects. Recognition is “an awareness of sameness.”⁸⁹ But this awareness of sameness is not an intellectual operation, not an operation involving comparison of various events in different durations. Apprehended events in the physical

⁸⁹ Ibid., 143

world are always four-dimensional –they, like the durations in which they are situated, retain temporal thickness. Events are units of process. Thus in the apprehension of even a single event, there is also recognition of factors characterizing that event which are not, themselves, passing.

The relationship between events and objects is, as we have said, termed “ingression.” This relation is a very intimate one.

“The ingression of an object into an event is the way the character of the event shapes itself in virtue of the being of the object. Namely the event is what it is, because the object is what it is; and when I am thinking of this modification of the event by the object, I call the relation between the two ‘the ingression of the object into the event.’ It is equally true to say that objects are what they are because events are what they are. Nature is such that there can be no events and no objects without the ingression of objects into events.”⁹⁰

It is a mistake to imagine that an object ingresses into events in such a way that it can be said to be at a definite place at a definite time. An object ingresses into *all* those events whose character it shapes. So, for example, I feel the warmth of the Sun on my back. The Sun, as an object, thus has ingression in the event that is my body at this moment. The noises that I hear coming through my window are also ingressions into my bodily event of cars on the street outside. “An object is ingredient throughout its neighbourhood, and its neighbourhood is indefinite.”⁹¹ Of course, any given object may have an entirely negligible effect on some particular event, nonetheless “we are driven to admit that each object is in some sense ingredient throughout nature”⁹² This all-pervasiveness of objects is somewhat alien to common sense, but becomes more easily

⁹⁰ Ibid., 144

⁹¹ Ibid., 145

⁹² Ibid.

recognizable in the case of scientific objects, such as electrons, which are imagined as affecting all other electrically charged particles anywhere in their future.

However, despite the fact that every sensed object affects the entire system of events disclosed by sense-awareness, we also recognize that ingression may have “a peculiar form in the case of some events; in a sense, a more concentrated form.”⁹³

Whitehead calls this more concentrated form of ingression “situation.” Thus a particular event can be the situation of a particular object. But this is not the same thing that we usually mean when we think of an object as being located at a certain time and place. It is important to note that different objects ingress into events in very different ways. We might note, for example, that the object “toothache” is ingressed in a particular tooth, but the object “tooth decay” might, to our surprise, be ingressed in a neighboring tooth. Thus the meaning of situation is different for each of these two objects.

Whitehead suggests that there are an indefinite number of types of object, but he invites us to consider just three types – sense objects, perceptual objects, and scientific objects.

Sense Objects

Sense objects are analogous to the ‘impressions’ spoken of by the early Empiricists. Lewis tells us that:

“The simplest kind of recognition of an object is recognition of some permanence within the specious present; of some ingredient character which characterizes both the before-part and the after-part distinguishable in even the smallest event that we can apprehend. And the

⁹³ Ibid., 146

simplest objects so recognized are qualia or sense-data; tastes, colors, shape-size, and so on. Whitehead calls these ‘sense-objects’⁹⁴

Whitehead gives us this technical definition:

“A sense-object is a factor of nature posited by sense-awareness which (i), in that it is an object, does not share in the passage of nature and (ii) is not a relation between other factors of nature.”⁹⁵

Although these sense objects are analogous to the impressions of the Empiricists, they are, in many ways, quite different. Whereas the impressions of the early Empiricists were imagined as essentially independent of each other, these sense objects are factors of Fact. Thus they are embedded in networks of significance. They are significant of the events in which they are ingredient. Those events are significant of other events in the systematic structure of events from which time and space are abstracted, and thus these sense objects are indirectly significant of other objects in other events. Objects, too, have a certain systematic character in terms of which they are more directly significant of each other. For example when there is awareness of red by adjective, there is awareness of other colors by relation. Perception of red may lead thought to a discernment of those other colors, even when they are not directly perceived. This retention of the network of significance saves sense objects from the logical sterility that affects mere ‘impressions.’

There is another, and even more surprising way in which sense objects are distinguished from the earlier notion of impressions. Naïve realism holds that sense objects belong to things ‘out there’ in the physical world. But critical reflection, noticing such factors as illusions, individual perceptual idiosyncrasies, and the dependence of

⁹⁴ Lewis, *Categories*, 721.

⁹⁵ Whitehead, *Concept of Nature*, 151

perceptible qualities on environmental influences (all cows look black at night), is quickly forced to realize that the relationship between things and their sensory appearances is not as simple as it first appears.

In fact, the ingression of a sense object into nature involves four different classes of events. Let us consider, for example, the events involved in the appearance of a yellow patch indicating the presence of a cup. There is the percipient event – the relevant bodily state of the observer. Then there is the situation. The situation is the event in which the sense object is apparently located. In this case it is the event ‘on the desk’. There are active conditioning events – those are the events “whose characters are particularly relevant for the event (which is the situation) to be the situation for that percipient event”⁹⁶ – in this case those would include both the situation of the cup and the lighting in the room. Finally there are the passive conditioning events which, ultimately, include the whole of the physical world in which this room finds its place. If the perception of the cup is non-delusive, then the situation event is itself an active conditioning event for the perception. If the yellow patch were, for example, being seen in a mirror, then the situation of the cup would be ‘behind the mirror’, and the mirror itself would be one of the active conditioning events.

Philosophical reflection on the fact that the ingression of a sense object involves all of these different classes of events often leads to the idea that the sense objects are not actually part of the physical world, but are rather ‘in our minds.’ Whitehead categorically rejects this interpretation.

⁹⁶ Ibid., 152

Remember that we have begun with the tentative idea that the physical world *is* that system of factors disclosed in sense awareness. Thus sense objects are not merely subjective impressions, but are actual constituents of the physical world. To understand what Whitehead means, we must first look more deeply at the structure of durations, and then look carefully at the way in which sense objects ingress into events.

Remember that what sense awareness discloses are durations. A duration is all of nature that is available for discernment in a specious present. It is the most concrete whole of nature of which we are aware. All other events and objects that are disclosed by sense awareness are differentiations of durations. Every duration has one special event as part of its structure – this is what Whitehead calls the percipient event. The percipient event is, in broad terms, the event which is the bodily state of the perceiver in that duration. What is important to note at this point is that any sense awareness, no matter what it discloses by adjective, always discloses a duration by relation, and every duration is defined by a percipient event.

Philosophical discourse has, not infrequently, gotten tied up in an analysis of experience which imagines ‘impressions’ as being presented to a ‘mind.’ Whitehead is reminding us that sense awareness is invariably associated with sense organs. The operation of a sense organ is an event, and that event is invariably a crucial part of a duration within which the events apprehended and the objects recognized are situated. Thus we cannot hope to understand the recognition of sense objects unless we place that recognition within the concrete whole of the durations in which they invariably occur.

Sense objects ingress into durations, and in order to understand this ingression we must understand it in terms of multiple relations. That is, in order to understand the ingression of any particular sense object, we must take into account the particular event which is its situation, the percipient event defining the duration, and all of the other events constituting that duration as well. This multiple termed, or polyadic logic might seem simple on the face of it, but it has been the source of endless confusions in earlier Empirical philosophies.

The difficulty, as Whitehead spells out frequently in his writings, is that there has been a habit of assuming that reality must be characterized by a two termed logic relating substances to attributes, or universals to particulars.⁹⁷ So, for example, we assume that the green which we see in the physical world is a characteristic of some particular blade of grass. But that green is always contextualized by the duration in which it appears. Thus its ingression can only be adequately accounted for by reference to the event which is the bodily life of the observer (the percipient event), the event in which the blade of grass is ingressed which is the situation of the green at the time of observation, and the time of observation itself, which, as the whole duration, is the rest of the nature at that time.

Now the only way we can account for this situation in terms of substances and attributes is to bracket out any reference to the percipient event. It is this bracketing that leads to a naively realistic position. Then, subsequently, with critical reflection, we note

⁹⁷ The argument in this and the following paragraphs follows closely Whitehead, *Process and Reality*, 314

that this relation only holds for a particular observer in a particular situation. We then conclude that the original green does not belong to the physical world itself, but rather to the mind of the observer, and that the observer's mind is in some mysterious relation to an objective reality which is outside of experience altogether. But once we have made this move, we lose any access to that external reality, and thus we are landed in solipsism. This is the bifurcation of nature which Whitehead finds to be so destructive to natural philosophy.

The only way out of this dilemma is to abandon the two termed, substance-attribute logic with which it begins, and to recognize that the ingression of sense objects into the physical world is always the result of a complex interrelation of multiple events. Once we do this, we have no need to bracket out the percipient event, and thus the whole confusion is avoided. The sense object is not an attribute of a substance, it is an object ingressing into the complex of events comprising a duration. Whitehead has shown us a way in which we can understand sense objects to be actual features of the natural world without having to interpret them as attributes of substances.

In this new way of seeing, however, the physical world is no longer a collection of things in a container. It is rather a system of durations, each of which is differentiated into various component events, one of which, in each case, is a percipient event. Sense objects are neither characteristics of things nor characteristics of minds, but rather characteristics of durations, which are more concrete than either things or minds. It is a significant challenge for us to imagine a universe in which durations, rather than things, are the most concrete elements. To do so, however, is an immense liberation. With this

multiple termed logic, Whitehead frees us from the sterile dichotomy of naïve realism vs. idealism, and ushers us into a new understanding of the universe.

Perceptual Objects

We now pass to a consideration of perceptual objects – objects such as cups, flowers, and desks, that so prominently characterize our experience of physical reality. “A perceptual object is recognized as an association of sense-objects in the same situation. The permanence of the association is the object which is recognized.”⁹⁸ The process of recognizing a perceptual object is more complex than the process of recognizing a sense object. It involves three stages.

The first stage of the process is “the primary recognition of one or more sense-objects in the same situation.”⁹⁹ The second stage of the process is “the conveyance of other sense-objects by these primary recognitions”¹⁰⁰ This notion of conveyance involves two components. One component is knowledge by relatedness of other events that are in determinate space-time relations to the event in which the perceptual object is situated.¹⁰¹ For example, I know, by relation, that the cup out of which I am drinking has a back side, which I could see if I turned it around. Another component of this primary recognition involves a kind of relatedness among sense objects such that the quality of

⁹⁸ Whitehead, *Principles*, 88

⁹⁹ *Ibid.*, 89

¹⁰⁰ *Ibid.*

¹⁰¹ Lewis, *Categories*, 723

yellow characterizing the cup ‘conveys’ an impression of hardness,¹⁰² and also a certain ‘habit of experience’ which associates sense objects with those with which they are customarily associated.¹⁰³ All of these relations figure in the recognition of perceptual objects. The third stage of recognition is a “perceptual judgement as to the character of the perceptual object which in its turn influences the character of the sense-objects conveyed. There are two kinds of perceptual objects – delusive perceptual objects and physical objects. An important function of the perceptual judgement is to discriminate between these two cases. A perceptual object is judged to be non-delusive, or ‘physical’, if it leads to the ingression of analogous sets of sensory objects for other percipient events, and if it is an active condition for those ingressions. The situation of a delusive perceptual object (for example, the space before the eyes in which a hallucination appears to be taking place) is a passive condition for the ingression of the relevant sense objects, and the delusion takes place only for one given percipient event.

The situations of physical objects differ from those of sense objects in that they are unique and continuous.¹⁰⁴ Sense objects – say yellow – can occupy any number of situations in any given duration. A perceptual object – say a particular cup – occupies a unique situation in a given duration. That is to say, perceptual objects are generally held to be in one and only one place at a time. Note, however, that if a duration is sufficiently long, the perceptual object may, within the duration, move through a whole set of related

¹⁰² Whitehead, *Principles*, 88

¹⁰³ Whitehead, *Concept of Nature*, 154

¹⁰⁴ *Ibid.*, 157

events, each of which has its own place and time. Thus this uniqueness “is an ideal limit to which we approximate as we proceed in thought along an abstractive set of durations in the approach to the ideal limit of the moment of time.”¹⁰⁵ Further, when we consider perceptual objects that move within a single duration, or that we perceive across several durations, we expect to be able to identify a continuous passage of events such that each of them is a situation of the object in question. Within a single duration this passage may be directly perceived. Across durations, it must be inferred.

The main point of this discussion is to establish the fact that we do not have to regard the physical world as a big container (space-time) in which physical objects or physical energies carry out their individual adventures. We can, rather, account for the physical world as a “continuum of happenings in their total relatedness, within which objects present themselves as lesser and included continuities, elicited by their relative preservation of continuing characters, in patterns the interconnections of which constitute their intelligible relationships.”¹⁰⁶

C. I. Lewis provides us with this memorable metaphor:

. . . events in their all-pervading continuity constitute that ocean of nature in which perceptual and physical objects are waves which we may discern. If there were no recognizable shapes and high-lights (sense objects) here and there, then the whole ocean would be characterless and could not be marked off into distinguishable parts (separate events). And if there were no waves, recognizable as propagated continuities of these sensible characters, then there would be no relatively permanent objects at

¹⁰⁵ Ibid.

¹⁰⁶ Lewis, *Categories*, 722

all. The permanence of the association of sense-objects *is* the perceptible object which is recognized.¹⁰⁷

This is what the common sense world looks like when seen from the point of view of Fact.

Scientific Objects

We are often interested in knowing the character of those events which condition the ingression of particular sense objects. In fact, all of our practical knowledge of the physical world is just such knowledge.

To the extent that physical objects are recognizable permanences of association among sense objects, they express those characters of events which are, therefore, of most interest to us. But physical objects are also conditions for sense objects other than those that are its components. Two examples: a telescope is a condition for a particular kind of transmission of light; the atmosphere “causes the events which are its situations to be active conditioning events in the transmission of sound.”¹⁰⁸ Thus, “the origin of scientific knowledge is the endeavor to express in terms of physical objects the various roles of events as active conditions in the ingression of sense-objects”¹⁰⁹ in the physical world.

It turns out, however, that physical objects are not entirely suited to this task. They suffer from several problems. First, not all sense objects can be construed as

¹⁰⁷ Ibid.

¹⁰⁸ Whitehead, *Concept of Nature*, 158

¹⁰⁹ Ibid.

belonging to perceptual objects. “Sights lend themselves easily to this construction, but sight can be baffled: for example, consider reflections in looking-glasses, apparently bent sticks half in and half out of water, rainbows, brilliant patches of light which conceal the object from which they emanate, and many analogous phenomena. Sound is more difficult; it tends largely to disengage itself from any such object. . . Illustrations to the same effect can be accumulated from every type of sensation.”¹¹⁰ Thus ordinary perceptual objects cannot account for the ingression of many sense objects.

A second difficulty with the explanatory use of perceptual objects is the problem of change. We stipulate that perceptual objects are recognizable permanences of association among sense objects, and yet this permanence is always a matter of more or less. When a sock is repaired to the point that all of the original material has been replaced, is it still the same sock? At what point in its decomposition does a old chair cease to be a chair and become a pile of sticks? While perceptual objects function with entire adequacy in the domain of everyday life, it is impossible to submit “the group of associations, forming the object, to any process of determination with a progressive approximation to precision.”¹¹¹ What is needed, then, is a new type of object – scientific objects.

Scientific objects are discerned by systematic application of a principle of thought which Whitehead calls the principle of “convergence to simplicity with diminution of

¹¹⁰ Whitehead, *Aims of Education*, 134

¹¹¹ Whitehead, *Principles*, 92

extent” – or, for short, the “principle of convergence.”¹¹² It is typical of Whitehead’s metaphysical genius that he could articulate this principle which is so important in our everyday thinking that it usually fades into the inarticulate background of thought.

What Whitehead is here pointing out is that the relations among the events that we actually perceive in our experience of the physical world are confused, fluctuating, imprecise,¹¹³ and phenomenally complex. In order to make sense of our perceptions, we need some way of “confining our attention to such parts as possess mutual relations sufficiently simple for our intellects to consider.”¹¹⁴ The principle of convergence is one of the most important ways in which we effect the requisite simplification.

We have already met two applications of this principle. First, the method of extensive abstraction by means of which Whitehead identifies geometrical elements as factors of Fact is an application of the principle of convergence. Secondly, the very recognition of perceptual objects is an application of this principle as well.¹¹⁵ We effect our initial identification of perceptual objects amidst the fluid and fragmentary presentations of sense by confining our attention to sufficiently small regions of time and space. As we move beyond common sense perceptual objects into the domain of science, we attempt to remove the vagueness of the perceptual objects by applying the principle of convergence to them in a way that breaks them down into smaller and smaller

¹¹² Whitehead, *Aims of Education*, 130

¹¹³ Ibid.

¹¹⁴ Ibid.

¹¹⁵ Ibid.

components. Whitehead provides a memorable example:¹¹⁶ We generally think of the Sphinx in Egypt as a permanent object. Nonetheless, over time, it does change. The nose, for example may be chipped, “but by proper inquiry we could find the missing part in some private house of Europe or North America. Thus either part, the rest of the Sphinx, or the chip, regains its permanence.”

We are wont to carry this search for smaller and smaller parts to the point at which the parts for which we are searching “can only be observed under the most favourable circumstances.”¹¹⁷ For example, in modern times, we account for the bodies of living things in terms of cells which can only be observed under a microscope. A cell, however, remains a perceptual object. Thus change in perceptual objects is largely explained in terms of a disintegration into smaller parts which are, themselves, perceptual objects.

All perceptual objects have, as was earlier observed, a partially hypothetical character. That is, we cannot form a full idea of a perceptual object without imagining various possible perceptions of it by various possible percipient events. As we continue to apply the principle of convergence in a search for smaller and smaller objects, there is a point at which the objects in terms of which we are generating our explanations become quite imperceptible, and thus *entirely* hypothetical. By this route, we reach a kind of pre-scientific atomism. In terms of such an atomic theory, we may be able to explain some of the sense objects in the physical world which are not expressions of the usual sorts of

¹¹⁶ Ibid.

¹¹⁷ Ibid.

perceptual objects. Light, for example, may be explained as a stream of luminous particles.

The explanatory power of these wholly hypothetical perceptual objects, however, leaves much to be desired. A decisive change in the procedure comes with a new category of objects – scientific objects.

These new objects are different in that they are not only pragmatically imperceptible, rather their characteristics cannot be represented in consciousness by sense objects at all. We know them only by virtue of our sense awareness of those events in which they happen to be ingredient. We imagine, for example, that electromagnetic waves are, through the elaborate mediation of the percipient events of our own bodies, the causes of visual impressions. But we cannot *see* electromagnetic waves themselves.

We search for scientific objects by looking for “those aspects of the situations of the physical objects which are most permanent.”¹¹⁸ In accordance with the general principle of convergence to simplicity with diminution of extent, we are looking for objects the relations among which are characterized by a maximum of simplicity and uniformity. Finally, we are looking for objects in terms of which the observed characters of perceptual objects and sense objects can be expressed.

These first scientific objects in the modern sense are molecules and atoms. These objects are not, of course, held to be ultimate. While atoms are still understood to be the principal permanences in terms of which perceptual and sense objects can be expressed, they themselves are held to ingress into systems, or societies, of sub-atomic events.

¹¹⁸ Whitehead, *Concept of Nature*, 158

Atoms are the permanent objects in perceptual and sense objects. The permanent objects in atoms are now believed to be even more abstract objects such as mass-energy, spin, charge, and momentum.

Partial Summary

We have been attempting to identify those factors of Fact which constitute the physical world. At this point it will be helpful to review the progress that we have made in this endeavor.

- We first identified consciousness, force, and determinate possibility as primordial factors of Fact.
- We then identified awareness as an operation of consciousness in terms of which individual factors are recognized, and we differentiated awareness into awareness by adjective and awareness by relation, thus securing a basis for causal and inductive reasoning.
- We identified thought as an operation of consciousness which pulls factors out from their background, and thus identifies entities as factors of Fact.
- We defined perception as a hybrid operation of awareness and thought, and observed that thought, acting on what is perceived, factors those perceptions into events and objects.
- We then factored awareness into the ideal and the sensory, and suggested that nature is that system of factors disclosed in sense awareness.
- We analyzed sense awareness, and showed that what it discloses are durations – concrete slabs of nature with ragged borders extending out to the ends of space,

and having a finite temporal thickness. Each duration is a complex of subsidiary events, one of which is the ‘percipient event’ around which that duration is defined.

- We showed that both the space and time of common sense and the geometrical continuum which is the space-time of science can be derived as abstractions from the structure of events and durations.
- We then analyzed some of the objects that are ingredient in events. In particular we considered:
 - Sense objects, or qualia, which are the simplest objects identifiable in the physical world, and the ingression of which must be understood in terms of a logic of multiple relations.
 - Perceptual objects, which are the recognizable permanences in the associations of sense objects, and
 - Scientific objects, which are hypothetical objects that express the capacity of events to serve as causes of sense objects and perceptual objects.

Granted that this analysis of the field of experience is adequate, we have now, following Whitehead, managed to describe an empiricism which is adequate to the task of grounding science. Granted, also, that what Whitehead calls “Fact” is equivalent to what Eastern thought calls, in F. S. C. Northrop’s terms “the differentiated aesthetic continuum,”¹¹⁹ Whitehead has inadvertently produced an important bridge linking the Wisdom of the East with the scientific knowledge of the West.

¹¹⁹ Northrop, *Meeting*, 447.

There is, however, a difficulty we still have to face before we can entirely accept these accomplishments. We have to look more carefully at the transition between perceptual objects and scientific objects.

The Problem of Measurement

As we saw, scientific objects first enter into thought through a particularly insistent application of the principle of convergence to simplicity with diminution of extent. The discovery of the atomic structure of matter was such a triumph of modernism that people sometimes wonder how an ancient thinker like Democritus could possibly have come up with it. But when we realize that the principle of convergence is one of the primary tools of common sense, one that we use whenever we try to understand something by taking it apart, the early articulation of an atomic theory seems quite natural.

Obviously, however, modern scientific objects differ significantly from the atoms of Democritus and the Stoics. What intervenes between the ancient theories and the modern theories is the scientific method. The scientific method is, in terms of the understanding of nature that we are here exploring, a method for identifying scientific objects.

Scientific method can be understood as having two components. The first component is its reliance on experiments. The experimental method – the systematic development of repeatable sets of circumstances for the identification of interesting phenomena – can be seen as a radical refinement of the principle of convergence. The second component is its reliance on *measurement*.

While we have had occasion to discuss measurement several times in the foregoing pages, we have not yet examined measurement *per se* and inquired into its mode of functioning in the domain of Fact. To fully appreciate the function of measurement in the domain of fact, we must differentiate it from two other operations – classification and counting.

Measurement is a procedure for associating a number with a factor of Fact. But before we can associate a number with a factor, we must first identify that factor as an entity. Recall that we may have awareness of a factor by adjective, or awareness of a factor by relation, but a factor of which we are merely *aware* cannot yet figure in the operation of measurement. Before a factor can be measured, it must first be clearly distinguished from its background and identified as an entity with which a number can be associated. Measurement, thus, is an operation of *thought*. Now, as Whitehead points out, “it is . . . impossible to find anything finite, that is to say, any entity for [thought], which does not in its apprehension by consciousness disclose relationships to other entities, and thereby disclose some systematic structure of factors within fact.”¹²⁰ Thus to identify a factor as an entity it is necessarily to place that entity in a systematic structure of other entities, and this is a kind of primitive classification. Premodern science, particularly as it is associated with the Aristotelian tradition, is primarily a science of classification.

Counting, which is the most obvious way of associating numbers with factors of Fact, is logically subsequent to the process of classification. The process of counting

¹²⁰ Whitehead, *Relativity*, 308.

involves something like the following sequence of operations: First, entities have to be identified; then, groups of entities belonging to the same class of entities have to be recognized as entities; those group entities have to be differentiated by relative size; numbers have to be abstracted out from those groups, and themselves identified as entities; sequential relations among numerical entities need to be identified. The point is that counting is a sophisticated operation of thought, which is logically dependent on a prior operation of classification.

Measurement is the application of counting to the analysis of spatio-temporal relationships. Measurement involves, in principle, the stipulation of a unit of measure, the division of the interval to be measured into intervals equal to that unit, and the counting of those units. Our knowledge of the world involves a complex combination of classification, counting, and measuring. But it is measurement, which allows the application of mathematics to the questions of dynamic change in time and space, which is decisive in the development of science. The question “how many” can be answered by counting. But questions such as “how big”, “how far”, “how long,” and “what rate” all involve measurement.

Measurement, of course, has been practiced since ancient times. But the combination of controlled experimentation with measurement in such a way that modern scientific objects can be identified is revolutionary. Remember that scientific objects are representations in thought of the causal properties of events. We investigate the scientific objects in events precisely because we hope to be able to predict, on the basis of our knowledge of current events, the ingressions of sensory and perceptual objects in the

future. Premodern scientific objects may have satisfied a certain philosophical need to account for “vagrant” sense objects and for the conundrums of common sense around issues of change, but they had only very limited power to generate detailed predictions of future ingressions in the sphere of terrestrial events.¹²¹ Modern scientific objects have immense predictive power, and they get that power precisely from their quantitative character.

The inventors of modern science discovered that they could measure force, mass, and acceleration. They discerned systematic mathematical relations among the numbers that were the results of their measurements. They expressed that relation in the famous equation $f = ma$. Armed with that equation, they could measure a certain force, measure a certain mass and then, abstracting from the concrete details of the situation in which those measurements were made, they could plug the numbers derived from the measurements into the equations and thus derive a new number which, applied back in the concrete world, would predict quantity of acceleration that would result from the application of that force to that mass. This was an extraordinary accomplishment.

This method, the method of using experiments to generate measurements, studying measurements to derive the equations linking them, and then using those equations to generate numbers which will be descriptive of subsequent measurements, has turned out to have wide applicability in many fields. One of the distinguishing features of our civilization is its fascination with the act of measurement. We have

¹²¹ The ancients, of course, generated impressively accurate predictions of celestial events such as eclipses. The identification of scientific objects brought the predictability of the celestial sphere into the terrestrial sphere.

extended the range of measurement from the secret recesses of the sub-atomic realm to the vast reaches of cosmic space. It is our capacity for accurate measurement (along, of course, with the mathematical developments that support it) that underlies all of our most magnificent technological achievements.

Insofar as we accept the scientific objects postulated by theoretical physics as the ultimate elements of physical reality, we are committed to the notion that what is physically real is what can be isolated in experiments and measured. Now we have been working with the idea that nature is that system of factors of Fact which is disclosed in sense awareness. But only some of the factors of Fact which are disclosed in sense awareness can be measured. Thus the physical world is something less than the totality of nature.

The extraordinary sophistication of the devices that scientists use for measurements, and the incredible precision of their results, tends to obscure the humble fact that, in the end, every measurement comes down to the recognition, in the mind of an actual scientist, of a correspondence between some phenomenon that he is measuring and some standard that he, or others, has set. In other words, no matter how complex and sophisticated a measurement may be, it has, in the end, very important formal and structural similarities with the simple act of using a ruler to measure a length.

With this in mind, let us examine which factors of Fact can be measured. To begin with, only factors of Fact that are disclosed in sense awareness can be measured. Thoughts, judgments, aesthetic appreciation, moral sentiments and the like are entirely beyond the reach of measurement. Sense objects, themselves, are only measurable in

certain very specific situations. Those sense objects which are ingressed into the percipient event of a duration, sense objects such as the sensation of hunger, cannot be subjected to measurement. I can measure my caloric intake, I can measure the quantity of food that I must consume in order to survive, I can even measure chemicals in my blood which I believe to correlate with my body's need for food, but I cannot measure the feeling of hunger itself.¹²² Thus only those sense objects that have their situations in events outside of the percipient event can be measured. Even those sense objects, however, cannot be directly measured. Rather, measurement, though it invariably involves sense objects, is always a relationship among perceptual objects. This relationship is one of equality, or congruence. We could say that an act of measurement is the recognition of a relationship among sense objects which is significant of a congruence between perceptual objects.

However, not just any congruence will do. If the recognition of congruence between two perceptual objects is to count as a measurement, one of those objects must be a suitable standard of measurement. In order to function as a standard of measurement in space, a perceptual object must hold its length no matter how it is moved about in space. In order to function as a standard of measurement in time, a system must continually mark off identical temporal durations. Thus, the only perceptual objects which can serve as appropriate standards are rigid rods (rulers) and regular oscillators (clocks).

¹²² It is possible to assign a number to these sense objects. I might, for example, rate my hunger on a scale of one to five, but this is not what is meant by measurement as that word is used in the hard sciences.

Only those factors of Fact that share durations with rigid rulers and clocks can be measured. All of our technological and scientific knowledge is built on the use of scientific objects to explain the ingression of perceptual and sense objects into the domain of experience. Scientific objects are discovered by a process of experimentation that culminates in measurement. And all measurement depends on the existence of rulers and clocks.

The Conditions Under Which Rulers and Clocks Can Function as Factors of Fact

We must, therefore, investigate the conditions under which rulers and clocks can function as factors of Fact. There are three such conditions, which I will first name, and then explore in more detail. First of all, it must be possible for a percipient event to recognize, within a single duration, that the ruler is congruent in length with itself, or that the periodicity of the oscillator is regular. Second, there must be a uniform structure of space and time which is characterized by a consistent metrical geometry. Third, there must be some 'physical law' in terms of which we can reasonably expect the length or the periodicity to remain congruent with itself across durations.

Recognition of Congruence

Measurement is a judgement of congruence. If I say that my desk is 30 inches wide, I mean that I can lay a yard-stick across the desk, and count off 30 inch long increments. In effecting this procedure, I am judging first that the yard-stick does not change in length during the process of measurement, and second, that the inch marks are equidistant from each other on the yard-stick. It is clear that sometimes my judgments on

matters such as this can be wrong in detail, and we sometimes, when extreme accuracy is required, devise procedures to compensate for such factors as change of length due to change in temperature. But ultimately, even the procedures that we use to judge the adequacy of our compensations rely on our capacity to judge congruence. This is true for temporal judgments as well as for spatial judgments – i.e., my decision to use a particular physical system as a clock depends, in the end, on my judgement that the period of its oscillation is regular.

One of the merits of understanding the physical world as a system of factors of Fact is that it provides a clear basis on which we can understand the possibility of these judgments of congruence. We have defined awareness, perception, and thought as factors of Fact, and we have seen that each of these factors, in its own way, involves a recognition of objects. But a recognition of objects is precisely a recognition of invariance characterizing the play of events. Thus the recognition of congruence required for measurement is just a particular case of the general recognition involved in the discernment of objects. We can recognize the congruence of the ruler with itself during the course of a duration, we can recognize the congruence of the various inches with each other, and we can recognize the congruence of the 30 inches with the width of the desk. Furthermore, because a duration has temporal thickness, we can recognize in an immediate way, within a single duration, the regularity of oscillation that qualifies a particular physical system as a clock.

A Uniform Structure of Space and Time

If, however, measurements did not carry implications beyond the immediate circumstance of a recognition of congruence within a single duration, they would have very little use. In fact, measurements are interesting precisely because of the ways in which they can be generalized. For example, I measure my desk as being 30 inches wide. I then cross the room, and measure the width of my door to see whether or not the desk will fit through it. In this situation, I add to the congruence recognitions involved in each separate measurement a number of other assumptions. First, I assume that the length of the ruler has not changed as I crossed the room. We will deal with this assumption in a moment. But the other assumption that I make is that both my desk and the doorway are situated in a common structure of space and time with very particular geometrical properties.

The assumption that my desk and the doorway are situated in a common structure of space and time is so ingrained in common sense, that it is somewhat difficult to realize the significance of the condition. But let us say that I were to have a dream in which my desk was an enormous expanse across which I was gliding on roller skates. I must have some way to differentiate between that vision of my desk as a vast expanse, on one hand, and my vision of the desk as 30" wide, on the other. How can this be done? As Whitehead points out in his essay on "Uniformity and Contingency," the principal way that we differentiate between dreams and waking reality – and, thus, discriminate the physical world from the larger nature in which it is embedded – is by judging that the

events we experience in dreams do not find their place in the one, uniform continuum of space and time which characterizes waking life.

Whitehead says:

The fitting in of distinct apprehended processes into one dominant continuum – for example, my life in the morning with my life in the afternoon of the same day -- can only mean that the apprehended process of the morning has disclosed a scheme of relations amid relata, which extends beyond itself (*i.e.*, beyond my life of the morning), so that my experience of the afternoon is nothing else than the apprehension of a process which is included in the predetermined scheme, and it is apprehended as being thus included. The same explanation holds of the continuity of the apprehended process of my life for shorter periods, from hour to hour, from minute to minute, from second to second. If the spatio-temporal continuity does not mean this, what does it mean? Furthermore, if there be no apprehended spatio-temporal continuity of this character, how do the advocates of experience as our sole source of knowledge propose to exclude dreams from the realm of reality?¹²³ Thus the discrimination of reality from dream requires an apprehended dominant space-time continuum determined in its totality, and this determination requires that it be uniform.”¹²⁴

In other words, in my waking reality, the structure of time and space that is disclosed in any given duration is significant of the structure of time and space that is disclosed in all of the actual durations characterizing that waking reality. Any measurements that I might make in my dreams are, scientifically at least, irrelevant to the physical world because the continua in which the dreams take place are not part of the one, dominant continuum of waking life.

Earlier, when we first discussed the geometrical properties of space and time, we left the particular relations among points and lines which characterize the physical world

¹²³ Whitehead, *Uniformity and Contingency*, 146-147.

¹²⁴ *Ibid.*, 148

undefined. Whitehead devotes a great deal of attention to this question.¹²⁵ He is able, first of all, to demonstrate that the entire apparatus of geometry can be abstracted from the structure of durations. We need not discuss this derivation in detail, but it is important to note that in order to abstract geometrical space from the structure of durations, Whitehead has to introduce one key assumption. That assumption is that every percipient event exhibits what he calls the relation of ‘cogredience’ to the duration which it structures. Whitehead defines cogredience as follows: “when the specious present is properly limited, there is a definite univocal meaning to the relation ‘here within the duration’ of the percipient event to the duration.”¹²⁶ In other words, to say that the percipient event is cogredient with its duration is to say that it is at a certain, definite, unmoving place within the duration. This assumption seems rather obvious, but its full significance will emerge when we consider subtle worlds in Chapter Five.

Once Whitehead has established that geometrical properties can be abstracted out of the structure of durations, he can then discuss what particular geometry will support the operation of measurement. Modern geometry has identified various sets of axioms which can characterize the relations among points and lines. The most general set of those axioms is that of projective geometry, but the axioms of projective geometry are not sufficiently restrictive to ensure that measurements have the necessary properties to support the existence of scientific objects. Then there are three sets of axioms in which

¹²⁵ Whitehead, *Principles*, 101-146; Whitehead, *Concept of Nature*, 77-142; Whitehead, *Relativity*, 316-357.

¹²⁶ Whitehead, *Principles*, 78.

these measurements are supported, the so-called metrical geometries – Euclidean, Riemannian, and Lobachevskian. It turns out that, among these three, the particular geometry that is used to describe the physical world is a matter of descriptive convenience. For reasons of descriptive convenience, Whitehead prefers to use Euclidean geometry. But, if measurement is to be generalizable everywhere in the physical world – that is, if I can, for example, decide on the basis of measurement whether or not my desk will fit through the door that is on the other side of the room, or if I can deduce, on the basis of measurements made here on Earth, the distances between remote galaxies – then the geometrical structure must be the same throughout the physical world. Because Einstein’s theory of relativity describes a heterogeneous space-time structure, Whitehead felt compelled to reject it and to formulate his own version of relativity theory.¹²⁷

For our purposes, the important points are, first, that the scientific objects in terms of which theoretical physics defines the physical world can only be identified by processes of measurement, and second, that the act of measurement is only useful in the identification of scientific objects if the entire physical world in which that measurement takes place is a structure of events which is interrelated as a uniform, metrical, geometrical continuum.

This particular requirement for the act of measurement has profound implications in relation to our attempt to locate those factors of Fact which make up the physical world. Remember that Whitehead defines nature as that system of factors which is

¹²⁷ Whitehead, *Relativity*.

disclosed in sense awareness. We have been suggesting that that the physical world is a subsystem of nature. We can now see how that is the case. The point is that hallucinations of various sorts, imaginary sensations, and dreams are all factors of Fact disclosed by sense awareness. The clear separation of the physical world from dreams and from the realities disclosed through other subtle perceptions is not necessarily obvious. In fact, as we saw in earlier chapters, it is only modern Western civilization that has made this separation in this peculiarly trenchant way.

As Whitehead says, “I am inclined to believe that the majority of humankind do include dreams among the events of nature.”¹²⁸ “. . . [A] delicate sense for spatio-temporal continuity, with its accompanying discrimination of reality from illusion, is the last product of a developed consciousness.”¹²⁹

Notice in this quote, and in the previous long quote above, that Whitehead identifies the physical world as “reality” and associates dreams with “illusion.” We have had occasion to question that assumption. But whether or not this particular ontological judgment holds, we are now in a position, following Whitehead, to apply one crucial, missing qualifier to our definition of the physical. We can now say that *the physical world is that system of factors of Fact disclosed by sense awareness which is comprised of events fitting into a “dominant” space-time continuum characterized by a uniform metrical geometry.*

¹²⁸ Ibid., 150

¹²⁹ Ibid., 147

Physical Laws

We now turn to the third requirement, that of a ‘physical law’ in terms of which we can reasonably expect the length of our rulers or the periodicity of our clocks to remain congruent with itself across durations.

Remember that we have defined Fact as the total field of experience, and our primordial factorization of Fact yielded three factors – consciousness, force, and determinate possibility. The further factoring of consciousness yields awareness, thought, and perception. Force is that factor by virtue of which there is process, and the further factoring of process yields events. Determinate possibility is that factor by virtue of which there are objects. Ingression is the relationship by virtue of which objects come to characterize events. As long as we remain strictly within Fact, which is to say within the field of experience, ingression is always a three-fold relationship which involves consciousness, force, and determinate possibility.

When we analyze the ingression of sense objects, this multiple termed logic of ingression is clearly demonstrated. The ingression of sense objects, as we have seen, always involves the event which is the situation of the ingression, the entire duration in which the ingression takes place, and the percipient event which is the locus of consciousness. When we come to perceptual and scientific objects, however, we begin to confront the possibility of a breakdown of this multiple termed logic or, as Whitehead says, a “breakdown of relativity.”¹³⁰

¹³⁰ Whitehead, *Relativity*, 315

Now we want to account for the physical world as a system of factors of Fact. We have seen that the physical world is that system of factors of Fact which is significant of scientific objects or, in other words, that system of factors of Fact in which measurement is possible. Measurement requires rulers and clocks. Rulers and clocks are perceptual objects. We are, therefore, very much concerned with the permanence of perceptual objects in general, and with the peculiar permanence which characterizes rigid rods and regular oscillators in particular. The question before us is whether or not this permanence can be adequately accounted for strictly within Fact.

In exploring this issue, it will be helpful to review the development of Whitehead's thought on the subject. In his earliest treatment of this issue, in "The Anatomy of Some Scientific Ideas," Whitehead was exploring the idea that a perceptual object is a class, or an "association" of sense objects.¹³¹ It is clear from the beginning, however, that this definition is not entirely adequate.

First of all, perceptual objects involve not only a significant element of imagination (these are clearly factors of Fact), but, more importantly, involve hypothetical perceptions by other percipient events.¹³² It is important to note that Whitehead cannot account for perceptual objects without at least assuming that a duration can contain more than one percipient event. On the other hand, in the ideas we have considered so far, he has not yet made it clear that the "percipience" of another percipient event is a factor of Fact.

¹³¹ Whitehead, *Aims of Education*, 131

¹³² Whitehead, *Aims of Education*, 133

Second, Whitehead increasingly realizes that he cannot give an entirely satisfactory accounting of “physical,” or non-delusive, perceptual objects merely as classes of sense objects. The difficulty here goes back to the problem of induction. If a physical object is nothing but a class of sense objects which we happen to find in the same situation, there is no rational basis on which we can expect an analogous class of sense objects to characterize further situations in further durations. Whitehead is clear that if induction is to be possible at all, there must be something in any given perception of a physical object which justifies it. Whitehead suggests, then, that the physical object functions as a *control* on the ingression of sense objects into the physical world. In order to function in this way, the physical object must be a “true Aristotelian adjective” of the event that it qualifies.¹³³ That is, Whitehead here maintains that “every event signifies a character for itself alone, but what exactly that character may be . . . is not disclosed in our immediate consciousness of the apparent world.”¹³⁴ As Whitehead himself says, this marks a “breakdown in relativity.”¹³⁵

If sense objects can be held to be significant of perceptual objects; if perceptual objects mark a character that events have for themselves alone, if that character can be analyzed in terms of the properties of scientific objects, and if those properties hold constant over time, then we have secured a basis on which we can found the trust that we place in rulers and clocks. But this solution to the problem is also far from satisfactory.

¹³³ Whitehead, *Relativity*, 315

¹³⁴ *Ibid.*

¹³⁵ *Ibid.*

Sense objects, which depend for their ingression on percipient events, are always elements of experience and thus are clearly factors of Fact. Perceptual objects, insofar as they are recognizable permanences of association among sense objects – even if the rules governing that recognizable permanence are too complex for our minds to articulate – are still, in principle, factors of Fact. But if perceptual objects are *more* than recognizable permanences of association among sense objects, if they are somehow janus-faced – on one hand controlling the ingression of sense objects into experience, and on the other hand being characteristics which events have *for themselves alone*, then in some important way they transcend experience and, to that extent, they are no longer factors of Fact.

With this solution to the problem of the relative permanence of perceptual objects Whitehead is flirting with a reintroduction of the bifurcation of nature. Here he is proposing a realm of experience in which consciousness is intrinsic and in which sense objects appear, and a purely causal realm of scientific objects which are governed by an Aristotelian logic which does not require consciousness at all. Perceptual objects here function as a kind of awkward hybrid, being signified by sense objects on one hand, and signifying scientific objects on the other. The permanence which we require of rulers and clocks must come from the scientific objects that control them, but that control comes from outside of Fact.

Whitehead ultimately realized, however, that he could solve the problem of intersubjectivity, the problem of the relative permanence of rulers and clocks, and the

problem of establishing a basis for the uniformity of space and time – all without abandoning the principle of relativity – by making the following assumptions:

- The application of the principle of convergence to the structure of events reveals, in principle, a set of smallest, or atomic events, which Whitehead calls “actual occasions.” Each actual occasion arises out of an environment (the “settled past”), animates a quantum of time, and then “expires” to become an element of the settled past for future occasions. This ongoing succession of actual occasions is called the “creative advance.”
- Each actual occasion, as it comes into being, must take into account the environment out of which it is arising. That is, we can say that the environment *causally conditions* the emerging occasion, or we can say that the occasion *experiences* the environment, and these two ways of speaking refer to the same phenomenon. Whitehead coins the word “prehension” as a way of naming this relationship between an occasion and the environment out of which it arises. Prehension will be discussed more fully in the next chapter.
- Each actual occasion comes to ingress the objects that it does in large part by the ways in which it prehends its past. Each actual occasion has some measure of freedom in the way that it interprets and responds to that past, and the objects which an actual occasion exhibits for other emerging occasions is a function of its own prehensive functioning.

- By virtue of the ways in which they condition each other, actual occasions tend to form “societies,” or groups of occasions which transmit objects from occasion to occasion through the creative advance.

On the basis of these assumptions, Whitehead came to see a duration as the experience of a socially situated actual occasion.¹³⁶ The percipient event is the society of occasions making up the “body” of the occasion in question, the other events in the duration are the remainder of the settled past.

In this new way of understanding durations, the intersubjectivity that is implied in the definition of perceptual objects is no longer a problem. Rather, all of the events that we recognize are already either actual occasions or societies of actual occasions – and actual occasions are all percipient. All of reality, that is to say, is intersubjective. If all events are percipient events, then all ingression is polyadic, there are no Aristotelian adjectives, and there is no breakdown of relativity.

Within this context, the problem of the relative permanence of perceptual and scientific objects is transformed. Each event comes to have the character that it does in large part because of the way that it “prehends” and interprets the other events that precede it. Each event influences the future insofar as it comes to have a character that is prehended. Continuity of character does not require some element of control that is outside of Fact, rather it becomes a problem of the propagation of character through societies of actual occasions.

¹³⁶ In Whitehead’s technical language, a duration is the way in which the contemporary world achieves “presentational immediacy” for a high grade actual occasion situated in a suitable social environment.

Space and time, in this new context, come to be understood as the most general rules in terms of which a society of events socially structures itself. If those societies evolve in such a way that the actual occasions which belong to them are very simple, and the social rules are such as to discourage the introduction of novelty in their operations, then they will tend towards relative permanence of character. The events making up the inorganic realm are such a society, and it is these events which provide us with rulers and clocks.

This is, of course, a highly simplified accounting of ideas which Whitehead developed in exquisite detail, particularly in *Science and the Modern World*, *Process and Reality*, and *Adventures of Ideas*. What is important for our purposes is that Whitehead did succeed in developing an adequate way of accounting both for the uniformity of space and time and for the relative permanence of rulers and clocks without having to invoke any factors outside of Fact. He did so on the assumption that the inorganic realm which, by the stability of conditions that it generates, makes measurement possible is a rigid society of events which propagate the objects ingressed in them with a minimum of creative variation.¹³⁷

¹³⁷ "Minimum", however, is not "zero". This implies that Whitehead did not secure an absolutely permanent, non-changing basis for measurement and the possibility for scientific objects, which suggests that the world of scientific objects is a "cosmic epoch." It has a finite lifetime, and is slowly shifting beneath our feet.

The Physical World in Fact

We have now secured the three conditions necessary for measurement – the recognition of congruence, a uniform structure of space-time, and a system of physical laws which support the existence of rulers and clocks. Where these conditions operate, scientific objects can be discerned. Where scientific objects can be discerned, they can, by definition, be used to account for ingressions of sense objects and perceptual objects.

We are now in a position to locate the physical world, quite precisely, in the domain of Fact. *The physical is that system of factors disclosed in sense awareness which is characterized by a uniform structure of space and time, and which is dominated by societies of events that are sufficiently rigid in their behavior to support the existence of rulers and clocks.* Within this system of factors, the scientific mode of explanation with which our civilization has been so preoccupied over the last few centuries is entirely justified.

However, as we shall see in the next chapter, Fact comprises much more than the physical world alone.

CHAPTER FIVE – ON THE NATURE OF THE SUBTLE WORLDS

We have now succeeded in accounting for the physical world as that system of factors of Fact which is disclosed by sense awareness; characterized by a uniform, metrically geometrical structure of spacetime; and dominated by societies of percipient events (actual occasions) that are sufficiently simple and regular in the rules by which their interactions are governed to support the existence of rulers and clocks.

What the senses disclose is only a part of Fact, and the physical world is only a tiny part of that. The subtle worlds comprise those factors of fact that are sensory, but which do *not* fit into the dominant spacetime continuum. This subset of the factors of fact disclosed by sense awareness does not come to us through the physical sense organs. But it is, nonetheless, sensation. This is what we call subtle sensations. The physical world is an order that we experience among those sensations disclosed by the physical sense organs. The subtle worlds are orders that we experience among those sensations disclosed by the subtle senses. As we will see, the range and depth of the worlds that we can access through these subtle senses is quite vast.

The Modes of Subtle Sensation

There are numerous modes in which we can experience subtle sensations.

Imagination

During our normal waking life, the subtle sensations recede into the background of consciousness, and the attention is monopolized by the sensations coming through the physical senses. Even during waking life, however, we are not infrequently interrupted

by subtle sensations that demand our attention in the mode of memory , fantasy, or thoughts that we hear in our minds. We will call this background of drama and thought that finds its expression in the visual sensations, the tactile feelings, the auditory mumblings, and the occasional smells and tastes of our own non-physical experience “imagination.” Except in periods of *samadhi*,¹³⁸ all of us experience some degree of imagination all of the time.

Daydreams and Active Imagination

Sometimes, our attention can get so drawn in by these subtle experiences that our attention to the outer world dims. It is almost as if we really are wherever it is that our imagination has taken us. We are then daydreaming. Daydreams tend to happen without much volition. We fall into them, and they may even become compulsive and tormenting. We can also engage the daydreaming function with greater intentionality, and thus enter into those states that are explored in the “active imagination” cultivated by Jung and his followers. Generally, when we are daydreaming or doing active imagination, even if the imaginal space dominates our attention, it is accompanied by a rather strong background awareness of physical sensation and of the physical world to which that sensation connects us. While we are daydreaming, we know where we are in the physical world, and we can respond to exigencies that arise in our physical environment.

¹³⁸ A deep trance in which all inner processes of the mind have been temporarily stilled.

Dreams

If, however, we allow the subtle sensations to sufficiently monopolize our attention, we may lose track of the physical sensations to a very large degree. Most often, when this happens, we fall asleep. In our experience there is an abrupt transition between daydream and full dreaming. Quite suddenly, we forget our waking life completely. We find ourselves living through a situation in a world strangely unlike our own, a world that – while we are there - we take entirely for granted. It is as if we had always been there, and as if we were a natural denizen of that world. While we are there, that world is utterly real.

Lucid Dreams and Out-of-Body Experiences

Many people report lucid dreams. In lucid dreams, we enter into the experience of dreaming *without* losing the memory of waking life. When the dreamer says “I am dreaming,” he or she, though immersed in the dream environment, is remembering (and anticipating) the waking experience. In lucid dreams, it becomes possible to bring to bear the kind of mental purposefulness that we can, at our best, bring to bear in our waking lives, but we are doing so in a subtle world that is disclosed by subtle senses. Out of body experiences resemble lucid dreams, but often include a memory of leaving and observing the physical body while in a subtle body, and often take place in worlds which

closely resemble the physical world. Lucid dreams can, however, merge into experiences in realities that less resemble the physical world and are more ‘dreamlike.’¹³⁹

Occult and Mystical Experiences

Theosophical texts¹⁴⁰ suggest that lucid dreams and out of body experiences, are just the outer fringes of the subtle worlds. They suggest that the subtle senses can offer us a vast array of illuminating experiences. Sri Aurobindo, who is our primary spokesperson for the occult tradition, says:

There is . . . a movement inward by which, instead of living in our surface mind, we break the wall between our external and our now subliminal self; this can be brought about by a gradual effort and discipline or by a vehement transition, sometimes a forceful involuntary rupture,—the latter by no means safe for the limited human mind accustomed to live securely only within its normal limits,—but in either way, safe or unsafe, the thing can be done. What we discover within this secret part of ourselves is an inner being, a soul, an inner mind, an inner life, an inner subtle-physical entity which is much larger in its potentialities, more plastic, more powerful, more capable of a manifold knowledge and dynamism than our surface mind, life or body; especially, it is capable of a direct communication with the universal forces, movements, objects of the cosmos, a direct feeling and opening to them, a direct action on them and even a widening of itself beyond the limits of the personal mind, the personal life, the body, so that it feels itself more and more a universal being no longer limited by the existing walls of our too narrow mental, vital, physical existence. This widening can extend itself to a complete entry into the consciousness of cosmic Mind, into unity with the universal Life, even into a oneness with universal Matter.¹⁴¹

¹³⁹ Bruce, *Astral Dynamics*. See part Five and, in particular, Chapter 30, “The Akashic Pulse.”

¹⁴⁰ See, for example, Powell, *Astral Body*. Chapter X of that text examines dreams in the larger context of the astral, or vital, world.

¹⁴¹ Aurobindo, *Life Divine*, 275-276.

Sri Aurobindo goes so far as to suggest that a thorough exploration of these subtle realms is one way that human beings can, ultimately, fulfill the evolutionary project by discovering their fundamental identity with the Divine source of the whole of existence.¹⁴²

This brief survey of the modes in which we can experience subtle sensations is sufficient to indicate both their variety and their importance. But modern thought has relegated these experiences to a shadowy, private existence on the ‘inside’ of subjects who are thought to enjoy objective existence only in the one, real, outer physical world.

It is, of course, undeniable that the physical world obtrudes with great authority on our waking lives. As we have seen, even Whitehead, in spite of his desire to account for science on entirely empirical grounds, at one point considered the possibility that physical objects (non-delusive perceptual objects) might be characteristics which events can have for themselves alone. If physical objects (and, by extension, scientific objects) are characteristics which events can have for themselves alone then they are “true Aristotelian adjectives.” The logic governing the ingression of Aristotelian adjectives into events is the simple, two-termed logic of substance and attribute. This logic is dear both to common sense and to scholastic philosophy. It is much neater and simpler than is the more complex polyadic logic of Fact.

If we imagine perceptual objects as Aristotelian adjectives, then they begin to strongly resemble the inert, self-existing, substantial *things* of materialism. The events in

¹⁴² Ibid., 276. See also of Sri Aurobindo, *Savitri*, 3rd ed., (Pondicherry: Sri Aurobindo Ashram, 1970), 95-304.

which they are ingressed come to seem like the furniture of a real, solid world and sense objects come to seem like ambassadors from that world into the complex, shifting, half-real world of experience to which we poor conscious beings are limited. If we think about reality in this way, then only those sense objects which are somehow in direct contact with physical objects tell us anything about the real world. The rest of the sense impressions must be indirectly produced by the scientific objects which analysis of the data of the physical senses reveals. This is the position of the materialists to which we have alluded numerous times in the course of this essay.

We have been exploring a line of inquiry which stays within the realm of concrete experience, and the Doctrine of the Subtle Worlds to which this approach lends support. According to the Doctrine of the Subtle Worlds, our subtle sensations are not complex echoes of physical sensations, they are rather the effects of real, external, subtle worlds of events that are entering into the perceptual process of our bodies in those worlds. According to the Doctrine of the Subtle Worlds, the worlds in which we imagine, dream, lucid dream and leave our bodies are worlds that have just as much claim to external reality as does the physical world in which we lead our waking lives.

This assertion necessarily focuses our attention on the meaning of the phrase “external world.” What do we actually mean when say that the world is “external?” While the externality of the world seems quite obvious and simple, it is one of those taken-for-granted elements of common sense that is extremely difficult to put into words.

Whitehead, in *An Inquiry into the Principles of Natural Knowledge*, has undertaken an exploration of this issue in terms of what he calls “the six constants of externality.”¹⁴³

The Six Constants of Externality

The constants of externality are a description of those characteristics which a factor of Fact possesses when we assign to it the “property of being an observation of the passage of external nature.”¹⁴⁴

The first of these constants is “the belief that what has been apprehended as a continuum, is a potentially definite complex of entities for knowledge.”¹⁴⁵ To see what Whitehead is getting at here, we must remember that in the perceptual process, factors of Fact are first discriminated in *awareness* before they are thought about or perceived. Mere awareness, like the consciousness of a newborn infant, is a highly fluid process. It does not discriminate one *thing* from another. It is an experience of a field of shifting values without clear boundaries and without clear definition. In awareness, all relations are internal. In other words, when a factor is first discriminated, it is not yet separated from the whole, restless, background of Fact in which it is implicated. It is only with *thought*, which focuses on the contrast between the factor in question and the field of other factors in which it is implicated, that objects and events are discriminated, and *entities*, which are mutually external things, emerge into consciousness. Thus, when we

¹⁴³ Whitehead, *Principles*, 71-74.

¹⁴⁴ *Ibid.*, 71.

¹⁴⁵ *Ibid.*, 74.

say that we are dealing with an external world, we are saying that we have to do with a system of factors which can, in thought, be resolved into a complex of definite entities, or discrete events.

The second constant is the relation of extension. The events that make up an external world are, as the first condition stipulates, discrete. In order to make up an external *world*, however, they must be not only discrete, but also systematically interrelated. In common sense, we think of the framework within which mutually discrete events interrelate as the structure of space and time. As we have seen, however, space and time are not, *per se*, factors of Fact. The factors of Fact that we perceive resolve themselves, in thought, into events and objects. The neutral container which we imagine when we speak of space and time is neither an event nor an object. However, as we established in Chapter Four, what we mean by space and time, both in common sense usage and in scientific usage, can be understood as an abstraction derived from the ways in which events *extend over*, or include one another. The first and second constants together stipulate that an external world is one which can be resolved into a collection of discrete events which are systematically interrelated in that they include, or extend over one another.

The third constant of externality is that every event which is part of an external world must be apprehended as related to a specious present which extends over it, and over all of nature now present, both discerned and discernable. The fourth constant is that this specious present is associated with a percipient event. These two constants

jointly stipulate that every event which is part of an external world is experienced in the context of what we have been calling a 'duration.'

The realization that every event belonging to an external world is structured as a duration is a decisive clarification of the notion of externality. The notion of externality is somewhat paradoxical because, in our common sense usage, it wavers uncertainly between two different ideas. On one hand, when we say 'the external world', we are implicitly contrasting that world with something else that is 'internal.' In this sense, the external world is the 'outer' world, as opposed to the 'inner' world. This inner world is the world of our own private experience. Since, however, all of our direct experience is, in some important sense, private and inner, the implication here is that the inner world contains the outer world. On the other hand, in our common sense dealings with the world, we often consider it in abstraction from our experience of it. Thus we tend to imagine the external world as self-existing and as containing the perceptual event by means of which it is known. Thus common sense implies that the external world contains us and our experience of it, *and* that our experience contains the external world.

As we have seen, Whitehead's strict empiricism insists that we examine nature in terms of the full, concrete reality of our experience of it, and this full concrete reality is always an *internal* experience of an *external* world. Without the subjectivity of the percipient event, there is no external world. Without an external world to experience, there is no internal experience. Thus the phrase 'external world' turns out to be shorthand for 'internal-external world.' In our experience we contain a world of events, and that world contains one particular event, a percipient event, by virtue of which we

participate in that world. Thus Whitehead's definition of externality as essentially involving durations does justice to the full paradoxical complexity of the common sense use of the term 'external world.'

The fifth constant of externality is what Whitehead calls 'cogredience.' As we saw in Chapter Four, Whitehead defines cogredience as follows: "when the specious present is properly limited, there is a definite univocal meaning to the relation 'here within the duration' of the percipient event to the duration."¹⁴⁶ On the face of it, this constant seems technical and uninteresting. If we look at it more closely, however, it is rather remarkable. If you look around yourself at this moment, you will notice that you are right at the center of your own perceptual field. If you then get up and walk across the room, you will still be at the center of your own perceptual field. It is as if each of us walks around in a little bubble of perception, and we are always just exactly at the center of it. Within any sufficiently brief span of time, within the single glimpse of simultaneous nature that constitutes a duration, 'here' does not change. In addition, we can observe other events within the duration which hold constant relationships to the 'here.' For example, within the particular duration that is transpiring as I write this word, I am 'here,' and my desk, the other furniture in the room, and the walls of the room remain in a fixed relationship to the 'here.' It is this fixed scheme of spatial relations around the unambiguous 'here' of the percipient event that Whitehead designates with the term 'cogredience.' Without assuming cogredience, Whitehead cannot abstract a

¹⁴⁶ Whitehead, *Principles*, 78.

geometrical scheme of relations from the structure of durations. Cogredience holds within the physical world. As we will see, however, this is the one constant of externality that does not hold in subtle worlds.

The sixth constant of externality is that there is a “community of nature.” Whitehead says: “[t]his sixth constant arises from the fragmentary nature of perceptual knowledge. There are breaks in individual perception, and there are distinct streams of perception corresponding to diverse percipients. For example, as one percipient awakes daily to a fresh perceptual stream, he apprehends the same external nature which can be comprised in one large duration extending over all his days. Again the same nature and the same events are apprehended by diverse percipients. . . .”¹⁴⁷ This is, of course, an important part of what we mean by an external world. As we have seen, scientific thinking tends to satisfy this requirement by considering the outer world in abstraction from the fact that it is perceived, and this leads to the “bifurcation of nature” into a realm of “real” events characterized by Aristotelian adjectives and a shadowy, private, half-real world of conscious perception. We have rather satisfied this requirement by making two key assumptions. First, that every event comes into being by “prehending,” or perceiving, its environment, so that the community of nature is fundamentally an intersubjective community. Secondly, by virtue of the ways in which events participate in each other’s constitution, they form communities of pattern that endure, and so provide a context in which the fragmentary perceptions of individuals can be ordered over time.

¹⁴⁷ Ibid, 78.

To summarize this discussion: An external world is a system, or community, of events, experienced in the context of a duration. These events can, in thought, be discriminated as discrete entities which extend over one another. A duration is the experience of an event that is socially situated in a percipient event through which it perceives the rest of the world. When there is ‘cogredience,’ the percipient event occupies an unequivocal ‘here’ within its associated duration. We now have a deeper and more nuanced understanding of what we mean by an external world. We know that the physical world is external in this sense since we have derived these requirements precisely by an examination of that world. Let us now turn our attention to the subtle worlds as we have defined them above, and see to what extent they, too, can be considered external worlds.

The Externality of Subtle Worlds

It is certainly the case that the subtle worlds are very different from the physical world. We will shortly examine the nature of these differences in some detail. But if we consider the subtle worlds with the constants of externality in mind, the extent to which they apply is immediately apparent.

Imagination, dream, active imagination, lucid dream, out-of body experience, and all occult experiences are organized in terms of durations. In every such experience, there is a specious present. In every such experience, there is some sense of presence in a world of events, and that presence is organized around a point of view which is defined by a percipient event. In other words, there is a strong sense in which we are *in* the

events that we imagine, and even more clearly, we are *in* dreams and, in dreams, we occupy dream bodies. In these subtle modes of perception, we clearly retain the ability to discriminate, in terms of objects, a system of discrete events, and those events clearly are involved in spatiotemporal relationships and do, therefore, exhibit relations of extension. Finally, we meet other subjects in subtle experiences, and those other subjects interact with us around common objects in a way that is quite analogous to our experiences in waking life. We have already seen that a consistent accounting of waking life as a system of factors of Fact suggests that all events are ultimately composed of percipient events and, thus, that all of reality is intersubjective. This logic applies at least as forcefully in dreams as it does in the physical world.

In all of these ways, subtle worlds manifest an externality analogous to that of the physical world. There are ways, however, in which the externality of the subtle worlds is quite different from that of the physical. We will now examine those differences.

How the Externality of the Subtle Worlds Differs from the Externality of the Physical World.

The Breakdown of Cogredience in Subtle Worlds

Perhaps the most striking difference between the physical world and the subtle worlds is that in the subtle worlds there is a breakdown of cogredience. Cogredience, as we have seen, is the unequivocal ‘here’ of the percipient event within the specious present. In imagination, and dream there is a breakdown of cogredience in several

senses. First, especially in imagination, there can often be a sense of being suspended between worlds. On the one hand, I am sitting here at my desk. On the other hand, my attention is ‘a million miles away,’ in some more or less colorful daydream. When the experience of imagination becomes sufficiently distinct, there can be a sense of inhabiting two percipient events at once, one physical and one subtle. While each percipient event may define its own unique ‘here’ within its respective duration, the possibility of being simultaneously cogredient in more than one duration begins to complexify our sense of cogredience. Secondly, cogredience breaks down in an even more flagrant sense within subtle durations themselves. Consider our experiences in dreams, where we sometimes say “I was that character, or maybe I was that other character, or maybe I was both.” Or we say “I was having the dream, but simultaneously I was watching it as if from outside.” In either of these situations, it becomes very difficult to find an unambiguous definition of ‘here in the duration,’ and the task of measurement becomes difficult, if not impossible.

It is because there is a breakdown of cogredience in subtle worlds that we often assume that subtle worlds are part of our private experience. We assume that an objective world is necessarily a world with the rigid geometrical structures of waking life. But, in terms of our analysis of Fact, there is no convincing reason to hold to this assumption. Remember that every duration extends over an indefinitely large number of events. The percipient event is some set of those events which define the perspective of the duration on the rest. But, as Whitehead often remarks, the percipient event (what we usually call “our body”) cannot be marked off from the other events comprising the

duration with any great degree of exactitude. Thus there is a sense in which all of the events comprising the duration are, to some degree, part of the percipient event.

There is no metaphysical necessity which dictates that that set of events which, in a given duration, defines a perspective on the rest, needs to be a compact physical object with a unique position and continuity of location within or among durations. There is no reason that it cannot simultaneously occupy more than one position, and no requirement that it needs to move along continuous trajectories. In fact, as we will see, this breakdown of cogredience is exactly what we would expect given the characteristics that we will discover in the objects which tend to be ingredient in events that can be discriminated in subtle worlds.

Cogredience is the only one of the six constants of externality that is violated in subtle worlds. The Doctrine of the Subtle Worlds suggests that this requirement is not an actual constant of externality per se. It is rather a characteristic of that particular mode of externality that permits measurement, and which defines that system of factors of Fact disclosed in sense awareness that comprises the physical world.

In Chapter One, it was suggested that we cannot operate consciously in subtle worlds until we learn to differentiate self from other in those worlds as we now make that discrimination in the physical world. We are, at this point, in a position to state more precisely what we mean by ‘differentiating self from other.’ To separate self from other in a given world is to designate for ourselves those events in that world that constitute the percipient event in terms of which we define our standpoint there. If, as we are suggesting, the percipient event in subtle worlds can simultaneously occupy more than

one location, then the cognitive skills necessary for differentiating the percipient events there will be very different from the cognitive skills that are required here in the physical domain. This is probably one of the chief obstacles that we face in attempting to operate more consciously in subtle worlds.

Spacetime in Subtle Worlds

In Chapter Four, we saw that measurement is only possible in a continuum which is structured as a uniform spacetime characterized by a metrical geometry. We saw, too, that Whitehead was able – given a percipient event cogredient with its duration – to abstract such a geometrical framework from the structure of durations. We see now that cogredience does not hold in subtle worlds. The question before us, then, is how we can understand the spacetime structure of those worlds.

Let us pause to remember that physics identifies the physical world with the configuration of material processes distributed throughout space at a given instant of time. The utility of this particular abstraction is attested to by the undeniable successes that physics has enjoyed over the past few centuries. Because the abstractions of physics can be pulled out of the structure of durations, the process of accounting for the physical world as a system of factors of Fact in no way excludes the insights of physics. Even in the physical world, however, this abstract space with its discrete, instantaneous times is not a fully adequate description of spacetime. In fact, if we fall into misplaced concreteness, and if we imagine the abstractions that underlie research in physics to be ultimate descriptions of what is real, we immediately run into difficulty. The problem is

that if reality consists of elements which exist only at isolated point of space, it is difficult to understand how those elements can come to interact with each other (this is the problem of “action at a distance”), and if those elements exist only at single instants of time, it is difficult to establish any causal connection between those elements and other elements which precede or succeed them.¹⁴⁸ Further, if we take these abstractions too seriously, we are hard pressed to account for physical variables such as acceleration - which do not display themselves at a single instant. Thus neither “action at a distance,” nor causal interactions, nor properties which display themselves only over time, can be accounted for if we take too seriously the abstractions of physics.¹⁴⁹ These considerations require a deeper look at the nature of spacetime within the physical world itself, and we will have to do that work before we can return to the issue of spacetime in the subtle worlds.

When we look at a world within the domain of Fact, what we discern is a system of interacting events. These events are organized into a system by the ways in which they include, or extend over one another. Thus every event finds within itself a multiplicity of other events, and these events are discerned as extending over one another. A great deal of Whitehead’s work – particularly in *Process and Reality* – is an exploration of this interaction among events. In order to clarify the characteristics of

¹⁴⁸ The idea that the existence of an entity is only at a given point in spacetime is a particular instance of the fallacy of misplaced concreteness. Whitehead terms this instance the fallacy of “simple location.” See A.N. Whitehead, *Science and the Modern World* (New York: The Free Press, 1967), 49.

¹⁴⁹ For a fuller examination of these issues, see Whitehead, *Science and the Modern World*, chapters 3 and 4.

spacetime in subtle worlds, we will have to review some of Whitehead's ideas about this interaction among events, and to introduce some of his indispensable technical vocabulary.

Each event is either an actual occasion of experience, or else it is a collection of actual occasions that share some defining characteristic. An actual occasion is a specious present, and it always has some finite temporal depth. As we have seen, each actual occasion is a unified experience of a multiplicity of events. Whitehead describes these occasions as a process by means of which the settled past is brought from the status of an original multiplicity into the unity of a single experience. It is this unity which is experienced by future occasions as an event which they, in their turn, can take into their own constitutions. In Whitehead's technical language, each actual occasion begins with the "prehension" of an "initial datum" which comprises a multiplicity of events. It proceeds through a process of "concrescence" by means of which that original multiplicity is welded into a unified experience which is the "final satisfaction" of the concrescence. It is this final satisfaction which is "objectified," and so becomes available for prehension by future occasions. The details of concrescence are intricate and endlessly fascinating, but we need not examine them in our current context. In order to understand the relationship between the spacetime of the physical world and the spacetimes of subtle worlds, however, we need to become clear about the full richness of the notion of "prehension." The term prehension is an attempt to name the most concrete reality of the relationship which events have to one another within the domain of Fact.

An event is a differentiated collection of factors, and factors emerge out of the background of Fact by the operation of awareness. For one event to prehend another is for one event to become *aware* of another. Fact is the totality of all experience.

Awareness is a factor of consciousness, and consciousness is the primordial factor of Fact by virtue of which it *is* experience instead of vacuous actuality. Thus, every prehension is an experience. As we shall see, however, there is much more to prehension than bare experience. The notion of *experience* can be abstracted from prehension if we bracket out or ignore the other qualities and functions of prehensions in the full functioning of occasions.

Prehension is not just simple awareness. It is, rather, as we know from our own prehensions, rich with the texture of personal relationship and valuation. If, however, we bracket out, or abstract from both the quality of awareness and from the personal richness (which Whitehead calls the “subjective form”), there does remain a kind of bare relationship of proximity. This is the relation of extension. Thus extension, too, is an abstraction from prehension.

Whitehead points out that the prehensions an occasion has of its initial datum are not the only prehensions which occur in concrescence. There are prehensions of prehensions, and there are prehensions of contemporary events and even prehensions of

future events.¹⁵⁰ But, if we restrict our attention to prehensions of the initial datum, then we see also a deep connection between efficient causation and prehension. The events which an occasion initially prehends are the occasions of which it is an experience, and out of which it arises. This initial datum immediately precedes that occasion in the “creative advance” (the ongoing emergence of occasions of experience from which time is an abstraction), and forms that portion of the past which most strongly contributes its element of definiteness to the new occasion. The occasions comprising the initial datum are, thus, the efficient cause of the occasion. From this point of view, efficient causation is an abstraction from the notion of the prehension of the initial datum.

Memory is also an abstraction from the notion of the prehension of the initial datum. This idea will require some exploration. One of the things that we mean by remembering is “having an experience of a past event.” The events that we remember may have preceded us in the creative advance at some remove (they may be part of the distant past), or they may have reached their own final satisfactions just as our present occasion of experience began (they may be in the immediate past). If I prehend an event which took place a week ago, that is a memory. If I prehend an event that took place an hour ago, that is a memory. If I prehend an event which took place a second ago, that is a

¹⁵⁰ Because Whitehead maintains the causal independence of contemporary occasions, any prehension of contemporary events must be an indirect prehension based on the common past which the prehending occasion shares with its prehended contemporaries. Because Whitehead maintains that the future is not yet determined, prehensions of future events must be prehension of them as possible, rather than as already actual. For a fuller examination of these issues, see Whitehead, *Adventures*, 191-200.

memory. If I prehend an event that took place *immediately* before the present occasion of experience, and is part of its initial datum,¹⁵¹ then that is also, in some important sense, a memory. This way of thinking considerably blurs the distinction between what we usually call perception and what we usually call memory.

Now it might seem that by memory we actually mean more than just prehension of a past event. We might try to sharpen the contrast between prehension of past events and memory by noting that memory is not just an experience of a past event, but rather an experience of a past *experience*. In this sense, a memory is a present experience of a past experience. But we are assuming that every event is, in its concrescence (or process of formation) an experience. Thus *every* prehension of an event in the initial datum is an experience of a past experience, and so even in this stronger sense of memory, memory and prehension of the initial datum are indistinguishable.

Finally, we might try to salvage the distinction between prehension and memory by restricting memory to the experience that an occasion has of some *particular* occasion in its immediate past. We might, that is, say that memory is the experience of “my own”

¹⁵¹ The exact status of the “objective datum” in Whitehead’s system is somewhat obscure. He sometimes discriminates between the “initial data” which is the disjunctively diverse nexus of past actualities, and the “objective datum” which is a unified datum which has been perspectively adjusted by “negative prehensions” so that elements of the past which are incompatible for synthesis into the emerging unity have been eliminated. I am here assuming that the objective datum can be understood as the immediate past of the occasion. This is somewhat in line with our common scientific understanding which restricts efficient causation to just the immediately preceding events, and which sees the remainder of the past as objectified *through* the immediate past. This is somewhat in tension with Whitehead’s doctrine of objective immortality. I hope, in the near future, to undertake a fuller exploration of these issues.

experience in the past. But this raises the question as to what qualifies a particular past event as “my own.”

Whitehead does acknowledge that our various prehension of past events differ among themselves in respect of their fullness. We can understand this difference in two different, complementary ways. On one hand, past events are prehended in the current occasion by means of some subset of the objects which they, in their own concrescence, ingressed. For example, I may prehend a far distant boulder only insofar as it ingresses the simple sensory object that is a miniscule blot in my visual field, but I may prehend the boulder on which I am sitting insofar as it ingresses a very complex perceptual object including many visual and tactile elements. On the other hand, Whitehead deduces that prehensions of the initial datum must also conform to some element of the subjective form of the prehensions of which they are objectifications. In other words when an actual occasion prehends a past event, it feels, to some extent, the feelings that the past occasions felt. This sounds somewhat strained when we imagine interactions among inorganic occasions, but there is no doubt that our memories come complete with the feelings that they aroused at the time they were formed, and, while we can change our minds and change our moods within any given occasion of experience, we always start each moment just where the last moment left off, both in terms of what we are perceiving and in terms of what we are feeling about those perceptions. Thus, insofar as we have intimate memories of our own past experience, we are demonstrating the capacity to prehend in a very concrete way the subjective forms of past occasions of experience.

In Whitehead's terms, past events "objectify" in present occasions with varying degrees of concreteness. An objectification is more concrete to the extent that it includes more elements of the final satisfaction of the objectified occasion, and to the extent that it includes more of the subjective form of the final satisfaction. Beings such as ourselves do seem to achieve a peculiar concreteness of objectification for one particular event in the immediate past, and we call that particular event "our own." But in any case, within the conceptual framework which we are exploring, even memory in this special sense is just a peculiarly complete prehension of a past event, different only in degree, but not in fundamental structure, from the experience of other immediately past events.

The point of the current discussion is to establish that the full concrete relation which, in Fact, binds durations into a system is such that *extension*, *inclusion*, *experience*, *efficient causation*, and *memory* are all abstractions from its fullness. The recognition of prehension as the fully concrete relation among events enables us to overcome a great deal of philosophical perplexity. Since events arise out of their prehensions of the past, they are not "simply located" at a specific point in spacetime, and causal relations are internal to their very being. Thus the understanding of events as "prehensive unifications," unlike an ontology of substances, can deal very effectively with the problem of causality. Since events arise by experiencing other events, an ontology prehending events situates consciousness in the heart of being, and so overcomes the duality of mind and matter. Finally, an ontology of causality as being inseparable from the experience of past experiences, builds memory into the very heart of being, and thus saves us from having invent elaborate and complex mechanisms of data storage. If, on

the other hand, we forget that extension, efficient causation, and memory are *abstractions* from the complex structure of concrescence, then we find ourselves unable to reassemble them into a coherent accounting for the real world that we actually do experience.

If, we keep the concrete fullness of prehension in mind, then our view of spacetime is considerably modified. Spacetime is no longer an objectively existing container, it is rather something much richer, which we can describe in at least three different ways. First, spacetime is an abstract description of the patterns in which the events that we experience include one another. As we have seen, an actual occasion concretes by unifying the experience of a diversity of events (the initial datum), all of which are in its immediate past. These events are patterned, and the simplest relation among them is that of extension. I discern a desk, and that desk extends over its surface, its legs, and so forth. Given cogredience, I can abstract from the relations of extension obtaining among a system of such events a geometrical structure of spacetime.

Secondly, spacetime is an abstract description of the pathways for the transmission of efficient causation. An analysis of the structure of actual occasions in relation to the passage of nature tells us that those events from which it originates are the legacy of the past in the present. The desk which I see is my experience of the desk as it was a fraction of a second ago. An occasion of experience comes into being as a process of appropriating the past, but it does not appropriate the entirety of the past, rather it appropriates only the *immediate* past. The events included in or extended over by my current duration are past events, and they, themselves, include or extend over events from *their* immediate past, and so forth. The efficient causes of the current duration are those

past events over which it extends. Those events are at once its immediate neighborhood in the spacetime past and its efficient causes. They themselves grew out of their own immediate neighborhoods, and the indefinite continuation of this process of nesting extensions is spacetime considered as the route of transmission for the efficient causes giving rise to the current occasion.

Thirdly, spacetime is an abstract description of the way in which our memory of the past is ordered. This follows from the way in which extension, experience and efficient causation are all abstractions from one concrete relation. If a duration necessarily experiences its efficient causes, then those causes are experiences of the past, and experiences of the past are memories.

In the foregoing discussion, we made the assumption that the distant past can be clearly distinguished from the immediate past, but in light of the way in which we have now blurred the distinction between perception and memory, this assumption needs to be more closely examined. What, indeed, is the difference between a prehension of an event which occurred last week and an event which occurred a microsecond ago? We generally assume that prehension of events that are more distant is mediated by events that are closer to hand. And yet, as we have seen, all prehension of past events is similar in its structure, and prehensions of events in the distant past have, on the face of it, just as much right to be considered elements of the initial datum as do events in the very recent past. Let us say that I am walking down the aisle in a supermarket when I suddenly remember a past occasion, earlier in the day, on which I was strongly desiring a piece of chocolate. Abruptly I change directions and head for the candy section. The occasion of

experience in which the memory occurs prehends that past occasion of desire, and thus it extends over, or includes that occasion. That remembered occasion is certainly experienced in the current occasion, and it no doubt functions as an efficient cause contributing its quota of definiteness to the concrescence. How, then, is it different from my prehension of the immediately preceding moment of walking down the supermarket aisle?

To clarify this vexing point, it will be necessary to look more deeply at the notion of extension. Up to this point, we have left the notion of extension or inclusion relatively undefined. But a precise definition of extension is crucial to an understanding of the nature of spacetime, both in the physical world and in subtle worlds. In a remarkable passage from *An Inquiry Concerning the Principles of Natural Knowledge*, Whitehead tells us:

Every element of space or of time (as conceived in science) is an abstract entity formed out of this relation of extension (in association at certain stages with the relation of cogredience) by means of a determinate logical procedure (the method of extensive abstraction). The importance of this procedure depends on certain properties of extension which are laws of nature depending on empirical verification. *There is, so far as I know, no reason why they should be so, except that they are.* (Italics added for emphasis).¹⁵²

The particular properties of extension to which Whitehead here refers are not difficult to understand. Common sense gives us a fairly clear notion of these properties, drawn mostly from the an examination of the visual field, supplemented by reference to tactile experience. In the process of developing his method of extensive abstraction,

¹⁵² Whitehead, *Principles*, 75.

Whitehead developed a rigorous logical formulation of this ordinary notion of extension.¹⁵³ We need not examine his logical formulations in detail. The important points for our purposes are these: the relation of extension is assumed to operate in a unified continuum. That is, it is assumed that all the events over which an occasion extends are involved in close relations of extension with one another. The visual field, as that field is presented to us by our physical eyes, is an excellent illustration of this notion of continuum. The visual field extends over all of the events which it includes, and each of those events, from its own point of view, extends over all of the others; the continuum is smooth. That is, if event A extends over event C, then there is some event B such that A extends over B and B extends over C. Further, given any two events, A and B, there is some event, say E, which extends over both; the relation of extension is transitive. That is, If a particular event, A, extends over another event, B; and if B extends over C, then A extends over C, and C does not extend over A.

Whitehead's procedure for abstracting the geometrical spacetime continuum out of the structure of durations, or actual occasions, made use of the method of extensive abstraction, and that method works only if extension exhibits these particular properties. But, as Whitehead points out, extension need not exhibit those properties. In fact, even a cursory examination of our own occasions of experience shows that these properties obtain within our own experience only in a rather limited way. Consider the occasion of experience we discussed a moment ago in which the memory of a past desire for

¹⁵³ He did this initially in Whitehead, *Principles*, 101-109. He returned to this issue again in Whitehead, *Process and Reality*, 294-301.

chocolate played such an important role. That event extended over, or included, all of the immediately past bodily events comprising what we would usually call the sensory perception of the supermarket environment. Within that subset of the initial datum, the relation of extension as Whitehead defined it roughly applies. But that occasion also prehended, included, or extended over, the event of the past desire for chocolate. So although, in terms of inorganic time (clock time), the desire for chocolate is in the relatively distant past, in terms of the vividness of my memory, and in terms of the power of efficient causation, it functions as if it is in the immediate past. If I assume that what I remember is in my immediate past, then the desire for chocolate is *my* immediate past, even though it is in the more distant past of my body. Thus the actual pattern of extension which characterizes human experience is too complex to be described by any simple geometry.¹⁵⁴

We normally make the assumption that all of the events of the initial datum must be extensively related to each other in a simple continuum of the type that Whitehead describes. On that basis, we infer that prehensions of past events which are not in the immediately past neighborhood of that continuum (memories of the more distant past) are not part of the initial datum, and are somehow mediated by or drawn out of that datum later in the concrescence. This makes an accounting for memory of the more distant past a very complex procedure, indeed. On the other hand, if we drop the assumption that all

¹⁵⁴ That is, it cannot be described by any of the metrical geometries (Euclidean, Riemannian, and Lobachevskian), nor by projective geometry – all of which assume an “extensive continuum” of the type here under consideration.

of the events of the initial datum must be implicated in a single, smooth continuum, the way is opened for a much more natural definition of memory. We are now free to explore the possibility that all of the prehensions which an occasion has of the past are part of its initial datum or – to put this another way, the immediate past of a given occasion is precisely that which the occasion remembers. This approach is, as we shall see, one of the keys that opens up an understanding of spacetime in subtle worlds.

To see how this works, we begin by noting that actual occasions differ in the complexity which characterizes their concrescent processes. The concrescence of the event which is an occasion of experience in, for example, the life of a hydrogen atom is considerably simpler than is the concrescence of an event which is an occasion for experience for a higher grade occasion such as a giraffe. Whitehead differentiates occasions into at least three grades. Low grade occasions are those which make up the societies (or systems) of occasions that constitute the inorganic world. Medium grade occasions are those which make up the living portions of organic beings. High grade occasions are those which make up the societies of occasions which are the experiences of thinking beings.¹⁵⁵

The physical world is dominated by a society of inorganic occasions. We have, through centuries of scientific investigation, been able to describe and predict the behaviors of inorganic occasions on the basis of two assumptions: first, that they

¹⁵⁵ Whitehead develops this idea in Whitehead, *Process and Reality*, in the chapter on “Organisms and Environment,” 110-129. Note that this distinction among various grades of occasion is very similar to the distinction that Sri Aurobindo makes between what he calls “Matter, Life and Mind.”

participate in a continuum of the type that supports the method of extensive abstraction,¹⁵⁶ and, second, that causal influences propagate through this continuum from the immediate past to the present in a (more or less) smooth and continuous manner. All of the events that constitute the initial datum for an inorganic occasion are bound together in such a way that they, themselves, share, almost entirely, a common past.

In the context of modern relativity, scientists routinely picture an occasion as a point at the apex of a spacetime cone such as that represented in Figure One, which represents an inorganic occasion, I. The curve A cuts through those occasions which are proximate to occasion I, and which form its immediate past. The curve B cuts through those occasions proximate to A, and so forth. The arrows represent the pathways of causal influence. The events in the past region of that cone are the totality of those events which have had an efficient causal influence on occasion I, and all of those influences are mediated by the events (through which the curve A passes) which form I's initial datum. In the context of our current mode of explanation, we would say that inorganic occasions remember, and thus are causally conditioned by, only a very simple cross-section of the past.

¹⁵⁶ Quantum non-locality suggests that the continuum binding inorganic occasions may be more complex than this, but this generalization still holds good for most macroscopic inorganic phenomena.

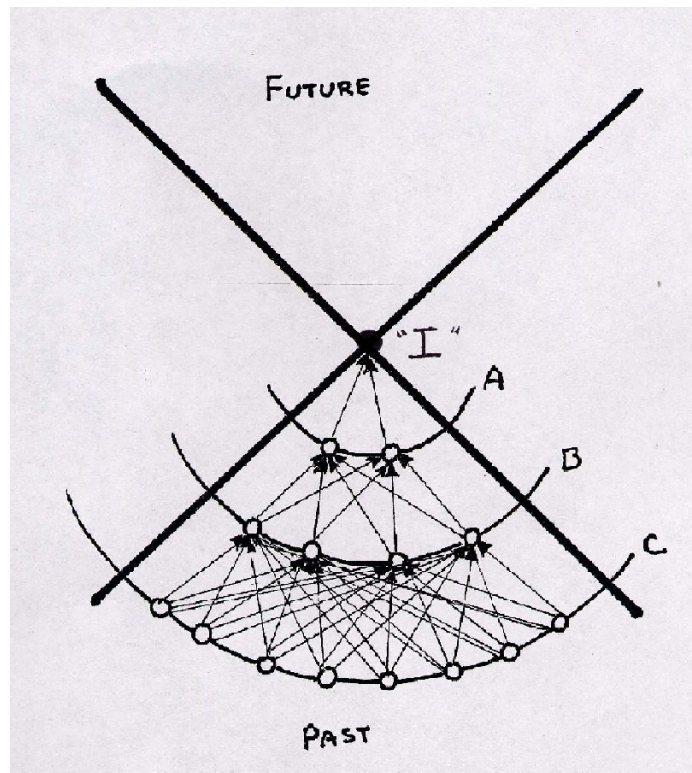


Figure 1: Causal Relations Among Inorganic Occasions

We cannot explain the behaviors of organic occasions (particularly as they rise in the scale of complexity) without assuming that they are influenced by memories of the more distant past. Figure Two represents a fairly high level organic occasion, O. As before, A, B, and C pass through occasions which are at further and further remove in inorganic spacetime. But here we observe not only the routes of causal transmission that propagate through successive inorganic occasions, but also the causal influences (or prehensions, or memories) of events from spacetime regions B and C which seem to bypass the linear pathways of transmission that characterize causality in inorganic spacetime. In common sense, and in scientific reasoning, we generally assume that these longer range causal influences must be mediated by routes of transmission which pass,

somehow or other, through inorganic spacetime. Here, however, we are exploring the possibility that these apparently more distant causal influences are, in fact, *direct*. That is, we are exploring the possibility that everything an occasion remembers is, by definition, in its immediate past. If this is the case, then the immediate neighborhood of organic occasions is not smooth in the sense we have discussed above, and the laws of extension, or inclusion, which order this continuum must be other than those which govern patterns of extension in the inorganic, world.

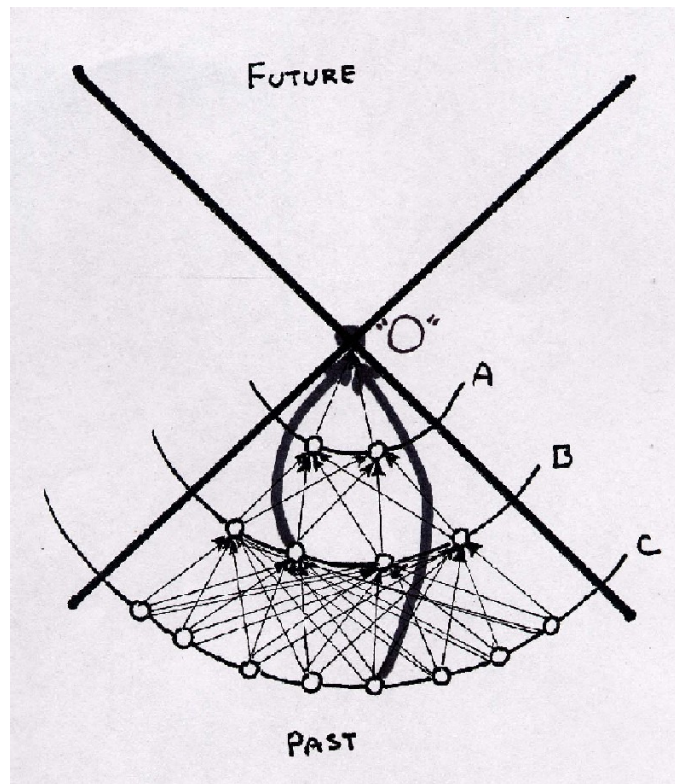


Figure 2: Causal Relations Among Organic Occasions

In the inorganic world, an occasion canprehend – which is say, can include, extend over, be causally influenced by, or remember -- only those other occasions which are immediately proximate to it in the past of a smooth, geometrical, extensive continuum. In this extensive scheme, the patterns of causal propagation can be expressed in terms of relatively simple geometrical laws such as those which govern the radiation of electromagnetic waves.

Organic occasions, on the other hand, canprehend occasions which occurred at some distance from them in that smooth continuum. But the patterns of extension, or the laws of causal propagation governing these prehensions, are not such that they can be expressed in geometrical terms. Suppose, for example, that I resolve to clear up a particular misunderstanding that I am having with a friend the next time I see him. Three days later, I run into him quite by surprise. At that moment I have a causally efficacious prehension of the past occasion on which my resolution was formulated. The occasion of the resolution might have objectified itself in two days or four days, or in any number of different locations. Thus the objectification is fairly independent of the geometry of inorganic spacetime. It seems, rather, that it objectifies itself when the overall pattern of “seeing my friend” occurs, wherever or whenever that happens to be. In other words, the event of the resolution objectifies itself in another event when that second event ingresses a pattern of sensory and perceptual objects which somehow indicates “my friend.” It is also possible that occasions may extend over other occasions that resemble them not in any objective manner, but only in subjective form. For example, I might resolve to behave differently the next time I am angry. Assuming that this resolution objectifies in

some future occasion, the occasion of the resolution and the occasion in which it objectifies are linked not so much by a similarity in their respective patterns of sensory or perceptual objects, but rather by their similarities of subjective form. Thus patterns of extension (or inclusion, or efficient causation, or memory) – the patterns from which spacetime is abstracted – need not be geometrical at all.

The notion that there are causal interactions among occasions which are mediated by overall pattern rather than by geometrical proximity has been explored by Rupert Sheldrake, who suggests connections among occasions may be mediated by what he calls “morphic resonance,” or overall similarity of form. Sheldrake, who uses this idea of morphic resonance to deal with issues of morphogenesis, defines it as “causal influence from previous similar forms . . . [requiring] an action across space and time unlike any known type of physical action.”¹⁵⁷ We will borrow his term to describe the patterns of extension characterizing the relations of medium and high grade occasions. The particular similarity of form which connects occasions may be an “external similarity” – i.e., it may be a similarity in the pattern of sensory or perceptual objects which the occasion is ingressing, or it may be more subjective – i.e., it may be a similarity of subjective form.

Inorganic occasionsprehend only those past occasions which have immediate proximity to them in the smooth extensive continuum out of which the spacetime of physics is abstracted. The prehensions that bind them into a society are entirely ordered

¹⁵⁷ Rupert Sheldrake, *A New Science of Life* (Los Angeles: J. P. Tarcher, Inc. 1981), 93.

by patterns which can be geometrically described. Organic occasions in the physical world extend over a particular society of such inorganic occasions, but they extend also over other occasions which are not geometrically proximal, but which are proximal by virtue of their morphic resonance with the current occasion. Thus their spacetime is fundamentally more complex than is the spacetime of inorganic societies.

When I am standing in the aisle of a supermarket and remembering my earlier desire for chocolate, the prehensions which figure in my perception of the supermarket around me are structured by my physical body which is my percipient event in the physical world. My body is composed of cells, which are, in turn, composed of molecules and atoms, and those atoms are inorganic occasions which are interrelated through the smooth continuum of the inorganic world. Thus, through my prehensions of the events making up my body, I am involved in a world which can be characterized by the spacetime of physics. Indeed, I can apply the method of extensive abstraction in this local space and, starting from my general impression of the supermarket scene I can, by that method, identify any particular point within that scene. But although both the supermarket scene and the occasion on which I experienced the desire for chocolate are integral parts my current duration, no process of extensive abstraction can account for my sense that both the supermarket scene and my desire for chocolate are, in the sense we are here discussing, in my immediate causal past.

Human beings are societies of high grade actual occasions. When we are awake, our various occasions of experience tend to be dominated by the continuum in which we participate by virtue of our physical bodies as percipient events. But we also have

memories, or direct prehensions, of occasions which took place at some considerable spacetime distance from our physical bodies. Those prehensions are integrated into the current duration not in terms of geometry, but rather in terms of some scheme of morphic resonance which (particularly insofar as it includes elements of subjective form) can neither be reduced to geometry nor expressed in terms of numbers. The behaviors of other organic beings suggest that they, too, participate in this system of inclusion by morphic resonances.

Two occasions in the inorganic continuum are proximate to the extent that their positions in that continuum resemble one another. Two occasions in the organic continuum are proximate to the extent that their overall morphic patterns resemble one another. The organic continuum is much more complex and much less well understood than is its inorganic counterpart, and no one has formulated its laws in the way that Whitehead has formulated the laws of the inorganic continuum. Nonetheless, the actual texture of our waking experience is significantly illuminated when we consider it as a superimposition of these two extensive continua. Our perceptual experiences of local space are dominated by the inorganic occasions that inhabit it. But our experience is also significantly affected by memories that are included, not so much by virtue of their proximity in inorganic spacetime, but rather by virtue of their resonance with the entire texture of the current occasion of experience. Thus our full experience of the world is vastly influenced by prehensions of events that are proximate in a spacetime which is ordered in terms of morphic resonance.

At this point, we are still on the outer fringes of the subtle worlds proper. Let us next consider the fact that organic beings such as ourselves not only apprehend events which took place at some remove from us in the inorganic continuum; we also have significant apprehensions of imaginary events, of dream events and of events comprising other occult experiences, which are not located in the inorganic continuum at all. In his essay, *Uniformity and Contingency*, Whitehead discusses this point at some length in reference to dreams. He says: “The distinction between the dream-world and nature is, that the space-time of the dream-world cannot conjoin with the scheme of the space-time of nature, as constituted by any part of nature. The dream-world is nowhere and at no time, though it has a dream-time and dream-space of its own.”¹⁵⁸ People’s lives are changed by dream experiences, and by imaginary experiences as well. There can be no doubt that these experiences are causally efficacious. In terms of the approach that we are exploring in these pages, we would have to say that the occasions of experience which take place in high level organic occasions such as ourselves regularly and significantly include, or extend over, events which are not part of the inorganic world at all. But these events which are disclosed in sense awareness, but which do not find a place in the dominant spacetime continuum, are precisely what we mean by subtle world events. Thus, to the extent that we are dealing with organic beings, we cannot understand them without acknowledging the extent to which they participate in subtle worlds.

¹⁵⁸ Whitehead, *Uniformity and Contingency*, 145.

Finally, in dreams and out-of-body experiences, our prehensions of the inorganic occasions out of which our bodies are composed fade into relative insignificance, and we then have experiences of subtle worlds which are largely unaffected by the extensive scheme which dominates our waking hours. The spacetime which we remember from our dreams is largely deficient in geometrical coherence. While there is one, dominant, geometrical continuum which extends over all of our waking lives, dreams seem to be ordered into many continua. Sometimes geometrical relations will seem to hold with some consistency within the stretch of a single dream, and sometimes we may even visit that same dream continuum again and again in successive dreams. On the other hand, even during a single night we may flit from dream to dream, and each of these dreams seems to take place in its own continuum. The extensive continuum of dreams is usually not smooth. In dreams we often experience abrupt changes of locale, and relations of inclusion are not necessarily transitive – e.g., in a dream, I could walk three paces, turn around, and see a scene entirely different from the scene which I left; or I could enter a room in a house, and find that room to be a huge space which contains the house which contains it. Remember, however, that the laws governing the smooth extensive continuum out of which the geometry of physical spacetime has been abstracted are in no way metaphysically necessary. They are, in fact, an extremely restrictive set of conditions. The laws governing patterns of inclusion among occasions in dream worlds are much less restrictive than are those in the physical world; and dreams, being portions of the subtle worlds that we recall when we are awake, are probably just those portions of the subtle worlds that most resemble our waking experience.

Every actual occasion must grow out of its own initial datum, but there is no reason whatsoever to assume that all occasions must include among that datum some number of inorganic events. Some organic events, those events belonging to societies of higher grade occasions which are “incarnated” in the physical world, do include inorganic occasions which, when they are awake, function as their percipient events in that world. But even those societies which are so incarnated function, in dreams and in other occult experiences, through percipient events which have no place in the physical world at all. Indeed, given that the physical continuum is only a peculiarly limited region of the larger and more complex continuum of the subtle worlds, it seems entirely natural to assume that there are vast regions of the subtle worlds composed of events which have essentially no relation to events in the physical world at all. This, as we saw in Chapter Two, is precisely what Sri Aurobindo suggests. In this sense, the spacetime of subtle worlds transcends the spacetime of the physical world.

The issue of locating the subtle realms in relation to the physical world has occupied human beings for a long time. In the *Odyssey*, Odysseus is able to reach Hades – which is a region of the subtle worlds – by boat. Later, it became clear that the subtle worlds were nowhere on the surface of the Earth. Dante, therefore, located them both below the Earth and out beyond the orbit of the Moon. With the articulation of perspectival space, which extends its grid-like structure in every direction as far as the imagination can reach, the subtle worlds were entirely banished from the physical

domain.¹⁵⁹ The Theosophists tried to re-establish a connection between physical space and subtle spaces by invoking a fourth spatial dimension.¹⁶⁰ But such a spatial dimension, should it be found to exist, would be just an extension of the measurable spacetime of the physical world, and could not do justice to the complex phenomenology of subtle worlds. Centuries of scientific work have demonstrated conclusively that the subtle worlds are nowhere in physical spacetime. What we are here suggesting is rather that the physical world is somewhere in subtle spacetime. It is a region of the subtle worlds dominated by a society of actual occasions operating according to the peculiarly restrictive extensive relations which we observe among inorganic occasions.

The following points summarize this discussion. Spacetime is an abstraction from the patterns in which actual occasions prehend, extend over, include, are causally effected by, or remember one other. The patterns of prehension binding inorganic occasions into societies are characterized by cogredience, and, thus, by relatively simple routes of transmission within a smooth continuum which can be described in geometrical terms. Organic occasions participate in a more complex continuum which need be neither smooth nor transitive, and in which patterns of inclusion are defined by morphic resonance rather than by geometrical proximity. The waking experience of organic occasions is a kind of superposition between the inorganic continuum defined by the low level occasions making up their physical bodies and the organic continuum in which they also participate. Organic occasions also appear to participate, by means of imagination,

¹⁵⁹ Weiss, *The Experience Of Space*..

¹⁶⁰ Powell, *Astral Body*, 161-166.

dream, out-of-body experiences, and various occult experiences in continua which are entirely outside of the inorganic continuum. The organic continuum and the actual occasions which constitute it systematically transcend the physical world – in other words, while the subtle worlds cannot be found anywhere in the physical world, the physical world can be understood as a region of the subtle worlds dominated by a society of inorganic occasions.

Objects in Subtle Worlds

The worlds of imagination, dream, lucid dream, out of body experiences, and occult experiences can, like those in the physical world, be discriminated into discrete events by virtue of the objects that have ingression in them. The polyadic logic of ingression, which requires an operation of consciousness, force, and determinate possibility to secure every ingression, applies with the same force in subtle realms of Fact as it does in the physical realm. However, the particular objects which come to characterize subtle world events differ somewhat from those found characterizing events in the physical world.

Sense Objects in Subtle Worlds

As we know, the sense objects which characterize events in the physical world are very much conditioned by the characteristics of the sense organs in the physical body – our percipient event in the physical world. Percipient events in subtle worlds need not share those same limitations. Thus it is possible that the sense objects belonging to a

particular sensory modality – say sight or sound – might be more various in subtle worlds. This is suggested in Theosophical texts.¹⁶¹ In addition, there is no metaphysical reason that percipient events in subtle worlds might not possess sensory modalities entirely other than those that characterize our physical bodies. We would not expect to find evidence for this expanded menu of sensory objects in our memories of imagination and dream, as it might be particularly difficult to access memories of experiences characterized by entirely unfamiliar sensory objects while we are operating through our physical bodies in the physical world.

Perceptual Objects in Subtle Worlds

We have defined perceptual objects as the permanence characterizing associations of sense objects in a situation. We have not yet, however, examined what we mean by “permanence of association.” Fact, as we have observed, is constantly active. Perceptual objects are, thus, permanences amidst change. But, in Fact, we never observe an absolute invariance. What we do observe is a relatively fixed pattern of change amidst change. The patterns of change which characterize perceptual objects are various. For example, the perceptual objects which come to characterize societies of inorganic occasions such as rulers and clocks do exhibit a kind of quantitative invariance. On the other hand, the perceptual objects which characterize societies of organic occasions (living beings) exhibit complex, nonlinear rhythmic patterns.

¹⁶¹ See, for example, Powell, *Astral Body*, 11.

The physical world, as we suggested in the last section, is a society of low grade, inorganic occasions. If we consider just the macroscopic physical world, we could say that it is entirely built up out of the basic elements identified in the Periodic Table of the Elements. Among the structures built up out of these elements, we frequently find the simpler, more linear perceptual objects which we associate with nonliving things. The subtle worlds, however, are societies of higher grade, more complex organic occasions. We have no Periodic Table for the subtle worlds, but the basic elements out of which they are structured are higher grade, and therefore more complex, more variable in their behaviors, and quite probably more numerous than are the basic elements of the physical world. Thus the structures that they form will be more complex and much more variable in their behaviors than structures found in the physical world.

We could say that physical objects approach a degree of simplicity which can be characterized as *invariance amidst change*, whereas as subtle world objects are always more variable, and can best be characterized as *pattern of change amidst change*.

We also pointed out that those perceptual objects which can qualify as physical objects have the properties of uniqueness and continuity, i.e., physical objects occupy one place at a time, and their movements through space are characterized by continuous trajectories. Quantum physics has taught us that *scientific* objects such as sub-atomic particles need not conform to these requirements, but when we are referring to the macroscopic physical world, what we mean by a physical object is something that is unambiguously in one place at one time, and that, in moving from point A to point B necessarily traverses a continuous path between them. Perceptual objects in subtle

worlds are not constrained by these conditions. Thus, in subtle worlds, as we know from our imaginal experiences and from our memories of dreams, a given perceptual object can be in more than one place at a time, and it can move from place to place without traversing any of the intervening points.

Earlier in this chapter, we discussed the notion of “cogredience.” Cogredience is a condition that holds in a duration when the percipient event of that duration is at exactly one position, and holds that position throughout the duration. Another way of stating this would be to say that cogredience holds when the percipient event ingresses a perceptual object of the physical kind. To the extent that our occasions of experience are dominated by their prehension of the physical body, which is, in this sense, a physical object, cogredience holds and we experience a physical world. Our waking experience is largely dominated by such prehensions but even there, given the importance of memory and imagination in our waking lives, this dominance is only partial. In dreams, out of body experiences, and occult experiences our prehensions of the physical body fade into the background, we leave cogredience behind, and we orient our perceptions through percipient events free from the logical constraints which characterize perceptual objects in the physical world.

Scientific Objects in Subtle Worlds

As we saw in Chapter Four, scientific objects are discerned by a sustained application of the principle of convergence to simplicity with diminution of extent and by the method of extensive abstraction, which is a further specification of that principle.

Earlier in this chapter, we saw that the principle of convergence only holds to the extent that the continuum in which it is applied is uniform, smooth, and transitive. These conditions do not obtain with any regularity in subtle worlds.

This is not to say that the principle of convergence is without application in subtle worlds. In our dreams we clearly discern perceptual objects, and every discernment of a perceptual object involves some application of the principle of convergence which pulls that particular object into focus. But in dreams that principle cannot be applied in the rigorous way that we apply it in waking life. In a dream, diminution of extent quite often fails to bring about convergence to simplicity. In a dream, I might start with a perception of a desk, and then, while attending to the leg of the desk, I might find there a living being, or even a whole world of living beings. Thus, in subtle worlds, scientific objects cannot, in general, be discerned.

On the other hand, while the law of convergence is a master key that unlocks many secrets in the physical realm, it is not the only tool that is available to thought. Another way in which we can make sense of durations, even in the physical world, is by noting morphic resonances, symbolic correspondences and the overall texture of synchronicities that plays among events. It is these tools which seem to function as master keys for the understanding the subtle worlds.

Prolegomenon to a Cosmology of the Subtle Worlds

Let us summarize the journey we have taken so far. In Chapter Three we established a framework for this discussion by defining the domain of Fact. In Chapter

Four, we saw that we could understand the physical world as that system of factors of Fact that is discerned in sense awareness, characterized by a uniform, metrically geometrical structure of spacetime, and dominated by societies of actual occasions that are sufficiently simple and regular in the rules by which their interactions are governed to support the existence of rulers and clocks. In this chapter, we have seen that the subtle worlds can be understood as that system of factors of Fact that is discerned in sense awareness, characterized by a complex structure of spacetime in which proximity is defined by morphic resonance rather than by geometrical relations, and dominated by societies of actual occasions that are too complex in the rules by which their interactions are governed to support the existence of rulers and clocks. We have seen, too, that the freedom and complexity which characterize subtle world experience is no reason to deny to subtle worlds the mark of “externality” which we so readily confer on the physical world of our waking experiences.

In our work so far in this chapter, we have primarily been concerned with the formal properties of extension and the formal characteristics of objects as they function in the various worlds. Before we can sketch out a fuller cosmological vision, we need, once again, to broaden and deepen our understanding of Whitehead’s analysis of the way in which occasions of experience function.

As we have observed, each occasion is a unified experience of a multiplicity of events. The events of which it is an experience comprise its initial datum, or its efficient cause. But Whitehead found that it was impossible to understand the unity of an occasion of experience without also positing a “subjective aim” which is “the ideal of what that

subject could become, which shapes the very nature of the becoming subject.”¹⁶² In other words, the concrescence which binds the experience of the initial datum into a unity is informed by purpose, by a final cause. That final cause, the subjective aim, is both an aim *at* unity of experience, and also an aim at becoming something particular for the occasions in the relevant future. The initial datum establishes the circumstances given for the concrescence. The subjective aim establishes what that concrescence might become. And the concrescence itself is a process of decision. In other words each concrescing occasion prehends its past, anticipates its possible future and, as an intrinsic part of its own process of becoming, it *decides* which possibilities it will actualize and will, thus, make available for prehension by future occasions.

Actual occasions of different grades conduct this process of decision in very different ways. Actual occasions of low grade, inorganic occasions, are dominated by a blind urge to perpetuate the past. They experience the past, and affirm the past for the future. The introduction of novelty into the physical world is a slow and painstaking task. Actual occasions of medium grade, organic occasions, on the other hand, are in constant pursuit of novel possibilities. Living beings exist through constant processes of growth and decay, and they are largely dominated by desire, which is a kind of compulsive attempt to realize changed conditions of experience. Actual occasions of high grade, thinking occasions, prehend a range of possibilities and choose consciously

¹⁶² Donald W. Sherburne, *A Key to Whitehead's Process and Reality* (Bloomington and London: University of Indiana Press, 1966), 244.

among them. Table Two, below, summarizes the observations which we have made concerning actual occasions of varying grades.

With the conceptual tools that we have now developed, let us see if we can weave the Doctrine of the Subtle Worlds into the outlines of a fuller cosmology. We begin with the physical world. The physical world is dominated by a society of low grade actual occasions. These occasions interact in a geometrical spacetime, which means that they can only remember, and only be affected by, events to which they are connected in terms of certain abstract, geometrical principles of order. They remember only the immediate past, they anticipate only the immediate future, and they show very little imagination. This physical world establishes what all of us who live in this physical universe recognize as our “dominant continuum.” The spacetime of science is abstracted from this continuum.

GRADE OF OCCASION	RELATIONS OF EXTENSION	OBJECTS INGRESSED	PROCESS OF DECISION
Low grade (inorganic)	Defined by a uniform, smooth, continuum in which relations of extension are transitive	- Perceptual objects which are invariances amidst change, with unambiguous position and continuity of position within and across durations. - Minimal objectification of subjective form	Perpetuation of the past (habit)
Medium grade (organic)	Defined by a non-uniform continuum in which relations of extension are ordered in terms of morphic resonance	- Perceptual objects which are complex patterns of change amidst change, able to occupy multiple positions in a given duration, and to change position discontinuously. - Medium objectification of subjective form.	Compulsive pursuit of novel possibilities (desire, imagination)
High grade (thinking)	Defined by a non-uniform continuum dominated by relations of meaning	- Perceptual objects which are reflective of conscious processes of structuring - High objectification of subjective form.	Conscious choice among a range of possibilities (free choice, conscious intentions)

Table 2: Grades of Actual Occasion

Certain regions of the spacetime continuum, regions such as the surface of the Earth, come alive. We are here explaining life as the presence, amidst the occasions of

the inorganic world, of medium grade actual occasions. Medium grade actual occasions participate in the physical world by virtue of their ongoing prehensions of some system of physical events (their percipient event, or body). But medium grade occasions are not limited to prehensions of the events making up their physical bodies. Every medium grade occasion also prehends events which took place in the more distant past of the physical body, but which are proximal by virtue of morphic resonance.

If we could examine the prehensions of a living being in the physical world, we would discern among them a set of prehensions of the events comprising a system of inorganic occasions belonging to the geometrical spacetime continuum. These prehensions would constitute its percipient event in the physical world, and its prehensions of all of the other events in the physical world would be ordered around that. We would also find prehensions of other living beings which are similar to it in grade, and which establish with it varying degrees of morphic resonance. Because these prehensions objectify the subjective form, or the feelings of past occasions in a fairly complete way, and because they are not limited by linear trains of propagation in the physical world, they form webs that are at once causal networks, shared memories, and bonds of empathy that transcend the mathematical patterns which so strongly condition the unfolding of inorganic societies.

In Chapter One, we distinguished between the subtle dimension of the physical world and the subtle worlds themselves. This web of empathy among living occasions is the subtle dimension of the physical world. In proportion as the living occasions are dominated by their prehensions of inorganic events, their patterns of morphic resonance

remain dominated by considerations of physical proximity, and the webs of empathy that they form remain small. These small empathic webs function within the bodies of multicelled plants and animals. As we know from the human experience, the societies of living events which comprise our bodies all show considerable sign of sharing, among themselves, rich webs of mutual prehension. If one part of our bodies is wounded, the entire body feels the suffering. If any part of our bodies experiences pleasure, that brings some measure of lightness and joy to the rest of the body as well.

As the occasions characterizing animal life rise in grade, the webs of empathy in which they participate become wider. Living occasions begin to develop webs of empathy that bind them to the living occasions inhabiting other physical bodies – to fellow inhabitants of the same nest, to offspring, to families, to fellow tribes-people and so on. Thus a living occasion of experience at a sufficiently high grade receives into its constitution: the feelings of the events comprising its physical body; the feelings of that living occasion which it identifies as its own immediate, personal past; the feelings of living occasions which took place earlier in its personal past; and the feelings of other living occasions, not part of its personal past, with which it is associated by morphic resonance.

The various contributions to the overall subjective form of an occasion need not be clearly discriminated as to source. They seem, in human experience at least, to form a kind of deep background mood. Elements of this mood may, however, be elicited into relevance during the process of concrescence, and then they are experienced as, for example, the mood of a particular place, as “vibes,” as an empathic knowledge of the

particular feelings of another being, as telepathic communication, or even as memories of experiences that occurred so far into the past of the inorganic continuum that they may be thought of as memories of previous lifetimes. The Doctrine of the Subtle Worlds suggests that modern science has vastly underestimated the importance of this subtle dimension of the physical world in shaping the experiences and the behaviors of organisms.¹⁶³

The prehensions of living occasions, particularly as they rise in grade, are not restricted to events within the spacetime continuum defined by the inorganic occasions of their physical percipient events. High grade living occasions imagine, and they dream. As we have seen, the events experienced in imagination and dream generally satisfy the constants of externality, and thus are experiences taking place in real, external, subtle worlds. Sensory experiences in subtle worlds are ordered by subtle percipient events, or subtle bodies appropriate to those worlds. To the extent that they imagine and dream, organic occasions have subtle bodies as well as physical bodies. Thus we would expect that living beings in the physical world are interrelated not only through the interactions of their physical bodies, but also through rich and complex webs of interactions of their subtle bodies as well. The behaviors of living beings, and even the details of their physiologies, are strongly conditioned by these subtle interactions. Thus our failure to

¹⁶³ While mainstream science has not acknowledged this subtle dimension, it does figure prominently in the popular imagination. For example, “the Force” which is explored by Jedi knights in the Star Wars universe operates through this dimension.

account for these interactions vastly impoverishes our understanding of biological processes.

Furthermore, there is no reason to believe that all living occasions have percipient events in the physical world. We, ourselves, have a physical body and we also have subtle bodies. But the subtle body does not depend for its existence on the existence of the physical body, and thus it is quite possible for there to be living beings who operate entirely outside of the physical world. In fact, the cosmology we are developing here suggests that the physical world is just a limited portion of a larger world – a portion in which extension is so constrained that it functions as a uniform, smooth continuum, and in which objects are constrained to occupy only one position at a time and to traverse continuous trajectories. The larger, freer world of which the physical world is a limitation is (as we saw in Chapter Two) what Sri Aurobindo calls the “vital world.” This is the world that all of us visit in our dreams, and that some of us visit in out of body experiences.

Let us try to imagine what it is like to have fully conscious experience outside of the physical body. In the vital world, there are no inorganic occasions. Everything there is alive. The inert stability of matter which we find so comforting in the physical world is absent there. Whereas physical objects tend, insofar as they can, to ignore changes in their environments, everything in the subtle worlds is actively adapting to its environment. The level of activity and change there is much greater than it is in the physical world. The level of variety and complexity which characterize the objects we find in the physical world is ultimately constrained by the relative simplicity of its

inorganic components. Since the fundamental components in the vital world are more complex and more responsive than are those in the physical world, the forms there are much more complex and much more variable than are those that are found here.

The experience of “having a body” is quite different in the vital world. In the physical world, we experience a strong web of empathy among the living occasions which make up our bodies, but, although we do have empathic bonds with other living beings, the intensity of the empathic bonds tends to drop off rather suddenly at the edge of our skins. Within the physical world, each of us is like an island of living occasions surrounded by an inorganic ocean. Because I have a strong empathic bond with the occasions making up my arm, I can move my arm “at will”. But I cannot feel my way into the cup on my desk, and I cannot get it to move merely by willing it. In the vital world, where everything is alive, the boundary of the body is much more diffuse. The portion of the vital world which I could operate as “my body” would be fluid and changeable. Also, our bodies in the vital world would not be physical objects, and thus would not be constrained to occupy one place at a time, and would not be constrained to traverse continuous trajectories as they move from place to place.

Human beings are mental beings that are involved in relations of prehension with systems of vital occasions that are, in turn, involved in relations of prehension with systems of inorganic occasions. When a human being is awake, all of these occasions are focused on process that are taking place in the physical world. When the human being is asleep, however, the various occasions in the complex body are less coordinated, and are free to exchange objectifications with each other and with various other subtle world

beings. Many of the fragmented dreams that we remember on awakening may be objectifications of experiences undergone by these lower level occasions during sleep.

The more coherent dreams that we have may be memories of experiences that the personally ordered mental society to which we belong has when we are asleep. Some of these dreams, as we know, resemble very strongly our experience in the physical world. There are also many reports of out of body experiences in which the environment is very similar to the physical environment, and in which the percipient event is very much like the physical body.¹⁶⁴ The yogis who have explored the vital worlds generally suggest that the vital world is stratified so that there are “lower” portions of it which are almost Earthlike in the degree of constraint under which they operate, and “higher” portions of it which are much freer.¹⁶⁵ The lucid dreams and out of body experiences which take place in Earthlike conditions are, presumably, explorations of the “lower” portions of the vital world.

Just as there are vital beings with no physical percipient events, so there are mental beings with no vital percipient events. These mental occasions form worlds that are so unconstrained that it is practically impossible for us to imagine them.¹⁶⁶ We can

¹⁶⁴ See, for example, Robert Monroe, *Far Journeys*, (New York: Doubleday, 1985), and Bruce, *Astral Dynamics*.

¹⁶⁵ Bruce, *Astral Dynamics*, 25-29. See also Powell, *Astral Body* (particularly Chapter 16) for a summary of Theosophical writings on this subject. Aurobindo, *Savitri*, Book Two, Cantos 3-9 is, in my opinion, the most profound evocation of the various levels of the vital plane which exists in the English language.

¹⁶⁶ The Theosophical attempts to imagine these mental worlds are summarized in Powell, *Mental Body* and Powell, *Causal Body*. Sri Aurobindo evokes these worlds in Aurobindo, *Savitri*, Book Two, Cantos 10-11.

only suggest something about those worlds by noting that, while the vital worlds are bound together in webs of empathy and shaped by currents of emotion, the mental worlds are bound together in webs of knowledge and shaped by currents of meaning.

As we know, science has not yet discovered these subtle worlds. If the subtle worlds are, as we are here suggesting, a larger and freer domain than the physical, a domain in which the measurement generally impossible and in which, therefore, scientific objects cannot be discerned, then it is clear that current scientific methods will not be able to disclose the existence of those worlds or to explain the particular ingressions of sense objects and perceptual objects that we observe there. Clearly, a full integration of these subtle worlds into our science will require a profound extension of current methods, one which has not yet been worked out.

On the other hand, the Doctrine of the Subtle Worlds has immense explanatory power. As we have seen: it allows us to account for the subtle dimension of the physical world; It accounts for the webs of empathy that generally bind organic occasions into communities of feeling; it gives us a new and interesting way to think about the way in which the society of high level occasions which we call ourselves can “operate” the societies of lower grade actual occasions that make up our bodies; it accounts for the general background feelings which affect us as moods and “vibes,” and for the occasional experiences of acute empathic, and even telepathic, communications that we have with other embodied beings; and it accounts, too, for the experiences that we call experiences of former lives.

It also makes intelligible the vast respect which our ancestors granted to imagination and dream. In terms of the Doctrine of the Subtle Worlds, imagination and dream are not just rehashed memories of old physical perceptions, but rather immediate perceptions of events in the subtle worlds which are vitally relevant to the affairs of the organic and thinking beings who are embodied here.

Because the Doctrine of the Subtle Worlds envisions the possibility of intelligent beings existing outside of the physical world and, indeed, because it envisions human beings as subtle world beings who are involved with, but not necessarily dependent upon, the societies of events making up their bodies, it gives us a way of understanding the survival of the personality after bodily death.

The Doctrine of the Subtle Worlds also provides a context within which we can understand the phenomenology of UFO's. There is an increasing consensus among UFO researchers that the aliens who operate these strange craft are not exactly physical beings.¹⁶⁷ They seem, rather, to be subtle world beings who have evolved a "technology" that enables them to interact with the physical world.

Finally, a great deal of psychedelic research becomes intelligible if we assume that psychedelic substances have the effect of thrusting physical prehensions into the background of awareness and forcing attention to concentrate on prehensions of events in subtle worlds.

¹⁶⁷ See Jacques Vallee, *Dimensions* (New York: Ballantine, 1988), Jacques Vallee, *Passport to Magonia: On UFO's, Folklore and Parallel Worlds*, 1993, and ., and Richard Thompson, *Alien Identities: Ancient Insights into Modern UFO Phenomena* (Alachua, Florida: Govardhan Hill Publishing, 1995).

While this is by no means a complete cosmology of the subtle worlds, enough has now been said to establish both the plausibility and the explanatory power of the Doctrine of the Subtle Worlds.

CHAPTER SIX – A CONCLUDING POSTSCRIPT

When I was a boy, I loved to read science fiction. It was not so much the plot or the characters that interested me – indeed, I suspect that much of what I read in those days was rather deficient in both of those dimensions – it was rather the *cosmology* that caught and held my attention. I found great joy in entering into and exploring new imaginal universes, and I found in those universes a release from the flat, dry, and closed spaces of modernity.

When I was a young man, I stumbled across the works of the Theosophists and their Doctrine of the Subtle Worlds. Here were serious cosmological works that made this world seem as interesting, as deep, as dimensional and as open as the worlds of science fiction that I so appreciated. This Theosophical vision operated in me as a powerful lure for feeling. I wanted, indeed, I still want, to live in that Theosophical universe. On the other hand, I received a modern education. White-coated scientists were the priests of my first religion. The authority of those priests has only been increased by the technological marvels that they have unleashed during my lifetime, and my mystical and occult experiences have been fleeting and rare. Thus I could not allow myself to fully adopt the Doctrine of the Subtle Worlds without testing that doctrine against the findings of science.

For a long time I cherished the hope that it might be possible to identify the subtle worlds with some scientific reality. I hoped, along with generations of Theosophists, that the mode of “explanation from abstractions” to which we have so often referred in this

essay might ultimately validate the Theosophical intuition. Figure Three schematically outlines that hope.

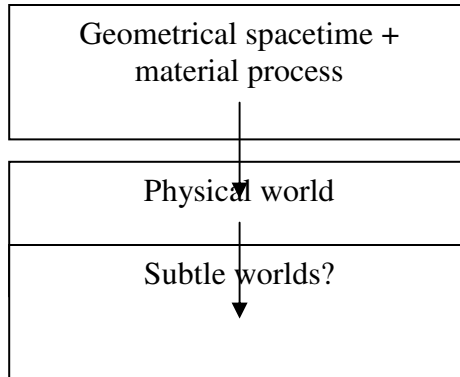


Figure 3: Accounting for the Subtle Worlds by "Explanation from Abstractions"

This explanation from abstractions begins by positing geometrical spacetime and material process as the ultimate metaphysical ground, and it proceeds to explain the facts of the physical world as an expression of the activities of that ground. I originally hoped that the ongoing advance of science, which has disclosed atoms, energetic fields, galaxies, black holes, and quantum events, would eventually disclose subtle worlds. I imagined that those subtle worlds might turn out to be something like self-organizing patterns of electromagnetic energy, configurations of probability waves, or energetic processes in higher spatial dimensions. It gradually became clear to me, however, that any phenomenon which could be explained by the hard sciences would, by definition, be part of the physical world, and that no strictly physical process could exhibit the freedom and the luminosity of the subtle worlds for which I was searching. I needed a new approach, a new starting point from which I could account both for the physical world disclosed by scientific investigation and for the subtle worlds which I was glimpsing.

yThis new mode of explanation, the one which underlies the work of this essay, is schematically outlined in Figure Four.

Rather than beginning by postulating the existence of geometrical spacetime and material process, it begins with an examination of Fact, the totality of what is experienced. By an analysis of Fact, it discloses events and objects. It envisions all possible worlds as configurations of events and objects, and it exhibits the physical world so dear to science as one, peculiarly limited, such configuration.

This new mode of explanation does full justice to modern science. Indeed, this mode of explanation was developed by Alfred North Whitehead as a way of demonstrating that science is, as it claims, empirically grounded. It has, as we have seen, several other advantages. First, since it never falls into the misplaced concreteness which posits spacetime and material process as existing outside of experience, it avoids the “hard problem” of accounting for the presence of consciousness in an otherwise inconscient reality. Second, it establishes a bridge linking the wisdom of the East with the knowledge of the West. Finally, it makes room for the Doctrine of the Subtle Worlds. Thus, this mode of explanation allows me to pay my full respects to science while still allowing myself to inhabit the enchanted word in which the Doctrine of the Subtle Worlds is a true characterization of the real world of human experience.

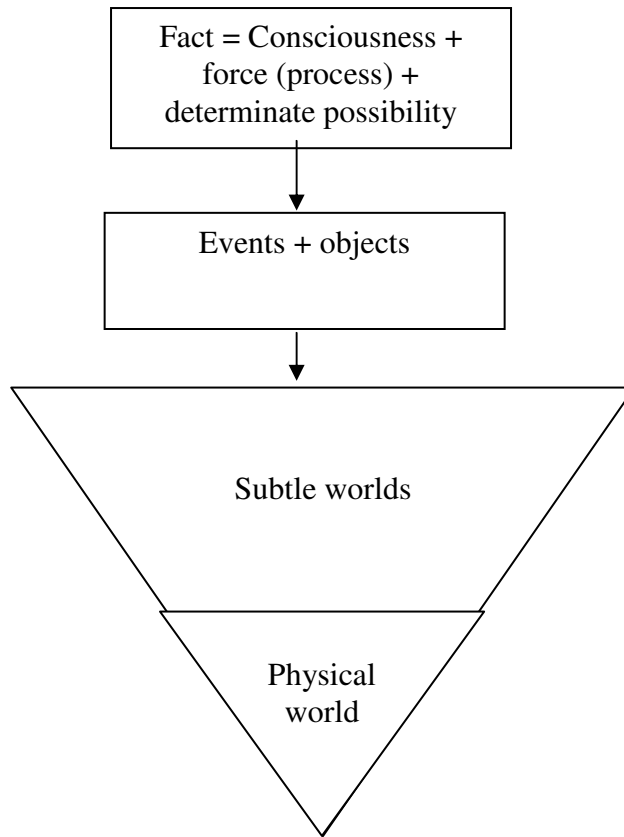


Figure 4: Accounting for Subtle Worlds by Means of “Explanation from the Concrete”

This essay is by no means a full cosmology of the subtle worlds. At best it establishes the initial plausibility of the Doctrine of the Subtle Worlds, and sketches out some of its outlines. Even with this tentative beginning, however, we can see the magnificent evolutionary possibilities that unfold in a universe where the Doctrine of the Subtle Worlds is true.

In this universe:

- Human beings are mental beings, implicated in networks of empathic and telepathic communication with all of the organic and inorganic beings constituting their physical bodies. A full exploration of these empathic and telepathic

communications could be the basis for entirely new departures in the science of medicine. Psycho-neuro-immunology is already a gesture in this direction.

- Human beings are implicated in networks of empathic and telepathic communication with all of their relations, organic and inorganic, in the biosphere. A development of these communications could open up the possibility for vastly more subtle and sophisticated forms of cooperation between humans and their relations, revolutionizing agriculture and technology. This possibility was pioneered at Findhorn.¹⁶⁸
- Human beings are implicated in networks of empathic and telepathic communication with each other at all times. An understanding of these communications could significantly deepen our understanding of history and sociology. A development of these networks which makes them more conscious might allow some of the stimulating intellectual discourse which we now associate with urban environments without requiring large-scale concentrations of population and the ecological devastation that such large concentrations usually entail. In other words, we might be able to accomplish some of what we now accomplish through the Internet and other mass media without requiring a vast electro-mechanical infrastructure.
- The personalities of human beings do not depend on their physical bodies, and thus can function independently of those bodies. The ability to function outside of

¹⁶⁸ Dorothy MacLean, *To Hear the Angels Sing: An Odyssey of Co-Creation With the Devic Kingdom* (Lindisfarne Books, 1994).

the physical body could open up entirely new worlds for human exploration.

Indeed, in the context of the Doctrine of the Subtle Worlds, it seems probable that communications between species inhabiting different planets would be conducted in this way, rather than by means of spaceships. Thus the true “Galactic Federation,” so beloved in the popular mythology of Star Trek, could be realized through an exploration of the subtle worlds. In addition, personalities which can function independently of the physical body might also be able to survive bodily death. Thus it might be possible to establish consistent and reliable communications with the personalities of the dead. Should this possibility be realized, it would completely change our understanding of death, and would have very interesting, if rather unpredictable, effects on the structure of civilization.

- Events in the physical world are influenced by various disincarnate intelligences. These are the beings that we know from our ancestors as the great hierarchy of angels, devils, and spirits. If we could develop the ability to recognize these entities consciously, we might get a better understanding of individual psychology, of the movements of history, and of the great, sweeping movements of the evolutionary process itself.

Is this universe the one that we are actually inhabiting? If we lived in a universe where these things were possible, and if we examined that universe with the methods of the hard sciences, we would come up with a physics that is indistinguishable from modern physics. If we understood ourselves to be living in that universe, then many factors of experience for which the hard sciences cannot account would find an

intelligible explanation. If we did, indeed, live in that universe, then we would be inspired to a whole new vision of our evolutionary vector – a vision in which the progressive elaboration of physical tools would be supplanted by a progressive cultivation of the sensory, affective, cognitive and volitional capabilities of our own human beings.

I now think that if we compare the Doctrine of the Subtle Worlds to any doctrine which suggests that the physical world is coextensive with the real world, it will show itself to be more coherent, more plausible, more useful, and much more interesting.

Here we are, at the dawn of the Twenty First Century, and I have awakened to find myself living in a science fiction novel. If this novel were to be written from the standpoint of the 23rd century, looking back to the beginning of the 21st, it might start something like this:

At that time, the certainties of science had faltered. The great charism of the men in white lab coats had faded. The bastions of materialism had crumbled from within, and the civilization that it had fostered was losing its way.

Meanwhile, three centuries of rapacious assault on the biosphere were, at last, showing decisive results. The globe was poisoned, people were sick, species were being slaughtered by the tens of thousands, global temperatures and global sea levels were both beginning to rise. A civilization was ending, and in its death throes, it was bringing to a close the Cenozoic Era. The Earth was preparing for a fresh creation.

Looking back, too, we can see that the promise of the new civilization had already begun to shine. The iron cage of the material world, in which the species had been trapped for centuries, was starting to dissolve. Here and there, the experiences of the subtle worlds were breaking through. A few intrepid explorers had seen the promise, and had just begun to glimpse the vast freedoms and the limitless horizons that we now enjoy, but the darkness was still thick and Kali was dancing wildly across the face of the globe. This is the story of those early pioneers . . .

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