

2. Science and Metaphysics

I began this exploration into the nature of *personality*—and the question of its survival beyond death by offering definitions for “personality” and “body.” And I also articulated five fundamental propositions that the new metaphysical framework developed in this book is meant to support:

- I. The personality exercises causal agency in its actual world;
- II. Trans-physical worlds are part of the actual world;
- III. Personality can function separately from its body, even while the body is alive;
- IV. The personality survives the death of its physical body, and has its ongoing existence in transphysical worlds;
- V. Reincarnation is part of the human life-cycle.

Then, in the previous chapter, I reviewed some of the evidence that supports these propositions.

However, even if the evidence is persuasive, for many people something much more compelling is required before either the propositions or the supporting evidence will be accepted. This is understandable. From the perspective of modern science, and even from the perspective of everyday commonsense, the kind of reality suggested by the propositions and revealed by the evidence amounts to a major break with widely accepted assumptions and beliefs about the nature of reality.

Because I will be criticizing beliefs that are often thought of as “scientific,” I need to say a few words about what I mean by the word “science” as I will use it in this chapter. I am aware of at least three different broad uses of the word that people use in different contexts.

- Science can be defined by referring to its Latin root *scientia* which means “knowledge.” In this sense, “science” just means “knowing” in general.

- Science can be defined in a more limited way by as “rational knowledge.” In this sense of the term, any knowledge about the actual world that can be reduced to a set of coherent propositions is considered science.
- Science can be defined still more narrowly by specifying that it is knowledge gained by a special method - the “scientific method” - which proceeds by means of hypothesis and testing.
- Finally, science is sometimes restricted only to those knowledge activities that are like physics, and that analyze phenomena through mathematical modeling.

In general, it is assumed that science is “empirical” in the sense that it restricts its data to that which can be gathered through the bodily senses.

When I use the word science, I will be referring to a particular knowledge tradition that has existed in the West since the time of Plato and Aristotle. I will divide science into three phases:

- “Natural history science,” or “Classification science” that began with the Greeks and is still strong today in sciences such as biology.
- “Modern science” which began around the time of the Renaissance, crystallized with Newton, and was dominant up until the beginning of the 20th Century.
- “Post-modern science,” which includes Relativity, Quantum Mechanics, Chaos Theory, Non-Equilibrium Thermodynamics and the theory of self-organization.

I will also make a distinction between science in general, and something that I will call “reductionistic” or “materialistic” science. In general, science is ontologically neutral. It either classifies entities, or it analyzes functional relations among entities, but it minimizes its assumptions as to what those entities really “are.” On the other hand, there is a certain scientific culture, still based in modern science (as opposed to post-modern science), which takes the ontological position that only physical matter - dead, insentient

stuff with nothing but mathematical properties - is the ultimate reality. I will have considerable reason to criticize this sort of reductionistic science, but I want to be very clear that in doing so I am not criticizing science in general.

I am quite sure that most are aware that our everyday, scientifically conditioned commonsense, as well as the fundamental assumptions at the foundations of *materialist* science are inadequate, to say the least, when we are dealing with phenomena that involve mind, consciousness, or any form of subjective experience. Consequently, if we are to expand science to include not only the objective physical world but also the domain of subjective experience then we will have to move science well beyond the bounds of strict materialism.

As things stand today, scientific materialism provides no way to illuminate the mystery of consciousness. As a result, the worldview handed to us by modern science tells us that we (conscious, living beings) are accidental products of automatic forces destined for inevitable universal decay (entropy). It is a bleak and absurd vision, offering no meaning or purpose to life.

We are, as Thomas Berry¹ and Brian Swimme² have said, in need of a new story. The metaphysical system that I will present in this book provides the foundation for a new story of the universe—for a world where consciousness, mind, soul, and spirit are just as real and obvious as the matter and energy that currently occupy the restricted gaze of materialistic science. In short, I am offering a new way of thinking about consciousness, matter, life and death, evolution, and the human role in the evolutionary process. In particular, I am proposing a new vision of our actual world that not only allows us to accept the truth of my five propositions, but also accounts for the kinds of results that scientists actually get in their experiments.

As is immediately evident from my opening propositions, and as will become clearer as we proceed, I am identifying a major gap between the world of modern reductionistic science and the new approach outlined in this book. But it is a gap that can be bridged.

¹ Thomas Berry, *The Great Work: Our Way into the Future*, Bell Tower, New York, 1999.

² Brian Swimme, *The Universe Story*, Harper One, 1994.

Our essential tool for building this bridge is *metaphysics*—in particular, the rigorous ontology and cosmology developed by the great twentieth-century philosopher Alfred North Whitehead.

As Whitehead did, we'll begin our metaphysical quest by “taking it down to Earth,” - by grounding it in our own familiar experience. While some of the key concepts and terminology may be unfamiliar initially, and therefore may require some extra care and attention, my aim is to use the tool of metaphysics to help make philosophical and scientific abstractions more concrete, by connecting them to our familiar experience of the world.

We'll start by looking at different forms of explanation that we use to make sense of our lives and of the world around us. For example, we use ethical explanations to account for why we take one course of action, rather than some other, as we attempt to balance self-interest with the interests of others and the good of the whole. We also use aesthetic explanations to justify choices based on perceived values that determine or influence actions intended to create beautiful objects and environments. In addition to modes of explanation focused on the “good” and the “beautiful,” we also seek to explain what we understand to be “true.” Scientific explanations are of this type. Modern and post-modern science is a body of knowledge based on an experimental method and designed to tentatively confirm or decisively refute assumptions, hypotheses, or theories about some aspect of physical reality. Specifically, modern and post-modern science seek to demonstrate how some particular phenomenon fits into a general scheme of efficient causes that unite the waking world into a single mathematical system.

Each of these forms of explanation takes certain basic ideas as given and then it uses those ideas in its explanatory work. Ethical explanations hinge on motives, on ideals, on knowledge available at the time of the moral act being explained and so forth. Artistic explanations hinge on sensitive descriptions of sensory patterns and felt relationships, for example between parts of a composition and the whole, and so forth. Scientific explanations hinge on observing and classifying the sensory characteristics of the entities found in the natural world, or on reliably measuring qualitative variations in those characteristics and producing mathematical statements of the relations among the

results of those measurements. All scientific work assembles its explanatory ideas into logical structures. Classification science tends to use Aristotelian logic, while mathematical science requires some form of propositional logic.³ To explain something within a particular explanatory discipline, then, is to account for it in terms of the ideas appropriate to that discipline.

Metaphysics is yet another form of explanation. It is generally similar to science in a number of ways:

- It is rooted in logic.
- It attempts to describe the actual world in its totality.
- It proceeds by means of hypothesis and testing.
- It seeks to bind the entirety of its domain into single system of logical relations—in other words, it seeks for explanations with terms that hold their meanings in different contexts, and where contradictions among terms and statements are avoided.

Metaphysics is unlike science, however, in the object of its study. Science restricts its domain to actualities disclosed through the bodily senses. It attempts to bind these actualities into a unified system in two ways: first, in the “natural history” phase, science aims to order the natural entities that it observes with the bodily senses into a hierarchy of logical categories. Then, in the more modern experimental phase, science aims to represent those entities by measurements, and to reduce those measurements to the unity of a single, all-embracing mathematical theory (a “Grand Unified Theory”).

By contrast, metaphysics takes for its domain the *entirety* of experience—not just experiences mediated by the bodily senses. It includes not only the domain of physical

³ Aristotelian logic is a logic of classification, and is generally associated with substance ontologies. Modern propositional logic is a logic of functions. It describes relations among entities in a very general way. Modern propositional logic is much more general than Aristotelian logic. In fact, Aristotelian logic is a subset of propositional logic which analyzes the particular functions involved in assigning characteristics to entities and classes, and assigning entities to classes. Mathematics can be derived from propositional logic, but it cannot be derived from Aristotelian logic. For a deeper consideration of these issues see: Ernst Cassirer, “Substance and Function and Einstein’s Theory of Relativity,” Dover Publications, Inc., 1953. Pp. 3-26.

events but also the domain of consciousness and all its operations—such as free association of thoughts, rational thinking, emotional and poetic musing, aesthetic and cognitive judgements, and so forth.

Metaphysics also differs from science (and other modes of knowledge such as ethics and aesthetics) in an additional fundamental and important way. Whereas, for example, science takes as its foundation a set of (often unquestioned) metaphysical assumptions, metaphysics *begins by questioning its own assumptions* as well as the assumptions of other disciplines such as science, ethics, and aesthetics. The attention that metaphysics brings to the issue of fundamental assumptions sets it apart from other knowledge disciplines. Other disciplines tend to start with a set of ideas that seem self-evident, and then to use those ideas to form explanations. Metaphysics, by contrast, looks *at* explanatory ideas themselves, and to critique them in terms of their coherence and their usefulness.

The *methods* of metaphysics are also quite different from those of other modes of knowing. It does not restrict itself either to hierarchical categorization or to mathematical analysis. Rather, metaphysics encompasses all of the different ways in which the field of experience can be coherently unified - in terms of story, in terms of aesthetic composition, in terms of various sorts of logic - and attempts to appreciate the values and the limits of each of the disciplines that it examines.

The method of metaphysics begins with the study of explanatory disciplines *per se*. Metaphysics takes on this task in order to identify and clarify key ideas that are used within a particular discipline—including the discipline of metaphysics itself. In doing so, it aims to see how far the ideas and connections used within any one discipline can be generalized and coherently applied to other disciplines and, ideally, to the whole range of experience.

Each individual discipline provides a set of conceptual tools *applicable* within its own domain. Examining those conceptual tools, metaphysics searches for ideas that can be generalized and shown to be *adequate* over the entirety of experience. For example, from quantum mechanics we get the idea that actuality is composed of discrete, causally interacting events. We know that this idea is applicable to the analysis of the sub-atomic realm. The metaphysical system we will be exploring here attempts to generalize this

idea to cover all of actuality—from the exotic realm of the sub-atomic all the way to the unfolding experience of human beings—which, as we will see, can also be understood as a system of causally interconnected discrete events.

As a kind of preview or foreshadowing of what is to come, you can consider this book as essentially an exercise in metaphysics that generalizes the revolutionary insights of quantum mechanics to the entire spectrum of experience—including consciousness itself and, in particular, human personality. However, I want to make it clear that I am not suggesting we can turn to quantum physics to *explain* consciousness or personality. Rather, I am saying that we can use the tools of metaphysics to show a fundamental coherence between certain ideas in quantum physics and a more comprehensive cosmology inspired by the metaphysics of Whitehead.

Testing Metaphysics

Having assembled a set of applicable ideas,⁴ metaphysics then proceeds to a kind of phenomenological testing. That is, a metaphysician will see whether or not a description of experience based on these ideas actually serves to illuminate experience in interesting and useful ways. Does this description actually correspond to experience? Does this description enable us to understand our experience in new and useful ways?

Metaphysics, as we will understand it, does not start with dogmatic axioms as, for example, mathematics does. Rather, it starts with what Whitehead calls “tentative formulations of the ultimate generalities”⁵ of experience which it then tests against experience itself. But then, like mathematics, it proceeds to make deductions from those tentative generalizations to see how successful they are in illuminating our experience. Some metaphysical generalizations pass this test, and others do not. When the deductions from the generalizations are unsuccessful, then the metaphysician, like the scientist, goes “back to the drawing board,” and examines his/her assumptions to see where they were wrong and how they can be revised.

⁴ For a discussion of the assemblage of applicable ideas see Alfred North Whitehead, *Modes of Thought*, New York, The Free Press, 1968, Chapter 1.

⁵ Alfred North Whitehead, *Process and Reality*, corrected ed. New York, The Free Press, 1985.

Finally, metaphysical activity is a search for ideas and forms of connection among ideas that can be generalized over the totality of experience so as to exhibit it in its orderly wholeness, and to find a place within that whole for all of the truths revealed by the various the specific disciplines..

Newton's astounding success in explaining the motions of moving bodies lulled our dominant academic institutions into the belief that modern science had uncovered *the truth* about the the nature of the actual world, and that it had no need whatsoever for the discipline of philosophy in general, and for the discipline of metaphysics in particular. However, as science developed, its very successes forced it into a series of metaphysical revolutions. Since Thomas Kuhn, we now think of these metaphysical revolutions as "paradigm shifts."⁶ A paradigm shift is, among other things, a change in the basic explanatory concepts of a science. It is a testament to the vitality and integrity of the scientific tradition that it has embraced these paradigm shifts. Unfortunately, because scientists think of themselves as dealing merely with facts and measurements, and not with the total activity of explaining the actual world, its paradigm shifts have led us, at the current time, into a terrible philosophical muddle, and have left quantum physicists and other advanced scientists out of harmony with the general ideas of scientifically informed commonsense.

In other words: Science-inspired commonsense (the general worldview of educated laypeople and most practicing scientists) is out of step with the great twentieth-century revolutions in the physics of relativity and quantum mechanics. Contemporary "scientific commonsense" is anachronistic—still stuck in the seventeenth-century mechanics of Isaac Newton or the eighteenth-century electromagnetism of Clerk Maxwell.

My objective, then, is to outline a framework of ideas that will allow us to make sense of postmodern science and of the five propositions at the core of this book. It is my hope that this general metaphysical system will allow us to be comfortable in holding both

⁶ Thomas Kuhn, *The Structure of Scientific Revolutions*, Chicago: University of Chicago Press, 1970.

the well-proven facts of science and the facts that point towards a more complex and interesting life-cycle for human personalities —the prime concern of this book.

I am sure that some of my readers will question the need for such a radical move, and would prefer to find some way to extend current modes of scientific explanation to accommodate the anomalous data we are considering. However, I will show why a major shift in our mode of thought is indeed required, and why metaphysical ideas assumed by pre-quantum science cannot be stretched to account for the data of parapsychology, personality survival, or reincarnation.

A Brief History of Scientific Ideas

In order to appreciate why we need this shift, let's briefly review how the metaphysical ideas of modern science developed.⁷ We can pick up the story of the development of these ideas with Copernicus and Kepler in the sixteenth and seventeenth centuries. Both of these men were members of kind of Platonic underground, a long line of scholars who had kept alive certain of Plato's ideas in the face of the dominant Aristotelian tenor of the times. One of the Platonic ideas that inspired the work of both Copernicus and Kepler was the belief that mathematics is the key to understanding nature. In particular, both were attempting to justify Plato's conjecture that the mysterious movements of the planets against the fixed stars must be governed by some elegant mathematical function. The fact that they could simplify their calculations of planetary movements by placing the Sun in the center of the system of planets was enough to convince them of the truth of the heliocentric view.

The successes of Copernicus and Kepler later influenced Galileo, who expanded their work by mathematically analyzing the movements not only of celestial objects, but also of objects here on Earth.

⁷ For an excellent treatment of this history, going back to Aristotle, see Leclerc, Ivor. *The Nature of Physical Existence*. London, George Allen and Unwin, 1972. For an excellent and highly readable history, going back to Copernicus and Kepler, see A. E. Burtt, *The Metaphysical Foundations of Modern Science*, Dover Publications, 2003.

If we view the ideas of Copernicus, Kepler, and Galileo from the cosmological perspective current at that time, we can clearly see the absurdity of the heliocentric theory. Nothing, after all, is more obvious than the stillness of the Earth and the movements of the Sun, the Moon and the other planets around it. Also, as anyone who has ridden a horse would clearly realize, moving through space at high velocity is a dramatic and risky business. If the Earth were actually moving, we'd all be thrown off. Furthermore, if the Earth were not at the center of the created world, all objects on the surface of the Earth would naturally fall towards the real center. Logic, backed up by observation, was clear: If the Sun really were at the center of things, then everything would fall off the Earth and tumble into its burning furnace. With the benefit of hindsight it might not be so obvious, but in fact the medieval scholars who rejected Copernicus' heliocentric view did so with reasons that were entirely valid at the time. Of course, in time, science found ways to neutralize those objections within its own framework.

The core lesson we learn from paradigm shifts is that obviousness is no guarantee of truth. Perceptions can be deceiving and beliefs can be profoundly mistaken. For example, in Galileo's time, accepting the heliocentric theory was just about as difficult as accepting my five central propositions and the new metaphysics that they imply might be today. But greater comprehensiveness, coherence, and adequacy of a worldview sooner or later trumps more limited ideas and beliefs.

Despite the evidence of daily observation, scientists found a way to overturn the obviousness of Earth-centered cosmology. They began by developing a theory of gravitation in terms of which each body attracts all other bodies to itself. They could then show that the Earth moves around the Sun, and that falling objects released in proximity to the Earth would still hit the Earth, and that the Earth could move at high velocities without people and things spinning off into space. By demonstrating how it could *seem as if* the Sun goes around the Earth even when the Earth is "really" going around the Sun, the new science began to win converts and initiated a new industrial civilization.

We are in a similar position today. The world must be very different from what we were taught to believe based on the ideas of scientific materialism. The data of parapsychology, evidence in support of survival of consciousness beyond death and reincarnation—not to mention the simple fact of consciousness itself—compel a latter-day paradigm shift comparable to the Copernican revolution. The dimensions of this metaphysical shift are suggested by the five propositions I have offered as a way to begin making sense of all the data. Make no mistake: Neither these propositions, nor the supporting data, can be accommodated within the dominant worldview of modern reductionistic science. We need a new metaphysics, a new world system, that not only shows why science gets the results it does, but also explains these results in the context of a universe where the revolutionary five propositions are true.

The importance of Galileo's breakthrough, and its significance for our times, can hardly be overstated. Nearly two millennia earlier, Plato had believed that the incorruptible, sacred heavens moved in a perfect mathematical order. Earth, the realm of mere appearance, could not be intelligible in terms of the perfection of number. Yet that is precisely what Galileo believed he had demonstrated: Earth is guided, or ruled, by an intricate perfection of mathematical order. Over time, it came to seem as if God had ordered all things by number, and that the ability of humans to discern mathematical order in nature was a unique communion between "man"⁸ and the Divine Creative Intelligence. From the beginning, there was a shadow side to this inspiration: If reality is ultimately intelligible through mathematics, then we gain an extraordinary ability to turn facts about the present into precise and accurate predictions about the future. All of modern technology with all of its consequences for good and for ill, is a testament to the power of that realization.

When Galileo and others began to articulate a new metaphysical cosmology, their foundational premise was that mathematics is the language of creation, and that mathematical analysis reveals nature's most intimate secrets. In one form or another, the question echoing through the new science was: "What must nature be like, given

⁸ I use the masculine pronoun here deliberately as it is characteristic of the mode of thought I am describing. To see only number in nature is miss the Mother entirely, and to fall into dismal patriarchy.

that she is ultimately mathematical in nature?” For a century or so following Galileo, scientists debated the relationship between numbers and reality—for example, whether matter is anything other than extension itself, whether there are individual atoms, and whether or not atoms have extension or mass. Finally, late in the seventeenth century, Newton stunned the scientific world by producing a masterful mathematical description of the laws of motion that accounted, in great detail, for everything from the movements of planets in the heavens to the falling of leaves. The Copernican-Galilean cosmology had vindicated the power of numbers to a range of application and degree of precision Plato could hardly have imagined. Henceforth, following Newton, the mathematical analysis of nature was secured. Nature was now understood to be a collection of changeless, miniscule, massy particles occupying, at any given instant, a volume of Euclidean space and influencing each other through mathematically described gravitational forces that fall off in intensity as a function of distance. If reality were truly as Newton’s equations suggested, then mathematical analysis would be the Holy Grail that unlocks the deepest secrets of Nature, giving humanity access to, and mastery over her latent powers.

If reality truly is as the Newtonians believed, then mathematical physicists are the ultimate oracles—using numbers to predict Nature’s every move. Coupling religion with science, the corollary naturally follows: If all of reality is mere movement of insentient mechanical matter, and humans alone possess the gift of intellect, then God has surely given “man” dominion over the Earth. With our “divine intellect” and the ability to discern mathematical patterns, we have direct insight into the mind of God, guaranteeing our right to do exactly as we please with the material world. This is the shadow side of science and technology.

On the other hand, if we agree with the scientists that nature is nothing more than a very complex mechanical device, then how are we to account for our own personalities—for *consciousness*? Should we grant ourselves the status of divine spirits who miraculously inhabit high-tech biological machines? Or, taking the other view, should we relegate ourselves to the status of epiphenomena, observing nature but having no real effect on it? More extremely, should we regard ourselves as entirely delusory, being confused about the unreality of our own, merely seeming existence?

These disturbing ontological questions follow, unavoidably, if we take Newton's cosmology as ultimate truth. And, as mentioned earlier, we also need to deal with a decisive epistemological conundrum lurking in the heart of materialistic science itself. Science is based on experiments which depend on sensory observations—and these, in turn, require conscious experience. However, there is no way to derive conscious sensation, let alone of the interpretive activity that necessarily accompanies it, from the mere hurrying about of insentient atoms. These problems are well known, and have been an outstanding scandal in Western thought for many generations.

The problem, when viewed from a metaphysical perspective, is not difficult to understand. It is a simple confusion of a conceptual model with the actual world. Let me explain.

Newton succeeded in creating an abstract model that is exceptionally useful for studying the motions of macrocosmic entities of all sorts—from peanuts to planets. If we represent space as a Cartesian grid, and each entity as a point (or a set of points) in that grid, and if we represent gravitational interaction as a vector-field⁹ on that grid, then we can use calculus to compute how those points will move over time under the influence of gravity. Remarkably enough, the movements of the points on the grid will more or less approximate the movements of actual entities in space over time. That is brilliant modeling.

But, given the complexity of the actual world, there is always some margin of error in applying the calculations back to the actual world. Actuality is more complex than any model can capture—the model is an *abstraction* from the *fully concrete actual world*. Ignoring the difference between the actual world and the model, scientists assumed that the *model* depicted the *real* world, while our perceptions of the world, where they differed from the model, were illusory. This move, confusing a model for the actual world, was called by Whitehead the “fallacy of misplaced concreteness.”¹⁰

⁹ To turn a grid into a vector-field, we place a little conceptual arrow to each point, representing the forces operating at that point that will tend to cause an object at that point in one moment to move in a particular direction and at a particular velocity at the next moment.

¹⁰ To fully understand the meaning of the “fallacy of misplaced concreteness, we must keep in mind that Whitehead uses the word concrete to refer to the opposite of the abstract. That which is concrete is that

Since the time of Newton and Descartes, this fallacy has more or less gone unchecked because it seemed to confirm the scientific idea that mathematical form alone determines the processes of nature. But, under critical philosophical analysis, the difficulties quickly become evident.

- First of all, the Cartesian-Newtonian view requires the separation of perceptions into those that reveal *primary qualities* and *secondary qualities*. Smell, taste, hearing and the perception of color were all held to be secondary because they did not reveal qualities that could be quantified; whereas touch and the visual perception of form were held to be primary because they figured prominently in measurement, and revealed qualities that could be quantified. Of course, touch and the visual perception of form are, as soon became apparent, also subjective and open to interpretation and error. And thus the epistemological morass of modernity came into being.
- A second consequence of mistaking the model for actuality was the notion that the physical world is a causally closed domain. After all, if the model discloses the actual world behind appearances, and if the model is complete, then no factors other than those represented by the model can affect the macroscopic movements of actual entities. Furthermore, because the mathematics of the model is entirely deterministic, there is no room left in the real world for freedom, value and genuine choice. Thus, the physical world is causally closed. Add to this the fact that Newton's model could not represent consciousness or personality at all, then the very fact of conscious experience becomes a "hard problem,"¹¹ indeed. The task of trying to derive consciousness from a model designed only to analyze fully determinate macrocosmic motions of inanimate objects is quite impossible.

which is fully actual. The concrete is infinitely complex. Scientific and Philosophical abstractions are simplified models of the concrete. To confuse a simplified abstraction with the concrete actuality from which it has been abstracted is to commit the fallacy of misplaced concreteness.

¹¹ David Chalmers, Facing Up to the Problem of Consciousness, *Journal of Consciousness Studies* 2(3):200-19, 1995.

The point here is that classical science, which is based on ideas that are responsive to a very narrow interest (the interest in measuring and predicting macrocosmic movements), is entirely too narrow in its scope to be applied to consciousness and personality, and thus hopeless when it comes to the issues of parapsychology, personality survival and reincarnation.

Now science—unlike scientifically shaped common sense—has not remained wedded to the simple Newtonian model. In fact, science has gone through several “paradigm shifts,” or metaphysical changes, in which its basic ideas have been modified. In particular:

- Science has come to accept the actual existence of “fields,” and has supplemented gravitational fields with electromagnetic fields, and strong and weak nuclear fields.
- With the Theory of Relativity, science was able to embrace a fusion of space with time, a fusion of energy with matter, and, finally, a fusion of energy with time-space itself.
- Through the use of computers, which permit the deep exploration of recursive functions, science has developed “Chaos Theory” that illuminates the tendency of natural systems to self-organize into stable, macroscopic structures; and it has developed the theory of fractal geometry, which illuminates Nature’s habit of reproducing similar structures at various scales of organization.
- Through Prigogine’s “non-equilibrium thermodynamics,” science has succeeded in showing how living organisms can function without violating the second law of thermodynamics, thus bringing the phenomena of life more into harmony with the principles of physics.

- Finally, at the frontier of classical science, Maturana and Varela¹² have proposed a theory of self-organizing systems that suggests that life is nothing but a particular *organization* of otherwise insentient matter, bringing life even more solidly into the purview of a modified classical physics.

These developments in scientific metaphysics have given us a deeper understanding of the behaviors of the physical world. They have also allowed us to include within the purview of science some of the patterns expressed by living matter. But, for our purposes, they remain excessively narrow and abstract. While chaos theory, non-equilibrium thermodynamics, and self-organization can model certain external *behaviors* of living system, they cannot say anything about consciousness and personality, and so cannot help us in our attempt to understand our five fundamental propositions.

Quantum mechanics (QM), however, the most recent and most far-reaching metaphysical revolution to develop within the scientific tradition, has finally developed a scientific model sufficiently rich to make room, at least, for consciousness and personality. Quantum theory revises our conception of the physical world in at least three fundamental ways:

- First, it gives up the idea of substantial atoms—of finite entities that endure unchanging through time—and replaces it with the idea of causally interacting *events* each of which takes place over a finite interval of time. Also, these events are *not* fully determined in advance. There is a certain irreducible uncertainty involved in predicting how they will behave. Further, this uncertainty can be, and often is, interpreted so as to suggest the existence of objective probabilities as part of the real world.
- Second, in at least some of its interpretations, QM implies the existence of consciousness (an “observer”) that is causal (a source of the decisions among alternatives that “collapse the wave function”) and not determined in any way by anything in the physical world. Thus QM not only makes room for the *existence*

¹² Humberto R. Maturana, and Francisco J. Varela. *Autopoiesis And Cognition: the Realization of the Living*. Boston, D. Reidel Publishing Co, 1980.

of consciousness, it also breaks the causal closure of the physical by making consciousness a significant factor that actually determines how events play out in the physical world.¹³

- Third, QM thoroughly rehabilitates those qualities that classical science had tended to dismiss as “secondary.” In QM, any quality that has a determinable probability of being detected by an emerging event can be represented in the model,¹⁴ and thus is held to be fully actual.

With quantum mechanics, science has, at last, advanced to a set of metaphysical ideas that at least open it to the presence of consciousness and personality, and so bring it within range of helping to explain our five propositions. But quantum mechanics is still primarily a theory concerning the behavior of inorganic events, and it is not yet a full metaphysical system, capable of dealing with the full phenomenology the personality, and with the ideas with which we are concerned.

The Current State of Metaphysics

As I noted earlier, Newton’s staggering success in predicting the motions of macrocosmic bodies so impressed the educated West that metaphysics as a discipline began to fall on hard times. The German philosopher Hegel was the last of the famous metaphysicians, and his synthesis fell apart—partly because it could not keep up with advances in science, partly because it painted eighteenth-century Prussian society as the ultimate achievement of cosmic evolution, and partly because the shock of two World Wars resulted in a great cynicism towards any form of systematic thought.

During the first half of the twentieth-century, metaphysics was an academic backwater. During the second half, it became practically nonexistent. Nonetheless, the need for a comprehensive understanding of the actual world continued to be felt, particularly after relativity theory and quantum mechanics swept the rug out from under the classical

¹³ See, for example, Henry Stapp, *Mind, Matter and Quantum Mechanics*, Second Edition, Springer, 2009; Henry Stapp, *The Mindful Universe*, Springer 2007; Michael Epperson, *Quantum Mechanics and the Philosophy of Alfred North Whitehead*, Fordham University Press, 2004.

¹⁴ It will be represented in “Hilbert space” as a dimension.

sciences that inform so much of modern commonsense. Certain scientists¹⁵ tried to fill the gap, but their ignorance of the larger philosophical tradition kept their work focused on narrow issues. Nonetheless, a few philosophers continued to work in this area, among them Alfred North Whitehead, Ernst Cassirer, and Sri Aurobindo. These writers are truly remarkable for the depth of their insights, and perhaps equally remarkable for the lack of attention that their ideas have received. I believe, for example, that Alfred North Whitehead entirely solved the mind-body problem back in the 1930s, and yet that issue is still debated as if he had never published his masterpiece *Process and Reality*. The ideas of these three philosophers form the central inspiration for the system I will shortly outline.

The fact is that our civilization is in desperate need of a comprehensive metaphysical framework that can integrate spiritual inspirations, moral and aesthetic aspirations, parapsychological investigations, exploration of the “long trajectory” of human existence, our ongoing investigations of the physical and biological sciences, and our technological manipulations of the world. We need some way of understanding how it is that all of these diverse explorations take place in the context of a single, unified world.

That is the task of the new metaphysical framework presented in this book—drawing heavily on the process metaphysics of Whitehead, and the metaphysical and cosmological ideas of Sri Aurobindo. I call it “Transphysical Process Metaphysics.”

¹⁵ For example Schroedinger, Von Neumann, Heisenberg and Neils Bohr.