QUANTUM REALITY AND ETHOS: A THOUGHT EXPERIMENT REGARDING THE FOUNDATION OF ETHICS IN COSMIC ORDER

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Abstract. The authors undertake a thought experiment the purpose of which is to explore possibilities for understanding moral principles in analogy with cosmic order. The experiment is based on three proposals, which are described in detail: an ontological, a neurological, and a moral proposal. The ontological proposal accepts from the phenomena of quantum physics that there is a nonempirical domain of physical reality that consists not of material things but of what is philosophically conceptualized as a realm of nonmaterial forms. This realm of forms is the realm of potentiality in physical reality that quantum physics posits as an indivisible Wholeness—the One. It is the ultimate reality because everything empirical is the actualization of its forms. The neurological proposal is the hypothesis that the brain is sensitive to the potentiality waves in the cosmic field, as ordinary measuring instruments in physics are sensitive to potentiality waves at the quantum level, so that the cosmic field can communicate with the human brain. The third proposal assumes that the communication with the cosmic field can translate into moral ideas and actions. Even though the three proposals underlying the thought experiment are highly speculative, they lead to definite implications that make sense in their own right and can be applied in a useful way. From the order of reality some simple rules of conduct follow that are identical with traditional moral rules but have the character of rules of wellness, leading to new aspects of Aristotle's concept of *eudaimonia* and Kant's concept of the highest good. In analogy with the structure of physical reality, where all empirical phenomena are actualizations of nonempirical forms, it is suggested that the structure of morality,

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too, is that of a tacit, nonempirical form that actualizes in explicit principles and moral acts through our consciousness. The tacit form is thought to exist in the realm of cosmic potentiality, together with all the other forms that the empirical world actualizes. It can appear spontaneously in our consciousness when needed, offering its guidance to our judgment and free will. Because it does not appear in the form of commandments accompanied by threats, the actions of the tacit moral form define a higher level of morality, similar to that offered by some aspects of the Christian teaching, where one acts not out of fear but on the desire to do things right.

Keywords: Aristotelian *potentia*; Cosmic Consciousness; forms as metaphysical principle of being; Carl Gustav Jung's collective unconscious; quantum reality

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This essay represents a personal synthesis in which the authors—a physical chemist, a psychologist, and a physicist—attempt to construct a framework of meaning that can comprehend their scientific work and also provide direction for living. The article should be considered as a thought experiment. It begins with the discovery of contemporary physics that a nonempirical domain to physical reality exists that does not consist of material things. We posit that this domain is a realm of forms that has the nature of an indivisible Wholeness. Though nonempirical, it is real, because its forms can appear spontaneously in the empirical world and act in it. It represents the ultimate reality because everything empirical is the actualization of one of its forms.

If one pursues the nature of matter to its roots, at the level of atoms and molecules the notion of matter is lost and one finds oneself in a realm of nonmaterial forms, where actuality turns into potentiality and reality reveals that it is structured in two domains: the open and well-known domain of empirical, material things and a hidden and invisible domain of nonmaterial, nonempirical forms. Thus, the true nature of reality cannot be derived from the experience of the visible order of the world, because that order appears to us in isolated, actual and material objects, whereas the supporting ground is the posited indivisible Wholeness—"the One"—which represents, in the sense of Aristotelian *potentia*, the realm of potentiality in physical reality. The visible world conceals or covers up, as it were, the realm of forms, from which it emanates.

Arguments for assuming such a structure of physical reality are suggested by the quantum phenomena (Schäfer 2008). Contemporary physics has led many physicists to the view that ultimate reality is unknowable wholeness—David Bohm ([1980] 1981), Hans-Peter Dürr (2000; 2004), Hans-Jürgen Fischbeck (2005), and Menas Kafatos and Robert Nadeau (1990). Specifically, Dürr writes: "Reality reveals itself primarily as nothing but potentiality. . . . Potentiality appears as the One—better yet, as the

Not-Twofold—which cannot be dissected or separated into parts" (2004, 12). In addition, an important aspect of the realm of potentiality is that it is constantly changing and evolving new possibilities. As Bohm writes, "Undivided Wholeness is Flowing Movement" ([1980] 1981, 11). Out of the constantly changing flux certain temporarily enduring and relatively independent aspects—the elements of our direct experience of the world—can be abstracted or "relevated" (p. 151), among them mind and matter. "In this flow, mind and matter are not separate substances. Rather, they are different aspects of one whole and unbroken movement" (p. 11).

When everything that is empirical in the human perspective is an actualization of forms, this condition applies to *all* aspects of the material world, including the phenomena of life and consciousness. Because the One contains life and consciousness in their protoforms, it can be concluded that the One is alive and aware of its processes, like a spirit. We call this a Cosmic Spirit. "Matter is not made up of matter," Dürr concludes. "Basically there is only spirit" (Dürr 2000, 18).

In this situation it is worthwhile to perform a thought experiment in which one explores what might follow if the human mind were connected with the cosmic realm of forms, assuming that the brain, like the measuring instruments of quantum physics, is sensitive to potentiality waves in the nonempirical part of physical reality. The experiment would rest on the assumption that in the same way in which the brain has evolved sensitivity to light waves by developing eyes, it has evolved neural structures that make it sensitive to processes in the cosmic realm of forms. This sensitivity would allow the brain to bring forms from the cosmic field into our consciousness and, in turn, to take forms of our consciousness into the cosmic field. A measurement in physics involves a visible reaction of a macroscopic object—the measuring instrument—to a quantum potentiality wave, which then appears in a somehow transformed manner as a physical structure of the empirical world. In the same way it can be thought that potentiality waves can trigger brain states. In the material world the actualization of potentiality waves leads to new physical structures. In a human mind it may lead to new concepts that appear spontaneously as intuitive insights in our consciousness.

It is the purpose of this essay to perform such a thought experiment and think through its possible consequences. We describe this experiment by its underlying analogies. The suggestion from quantum physics that physical reality is structured in virtual (potential) and actual domains is considered analogous for interpreting what happens at other levels, such as the level of consciousness. The analogy connects the ontological proposal from quantum physics—that there is a nonempirical and nonmaterial part to physical reality—with a hypothetical neurological proposal—that the central nervous system can connect and communicate with the cosmic field of forms—and, further, with an even more hypothetical moral proposal: that

the interaction of the brain with cosmic order can translate into moral ideas and actions. Just as the realm of potentiality is related by the actualization of its forms to the actual world in physical reality, it is thought to be related to the actuality of the human mind; that is, the forms of the cosmic order can actualize into concepts of consciousness, including moral concepts.

We emphasize the extremely hypothetical, even speculative, nature of our experiment. Issues of the kind that we focus on do not allow for factual certainty. However, like the insights of a mystic that cannot be tested experimentally, our conclusions are meaningful, even inspiring. Regardless of the mode of derivation, the conclusions also are useful in their own right because they can be applied in a useful way. Specifically, our considerations allow us to specify moral principles instructed by cosmic order and to explore the consequences of the hypothesis that the structure of morality is the same as the structure of all empirical phenomena. That is, explicit moral principles and empirical moral actions are actualizations of a nonempirical moral form that exists in the cosmic realm together with all the other forms that actualize as the empirical world. As a form of the cosmic potentiality, the moral form cannot be expressed in words (it is tacit), but in situations in which it is needed it emerges with clarity in our consciousness and offers its guidance to our judgment and free will.

Human thinking is never without precedent. For example, using a single form as the basis of morality echoes Plato's concept of the unity of all virtues that he proposed in his Protagoras (Plato 328d–332a).[1] Likewise, attempts to pattern moral laws in accordance with cosmic order are not new. In the fourth century B.C.E, for example, Zeno of Citium developed a system of ethics whose fundamental value it is "to live in harmony with Nature" (Hauskeller 1997, 203), where Nature is not only human nature but includes the nature of the cosmos.

> Our natures are parts of the World-Whole. For this reason, the final goal is to live in accordance with Nature, which means the life in accordance with our own nature as well as the nature of the cosmos. In such a life one undertakes nothing that the World-Reason (really the general law) forbids. This, however, is the true Reason (*orthos logos*) which permeates everything and is one in essence with Zeus, who provides order to the universe and guides it. (Hauskeller 1997, 204)

Thus, the first duty according to Zeno is to live in accordance with the Nature of the Universe.

In various instances our thoughts can be put into the context of ancient teaching. In making such connections, one must always be aware of the dangers of anachronisms. Moreover, in comparing statements of contemporary physics with similar theses of ancient philosophers we do not intend to imply that philosophers such as Aristotle or Immanuel Kant could have known what we are explaining. The comparisons are nevertheless instructive for reasons pointed out by Carl Gustav Jung: "There is not a

single important idea or view that does not possess historical antecedents. Ultimately they are all founded on primordial archetypal forms whose concreteness dates from a time when consciousness did not *think*, but only *perceived*" (Jung [1959] 1990, 33).

In this sense, then, we describe our thought experiment by presenting the three proposals—ontological, neurological, and moral—on which it is based. Out of the uncertain and speculative procedure some definite recommendations arise that are in agreement with important elements of classical moral teaching.

The Ontological Proposal

The Importance of a Nonempirical Reality. The question of whether or not a higher, perhaps nonempirical, reality exists is of utmost significance for all ethical theories. If this question could be discussed from the perspective of physics, that would be of great significance. By nonempirical we mean all those entities, processes, or states that exist in physical reality but cannot be observed in any way. These entities are intrinsically unobservable due to their very nature and not because the requisite instruments do not yet exist. Such nonempirical entities are elements of reality, that is, they are real, because they can appear in the world of our conscious experience, which we call the empirical world and whose elements we call empirical. These terms—*empirical* and *nonempirical* and the corresponding references to *domains* or *realms* of reality—are specifically human terms, and throughout this article they must be understood in this way. They are used here as a manner of description and not to assert a Cartesian type of duality. On the contrary, reality in itself is wholeness—the One—and has no separate domains or compartments with different qualities.

In contemporary physics the notion of a nonempirical reality arises in various ways. For example, nonlocal phenomena have been discussed in terms of processes that occur outside of space-time (Stapp 1977; Kafatos and Nadeau 1990; Goswami, Reed, and Goswami 1993; Nesteruk 2000; Gisin 2005). More generally, already in the 1930s James Jeans pointed out

> that the minutest phenomena of nature do not admit of representation in the space-time framework at all. On this view the four-dimensional continuum of the theory of relativity is adequate only for some of the phenomena of nature . . . other phenomena can only be represented by going outside the continuum. We have, for instance, already tentatively pictured consciousness as something outside the continuum. (Jeans 1931, 132)

By definition, processes outside our space and time are nonempirical. Nevertheless they are real because they can affect space-time processes. For the same reason, the empty states of material systems, called *virtual states* in quantum chemistry, are nonempirical and real: they are nonempirical because they are empty and there is nothing there to see, and they are real

because their logical order can actualize in the empirical world (Schäfer 2008). Another class of nonempirical states is found in superposition states, where we distinguish between states involving complementary variables (properties that cannot be determined with infinite precision at the same time) and states that involve only a single variable, such as the position of a free electron. All nonempirical states and entities form a *realm of potentiality* in physical reality. That is, they are not part of the actual world but *can* appear in it. Their existence implies that there are not just "frontiers" to our knowledge but "limits, which cannot be crossed" (Dürr 2000, 14).

The neo-Aristotelian view on the notion of quantum mechanical potentiality was favored by Werner Heisenberg (1959). He suggests, as do Abner Shimony (1993) and others, that the quantum mechanical state vector represents a network of potentialities governed by the linearity of Schrödinger dynamics. The linear superposition of states denotes the characteristic ability of quantum systems to evolve in states, which represent a network of potentialities but not a state of actuality. A potentiality not only indicates that a physical property has no actual value but also indicates nonclassical correlations between different quantum states contained in the network of potentiality. The actuality emerges due to controlled or uncontrolled acts of measurement—that is, irreversible interactions of a microphysical potentiality state with a macroscopic object or environment. This act of measurement gives rise to definiteness due to the loss of the correlation, which often is referred to as *decoherence*. The measurement problem in quantum mechanics is simply a challenge in understanding the transition from potentiality to actuality—that is, between the two modalities of existence.

The crucial question is if potentialities are as observable as actualities—that is, if it is possible to observe the network of potentialities. Technically speaking, the question is whether or not a quantum state is (an) observable. Paul Busch, Marian Grabowski, and Pekka J. Lahti (1995) have discussed this issue in a systematic way within the framework of what they call the generalized representation of observables. This approach is generally referred to as *operational quantum theory*. It differs from conventional theory because it includes the inherent indeterminacy of experimental operations in its formalism. Usually, when one wants to know the state of a system, one has to perform a measurement of some observables. Due to Heisenberg's uncertainty principle it is impossible to determine an unknown state uniquely (with precision) by a single measurement.

It often is claimed that quantum mechanics is a theory that applies only to ensembles of entities and not to single objects. However, in recent years various experimental techniques have been developed that make it possible to observe individual quantum events, such as the transition of a single molecule between two stationary states in single-molecule spectroscopy, or the detection of a single particle in single-particle interfererometry.

Thus it is necessary to investigate in what sense quantum theory is applicable to individual systems. After rigorous analysis, Busch (1997, 69) concluded, "there are measurement procedures of a single observable which give complete statistical information about the state of a system. Such an informationally complete observable is necessarily unsharp." This means for example that in a double-slit experiment simultaneous information on complementary aspects is possible, but not with infinite precision; that is, the more information is available on one of the complementary aspects (wave or particle), the less information exists on the other (Wootters and Zurek 1979). It follows that quantum states, which are unobservable within the framework of conventional quantum theory, are not unobservable in the operational sense of quantum theory (Busch, Grabowski, and Lahti 1995). This means that conventionally unobservable entities can be observed, but only with considerable "unsharpness." In a strict definition, elements of reality must be determined with precision. For example, Albert Einstein, Boris Podolsky, and Nathan Rosen have defined elements of reality in the following way: "If, without in any way disturbing a system, we can predict with certainty (i.e. with probability equal to unity) the value of a physical quantity, then there exists an element of physical reality corresponding to this physical quantity" (1935, 777). Interestingly, in Aristotle's metaphysics everything that has come into being is a composite of stuff and form. As Johannes Hirschberger writes, for Aristotle "all being means to have been formed; all becoming means receiving a form; all decaying (fading out of reality) means losing form" (1976, 1:192). In this view, when an object appears only with some "unsharpness"—that is, does not have a definite form—it is not quite real.

Generally it is argued that one cannot measure simultaneously the complementary aspects of any entity such as the wave or particle properties of an electron. Conventional quantum theory denies the simultaneous existence of such complementary aspects. However, within the framework of operational quantum theory complementary aspects can be measured simultaneously—that is, they are observable—but only at the expense of considerable unsharpness. Superposition states involving complementary variables, such as the orientation of spin states of a free electron, are observable in this limited sense. This finding does not affect the conclusion that superposition states involving a single variable, such as the position of a free particle in space, are strictly unobservable (nonempirical) under all conditions. A free electron evolves in a state in which its probability of presence is a superposition of nonzero probability densities in many coordinates. But when this electron is searched for and found in a specific location in space, this observation destroys the superposition. Similarly, in a wave packet an electron is in a superposition of different momentum states. When the momentum of this particle is measured, a specific value

for momentum is found and the superposition is necessarily destroyed by the measurement.

These topics are currently also under investigation within the framework of Weak Measurement Theory (Aharonov and Vaidman 1993) and the concept of the partial reduction of the state vector (Dasgupta and Roy 2007).

The Importance of Forms as Metaphysical Principle of Being. The significance of forms is an important topic in contemporary physics as well as in ancient spiritual teaching. Because our model of morality is based on the reality of an underlying form, we review the concept in this section.

The Pythagoreans were the first to introduce the concept of "forms as metaphysical principle of being" (Hirschberger 1976, 1:24, 604) into Western thinking, proposing that the foundation of reality is not in stuff or matter but in ratios of numbers or mathematical forms. The concept was further developed by Plato in his well-known proposal that a transcendent realm of forms exists that is the basis of all and the true reality. For Aristotle, forms were not transcendent but immanent, and in his hylemorphism he developed the notion that forms are needed to give unformed matter reality. For Plotinus, *Spirit*, or *Nous*, is the "epitome of all ideas, norms, laws and structures of being, it is the *cosmos noetos* . . . and the first that the One allows to emanate out of it" (Hirschberger 1976, 1:306–7). Augustine of Hippo believed that the essence of things resided in forms, which are thoughts in the mind of God, and the "creation is an actualization of ideas out of God's plenitude" (Hirschberger 1976, 1:358).

In contemporary physics mathematical forms were first used to rationalize the phenomena of the empirical world, but then the view emerged that they truly exist in a nonempirical and nonmaterial basis of physical reality—for example as potentiality waves (Villars 1987) and virtual states (Schäfer 2006; 2008). The forms of quantum physics are both in the things (immanent) and beyond (transcendent); that is, they transcend our experience and can be thought to exist independently of material things.

Science fiction writers coined the term *teleportation* for all processes in which an object or person disintegrates in one place while a perfect replica appears somewhere else. The idea is that the original object is "scanned" in an apparatus like a fax machine to extract all the information contained in it, which is then transmitted to the receiving location, where it is used to construct a replica. In this process the important point is not that the replica is made up of the same material as the original object (the same atoms and molecules) but that the replica has the same material structure as the original object (Bennett et al. 1993). Recently, Nicolas Gisin and his collaborators performed long-distance teleportation at telecommunication wavelengths (Marcikic et al. 2003). An important aspect of these experiments is that they teleported not matter and energy but forms: "Matter

and energy cannot be teleported from one place to another without passing through intermediate locations. However, teleportation of quantum states (the ultimate structure of objects) is possible: only the structure is teleported—the matter stays at the source side and must be already present at the final location" (Marcikic et al. 2003, 509).

The possibility of teleporting the forms of quantum states without any matter or energy allows an immensely important conclusion: *Forms and quantum states are independently existing entities in their own right, which do not need matter or energy to be real.* They are real even when they are not attached to matter. Thus, the forms should be considered as the ultimate structure and essence of material things.

In a recent interview Austrian physicist Anton Zeilinger (2006) expressed similar views, pointing out that teleportation

> differs from simple copying in that the original loses all its properties. This is something so crazy that it could only exist in the quantum world. You can actually remove all the properties of a particle and give them to another particle. . . . The question is how do I recognize an original? I maintain: solely through its properties. Matter itself is completely irrelevant. If I swap all my carbon atoms for other carbon atoms, I am still Anton Zeilinger. . . . The only important things are my properties and they are based on the order of the atoms—that is what makes me who am I.

In Indian philosophy, the concepts of potentiality and forms are conjoined with the theories of various schools regarding the creation of the universe. According to the Vedantic texts, Brahman, the ultimate reality, which is without form and has the nature of intelligence, is the only cause of the universe (Sivananda 1999, chap. 2:3). In this worldview the material universe emanates out of Brahman, but the emanation is not creation because the universe is already hidden in Brahman before it emanates, like a tree in the seed; that is, the universe is not absolutely nonexistent before the creation because it already exists as a potentiality in Brahman.

In *Sruti*, the revealed literature of Indian philosophy (Radakrishnan 1968, 22), one finds this Sanskrit *sloka* (statement): "*Asad va idam agra asit*" (Sivananda 1999, chap. 2:24). The literal translation is "At first the universe was there, but nonexistent." The word *asat* does not mean absolute nonexistence. The word *sat* has to be taken as "being manifest" and not simply as "existence" in the sense of having a name and form and being differentiated, or structured. Its negation, *asat*, means "subtle," "fine," and "unmanifested." Thus, the *sloka* means that the *asat* universe existed in an extremely subtle, unmanifested state before it became manifest in a differentiated state. Existence and nonexistence are the different modalities of the ultimate reality.

The importance of form is also discussed in Buddhist philosophy (Suzuki 1999, 176) where *Alayavijnana* is an important concept. *Alaya* denotes a storehouse for all kinds of goods. *Vijnana* denotes a principle of

consciousness, as distinguished from the body. The function of *Alayavijnana* is to store, as seeds, all the memories of all sentient beings of their thoughts, affections, desires, and deeds. According to other schools of Indian spiritual teaching (Sivananda 1999, chap. 2:84), *Alayavijnana* denotes a Cosmic Mind—the repository of all individual minds in a potential form.

Object-Permanence, Self-Permanence, and Free Will. For most adults it goes without saying that ordinary objects have an uninterrupted and independent presence; they continue to exist when they are out of sight. An infant, however, needs nearly a year to develop this concept of object-permanence, as Swiss psychologist Jean Piaget (1955) discovered.

Like object-permanence, *self-permanence*—the awareness of our continuous and uninterrupted identity—is an important element of our development, specifically our moral development; without it there would be no basis for moral responsibility. Thus, an important aspect of the empirical world is that the permanence of its objects is an uncertain physical proposition. This is because, in principle, the uninterrupted observation of anything is impossible (Schäfer 2004, 235), so no single occurrence of it is a verifiable fact. In addition, because of the quantum nature of matter, "strictly speaking there are no objects which are temporally identical with themselves" (Dürr 2000, 63). "There is no Being, there is nothing that exists. There is only metamorphosis, change, operations, processes" (Dürr 2000, 18). The molecules in our bodies are constantly being replaced by others in chemical processes of maintenance and repair. There is no molecule present now that was there a long time ago.

How, then, do we derive the certainty of an enduring identity? Self-permanence is a property of the self-conscious mind. It is the basis of the experience of the *I* and its defining property. Because this property does not exist in the material world, it is not amazing that it is not discovered in material structures, such as the brain, and contemporary neurologists must conclude that the *I* is not some thing but a construct (Llinas 2002, 127).

Similar considerations hold for morality and free will. The free will defines a realm of potentiality out of which specific acts become manifest in the empirical world. Because all is one, we must assume that our personal realm of potentiality belongs to the cosmic realm. In Kant's terminology, the actualizations of freedom are in the *sensible* world, while freedom itself is outside of space and time, part of the nonempirical, *noumenal* world. In our own terminology, freedom is an expression of the potentiality of the I, which belongs, in turn, to the cosmic potentiality. Before a decision is made, all kinds of actions are possible, as in a superposition state. The corresponding superposition states cannot be observed in the brain, because observation destroys them. When the free will is in action, a particular choice is actualized out of the many potential ones that exist in the network, but the free will is not discovered in the actualization.

Each human being is a vortex in the flux of the cosmic potentiality (transcribing a term used by Rodolfo Llinas [2002]), an elementary and individualized center of the cosmic potentiality, out of which possible actions become empirical. The attributes of such nonempirical centers are consciousness, freedom, self-awareness, self-permanence, and connectedness with the cosmic potentiality. For each of us such a complex center is the *I*. To develop and actualize our personal share in the cosmic potentiality, in the sense of the Greek concept of *aretē* (Hauskeller 1997, 21), is an instinctive and cosmic need and the basis of a moral life.

The assumption of personal freedom is not a claim that freedom is unlimited. Rather, we follow Jung's thesis that the freedom of our consciousness is conditioned by the unconscious, because the largely unconscious part of our psyche that Jung calls the *self* limits the freedom of our consciousness, or Ego.

> Inside the field of consciousness [the Ego] has, as we say, free will. By this I do not mean anything philosophical, only the well-known psychological fact of "free choice", or rather the subjective feeling of freedom. But, just as our free will clashes with necessity in the outside world, so also it finds its limits outside the field of consciousness in the subjective inner world, where it comes into conflict with the facts of the self. And . . . so the self acts upon the ego like an *objective occurrence* which free will can do very little to alter. (Jung [1959] 1978, 5)

The Neurological Proposal

Jung's Collective Unconscious: Realm of Potentiality and Nonempirical Forms. The neurological proposal on which our thought experiment is based is the thesis that *the brain can connect with the cosmic field of forms so that the cosmic order can communicate with the human mind*. This proposal is the expression of an analogy; it assumes that the actuality of our consciousness is related to the cosmic potentiality in the same way in which the actuality of the empirical physical world is related to the cosmic potentiality.

In Western psychology, Jung described a nonpersonal part of the human psyche, the *collective unconscious*, which is a realm of forms—the archetypes—that can appear spontaneously in our consciousness and act in it, influencing "our imagination, perception, and thinking" (Jung [1959] 1990, 44). As "typical modes of apprehension" (Jung [1960] 1981, 137), the archetypes shape the conscious contents of our mind by regulating, modifying, and motivating them. In order to be able to live and to give meaning to life, we must constantly reach into the realm of these forms and convert their potentiality into actuality.

Jung's discovery of the collective unconscious is of great significance for the neurological proposal of our thought experiment. If the brain is asserted to be connected to some transpersonal order, some signs of this connection must be discoverable in our mind. The appearance of the archetypes is such a sign.

Jung's description of the collective unconscious appears like a description of the realm of the One discovered in quantum reality. Beyond the narrow confines of our personal psyche the collective unconscious is

> a boundless expanse full of unprecedented uncertainty, with apparently no inside and no outside, no above and no below, no here and no there, no mine and no thine, no good and no bad . . . where I am indivisibly this *and* that; where I experience the other in myself and the other-than-myself experiences me. . . . There I am utterly one with the world, so much a part of it that I forget all too easily who I really am. (Jung [1959] 1990, 21)

In physical measurements nonempirical potentiality states become states of empirical phenomena. In our mind unconscious states from a realm of nonempirical forms find experience in our consciousness. By having the potential to become conscious in us, the archetypes form a realm of potentiality. Because they "have never been in consciousness" before (Jung [1959] 1990, 42), they are part of a nonempirical world. Thus, for each one of us the birth of the conscious self is, like the emanation of the empirical physical reality, out of a realm of nonempirical forms. It is difficult not to consider the possibility that the set of potentiality forms that Jung discovered is a subset of the potentiality forms that quantum physics discovered; both are part of the medium of Spirit in the order of the One.

Connecting Human Consciousness with the Cosmic Potentiality. Within the framework of the "biogenetic structural theory" Charles D. Laughlin has proposed that Jung's "archetypes are structures within the nervous system" (Laughlin 1996, 385). In general, biogenetic structural theory operates on the assumption that typical functions of the human mind are based on genetically determined hard-wired neuronal structures. An important function of the brain is to develop what Laughlin calls the cognized environment. "The cognized environment is the total set of neurophysiological models that mediate all of an individual's experiences." These models develop from

> genetically determined neural structures already producing the experience of the fetus and infant. We call these nascent models *neurognostic structures*. . . . The neurognostic structures correspond to Jung's archetypes. . . . When we are speaking of the functioning of these neural structures in producing either experience or some other activity unconscious to the individual, we use the term neurognosis. (1996, 385)

An important aspect of neurognosis, suggested by Laughlin, is that it operates not only at the level of neurons but also at the quantum level, enabling the brain to interact with the zero-point energy field of the vacuum in the universe, which Laughlin calls the "quantum sea" (1996, 390). Here Laughlin accepts from contemporary physics the view that the cosmic vacuum is perhaps not empty but filled with an immense amount of mass-energy—the zero-point energy—with which the material structures of the

brain are thought to interact, "penetrating to and being penetrated by events in the sea. . . . Transformations of neural activity may produce transformations in the structure of the sea, and vice versa" (1996, 390). In this process, "local causation" in the brain can lead to "non-local causation" in the sea whose structure is "transduced into patterned neural activity and vice versa" (1996, 390, 393). "Each human brain may indeed prove to be a microcosm that contains . . . all the wisdom of the ages, requiring only the optimal conditions of development for each person to individuate into a sage" (1996, 395).

Laughlin's is a fascinating proposal for considering the possibility that the human mind can connect and interact with a cosmic medium. However, the specific suggestion that the brain interacts with the quantum vacuum is problematic because, at the current state of physics, no precedent for such processes is known. In addition, Laughlin's theses should be modified to include developments in neuroscience that are relevant for it. Specifically, J. András Pellionisz and Llinas (1985) have proposed that the functionality of the brain is connected with a functional geometry associated with the central nervous system. Recently, Sisir Roy and Llinas (2008) have proposed that this functional geometry is dynamic, producing various patterns or forms via fluctuations of the underlying geometry.

The proposal by Roy and Llinas offers a physiological basis for the neurological proposal of our thought experiment. It makes it possible to think that the archetypes are independently existing forms in the cosmic potentiality field and that the evolution of the requisite geometry has made the brain sensitive to these forms. This sensitivity allows the brain to be instructed by the cosmic potentiality and to instruct it, bringing forms from the cosmic field into our consciousness and, in turn, taking forms of our consciousness into the cosmic field. Dürr has described similar views, proposing that the brain can "scan an immaterial software code in the background realm of potentiality . . . and the genes have basically just the function of a software for the construction of amplifiers, with which we can survey this structured potential background field" (2004, 67).

Like Laughlin's model, ours does not offer a detailed mechanism of how the human brain can connect with the cosmic potentiality. But the lack of mechanistic detail does not speak against it, because exactly that same lack of knowledge applies to all of quantum physics, where the measurement problem denotes the inability to explain how a specific state appears in the actual world out of a state of potentiality when a measurement is made. Even though we do not know *how* potentiality waves actualize, we know *that* such processes occur at the quantum level. Thus, the process that we suggest is not without precedent.

Various other analogies from physics can be cited in support of the neurological proposal of our thought experiment. For example, in molecular processes, nonempirical, virtual (empty) quantum states (Schäfer 2008)

can appear spontaneously in our empirical perception. This is analogous to the appearance of Jung's archetypes in consciousness. Similarly, a measurement in physics is an observation interaction (Villars 1987) of a quantum entity in a potentiality state with a decoherent classical object. It enables a visible reaction of a macroscopic object—the measuring instrument—to a potentiality wave and, thus, the appearance of a somehow transformed nonempirical form in the empirical world. Just as potentiality waves can trigger the visible reaction of a macroscopic measuring instrument, it can be thought that they can trigger brain states. In the material world, the collapse of the potentiality waves leads to new empirical structures. In our minds it leads to new concepts from which the learning process begins anew.

In this context the recent teleportation experiments (Marcikic et al. 2003) are important, because they show that forms can be teleported from one point in space to another. It is possible to think that transpersonal psychic phenomena involve similar processes, in which forms from one brain are teleported to another, where they will cause some psychic activity.

The Moral Proposal

Some Logical Consequences from Cosmic Order for a Fulfilling Life in Harmony with Nature. Some simple rules of conduct follow from the order of reality that are identical with traditional moral laws and have, at the same time, the character of rules of wellness. The aspects of reality to which we refer are those of the ontological proposal of our thought experiment described above. The order of the universe is what it is; it seems logical that we should not live in conflict with it or in contempt of any one of its basic characters. In fact, living in accordance with the order of reality can be a guiding principle for a fulfilling life.

According to sociobiologists and evolutionary biologists, all human behaviors, including morality, are adaptations (see, for example, Ruse and Wilson 1993, 310). This view implies that there are no human values and, specifically, no universal moral principles (Ruse 2001a, b), just the clever games of individuals striving for biological fitness. Within the same paradigm, there is also reason to believe that "evolution tends to make pleasurable those behaviors that are adaptive" (Miller 2000, 259). In contrast to such theses, we propose that *our mind makes pleasurable all those behaviors that bring us in contact with the One and allow us to act in the spirit of the One.*

In the understanding of virtue that follows from this thesis, everything that strengthens the coherence with the One is good, while everything that destroys the coherence is evil. In this context it seems to be more than just an accidental coincidence that many traditional virtues, such as love, charity, kindness, generosity, and sincerity, are unifying principles. Acts following their spirit allow a person to reach out to others. They bring out a typical aspect of reality—its wholeness or connectedness—and strengthen

the coherence of an individual with the whole. When all is one, giving is receiving, and the unifying principles make sense. From here derives the impression that everything that is good leads us closer to the One, while everything that is evil leads away from the One. Many traditional vices—greed, hatred, vengefulness, deceptiveness, and violence—destroy the communion and separate a person from the One. This echoes Plato's view that the evil person "leads a robber's life" outside of any community. "Such a one is the friend neither of god nor man, for he is incapable of communion, and he who is incapable of communion is also incapable of friendship. . . . [But] communion and friendship . . . bind together heaven and earth and gods and man" (Plato 2005, in Gorgias, 508a).

Existentialist philosophers often have stressed the absurdity of being, the sense of alienation and nothingness in a meaningless world, and anxiety in the face of death. The absurdity of being is this matter-bound existence in the loneliness of the world of separated things, and it follows from our outrageous eviction, we do not know why, from the realm of the One. It is a traumatic experience in everybody's life that we can never overcome. There is a longing to return to the wholeness and a need to make contact with it, as we long to connect with a person with whom we are in love. This need is at the basis of all mystical experiences and spiritual needs and of the pleasure we feel when we act with responsibility and love in the spirit of the One.

It seems trivial to state that a life in conflict with the laws of nature—that is, in conflict with the nature of reality—cannot be a wholesome life. But usually it is overlooked that this principle—to live in accordance with the nature of reality—has consequences not only for our physical way of life but also for our spiritual life. Belonging to the order of the One, we are part of the material world as well as of the nonmaterial domain of physical reality, and both need our attention. We cannot shrug off a part of our nature, for example, by seeking fulfillment in the mindless satisfaction of bodily functions or by living the selfish life of the greedy, and hope to find happiness. In the reality of the One, one does nothing to impair the other. One does not lie, steal, hurt, or cheat, because cheating the other is cheating the One. Those who think that exploiting and cheating others will bring them happiness will soon find that they have amassed a big fortune but cheated themselves out of peace of mind. The principles of our mind are the principles of the universe. We cannot live in peace with our own mind if we are at war with its very principles, that is, the principles of the universe. Some traditional moral laws are directly connected with wellness, like the prescriptions of a wholesome diet or a fitness program. Apart from the moral commitment, it is a matter of prudence to accept these rules; to disregard them is ill-advised.

Many historic precedents exist for conclusions of this kind. Matthieu Ricard (2003) describes suggestions for happiness that follow from the

Buddhist view of the world. According to Aristotelian ethics, *eudaimonia* is the highest good that human beings can strive for. "Often translated as *happiness* or *blissfulness*, it denotes as much as the experience or the fulfillment of a successful life. It is the task of Aristotelian ethics as a scientific discipline to discuss the preconditions for such a successful life" (Hauskeller 1997, 83). Such conditions must take nature into account, our own nature as well as the nature of reality. In agreement with the order of reality, morality is naturally accompanied by *eudaimonia*, because a sense of joy accompanies all actions that bring us closer to the One and allow us to act in its spirit. Epicurus taught that "pleasure signals to a sentient being what is beneficial for it and its constitution; whereas displeasure and pain indicate what is harmful" (Hauskeller 1997, 142). Translating all of these views into the context of the moral proposal of our thought experiment, we are led to the proposal that getting in contact with the One is beneficial for our constitution.

In his *Critique of Practical Reason* Kant defined the *highest Good* as the necessary conjunction of virtue (the worthiness of being happy) with happiness (the appropriate reward for a virtuous life) (Kant [1788] 1998, 177, 181). He saw a problem in the fact that practical reason is not able to control the causes and effects in the empirical world to such an extent that "sufficient connection of happiness and virtue could be expected in the world" (p. 182). In such a world a transcendent Deity is needed to give meaning to morality so that "the existence of God [is] a postulate of pure, practical reason" (p. 197). In contrast, in the quantum reality and within the framework of our thought experiment, the Cosmic Spirit is *in* the world and *in* us, and virtuous acts contribute automatically and instantaneously to wellness. Acts in accordance with cosmic order will always be pleasurable and enhance wellness in this life. By contributing to wellness we mean the relative enhancement of the general condition of a person, whatever that is depending on a multiplicity of other, unrelated factors.

In his book *Für eine zivile Gesellschaft* (For a civil society) Dürr describes how the awareness of quantum reality can lead us to the conception of a humane society that is characterized by community, not adversity, and by cooperation, not competition (2000, 29). To the list of characteristics of quantum reality that are relevant for our way of life Dürr adds its creativity:

> The future is essentially open. At every instant the world is created anew, but before the background of that, which it was before. (p. 19)
>
> Those who ultimately survive in the evolution of life with its shifting goals must have the ability to play. . . . This demands liveliness, flexibility, increasing the number of options, instead of maximizing a certain option. (p. 29)
>
> I am constantly reaching, again and again, into the full jar of potentiality, plunge into anticipations and try to develop new ideas out of it, which I will try to grasp in my words and to realize in my actions. This is the exciting experience which we call life. (p. 28)

At this point we realize with some astonishment that our thought experiment, speculative and uncertain as its basis is, has led us to Abraham Maslow's humanistic psychology (1943; [1964] 1994; [1968] 1999; [1971] 1993). According to Maslow, human beings live with a structure of complex needs that can be arranged in hierarchical order as a ladder or the steps of a pyramid ([1968] 1999, 168; 1943). At the lowest level we find physiological needs, followed, in ascending order, by safety needs, love and belonging needs, and self-esteem needs. Each higher level will be activated only when the needs of the lower levels have been satisfied. However,

> even if all these needs are satisfied, we may still often (if not always) expect that a new discontent and restlessness will soon develop, unless the individual is doing what he is fitted for. A musician must make music, an artist must paint, a poet must write, if he is to be ultimately happy. What a man *can* be, he *must* be. This need we may call self-actualization. This term . . . refers to the desire for self-fulfillment, namely to the tendency for him to become actualized in what he is potentially. This tendency might be phrased as the desire to become more and more what one is, to become everything that one is capable of becoming. (1943, 382)

Maslow considered it a significant discovery of humanistic psychology

> that human nature has been sold short, that man has a higher nature which is just as "instinctoid" as his lower nature, and that this higher nature includes the needs for meaningful work, for responsibility, for creativeness, for being fair and just, for doing what is worthwhile and for preferring to do it well. ([1968] 1999, 244)

The two views—that human beings *must* be what they can be to find self-fulfillment and that living in accordance with cosmic order is the only way to find a fulfilling life—are easily matched. Each of us is an elementary center, an embodiment, of the cosmic potentiality, which is by its nature under pressure everywhere to actualize in the empirical world; in human beings it has found a special way to do so. The need of self-actualization is a cosmic (instinctive) need and an inalienable human right. The moral imperative that follows is simple: We must never in any way interfere with anyone's right of self-actualization.

This principle should apply to public institutions as well as to the workplace and our personal environment. Kant's practical imperative as expressed in the *Groundwork* ([1785] 1964, 96) is easily recognized: Act in such a way that you always treat humanity, whether in your own person or in the person of any other, never simply as a means but always at the same time as an end. This imperative derives its authority from the condition that our actions should be potentially universal. The principles derived by our thought experiment, too, are of a universal kind, because they are derived from universal order.

The Structure of Morality: Tacit Nonempirical Form and Explicit Empirical Act. There is a second part to the moral proposal of our thought experiment that explores the hypothetical consequences that follow when

the phenomena of morality are assumed to have the same structure as all empirical phenomena.

A person who does not believe in gravity will act differently than someone who has fallen off a roof. A person who adheres to a materialistic view of the world will act differently than someone who is aware of the structure of reality in potentiality and actuality. We believe that this structure is the key to morality: Moral laws, explicit circumscriptions of virtue, and moral acts are part of the empirical world; their roots are in a tacit form—a potentiality wave—in the nonempirical realm of reality.

"We do not know," Jung writes ([1959] 1978, 26), "where the roots of the feeling of moral freedom lie; and yet they exist no less surely than the instincts, which are felt as compelling forces." Kant was equally positive that "the awareness of the moral law is a fact of reason" ([1788] 1998, 55) but he did not explain why this is so. Similarly, in the *Groundwork* he writes: "All moral concepts have their seat and origin in reason completely *a priori*, and indeed in the most ordinary human reason just as much as in the most highly speculative: they cannot be abstracted from any empirical, and therefore merely contingent, knowledge" ([1785] 1964, 79). Here, as usual, Kant takes an a priori principle for granted and does not explain where it is coming from.

We propose that Kant's a priori principles have their roots in the realm of the cosmic potentiality, from where they can appear in our psyche. Thus, Kant was not correct in asserting that the laws of physics are *made* by the human mind. Rather, there is agreement of our knowledge of reality with the actual reality, because both the material structures of the empirical world and our concepts of it are products (emanations) of the same realm of forms. Similarly, the principles of morality may be thought of as actualizations of a nonempirical, tacit moral form that translates spontaneously in our consciousness when it is needed and offers its moral intent, adapted to a given situation, to our judgment and free will.

In his Protagoras Plato discusses the question of whether the various virtues that can be named are really only a single one (Plato [1957] 2007; Protagoras 329d). Indeed, explicit systems of ethics need a multiplicity of commandments or principles, but a single tacit form can be the source of all conceivable expressions of virtue. We call the moral form tacit because it belongs to the realm of potentiality, which we cannot describe in words. But even though it be tacit, we can think that its appearances are, in some transformed manner of its tacit content, explicit variations of expressions of wholeness that make it possible for us to act in such a way that the Cosmic Spirit is in our actions. Its tacit nature is exactly the basis for the plasticity and versatility that an acting principle needs to be effective in the different types of situations that human beings have to face, including unprecedented ones. Images of the form appear spontaneously and timelessly in our consciousness, like a Jungian archetype, and in situations of

great distress, when unusually grave decisions have to be made, they will overrule, if necessary, all explicit maxims of morality, like those that the historic systems of ethics have proposed without agreeing on them.

Kant, too, believed that a single moral principle—the categorical imperative—is sufficient as guidance in all conceivable situations. Our view differs in that we believe that the single form at the basis of morality is not an abstract, logical imperative but a truly existing form, not a logical but an ontological principle that appears everywhere not as an imperative or commandment but as a recommendation of what we can do that is right. The potentiality waves that make up the moral form are, like the potentiality waves of physics that Villars (1987) described, physically real waves that exist in their own right and not merely as representations of human behavior. We are tempted to say that the moral form is a part of the One, except that the One does not have parts. Like all empirical phenomena, the fact of morality must be an emanation out of the One and must have its roots in the superposition states that make up the structure of the One, or, using Dürr's term, its *Gestalt* (2000, 18).

The authority of the tacit form over explicit commandments or principles can be illustrated in the following way. Consider that you are hiding in your house a person who is wanted for wrongful execution by a criminal regime, and the police knock on your door and ask whether you have seen him. In this situation it would be preposterous to think that lying must be avoided at all cost because it violates Kant's imperative or the Decalogue (the Ten Commandments), and thus the miserable person must be delivered to his death. For every explicit moral principle there is a situation in which it will fail. In difficult situations, when every possible action will be in conflict with some explicit moral law, a different kind of advice is needed—that is, an intuitive certainty that emerges spontaneously in our mind and informs us of what we can do that is right.

The choice of words here is important. The principle emerging in our mind does not tell us what we *have to* do; it tells us what we *can* do that is right—that is, it is in the spirit of the One. Thus, the tacit moral form is not categorical, not an imperative, and not a Decalogue. Its appearances do not pretend to have authority, do not intimidate, do not threaten or dictate by imposing fear; they just convey the intuition of the right thing to do—to take it in the spirit of the One, or leave it. We consider moral systems based on threats and punishments expressions of an early stage of human development, like a stage of childhood, from where we have to proceed to a more enlightened view of moral responsibility.

In times of famine, few people will obey dietary rules for avoiding obesity. In extreme situations, for example when someone's life is at stake, moral rules based on principles of reason or *eudaimonia* are equally out of place. In such situations it is not the striving for happiness or the highest Good that counts, but making the right decision and using the input from

the tacit root of morality to solve an aporia that no preformulated, explicit rule can solve. When decisions are made on such a basis, the Cosmic Spirit is expressed in our actions. When one is put on the spot, moral instincts are instantaneous, intuitive, and spontaneous.

Jung described the collective unconscious as the medium in which the parameters of human thinking—time and space, good and bad, you and I—dissolve into the wholeness of the One ([1959] 1990, 21). In general the potentiality waves do not in themselves have the qualities that their actualizations display in the empirical world. We know the empirical phenomena that emerge from the One, but we do not know the nature of the underlying forms. We know life and consciousness in their empirical forms; we do not know the forms of protolife and protoconsciousness in the realm of potentiality. For the same reason we must also think that the potentiality waves that make up the tacit moral form do not in themselves bear the qualities of good and evil. In the cosmic realm of potentiality, the memories of crimes, sins, or extraordinary human achievements all are the same: potentiality waves. The concept of separateness has no meaning in the order of the One. Actualized objects are separate, nevertheless. Similarly, when the good is taken as a means to strengthen the communion with the One, that restricts the mode of morality to the world of separated things. It is only in their actualizations that qualities and values emerge, and perhaps this is the *raison d'être* of the empirical world.

All formulations of ethical laws are secondary, incomplete, and imperfect transcriptions of the one tacit moral form. For each formulation, hypothetical situations can be constructed and *Gedankenexperimente* performed that show their limitations and exceptions, even though, by definition, moral laws cannot tolerate exceptions. The roots of morality are tacit in Michael Polanyi's understanding of that term (Polanyi 1966). When the Cosmic Spirit is in our decisions, the Oneness reveals itself in a flash; there is instant recognition of its messages in the manner of recognizing a face. Without the limitation by words, the right way out of a seemingly pathless situation will offer itself to our free will. In contrast, ethical systems with handbooks of detailed prescriptions represent a mechanistic approach to morality. The world is not a machine. The realm of potentiality is alive and creative, and the best way of life reflects its character.

There are various other aspects that we do not discuss in detail here. They include the potential importance of a cosmic memory field as described by Dürr (2004, 67) and Ervin Laszlo ([2004] 2007, 75). If such a field exists, we have to consider that it stores all human experiences and contains the memories of achievements as well as those of crimes, reviving the ancient concept of inherited sins. Furthermore, the unavoidable presence of evil in the world must be discussed in light of the fact that human beings actualize different levels of consciousness and moral understanding (Neumann 1995; Kohlberg, Levine, and Hewer, 1983). At lower stages of

consciousness the perception of virtue can be completely opposite to that of a higher stage, and to an undeveloped mind even the evil can appear as good (Jung [1958] 1989, 197).

One of Kant's main concerns was human dignity. The "law-making which determines all value must have a dignity. . . . *Autonomy* is therefore the ground of the dignity of human nature and of every rational nature" ([1785] 1964, 103). To strive for accordance with cosmic order seems to abandon autonomy, and in the submission to external law dignity seems lost. However, the order of the One is not external to us. Cosmic order is our order, and its laws are our laws. Furthermore, the tacit moral form does not appear with threats of punishment but treats us with dignity and offers perspectives to our free will in the manner of the teaching of Christ (Schellenberger 2006, 15–16); the Christian principle of acting with love has the nature of a general form (von Weizsäcker 1992, 30) that fits all conceivable actions and is not a mechanistic commandment. The perspectives of general forms define a higher level of moral commitment.

We believe that, ultimately, the joy associated with virtuous acts is the joy of making contact with the One. It is the mystical joy that Plotinus described:

> Often when I wake up out of my body to myself and step out of the otherness into myself, I behold a most wonderful beauty. It is then that I believe in the strongest to belong to the greater destiny, and bring about with my force the perfect life, and have become One Thing with the Divine, and as I am founded in that, I arrive at that power and lift myself above all the perceptible. (cited by Buber [1909] 2007, 88)

In the realm of forms, there is no good and no evil. There are no values, just forms, information; but when they appear, the forms assume a value depending on how they are applied. Thus, happiness, goodness, and love are created by us. The key is inside us; we are the magicians.

In the quantum world, when two get entangled, one is entangled with the other, and the other with the one. Ultimately, there is only the One. If all is out of the One, the One is also in all, and the Cosmic Spirit is in ours. When we act in the spirit of the One, the Cosmic Spirit is acting in us.

Notes

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1. The numbers cited are the page and segment numbers of the Plato edition by Henricus Stephanus of 1578, which are usually used to quote Plato.

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