MIND, MEANING, AND QUANTUM PHYSICS:
Models for Understanding the Dynamic Unconscious

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> Meaning is embodied in our total affective interest in the world.
> —Gambattista Vico, 1744

MIND AND MEANING

In Winnicott's evocative article titled "Mind and Its Relation to the Psyche-Soma," he states that mind "is then no more than a special case of the functioning of the psyche-soma." Elaborating on this thought he notes that "the word psyche here means the imaginative elaboration of somatic parts, feelings, and function, that is, of physical aliveness" (p. 244). Mind, as he uses the term in this essay, describes a false entity that comes about because of an early environmental failure necessitating a very young individual's taking over some of the functions that the caretaking environment is not providing. In such a situation, mind becomes, in Winnicott's schema, a localized phenomenon, dedicated to compensating and figuring out. It has, of necessity, taken over the functions of a less than optimal caretaking environment. Winnicott describes this compensatory, figuring out, "caretaking-mind" as *located* in one's head.

But if such a mind is located in one's head and dedicated to compensating for environmental failure through compensatory figuring out and compliance, how should we characterize the healthy functioning of psyche/soma that we ordinarily describe as "mind"? That is, given Winnicott's perspective of psyche/soma aliveness, how can we understand what we, in ordinary speech, refer to as mind? I believe that we can still speak of mind but in order to do so we have to not only overcome Descartes' live mind–dead matter dichotomy, but also the everyday bias of

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thinking about mind as exclusively a singular possession, with clear and definable boundaries between one's mind and one's community. Mind, which encompasses conscious and nonconscious functions, is best conceptualized, I believe, as an integrated manifestation of body, brain, and community.[1]

Mind is clearly a multifaceted, dynamic phenomenon, particularly for such social beings as humans, seemingly singularly endowed with the capacity to distinguish the universal from the particular, as exemplified in Aristotelian logic, for example, as well as possessing a creative imagination. I will return to the question of mind and brain shortly.[2,3]

Among the animal species we humans seem to be the only ones dedicated to continuously teaching each other, to pleasing each other, to the sustained taking care of each other, despite our love of savage violence toward each other. We perform most of these tasks through socialization, mediated through language. Human language includes movement (dance/ritual), sound (speech/music), and physical representation (visual arts). Verbal language is, par excellence, a conveyor of cultural and personal meaning. It is a vehicle for teaching and passing on to the new generation one's understanding and mastery of the world. Meaning, therefore, both personal and cultural, arises within and out of a particular historical community; it is, for the most part, limited by the historical/cultural/intellectual actuality of each community.[4] So although Winnicott speaks about the inner imaginative elaboration and sense of physical aliveness, which, in fact, is the ground place of thought, it cannot be understood as separate from one's historical community. Although language is not coequal with thought, language enables humans to recognize and to experience meaning. Language is a uniquely human vehicle, particularly by way of imagination, for creating the found world, to employ another of Winnicott's insights. Imagination, as we know, can elaborate a world of images; imagination is the seedbed of metaphor—both conscious and unconscious.[5] (The absolute silence of the inner alone/self, which Winnicott also addresses, is beyond any language and therefore beyond communicable knowledge; it can be experienced but not taught.)

The experience of meaning, as noted, inevitably ties one to language; it is the experience of being alive in a particular com-

munity, at the particular moment of one's historical actuality by experiencing interconnections and interactions.[6] Healthy mind, as Winnicott reminds us, is a special function of psyche/soma; it is not a localized phenomenon but, rather, a function of feeling alive in one's body and therefore of being imaginatively engaged in the world. Such a mind, although dependent on a functioning brain, is not located in one's head. The experience of meaning, which is the calling card of mind, allows us to know our inner imaginative elaborations, our judgments and our problem solving. Consequently, it serves as a bridge between our inner sense of ourselves and our experience of functioning in the community in which we live. In a previous publication (Gargiulo, 2004) I noted,

> We come to know mind through all the languages of culture. It is, consequently, not reducible to a biological entity. Consciousness, which is uniquely dependent on neurological brain functioning, is a prerequisite for the experience of mind, but it is not co-equal. Consciousness, in human experience, makes the awareness of mind possible. But meaning, which is the calling card of mind, is a singularly communal accomplishment. . . . (p. 35)

FALSE SELF AND MIND

Obsessive–compulsive mechanisms are a prime example of split-off mind: mind that has lost any bearing to psyche/soma, mind that no longer feels alive through every pore of the body but is exclusively experienced through one's head. Winnicott spoke of such functioning as evidence of a false self-organization, conforming to rather than emotionally engaging with one's environment. From such a perspective we can understand Winnicott's perceptive comment that functioning in such a way precludes the experience of feeling personally alive. Feeling alive, as we know, has to do with experiencing one's emotional and psychological interconnection with the world in which one lives, that is, experiencing oneself as real in the here and now of one's life. Feeling alive also means not separating one's inner sense of self from one's ongoing dialogue with the world. Perception and interaction with the world are the basis for any inner elaboration that we designate as phantasy, whether conscious or noncon-

scious.[7] Therapeutically, analysis addresses obsessive–compulsive patterns as well as other defenses that militate against the experience of creativity and personal aliveness. While defense is generic, the treatment is, of necessity, personal and therefore somewhat idiosyncratic.

CLINICAL PRACTICE AND SCIENTIFIC DISCOURSE

Should analysts claim that psychoanalysis is a scientific enterprise if the necessarily individualized goal of establishing personal aliveness, one aspect of which is to experience self-definition, that is, personal meaning, is normative for a successful psychoanalysis? Should analysts even try to establish cause and effect if the subject matter of their studies is a hundred different patients with a hundred different analysts offering many different interventions, notwithstanding obvious and similar goals? There is, patently, a significant area of unpredictability in psychoanalytic work that has to be realistically acknowledged. Such a process seems to fly in the face of clinical replication and testable verification. Should one simply dismiss any claim that psychoanalysis is, in any way, a scientific enterprise? Is there any useful model that can address a subject matter with such inherent diversity?

I believe there is.

Those analysts who are convinced that psychoanalysis is a hermeneutical humanistic science believe that their model answers many of these concerns. The work of Paul Ricoeur, among others, has focused on such a hermeneutical aspect of psychoanalysis and proposed norms for evaluating interventions and interpretations. Historically, more classically trained analysts believe that psychotherapeutic interventions and interpretations based on a well-defined understanding of developmental processes and psychological reactions and/or defenses guarantee an objectively reliable basis to psychoanalytic work. The scientific basis of psychoanalysis has, nevertheless, been repeatedly challenged as well as defended. Of late, neurological findings have taken precedence as offering empirical confirmation for some psychoanalytic premises and therefore potentially validating some of its assumptions.

A QUANTUM MECHANICS MODEL

In terms of everyday clinical experience, I believe that a hermeneutical model for conceptualizing clinical practice offers a useful and functional approach.[8] I would like now, however, to discuss a few concepts from quantum mechanics that can offer an alternate model for conceptualizing psychoanalytic clinical experience. I believe that some quantum mechanics findings can explicate, *by way of analogy*, what it is that analysts do, particularly as exemplified in their work with the dynamic unconscious, in a way that clarifies the scientific yet nonmaterialistic framework of psychoanalysis. I am also employing such an approach since I believe it can deepen an appreciation of mind as dependent not only on brain and body but on community as well. (That the practice of psychoanalysis is an art, as well, is not in conflict with this perspective, I believe.)

Psychoanalysts are, to follow Freud's lead, as much secular pastoral counselors as they are scientific practitioners; they offer personal individual care within a framework of impartial yet technically informed listening. Psychoanalysis, in many ways, is a unique endeavor. Quantum mechanics is likewise *sui generis,* unique in its subject matter and in its conclusions. It is an enterprise that not only addresses the question of measurement but, in the process, necessarily explores the nature of reality itself. It is, following Werner Heisenberg's thought, not a materialistic search for any *real* objects that exist independent of context. In contradistinction to Kant's *thing-in-itself*, it was the conviction/conclusion of both Niels Bohr and Werner Heisenberg, two of the founding pioneers of quantum physics, that there is no deep reality, that is, there is no *as it is* of the world. I am not excluding the reality of energy—whatever that is–but, rather, what we see is what we get—or, closer to the truth, what we measure is all we have. I do not mean this in any simplistic sense. We are, after all, measuring information.[9] When, if ever, we have a theory of information that explains most of the phenomena of the micro world, the area studied by quantum physics, we will simultaneously understand much more of the macro world in which we pass our days. Reality is one—that is, both micro and macro worlds—what changes is our lens. What quantum physics has al-

ready uncovered about the micro world is already helpful in understanding this macro world, notwithstanding that some of its findings fly in the face of everyday experiences.

Quantum physicists speak of *the collapse of the wave function* when, for example, either the position, or the speed, of a proton is established. This is a term that indicates that a measurement has been taken, that is, out of the world of probability/possibility a result has occurred. More specifically and for our purposes more pertinent is the conclusion that the measuring observation causes the actuality of the proton that is observed. That is, the proton exists when it is observed, not before, not after. Strange findings! I will discuss this phenomenon a little later but, for now, we can note that just as measurement causes, in quantum mechanics, a wave function to collapse into a particular state, so likewise does a psychoanalytic interpretation create (in contradistinction to simply uncover), out of a myriad of possibilities, a given conclusion. What I am proposing is that we can liken interpretation in psychoanalysis to a quantum mechanics mode of measurement. I am suggesting an analogy, not identification, between psychoanalytic interpretative experience and quantum measurements. I will return to and develop this thesis in more detail shortly.

Psychoanalytic theory recognizes that what an analyst and patient bring to each moment, that is, their total life experiences, will affect how the analysis is conducted and, within that framework, that which is identified as repressed—specifically, how it is named and put into words. Put another way, we can say that we live in a universe of mind-numbing interactive probability/complexity. One obvious consequence of such complexity, Heisenberg (1958) concluded, is the impossibility of sustaining any rigid separation between the personal self and the objective world. He wrote, "Natural science . . . describes nature as exposed to our method of questioning . . . it makes the sharp separation between the world and the 'I' impossible" (p. 81). The level of interpretive work analysts engage in, likewise, does not support a rigid separation between self and world or that of analyst and patient either. As this discussion develops I hope to further support my conviction that quantum mechanics findings provide a theoretical model that, if applied to psychoanalytic

practice, can offer a clarifying model for diverse clinical findings and multileveled interventions, which do not necessarily issue in *predictable repetition*. I am not proposing criteria by which to judge the effectiveness of clinical interventions.[10] The quantum model I am outlining has to be understood on a different level of abstraction.

Notwithstanding that reality is one, we obviously distinguish between the macro world of everyday experience and the micro world that quantum physics studies. While both worlds are the basis for our experience of reality, they offer radically different experiences of it. For example, in the macro world of everyday experience, either/or statements and judgments are normative, that is, a thing cannot be and not be at the same time. But in the micro world (*and for grasping the complexity of the human psyche*) such a principle of contradiction is not applicable. In the micro world absolute distinctions between past and present, here and elsewhere, are difficult to maintain.[11] In the micro world of quantum physics reality is understood as a construct, which is obviously different than measuring an objective, independent, material, out-there macro world. John Wheeler famously noted that the questions we ask determine the answers we get (an observation that is equally valid in psychoanalytic practice).[12]

The noted physicist Edwin Schrodinger spoke to the issue of reality as a construct.[13] He concluded that our everyday notion of reality is *meaningless.* What we experience as true or not true, as present versus the past, as an object here rather than somewhere else, is questioned because of the strange findings of quantum physics. Speaking to this issue of the elusiveness of what we experience as everyday reality, I noted in a previous article (Gargiulio, 2006) that

> The physicist and writer Brian Greene offers a few examples of some quantum mysteries. Speaking of John Wheeler's delayed choice experiment, he writes: *The experiment brushes up against an eerily odd sounding question: Does the past depend on the future?* (p. 186). Richard Fenyman . . . has termed the phrase "sum over Histories" . . . to indicate that a proton takes every possible course, even backward in time. (p. 10)

It bears repeating to note that the scientific model that quantum mechanics employs, with, for example, its appreciation of the inherent limitations of exact measurement, the inherent unpredictability that flows from probability, and its assumption of the equation of potentiality and actuality provide, *by way of analogy,* useful models for understanding much of psychoanalytic experience.

I would like now to further my discussion of the repressed unconscious and its relation to quantum mechanics findings.

WAYS OF THINKING ABOUT REPRESSION

In a previous publication I (Gargiulio, 2006) maintained, and touched on the thesis mentioned earlier, that the repressed unconscious, as interpreted in the clinical setting, does not exist either before or after its interpretation.[14] What I hope to convey by such a statement is that we can compare an interpretation to an admittedly puzzling finding of quantum mechanics, that a particle does not exist before or after an observation, that is, a photon particle has no rest mass. In other words *it only exists* as it is and when it is observed. Werner Heisenberg (1958) put it this way: "But the atoms or the elementary particles themselves are not as real; they form a world of potentialities or possibilities rather than one of things or facts (p. 186). By way of comparison, then, we can likewise say that the dynamically repressed unconscious is a creation; it is not an ongoing reality in itself. It is only known by interpretation (self interpreting and/or analyst interpreting).[15] What we are comparing is a psychoanalytic interpretation to the act of measurement in quantum mechanics. What does this mean? It bears repetition to note that whatever memories, phantasies, or images that come to light in the course of an analysis have been stored in the physical brain. That, in itself, does not make them clinically or psychologically repressed. That makes them not presently available to a person's conscious recognition. It is through interpretation that they are understood, or experienced, as repressed. *Lifting repression is identifying a phenomenon as repressed.* But if this is the case what are we to make of Freud's theory of a counterforce keeping such

phenomena out of consciousness? Obviously there is no single counterforce but rather an array of defenses, the psychoanalytic metaphors, which explain the various personal and sometimes communal strategies used to not recognize, or accept, or explain, behavior or beliefs,[16] all of which serve the purpose of unawareness. Such an approach makes more sense of Freud's cryptic remark that at the end of analysis a patient usually affirms that he or she *knew it all along*.

Measurement, in quantum mechanics terms, as mentioned, represents the change that occurs in our knowledge when we become aware of what is referred to as *the wave function collapse.* Again, that means observation/measurement brings about a change from potential to actual. Likewise, clinical interpretation brings about a change in the knowledge of both analyst and patient by its very nature. For example, when a psychoanalyst puts into words what he or she senses is present but which the patient is not currently aware of, the analyst is creating the repressed unconscious via interpretation. This is similar to collapsing a wave function from a host of possibilities issuing in a particular possible meaning. The repressed unconscious "exists" but, to follow our quantum model, it exists as it is identified, only as it is named, through interpretation.

One of my objectives is to question the usual way analysts have of discussing the repressed unconscious, that is, as if it is an ongoing reality rather than an ongoing psychic possibility. That humans live in a world of information, some conscious, more not conscious, has clearly been established by psychoanalysis and confirmed by neurological findings. What is designated as the repressed unconscious, however, comes to be via interpretation; it is always, necessarily, in potentiality and sometimes in actuality. The repressed unconscious, it bears repeating, is a model—a theoretical model only. In this regard it is important to remind ourselves that "what we observe is not nature in itself but nature exposed to our method of questioning" (Heisenberg, 1958, p. 85). What I am highlighting by this quotation is not only the idiosyncratic nature of the clinical material that is the subject of interpretation but the structure of interpretation itself.

COMPARATIVE MODELS AND THE CLINICAL UNCONSCIOUS

In order to better situate our argument and to understand how I am using the term *the clinical unconscious* we can revisit some old discussions on the nature and reality of the unconscious. (Freud, as we know, spoke alternately of a generic unconscious and a repressed unconscious; in this paper I am limiting my discussion to the repressed unconscious.) The philosopher Henri Ey (1978) states: "We must remind psychoanalysis of what the intoxication of discovery has caused it to forget of its first fundamental intuitions: there is no Unconscious without the structure of consciousness" (p. 329). In this regard we should equally remind ourselves that the human brain's structure that allows for remembering and forgetting, for a variety of reasons, is not what we mean when speaking of the dynamic repressed unconscious. A clinical interpretation of the dynamic unconscious does not uncover a lost archeological find, as Freud's metaphor suggests, as much as it creates a new meaning for both patient and analyst. *It is not discovered by excavation but arrived at by interpretation.* Reawakened memories, or constructed or reconstructed phantasies, are meaningless unless understood within the context of an interpretation. At this point it is helpful to recall, once more, that any interpretation arises from all the innumerable factors, memories, phantasies, thoughts, and conclusions that impinge on and affect both the patient and the analyst.[17] Furthermore, if ultimately reality is *nonlocal*, as many quantum physicists maintain, then an appreciation of the all-encompassing interpenetration/interaction of everything with everything is fundamental to understanding anything. Such a perspective is referred to as *entanglement* in quantum theory. I will return to this concept shortly.

The creation of meaning, given the diversity of subject matter each individual brings to the analytic setting, explains the necessary singularity of analytic practice. Therefore the frequent frustration on the part of some empirical scientists who are used to repeatable and testable duplication—who are used to what they consider as real material objects. What quantum mechanics has demonstrated, however, is that unpredictability is not ipso facto unscientific and that real-material-objects cannot simply be

taken at face value. Quantum theoreticians speak of "quantum randomness" and what they mean by that is "identical situations give rise to different results."[18] As puzzling as this seems, such findings have significantly broadened the notion of what science is. Perhaps the variability of analytic interpretations, while still presuming theoretical justification, mirrors a variability that is not alien to nature's deepest functioning. Predictability is not easily come by in the analytic situation, which, as I have mentioned, mirrors the micro world that quantum physics studies. In making this comparison I am not stating, obviously, that the unconscious is a particle or that it is a measurable *thing*.

Psychoanalysis deals with phantasies, memories, defenses, and reality experiences. Its models are metaphorical creations; its findings are specific, while its assumptions are universal. What I am suggesting, with the preceding example, is that if we can grasp the significance of quantum findings about a particle, we might better conceptualize what is done in the clinical setting when an interpretation is created. Freud's concept of overdetermination is a suggestive parallel to what we are discussing. As a personalized creation, an interpretation is not easily replicable, just as the infinite range of probability waves a particle can traverse is not replicable. That factor, in itself, is no reason to discount the scientific usefulness of psychoanalytic practice.

RETURNING TO MIND

Body and brain, we can summarize, situated and operating within a given historical community that forms and informs, through its various languages, a person's identity, are the realities that go into making up what I have spoken of as mind. Winnicott's pathological mind, the split-off mind, comes into existence as a reaction to early developmental failures, that is, when the mothering environment is not up to its side of the process. It is out of this awareness that Winnicott speaks to the reality that there is no such thing as a baby, that is, without the mothering environment. To this we can clearly add that there is no such thing as a mind without a community in which it comes to be. More specifically, there is no such thing as a dynamic unconscious without the community of patient and analyst and the

presence of interpretation, just as there is no such thing as a particle without observation. There is only one closed system, and that is the cosmos itself; everything within that system is intimately and interchangeably related to everything else in that system; it is what quantum physicists refer to as *nonlocal*.[19] The system, of course, is what we humans call reality. Consequently, as is currently recognized in the psychoanalytic literature, no analyst is a separate, unaffected, noninterfering neutral observer. One thing that quantum mechanics has confirmed is that there are no neutral observers. Additionally, building on the quantum concept of nonlocality, we can recognize that we are all part of, interact with, and are manifestations of the reality in which we live.

The quantum thesis that the cosmos is one closed system offers an interesting footnote, as it were, a possible new perspective on the medieval Judeo/Christian/Islamic philosophical question as to whether there is one mind, in which each human participates, or many minds—as would obviously seem to be the case. This is not to posit any overriding God-reality that embodies such a mind. What it might suggest is that we higher vertebrates are, perhaps, momentary expressions of what we call intelligence, of what we experience as information and classify as meaning. Meaning, in this context, encompasses the sum of experiences that go into making both internality and externality. What we experience as life is one manifestation of a particular history of an unimaginable and uncountable number of wave functions.[20] Heisenberg (1958) stated it this way: "The world thus appears as a complicated tissue of events, in which connections of different kinds alternate or overlap or combine and thereby determine the texture of the whole" (p. 107).

What we experience as the dynamic repressed unconscious is the coming to be, the passing away, and the continual expansion of one small aspect of what we have called mind. Mind comes to be, as we have discussed, through one's personal history and interactions, just as much as through the communities in which one lives. It is as if mind itself, to employ a finding from neurology, is a mirror neuron and, therefore, any notion of self is automatically a notion of environment. Any notion of singularity is simultaneously and necessarily communal, a fur-

ther elaboration of the quantum concept of entanglement, in quantum thought.[21]

SUMMARY

These brief reflections will have served a purpose if I have managed to convey a few of the puzzling findings that inform quantum mechanics and of how such findings and assumptions might be helpful to analysts conceptualizing their work. Part of that conceptualization entails understanding the concept of mind in a wider context than is usually recognized. Mind ties us to each other much more than it locks us within ourselves. While the professional parameters of patient and analyst entail a certain asymmetry, there is absolute symmetry as patient and analyst contribute and create the process and any interpretations that arise from that process. Put another way, we might say that the experience of and creation of meaning is democratic; it is not hierarchical. Mind is as much a shared reality as a personal experience. As an individual is able to experience such a shared reality, he or she can transcend mind as a pathological entity and experience mind as a communal accomplishment. Living life is simultaneously a singular experience and a communal accomplishment, an accomplishment that mirrors the interrelationship of every atom with every other atom in the cosmos.

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NOTES

1. Regina Pally (2007) writes: "Among neuroscientists it is well accepted that 'mind' is a product of brain activity, and that psychological processes are the result of underlying brain processes" (p. 875). Of course the question is *the result of* or, *the same as*. I would have no difficulty with this statement

as long as the experience of mind is understood to be *dependent* on brain functioning. Mind and brain cannot simply be conflated.

2. Buddhist practice offers the possibility where an individual can feel safe to have "no-mind" in order to regain and/or sustain feeling alive in one's psyche/soma. The reality of being alive, in absolute quietness, which is beyond figuring out and problem solving, is basic to achieving any self-transcendence, i.e., resolving narcissistic self-preoccupation.
3. See Rorty (1979), chapt. 3, in particular.
4. Meaning, of course, has a very wide range of signifance, from simple identification, as "this is a cat," to, for example, the more abstract, "The concept of reality is merely an operational construct."
5. Gargiulo (1998a) "ultimately, then, it makes no sense to believe in anything if that means forgetting the metaphorical nature of knowledge" (p. 8). After this paper was written I became aware of both Modell's (2003) excellent discussion of metaphor and meaning. as well as Rorty's (1979) analysis of knowledge from a pragmatist's perspective. Rorty writes, "If we see knowledge as a matter of conversation and of social practice, rather than as an attempt to mirror nature, we will not be likely to envisage a metapractice which will be the critique of all possible forms of social practice" (p. 171).
6. See Cavell (1988), for a comprehensive and deeply penetrating discussion of how meaning is embedded in community. Many of my own conclusions in understanding mind are related to her creative work.
7. Note the following from Zvi Lothane (1992): "Fantasies exist because perceptions exist: one is a necessary prerequisite of the other, or else we would never be able to remember a dream, let alone go through an analysis, or the examined life" (p. 31).
8. For a more detailed discussion of the concept of coherence as a norm to evaluate psychoanalytic interventions, see Gargiulo (1994) and Summers (2008).
9. For an incisive discussion of information theory, see Seife (2006). "The 'thing-in-itself' is for the atomic physicist, if he uses this concept at all, finally a mathematical structure; but this structure is–contrarty to Kant—indirectly deduced from experience" (pg. 91 Heisenberg 1958/1999).
10. Summers (2008), as mentioned, offers an operative norm by which analysts can reach a common criterion for judging clinical interventions. This is an excellent discussion of what besets psychoanalysis as a scientific enterprise.
11. The quantum concept of *entanglement*, among others, addresses such issues. In reference to the notion of the apparent distance between things Wolfram (2002) defines "entanglement" as "separated parts of a system [which] often inevitably behave in irreducibly correlated ways" (p. 1059). Put another way, the cosmos is one system, not a collection of many subsystems. (See n. 18 and 20 in this paper). In this vein we can also note that "time-reversal symmetry" is defined by Greene (2005) as "the property of the accepted laws of nature in which laws make no distinction between one direction in time and the other. From any given moment, the laws treat past and future in exactly the same way" (p. 541).
12. Heisenberg (1958) noted: "What we observe is not nature in itself, but nature exposed to our method of questioning. Our scientific work in physics consists in asking questions about nature in the language we posses . . ." (p. 58).
13. Mara Beller (1999), commenting on Schrodinger's convictions, writes, "the

concept of reality as such, as it objectively exists independent of all human observers, is indefensible, if not downright meaningless. . . . Still, the concept of reality, Schrodinger held, is as indispensable in science as it is in everyday life" (as quoted in Gargiulo, 2006, p. 10).

14. Freud (1923): "We restrict the term unconscious to the dynamically unconscious repressed" (p. 15).
15. Gerald Edelman (2006) speaks to a similar conclusion when he notes that "the very complexity of the brain's repertoires [means that] every act of perception is to some degree an act of creation and every act of memory is to some degree an act of imagination" (p. 100).
16. Peter Medawar (1982), the noted English biologist and philosopher, speaks to this issue when he notes his conviction of our subjective sense of different and at times conflicting experiences of one's "I." Defenses are not armor (even thought they sometimes function that way); they are not taken off and on, so to speak. We might liken them to the shape of consciousness and consequent self-experience. Defenses are not facts; they are likewise created by observation, that is, by interpretation. In this vein note Medawar's comment: "Facts cannot be observed as Facts except in virtue of the Conceptions which the observer himself unconsciously supplies" (p. 130). The world that quantum physics has given us is the world as observed, as interpreted, rather than any world in itself.
17. We might compare this reality with the quantum mechanics assumption of "decoherence." Briefly put, the concept of decoherence tries to account for our macro perceptions by postulating that all the impingements, all the photons, for example, which affect a given situation cause the probability wave functions to collapse into one stable macro object that we, in fact, observe. Brian Greene, (2004) notes: "Decoherence allows quantum probabilities to be interpreted much like classical ones, but does not provide any finer details that select one of the many possible outcomes to actually happen" (p. 213).
18. See Herbert 1985, p. 119ff.
19. This is known as Bell's theorem of nonlocality. Greene (2005) explains nonlocality this way: "The outcome of what you do at one place can be linked with what happens at another place, even if nothing travels between the two locations—even if there isn't enough time for anything to complete the journey between two locations" (pp. 114–115). See also Maudin (2005), p. 478ff.
20. The physicist Hugh Everett has maintained that each wave function issues in a new world, a model, currently being studied anew, known as the many worlds theory. See Herbert (1987), p. 19ff. and Byrne (2007).
21. One way of understanding "entanglement" is to think of the cosmos as one totally interrelated system. Put another way, from a quantum mechanics perspective (Bell's theorem), we have to consider that reality is nonlocal, meaning that distance, between objects, is not experienced. See also n. 18.

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