

The Psychoanalytic Unconscious in a Quantum World  
*A Contribution to Relational Psychoanalysis*  
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This morning I would like to share some thoughts relating quantum mechanics findings and psychoanalytic clinical experience. Such a comparison offers a way of appreciating psychoanalytic clinical practice that not only helps us situate the respective contributions of analyst and patient but also one that closely parallels an accepted area of scientific discourse. My hope, as we reflect on such findings, is that you will recognize that there is significant benefit in relating these two disciplines; notwithstanding the fact that we are walking on a bridge of analogy, so to speak.

Werner Heisenberg (1958), one of the pioneers of quantum physics, stated that this science made a break with what he calls the materialists in science. I will explain what he means by this as we go on. Before doing so, however, it is important to reiterate that the bridge of analogy, which we will be walking on, is one comparing process, not content. What do I mean by that?

What I am proposing, a thesis, so to speak, is that the clinical process of naming, and therefore identifying some clinical material as unconscious, is similar to the observational process, in quantum mechanics, resulting in the coming into actuality of a proton particle, for example. In addition to discussing this particular process, I believe that some findings of quantum mechanics can provide a satisfying framework for other psychoanalytic experiences. Such as, for example, the obvious difficulty, from an empirical perspective, of explaining the wide spectrum of interpretations, even given a hypothetical same patient, that psychoanalysis offers. Certainly an issue with those who equate scientific thought with replicability. A more basic problem that I am addressing, and where quantum findings can impact psychoanalytic experience, is in correcting the tendency to reify psychoanalytic concepts. Psychoanalytic formulations are metaphors, the clinical unconscious, for example, or the defenses are metaphors, not ontological realities. What this all means should become clearer as we

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discuss some basic quantum mechanics findings.

On a popular level, most people have heard of quantum physics's principle of indeterminacy (the uncertainty principle). What does that mean? Briefly what Heisenberg established is that one cannot know, with certainty, the location and/or the speed of a proton, simultaneously. The consequence of this finding has to do with the nature of what is referred to as the micro world or micro reality. In the micro world *probability*, as a norm, takes precedence over replicable *predictability*. And it is crucial to know that probability does not describe one event but rather, as Heisenberg (1958) tells us *...during the process of observation, a whole series of possible events ...* (p.54). This essential aspect of the micro world can help us contextualize the fact that there is no way, of course assuming that different analysts are competently trained, sensibly intelligent, and ethically aware, that one can predict their significantly different responses even to a hypothetical same patient. Psychic determinism, I would suggest, has to be understood in view of such a finding. In this regard we can recognize that something can be mechanistic without being determined; but we cannot develop this at the present time. Historically, Edward Glover's, as well as others, warnings about the danger of inexact interpretations, comes out of a scientific framework that assumes predictability, not probability.

Without the phantasy of *the correct interpretation* and with an understanding of psychoanalytic concepts as metaphors, as well as the illusive nature of predictable knowledge, John Wheeler's observation – applicable to physics as it is to psychoanalysis, i.e., *the questions we ask determine the answers we get* – is applicable for evaluating psychoanalytic clinical practice. Wheeler, from Princeton University, was a good friend of Einstein and his dictum echoes Einstein's conviction that it is the theory that determines what we can observe. This need not be seen as a hopeless relativism or wild analysis. How an experiment is set up determines the range of observations that can be made; the questions we ask determine the answers we get establishes the complexity of psychoanalytic inquiry not, in itself, its un-scientific personal arbitrariness. Clearly without a context, there are no facts – facts only exist within a given framework. What quantum mechanics has established is that the probability aspect of psychoanalytic discourse is not unrelated to other areas of scientific inquiry.

When Heisenberg established that one could not simultaneously know the speed of a proton and its exact location, that is, to know the one was to be ignorant of the other – he laid an essential cornerstone of quantum physics. Quantum theoreticians, in speaking about how, for example, an electron particle shows itself, speak of *collapsing the wave function*. What does this

mean? What is collapsing? In philosophical, as well as quantum terms, potential probability is collapsing into observable actuality. What causes such a collapse? Observation, that is, measurement creates the wave function collapse. Observation, I repeat, creates the reality that is being examined! This is obviously different than what happens in the macro world – but not so different, I am suggesting, from what happens in psychoanalytic practice when either an analyst, or a patient, make an interpretation.

In quantum discourse, the concept of potentiality has more force, so to speak, than is usually recognized in contemporary philosophical discourse. That is, potentiality is appreciated as just as normative a reality as actuality. An electron particle, for example, exists as an energy point *when and only when it is observed*. Just as what is unconscious is known, that is, comes into being, by being identified, i.e., by being interpreted. (I am not limiting interpretation to verbal discourse). An electron particle has an actual presence, out of an infinite world of potentiality/probability, when it is observed, via the wave function collapse. After it is observed, one can only speak of it as a potential reality, once more. An interpretation can likewise be understood as bringing into conscious awareness, out of the un-countable potential/probability reservoir of phantasies, memories, hopes, feelings, thoughts, and wishes we humans possess. I will develop this position as our discussion unfolds.

Given the indeterminacy of how a electron might manifest itself – for example as a particle (a quantum), or as a wave, as here rather than there, quantum theory, as we have mentioned, is clearly a theory of probability rather than predictability – notwithstanding that usually it is the highest probability that is observed. Quantum physicists often speak of this world of probability, as *a haze of infinite possibilities* out of which the cosmos comes to be. (I think that such an infinite haze of possibilities might very well be a helpful metaphor for the generic unconscious, but we cannot follow that line of thought at present.)

Repeatable, exact measurability, satisfying predictability, is extremely useful for the macro world in which we live. But such procedures are not useful for understanding the micro world of electrons, neutrons, protons, atoms, etc, which constitute the subject matter of quantum physics – notwithstanding that they are building blocks of our everyday macro world. To recapitulate: in the micro world something is actually real when it is observed, that is, when it brings about a change in the observer's knowledge; before that, and after that, it is only potentially real. It exists, so to speak, in the realm of infinite possibilities/potentialities

Freud, (1923) in *The Ego and the Id*, wrote ...*We restrict the term*

*unconscious to the dynamically unconscious repressed (p15)*. An observation that is still valid today, notwithstanding the archeological metaphors Freud used when describing such an unconscious. In this discussion it is important to clarify that I am not addressing the phenomenon of expectable memory loss, nor am I addressing the extensive realm of the non-conscious – that vast collection of physical and neurological processes that enable us to live and to function. I have questioned Freud's use of archeological metaphors when speaking about the unconscious because such metaphors suggest that the unconscious is somehow a place, i.e., the ever-present danger of reification – rather than simply a metaphorical clinical designation.

The unconscious is, as is obvious, a clinically useful concept. The evoked images of pushing out, placing aside, and/or keeping down, not acknowledging are, however, merely metaphors for an individual's capacity to turn his or her attention *away from*. That is, to experience significant gradations of his or her's conscious awareness. We human beings seem quite capable of turning the knob or light switch, if you will, from a very low level to a high level and then to sustain our choices (defenses). And obviously gradations-of-light is just another metaphor for how we handle the emotionally pleasant and/or painful.

We know, for example, that a brain surgeon can apply an electrical stimulation to certain parts of the brain and an adult subject will correspondingly talk as if he or she were four, five or six years old. Such a phenomenon is not what we mean by the unconscious. That all of our experiences are lodged in our brain does not establish the clinical concept of the unconscious. It bears repeating, although obvious, to note that psychoanalysis, in its clinical application, is a psychological endeavor, not a neurological one. We are not neurologists. Given the complexity of the psyche, however, we can use all the metaphors and neurological findings we can get, - as long as we keep in mind that our psychoanalytic concepts are not lodged anywhere – they only exist as points of reference for our understanding. The unconscious system has to be understood comparatively, like the limbic system; one is measurable, the other is descriptive. (Such a perspective does no violence to the reality that most of what we designate as the internal world is latent, is below the intensity of consciousness.)

I believe that the *collapse of wave function* model can be a useful analogy for what we are doing in clinical practice, when we make an interpretation. When an analyst brings his or her total emotional/feeling, intellectual and physical presence in response to what is likewise brought by the patient - (I include all the vicissitudes of projective identification on both sides) - and

selects, by conscious intention or by creative surprise, to bring something into more conscious focus, to give an interpretation of what is not available to the patient's full awareness, then, from a clinical perspective, we can speak of creating the unconscious. The interpretation makes what was potentially real, - actually real, very similar to what the collapse of the wave function achieves.

What potentiality are we talking about? An analyst, it bears repeating, out of his or her own world and capabilities, in response to the patient's world and sensibilities, responds by bringing to conscious awareness what was denied, repudiated, unacknowledged, or even un-thought, if you will. Usually the vehicle for such a response is language, informed by feelings, but such is not always the case. One reason why a psychoanalysis is theoretically unending is due, as previously mentioned, to the unimaginable number of stored life experiences, memories, phantasies, dreams, thoughts each human being has. Consequent upon such an array of material, any interpretation is, of necessity, subject to the here and now of experience and to the norm of probability, not replicable predictability.

Obviously, just as any micro experiment has to be carefully set up to be reliable, the equivalent in psychoanalysis is likewise the situation. An analyst must bring as broad based intellectual understanding and affective sensitivity he or she is capable of to the process, just as a patient must bring his or her pain, emotional history, intellect, and a deep desire for personal honesty. Encountering the unconscious is, in actuality, enabling a patient to turn the light of his or her cognitive and emotional consciousness onto the more dimly lit aspects of his or her memories, fantasies, thoughts and feelings. What I am focusing on in this discussion, I need to repeat, is process, not content. I am not addressing "the what," that is, the content of an interpretation.

If we are looking in the macro world for a useful framework to situate the variability of analytic practice we are looking in the wrong place. Alfred North Whitehead, the noted physicist/mathematician/philosopher, speaks of organizing reality in terms of *process*. His understanding is that everything is in a process of coming to be and a fading away. Consequently he, along with quantum physicists, does not accept any hidden *substance*, that is, any *thing-in-itself*. Heisenberg (1958. p.129) addresses the same issue when he talks of the scientific materialists or, more to the point, the *dogmatic realists* [things exist in themselves] in contradistinction to what he follows, namely, the *practical realism*. Applying absolute predictability [dogmatic realists] to psychoanalysis reduces psychoanalytic experience to an untenable concreteness, despite the macro world's need for predictability.

Freud, as we know, operated within a Kantian and positivistic scientific model. In one of his many attempts to describe the unconscious he compared it to Kant's *thing-in-itself*. No wonder there is such a danger to reify psychoanalytic concepts. There is no need, according to Heisenberg as well as Whitehead, to posit Kant's *thing-in-itself*. Heisenberg (1958) states that *...the thing-in-itself, is, for an atomic physicist, if he uses this concept at all, a mathematical structure; but this structure is – contrary to Kant - indirectly deduced from experience* (p.91). Such a conviction is consonant, I believe, with Gerald Edelman's (2006) observation 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). I read that as saying that the brain modifies. The mind does not impose the categories of space and time, for example, as Kant maintained. They are existent realities. That is, we can know the world, even the illusive, puzzling imprints of the micro world that we study. Put in psychoanalytic terms we might say that we do not just dialogue with internal representations, we talk, fight, love and hate real objects in the world in which we live. There is just one world, so to speak, of un-actualized potentialities – or, in John Wheeler's terms, one haze of infinite possibilities.

Wave/particle duality (Niels Bohr's principle of complementarity) implies that *every electron, every photon, everything, in fact, has both wavelike and particle like aspects*. (Greene, p.185). A particle, for example, can go through a double slit opening before it registers on a screen, and it can actually go through both slits at once and interfere with itself! We are talking about one proton – not two. In our macro world the principle of contradiction holds – in the micro world it does not hold. More puzzling, still, is that a particle seems to be able to go back in time. Richard Feynman, the noted American physicist, speaks of this strange phenomenon with his theory of *sum over histories*. In this same area of inquiry Wheeler's delayed *choice experiment* (Greene, p.186ff) suggests that in some way the past depends on the future. That is, one can change some of the variables mid-experiment and such changes will alter the events at the beginning of the experiment! These are very strange findings - so much for linear thinking and a simplistic notion of cause and effect as well as object/subject dichotomy. There are obvious comparisons here with Freud's thoughts about primary process thinking. Consequently, the *modus operandi* of the psyche, I believe, is much closer to our experiences of the quantum world than to the micro world in which we seemingly operate.

Edwin Schrodinger, another theoretician of quantum mechanics, spoke to this issue when he said that the concept of reality was, in itself,

meaningless (see Bella 1999) – that is, reality is a construct. What we experience as true or not true, as present versus the past, as an object here rather than somewhere else, is all questioned because of the strange findings of quantum physics.

I would like, now, to turn our attention to another important finding of quantum theory, a finding that deeply affects our understanding of our world and our psyche. I am alluding to what is known as *quantum entanglement*. The short translation of quantum entanglement is that reality – at its foundational micro level – is non-local. What does this mean? Briefly, it means that two particles, which are related, can and will affect each other, notwithstanding how distant they are from each other. They simultaneously affect each other despite the fact that no information, even carried at the speed of light, passes between them. The reality of entanglement, which has been repeatedly verified, has extensive applications. It is particularly helpful, I believe, in overcoming the operative assumption of a strict dichotomy between inside/outside and subject/object. Such dichotomies have plagued psychoanalysis since its inception. What entanglement seems to suggest is that the micro world is one-completely-inter-active, inter-dependent system. Location is not an absolute – the micro world is non-local - a theory that Einstein strongly disagreed with until it was definitively established by John Bell (1987), in the nineteen sixties. If we live in a cosmos that is one system, then it is not an exaggeration to say that each atom in such a cosmos is related to every other atom. The full import of what this means is probably beyond our human capacity to understand. But Reik's *Listening with The Third Ear*, and what Freud speaks to when he says the analyst turns his unconscious to listen to the unconscious of the patient takes on a new, more evocative meaning, via the reality of entanglement.

We can apply this reality of entanglement to the question of mind. That is, personal subjectivity is deeply entangled with the individual historical and social communities in which one lives; consequently, to modify one is to modify the other. Such a conclusion is the basis of my thoughts about mind, which I will discuss at the end of this paper.

If entanglement is reality how do quantum physicists explain the relatively predictable, distinguishable objects, of world in which we live? In other words, given the probability nature of the micro world and assuming that the wave-function collapse is a correct description, as well as the non-local quality of the micro world, how can we explain the experience and the appearance of our everyday object filled world? Quantum theory addresses this problem by positing what it calls *decoherence*. As best I understand this term it refers to the phenomenon that posits an un-countable number of wave

function collapses, operative within this one cosmic system, which are constantly interacting/interfering with each other and generating the observable/ experienced macro world. The world of larger and larger objects destroys what is referred to as coherent superposition. *Decoherence washes out*, [according to Bell, 1987] *quantum entanglement; putting previously entangled objects into a state where they behave as separate objects* (p.xxxiv).

Notwithstanding our day-to-day experiences of the macro world, Whitehead (1925), fifty years before Bell's confirmation of quantum entanglement, wrote, *...In a certain sense, everything is everywhere at all times. For every location involves an aspect of itself in every other location. Thus every spatio-temporal standpoint mirrors the world* (p. 114). Such a perspective suggests that a strict division between subject and object is not possible, a strict division between inner mind and outer world is not possible, and a solipsistic reading of an autonomous "I" is not possible. All such considerations have import for psychoanalysis. Speaking to this last point Heisenberg (1958) concludes that *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). I (2004, 2006, 2010) have tried to address some of these matters in previous publications; we have yet to evolve a psychoanalytic practice that takes full account of such conclusions.

In this staggeringly complex cosmos in which we live we can barely understand where we are, who we are, and what is. What we seemingly know is what one measures, via collapse of the wave function. We obviously also live in a world of emotional knowledge, aesthetic awareness, inference and possibly even thought transfers. Whitehead addresses such issues but he does so involving his rather obtuse categories. Quantum theory, in its understanding of a world of infinite possibilities out of which the world of probability comes to be, evokes awe and mystery. I (2004) have defined mystery as *the ever-receding horizon to one's knowledge*. The experience of awe does invoke a profound silence within us. We need mystery and awe in our lives – the task is to avoid mystification.

In this short discussion I have not mentioned *the many worlds theory* of Hugh Everett, who gives a different reading to the collapse of the wave function i.e., which function is also known as the Copenhagen interpretation. I have not addressed Edwin Schrodlinger's conviction, in any detail, that the concept of reality is necessary but ultimately meaningless concept. In view of the notion of entanglement such topics need extensive discussion. Nor have I have mentioned John Wheeler's Anthropic Principle – an attempt to

explain, teleologically, the structural reality of our world in view of the presence human beings. All of which have applicability, I believe, for psychoanalytic reflection.

Before I close our discussion, however, I would like to return to the issue of mind and offer some further thoughts – notwithstanding the complexity of the issue and the brevity of my presentation.

Mind is best thought of, I would suggest, as a bridge, not just a personal possession or an exclusive subjective experience. It locates us within a particular community at a particular historical moment. It has to do with the experience of meaning and the “location” of meaning, which arises in and from the communities in which we live. Mind, as I have mentioned, is a statement about our entanglement with such communities; it cannot be appreciated as if it is solely an internal possibility. In this regard I have built my understanding of mind as related to community upon Donald Winnicott’s, as well as M. Cavell’s (1988), thoughts. Winnicott (1958) writes that *mind is then no more than a special case of the functioning of the psyche-soma*. Elaborating on this he further notes that *the word psyche here means the imaginative elaboration of somatic parts, feelings and function, that is, of physical aliveness (p.244)*. Whitehead (1925) addresses a similar perspective when he writes, that *the organic starting point [for an understanding of mind] is from the analysis of process as the realization of events disposed in an interlocked community (152.)*. This issue, clearly, needs extensive discussion, particularly in view of the concept of entanglement. Unfortunately time does not permit such a discussion.

What I hope I have conveyed, in this short talk, is a rudimentary appreciation of how some of the findings of quantum mechanics might help psychoanalysts understand what they are doing by providing them with alternate models for their work. Models are alternate tools for aiding our understanding – they are not meant to be confining theories, demanding allegiance. Respect for insights given by our best thinkers should never suggest an exaggerated awe for the thinkers themselves. Just as we have to be on guard against reifying psychoanalytic concepts, we have to avoid “reifying,” so to speak, our theoreticians. Most of the authors I have read in quantum theory have avoided that kind of distracting adulation – even for their greatest thinkers. In my reading of psychoanalytic authors, I have not always found the same degree of restraint – the lack of which is more than unfortunate for any endeavor that searches for truth.

Thank you for your attention.

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