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Four Process Observations on Neuroscience & Spiritual Practices

By David E. Roy, Ph.D.

In the approximately 20 minutes I have – about the length of typical sermon – I would like to sum up everything I have come to know and understand about process thought, the relationship between the mind and the body (including the brain), the role of the Sacred in healing and growth, my spiritual and meditative practices, the ultimate aim of human evolution, who is going to win the election in November, and how we can resolve the global financial crisis.

Since by now that I have only about 19 and a half minutes left, I suppose I had better hurry. Fortunately, Whitehead indicated that what is excluded from the full picture leaves a tell-tale mark. Because of this, I am hopeful that if I just trace some broad contours about a few of these topics, the implications of what I might have said if I talked on and on and on will be clear.

There are any number of important observations from process thought that are relevant to our collective mental-emotional-physical-spiritual wrestling. I will limit myself to four.

1. The relationship between the psyche and the soma, the mind and the body:

For Whitehead, all of reality is constituted out of what William James called “drops of experience.” These subjective, experiencing events combine to create our

body and our mind. Therefore, the mind or psyche is not qualitatively different from the body, even if the events that constitute our psyche are developed in ways that the events of the body are not. This also means that our psyche is not reducible to our body, the brain in particular, which is another way of saying that understanding the brain will not fully reveal how the mind functions.

From a process perspective, one way the fundamental relationship between the mind and the brain can be described is as follows: The human brain, with all its complexity and specialization, serves to augment the full dynamics of the mind. Without the full complexity of the brain, the dynamics of the human mind would be unable to be realized. On the other hand, as I will suggest in the fourth point, it is possible that the brain has developed to this level of complexity in response to the potential complexity of the dynamics of the mind, as a way of realizing the mind's full potential.

Regardless of the merits of this previous argument, it should be clear that the mind and the brain have an incredibly intimate, interdependent, lively, interactive relationship. If something major goes wrong in the brain, obviously this has a tremendous impact on the mind. One only has to think of dementia or brain tumors to know the reality of this. The other way around is also true. This has been demonstrated for years with biofeedback. Intentionally meditating with auditory feedback can modify brain functioning as indicated by changes in brain waves from beta to alpha, for example. More recent research that Dr. Daniel Siegel and others have presented show that meditators can add neural growth to specific areas of the

brain. Other than Rene Descartes and the marketing departments of drug manufacturers, few today would argue that depression following the loss of a loved one or a career was somehow coincidentally the result of faulty brain chemistry. The loss of attachment and meaning is experienced in the mind and the brain responds accordingly.

There is an enormous array of important mental-emotional-mood disorders that are being described as faulty wiring, bad chemistry, and so on. These disorders are most likely much more complex than that description would suggest. With Whitehead, the conjunction "and" is much more appropriate than "or." It is not nature or nurture, but nature and nurture. The dance is continuous and complex and if we are not permitted to consider anything other than our biology, we will never obtain anywhere near a complete idea of what really is going on within and between human beings who are suffering and seeking to grow beyond that.

As David Griffin has demonstrated so thoroughly in his book, *Unsnarling the World Knot*, Whitehead's metaphysics resolves the age-old mind-body problem that Schopenhauer called the world-knot. This understanding enables us to see more clearly how human beings are capable of making novel choices not totally determined by the press of the past, to live beyond basic determinism – something virtually all of us take for granted in how we live our lives.

2. The source of novelty in the world:

The strict determinist point of view that underlies experimental science has a difficult, if not impossible, time accounting for novelty. Simply put, if every event is

totally and completely caused by an antecedent event, then there could be no change that was novel, that was not somehow predictable. While this philosophy may often work well in analyzing inorganic and organic matter at a biological, molecular, atomic, and sub-atomic level, it does not seem to work well with our common understanding of the development of human society. There are many developments over the course of recorded human history (not the least of which are scientific discoveries) that depend upon radical novelty.

Whitehead accounts for the introduction of novelty in a way that does not contradict either the strictly scientific form of causal analysis nor our human experience of new ideas. Whitehead's critique says that the perspective of the scientific world view is good as far as it goes, but that it is incomplete. One of his comments was that the laws of nature are better understood as the habits of nature. That is, science typically investigates the habits of nature.

For Whitehead, the potential for novelty is not only a fact of reality but can be seen as a primary driving force in reality. That is, the universe drives toward change, is totally under the sway of creativity. The chief agent of creativity is God, the Divine Eros. God, according to Whitehead, holds and orders all pure potential – eternal objects is his technical term. Then, based upon what choices have been made in actuality, God offers a uniquely configured "initial aim" for each event, including each instance of the human psyche. This Sacred initial aim seeks to lure us toward maximizing the comprehensiveness of our experience and points us toward maximizing our positive influence on the future. By comprehensiveness, I am referring to

increasing the complexity of our experience because that results in the kind of intensity that God seeks. By positive influence on the future, I mean that we are called by the Sacred Aim to seek the common good.

3. What is Mindfulness Meditation from a process perspective? Or, what is it not?

The attitude of mindfulness would fit what Whitehead called a subjective form, that is, how the subject feels what it is receiving. Mindfulness clearly is characterized by consciousness (also a subjective form) and most likely is a specialized form of consciousness. It is a way of experiencing self and the world that involves a certain kind of focused attention.

Now, of course, one kind of focused attention seems bound up with the urge to judge and to act. I am looking out the window as I write and I see a revolving wind mobile in the ground whose pole is not perfectly vertical. If the urge to correct this is strong enough – or the resistance to writing high enough – I may go out and reposition the mobile. This is not mindfulness.

If I simply enjoy the mobile with its stars and moons that revolve in the wind, this is probably much closer to mindfulness. I am receiving, I am enjoying, and I am at peace with the experience.

If I start worrying about the other things I need to do before the day is out, I am no longer in a mindful state – unless I simply become aware of this and, again, only observe what is happening with perhaps an attitude of slightly detached enjoyment.

From the perspective of Whitehead's theory of perception, one could say there is a shift in the ratio of his two primary modes of perception: The influence of *presentational immediacy* diminishes while the influence of *causal efficacy* increases. Let me explain these terms and ideas briefly. In *Symbolism: Its Meaning and Effect*, Whitehead developed a theory of perception that he later brought into his *magnum opus*, *Process and Reality*. In his theory, there are two pure modes of perception that, when combined, produce consciousness. The more basic or fundamental mode he termed *causal efficacy*. We know this, roughly speaking, as something that hits us in our guts. In its extreme form, it is entirely receptive. We feel the "causal efficacy" of what comes into us at any given moment. The word "attunement" would belong with this mode. As a therapist, I frequently have experiences with clients that are of this nature where I literally resonate with their moods and emotions and even, occasionally, actual bodily sensations. This mode also brings into us our sense of connection to our body and the world around us. It is via this mode that we experience the ultimate in intimacy, whether with another person, the world around us, or the Divine in our midst. Interestingly, Whitehead believed that this mode also could function without mediation (non-mediated causality at a distance). In this way, it would account for what process thinkers term "internal relations," whereby our experience of another is literally a part of us – the ultimate in intimacy.

The other pure or direct mode of perception he called *presentational immediacy*. This, simply put, is what our visual perceptions most often are like. We see the world around us, out there, as it is presented to us in the here-and-now. It is in this mode

that we conduct much of our life: driving a car, performing scientific research, hunting for food (well, at least in the days in which we needed to do so or we would go hungry). Without any doubt, this mode is critical for survival purposes. This mode also emphasizes separateness, boundaries, fine-tuned discriminations.

I don't think there should be much doubt that this second mode of perception has the upper hand in much of life ... to the point that the first mode, including how it operates as well as what it brings into us, tends to be judged as suspect or simply not real. And, yet, we are vastly incomplete without the ability to appreciate and live out of this mode more often than we tend to do in our Western culture. It is through the kinds of experiences of connection, for example, that true compassion arises, that ability to feel what someone or something else is experiencing in the most intimate sense possible. (This is distinct in my mind from empathy, which is mentally imagining oneself in the shoes of another; this is much more akin to the mode of presentational immediacy.)

As I mentioned, for Whitehead, consciousness is the integration of these two pure modes (which he termed *symbolic reference*). This means that, in a general sense, both modes are always a part of our experience. However, it is definitely possible to have one mode be foreground and the other a distant background. I believe that mindfulness meditation reverses the typical figure-ground so that the mode of causal efficacy is foreground with all the healing properties that Dr. Siegel and others have brought to our attention.

The one thing that mindfulness is not, from a process perspective, is awareness in the present moment of the present moment. This is a technical issue, but I believe it helps focus our understanding better on what mindfulness actually involves. The technical part of this is that a becoming subject can only experience those subjects that have concluded their becoming – i.e., are now objects. This means we can be aware, in theory at least, of the immediately preceding moment, and all those that went before, but not *in* the present *of* the present.

This suggests that mindfulness helps us be aware of – literally, to feel – our sense of connection to our body and through our body to the world that is in our immediate surroundings. This requires an emphasis on causal efficacy. When people focus on what is going on in and around themselves, the emphasis becomes on felt experience and away from thoughts. For example, I often recommend a clear and delightfully simple book by Thich Nhat Hahn – *Peace is Every Step* – to clients as I guide them toward mindfulness meditation. The meditations in this book frequently invite readers to open their awareness to a fuller sense of connection to the earth, the sky, the rain.

Another key feature of mindfulness is a freshness of perception. Through the practice of mindfulness, we become able to wake up, to enjoy the novelty of our experience, to see and hear and feel anew. This has to heighten our experience of novelty, of feeling or sensing the pure possibilities realized in past actualities in a way that lifts them a bit out of the given, much as Whitehead defines a proposition.

Without going into any more detail, if this is the case, then this has the potential to make us more responsive or attuned to the ever-presented Sacred Aim.

Clearly this mode of consciousness – mindfulness – is greatly needed today for personal, interpersonal, and global healing and peace.

4. Does phylogeny reflect ontology?

As mentioned in a previous point, one of the overarching aims of the universe in the process perspective is to maximize intensity of experience based upon an integration of complexity. For example, when competing aims are fully harmonized (not homogenized), the outcome is more intense because the complexity of the now-unified experience is greater. In psychotherapy, this occurs, for example, when individuals are able to see their parents as whole people, to see their parents' positive and negative characteristics together in a single person. This is liberating for the client. This is true in many other settings. For example, I recently finished Doris Kearns Goodwin's book about Lincoln and his *Team of Rivals*. In Goodwin's careful analysis, one can see the same principle at work. Lincoln brought his political opponents along with others with divergent viewpoints into his cabinet, thereby setting the stage for more complex decisions.

A question for our own gathering is how this principle might apply to neurophysiology, in particular to the development of the central nervous system. The speculative assertion in this section is that the evolution of the central nervous system (phylogeny), the vertebrate brain in particular, appears to reflect the drive toward handling increased complexity that Whitehead's metaphysics (the ontology) would

predict. Of course, one could argue that the capacity to entertain complexity has a survival value, and surely it does. I am not here today to argue this point in a definitive way, simply to say that the possibility that evolution has been driven by the ontological need for increased capacity of the mental pole to entertain complexity and novelty is worth pursuing, perhaps in a conference of its own.

I want simply to sketch a few of the relevant points in this thesis to give an idea of what supports this intuition. This does require a small amount of technical information about Whitehead's metaphysics. This material is taken from my book, *Toward a Process Psychology*, where one can find a far more extensive discussion of the Whiteheadian material.

Whitehead's basic unit of reality, one of these Jamesian drops of experience, is called an *actual occasion*. By *actual*, he means real and by *occasion*, he means that it is an event, not an enduring thing. These events arise out of the press of the past and the lure of their initial aim and they configure themselves into some kind of harmonized integration of their dynamics, and then they are concluded.

Each such event has a *physical pole* and a *mental pole*. [See the diagrams at the end of the paper.] The physical pole is its conformal response to the past; this is sheer causality. The mental pole, on the other hand, represents the dynamic of the actual occasion where change can occur, where novelty can be included.

For actual occasions that constitute a rock, or the structure of the building we are in at the moment, hopefully there is very little if any novelty. We want the floor and walls and ceiling to stay put. But in each of our minds, we are aiming for new

ideas during this conference, are we not? We are hoping that the mental pole of our psyche – or someone else's psyche – can integrate these new perspectives that we are hearing and responding to internally and externally.

So, what goes on in the mental pole and how might this correlate with the evolution of the vertebrate brain?

The mental pole of an occasion is where the form that is fully realized in the preceding event is revisited. While this is vastly oversimplified, in a sense the question being posed is: Do I want to keep things the way they have been or do I want to make some changes? A key dynamic in this process is the ability to form theories and then test them against reality. For example, if rearranging a room, one could ask, does this room look better with this chair by the window or on the opposite wall? Or, do we even want a chair in the room? Perhaps a bunch of cushions on the floor would be better. Hey, what about fastening some of the cushions to the wall – or even the ceiling?

This brain storming, which involves what Whitehead called propositions, helps to give rise to consciousness and requires the capacity to contain and manage complexity of experience; or, put differently, to contain and manage complexity of perception. One of the obvious features that would support this is a sheer increase in brain size relative to body mass. The assumption behind this is that the body requires a certain amount of brain mass to run our basic biological systems. Anything left over, so to speak, can go to perceptual and processing demands. A second feature, only slightly less obvious, that would support this would be increasingly differentiated brain structures that become increasingly specialized.

Georg F. Striedter, a neurobiologist at University of California at Irvine, recently published a book on the Principles of Brain Evolution (Sinauer Associates, Sunderland, MA, 2005) in which he goes into great detail on these and other topics. There also is a summary of his book, "*Précis of Principles of Brain Evolution,*" *Behavioral and Brain Sciences* (2006) 29, 1-36. I believe this is available to conference participants on the web and so I will reference this in this talk.

Interestingly, one of Striedter's main arguments is that absolute brain size, which has been subordinated in importance to relative brain size for species survival, is a also crucial variable because it allows for increased brain specialization without having to increase brain size. Part of this specialization has to do with the fact that certain brain regions become both larger and in some ways more complexly wired.

Striedter's comments about this evolutionary process for the branch that led to *Homo sapiens sapiens* are certainly intriguing. He points out that, "In the roughly six million years since hominins (bipedal apes) diverged from other apes, absolute brain size increased dramatically (roughly fourfold). Particularly intriguing is that this increase in absolute brain size was not 'slow and steady,' but occurred in several bursts" (p. 9). The first leap was to double. That lasted 1.5 million years. Then half a million years ago with the appearance of *Homo sapiens*, the brain increased again, as much as doubling again by about 100,000 years ago. One of the results, according to Striedter, is a significant increase in neocortical connections that "... probably allowed modern humans to produce more finely controlled movements of the hands, respiratory

muscles, eyes, jaws, lips, tongue, and vocal folds." (p.10) Not only can we speak as a result of this, we also can make faces at each other!

In addition, says Striedter, "Within the neocortex, the lateral prefrontal cortex became disproportionately large ... [which] increased the amount of influence that the lateral prefrontal cortex has within the brain." (p. 10) Other factors associated with the increase in size "... encouraged the two hemispheres to become more asymmetrical" (p. 10)

Striedter, interestingly for those of us here interested in the possible relationship between process metaphysics and neuroscience, has this to say about Darwinian evolution and the need for a metatheory:

Once upon a time, biologists tended to think that evolution was guided by a single law of progress that caused simple organisms to become complex, and "lower" species to ascend "the scale," but that view is no longer tenable. Nor is it sensible to argue that all of biology can be explained solely in terms of Darwin's law of natural selection ... for natural selection has to work with raw materials that are subject to a variety of other principles or laws, including what we generally call developmental and/or physical constraints. Although this view of biology as being governed by a multitude of laws bothers some philosophers of science ..., it is not really troublesome, for most complex systems, including those studied by physicists, tend to be governed by a variety of laws, forces, and factors that interact. Therefore, biologists ought not to whittle down their list of laws, but seek a unitary theory that accommodates and unifies a lot of different laws. Because that unifying theory is incomplete, most evolutionary explanations are just explanatory "sketches" rather than full-fledged theories. (p. 1)

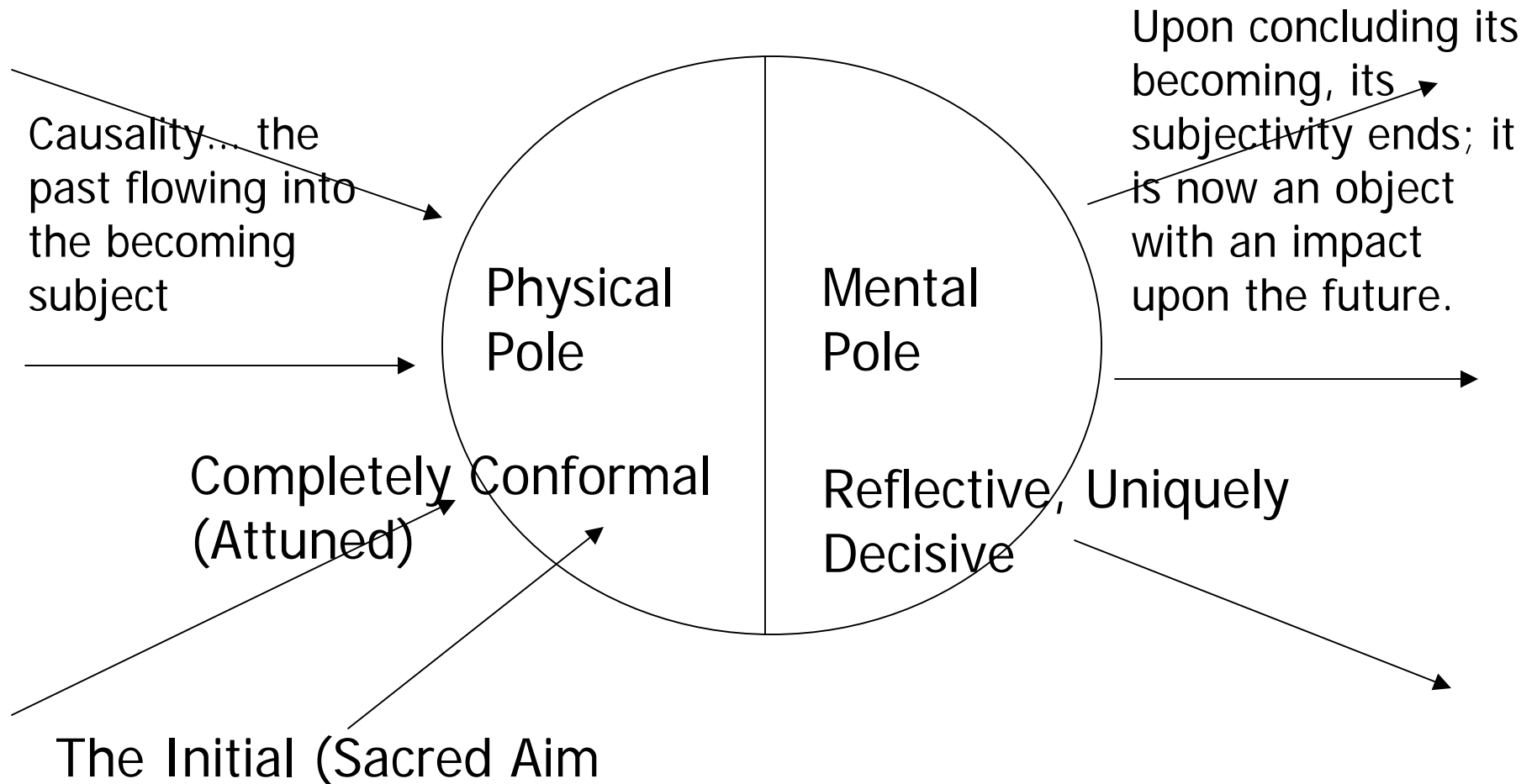
As a process person with an enduring interest in neuropsychology and neurophysiology, as well as spirituality and meditation, I see a potentially significant opportunity here.

Conclusion

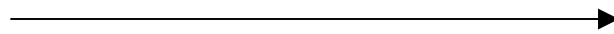
By way of concluding, I want to share a comment about my own work as a pastoral psychotherapist – that is, someone who does therapy from a pastoral or sacred perspective. Often, my work is a spiritual experience, particularly when I am in a more mindful frame of mind. This is another way of saying that part of my own spiritual discipline is my clinical work. The other half of this aspect of my spiritual discipline is an on-going pursuit of my own growth and healing in my own therapy. I do see the development of the fully compassionate person as the aim of human development and therefore a underlying goal of psychotherapy.

While I don't know who is going to win our election in a few weeks or how to resolve the global financial crisis – sorry if I misled you on those promises – I do know that we as a nation need to become far more compassionate toward others, including those within our own nation as well as around the world. Though we are involved here these few days in a highly speculative exchange, my hope is that our work can contribute to the actualization of the vision of a world at peace with itself.

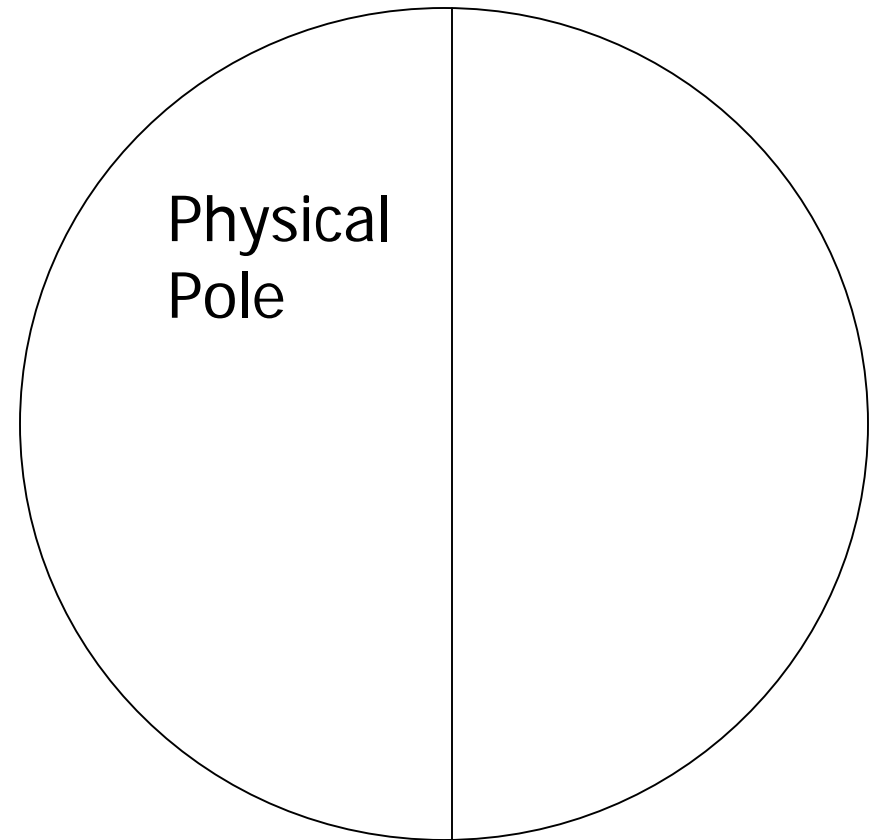
An Actual Occasion (a drawing of the undrawable)



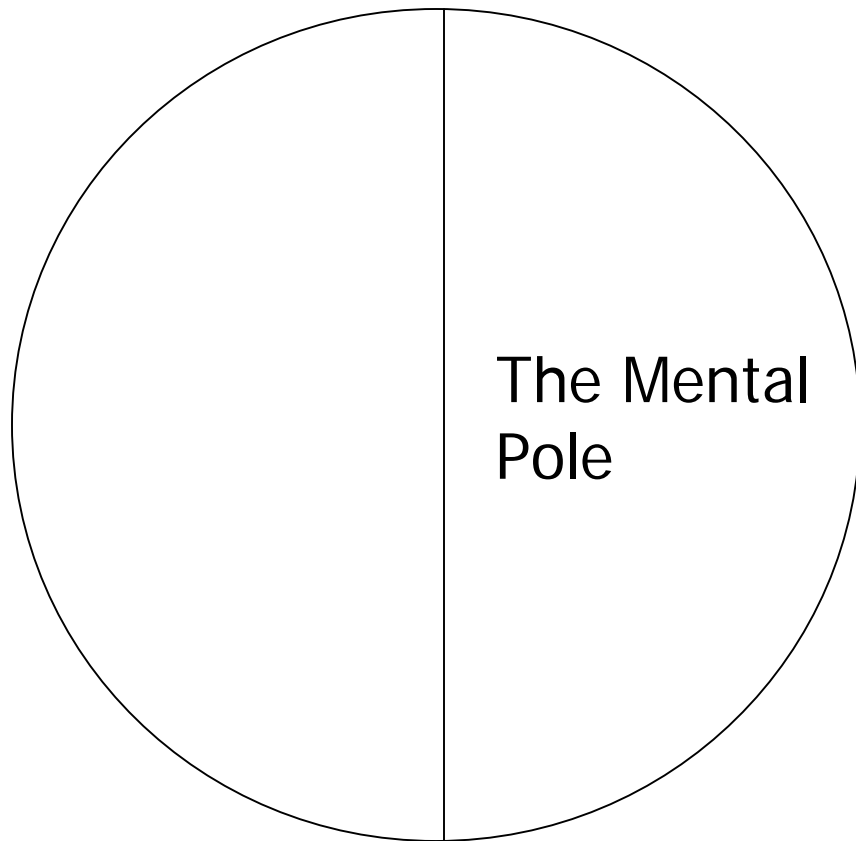
The physical pole of an actual occasion is fully receptive to the past. It is completely conformal and in that sense, fully attuned to what it receives.



This pole correlates with perception in the mode of *causal efficacy*. This is akin to the feeling in our gut, to feeling the “vibes” of another.



Come to me as you are.



The perceptual mode of Presentational Immediacy is associated with the Mental Pole.

The Mental Pole is where the subject "rethinks" what has been, reviewing the "form" (the eternal object), deciding whether to keep it the same or to introduce changes ... i.e., a consideration of novelty, a fresh vision. The novelty is introduced by the Initial (Sacred) Aim but the decision is entirely up to the subject.

The Mental Pole, if sufficiently developed, can give rise to consciousness.