In Search of Stepping Stones

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Abstract

Exploring the unknown is a task that scientists and mystics alike have set themselves, although starting off in rather different directions. At first, these tasks were seen to be sufficiently different, so that they did not crowd each other. But by now scientific insight has grown to such an extent that there seems to be less and less room for mystic explorations. Simply said: there seems to be little left of an unknown to jump into, in order to find a deeper grounding for our fleeting world of experience, through direct contact with reality, call it mystic, spiritual, or contemplative. Will the objective approach of science have the last word, and tell us how our experiences, from the every-day to the deeply spiritual, can seen as simple consequences of complex electrochemical phenomena in the brain? Or will further progress bring about a modification of both scientific and contemplative approaches, perhaps introducing a form of science of the subject, together with a heightened appreciation of the limits of the describable, even in a world of objects? In order to address those questions, what we need are stepping stones to connect the bodies of knowledge that have been acquired in different traditions. A systematic way to return to the phenomena themselves may provide such a stepping stone. Already familiar in science, philosophy, and personal paths of explorations, but under rather different names, such a phenomenology may help the different sides to reach each other.

1. Searching for an opening

I love to read the writings of Medieval mystics. In many ways, their world is close to that of ours, when compared to the world viewed by non-European traditions, past or present. Their Christian outlook is familiar, and not yet sharpened through reformation and contrareformation and struggles against science, enlightenment and secularization. When they give a voice to their experience, I can relate to them. And to some extent I envy them, given that they lived in a time when there clearly was room for mysticism.

Not that they had it easy: every deep mystic ran the risk to be brandished a heretic, with dire consequences. But it was generally accepted that human knowledge was rather limited, that many aspects of reality were totally mysterious, and that it made sense to contemplate reality, in meditation and prayer and philosophy, in order to get deeper in touch with reality itself. It was a time in which nothing was yet known about the basic structure of matter. Was it continuously divisible, or did it really consist of atoms? There was no knowledge of DNA, or of germs and bacteria, and for all they knew, small animals could spring into existence spontaneously. Little was known about far-away continents on Earth, and even less was known about the Moon, Sun, planets, and the stars.

With so many aspects of life remaining unknown and mysterious, it must have seemed quite natural to jump into the unknown. It may not have seemed like a reasonable thing to do for many people; spiritual seekers have always been in a small minority. Jumping in the dark is not something practical-minded people like to do. But at least there was a darkness to jump into. With the world on the largest and smallest scales totally unknown, and the complexity of living bodies and minds equally unknown, it must not have been unnatural to search for the unknown in one's own heart and soul.

We now live in a very different world. It often seems as if there is no darkness left. The brightly lit streets and buildings at night are an apt metaphor for the light that science has thrown on the large, the small, and the complex: from the edge of the visible universe to subatomic structure to an understanding of the human genome and the neurophysiology of the human brain, we can get the impression that we basically know the lay of the land by now. The overall structure of reality seems to be captured quite well in the current frameworks of physics, chemistry, biology, and cognitive science. There are many details waiting to be resolved, but one may argue that the broad outlines of a scientific world view are in place.

Whether to subscribe to such a view or not is an interesting topic for discussion, but either way it seems clear that there really is very little darkness left to jump into. At least, that is how I felt, when I grew up and tried to make sense of my conflicting interests in natural science and in some of the more contemplative approaches to dealing with the world. I loved to read up on math and physics, to do experiments (some of them quite dangerous) in chemistry, to do observations with my hand-made telescope, and to tinker with machinery such as old motorcycles. At the same time, in the late sixties, Eastern religions had become a fashionable topic, so it was natural that I started reading about Hinduism, Buddhism and Taoism, when I was 17 years old. And then the trouble started.

I saw a huge paradox. My own culture and upbringing had presented me with a world without anything dark to jump into. Yet those writings from other cultures spoke directly to my heart, each one describing different paths for jumping in the dark, and for finding other aspects of reality than were explored in the glaring light of science. I felt torn. Clearly, science had uncovered an important form of truth about reality. Equally clearly, I felt that those non-European writings also touched upon an important form of truth about reality. Howe to reconcile the two? How to find an opening in my own received world view? This search for an opening, fueled by a yearning for a dark to be able to jump into, would occupy my main concern ever since.

2. Containment

Reading about emptiness and openness in Buddhism, about a search for one's True Nature in a quest for some form of enlightenment, all of that resonated with me. At the same time, I had no idea how to reconcile that picture of the world with the scientific picture I had grown up with. While I explored the world of science from the inside, studying astrophysics and later making a career in that field, I kept wondering 'what contains what'.

From a materialist point of view, reality is simply given as complex patterns of matter and energy in space, originating in the big bang, and unfolding every since in time. From that point of view, all human experience, and by implication any sense of values, beauty, responsibility, etc., are just products of the brain, a most complex material structure, but nothing more than just a complex material structure. In that sense, any form of spirituality is a product of software anchored to the hardware of the brain, itself a tiny speck in a vast universe. In other words, the reality of matter contains the appearance of spirituality as a pattern of complex information, localized in human brains.

From a contemplative/spiritual/mystical point of view, the story is quite different, and also there is not just one story. Different stories posit our familiar material reality to be one realm out of many, not the only one and certainly not the ultimate one. In monotheistic religions, God is seen as wider than or above the material reality, interpreted as his creation. In other religions, different creation myths talk in different way about realms wider or other than that of our familiar material world. So in general, our everyday realm is contained in a larger, essentially non-material world.

How to reconcile those two approaches? It is hard to see how both can be right, with each one essentially claiming a different inclusion relation. Which realm contains which? Perhaps the scientific picture of reality is 'really right', while it still may be useful to live your life *as if* the religious view is right, in order to lead the richest form of 'inner life'. However, such a surrogate way of approaching spirituality seems to take the life out of it even before getting into it. But what is the alternative? How can the spiritual picture of reality be 'really right', if science seems so clearly unstoppable in its move to explain all and everything around us, even the details of how our brains and bodies function? If spirituality is pushed toward a ghostly realm vaguely and symbolically enveloping our material realm without any measurable consequences within this realm, then what good is it for us, what is its 'cash value'?

So, with no opening inside this world, and no horizon either to peek across, it may seem as if we have become prisoners inside a world of objectivity, a marble scientific edifice with no windows, doors, or even trap doors to any other world. There seems to be no room even for cracks in the walls; what would they be cracks in, what could they possibly lead to?

3. Laboratory Life

While I continued my experiential investigation in forms of Japanese Zen Buddhism and various aspects of Tibetan Buddhism, I more or less put on hold this burning question of 'what contains what'. The exploration itself was fascinating, and little by little I learned to view my life as a laboratory.

From my earliest contacts with Hinduism and Buddhism, I had been struck by the scientific character of their investigations of reality, starting from the phenomenology of human experience. Just as a scientist retreats into a lab, in order to study a well defined small part of reality in a disciplined way, so the meditator is invited to go to a quiet place and to focus his or her mind in specific disciplined ways. And in both cases, the goal is to then recognize and apply what has been learned in the world at large, in order to understand the world better and live a more effective life.

Just like there is a continuum between lab work and field work in science, so there is a similar continuum between sitting on a cushion and living your life. In meditation exercises you learn to explore more of the functioning of your body and mind. The challenge then is to carry over that same open inquisitive attitude to an exploration of the reality of your daily life. And the most important lesson I learned, in both science and spirituality, was the importance of failure.

If somebody asks me what I do as a scientist, the whole day, I sometimes answer: I am being paid to make mistakes. Scientific research means groping in the dark, daring to make mistakes over and over again, until you find what you were looking for – or often until you find something else, that you were not looking for but that turned out to be more interesting. When you write a paper, after three months of research, it may be that you can replicate all your work in only three days or less, once you have learned how to approach the problem you were working on. But without first having explored all kind of blind alleys, it is unlikely that you would have found the answers.

So in scientific research the point is: don't be afraid to make mistakes, but be sure to learn from every mistake you make. In order words, take care to make notes of all you do, so that you don't have to make the same mistake twice. I have found the same attitude to work quite well in my contemplative explorations, and especially in my attempts to carry over what I learned into daily life.

For example, my first attempts to do some form of zen meditation were well intended, but I was incredibly stiff and tight, I now realize. Without any teacher at hand, I tried to follow the written instructions of various books, and soon I got quite frustrated and disappointed. Although I tried to persevere, off and on, it was only much later that I began to understand how to approach meditation. The combination of personal instruction, more meditation experience, more life experience, and finding more sensible books to read, all brought me to a key insight.

I began to realize that the point of meditation was not to forcefully shut out all that seemed to distract me from single-minded concentration, but rather to accept and embrace any and all distractions, and to let them be part of the practice. Letting my meditation become an engine that was running on all kinds of fuel, on anything that presented itself, was the largest breakthrough I have experienced. From that point on, I could treat my spiritual practice, in daily life as well as on my cushion, in true laboratory mode. No longer was I frustrated by my perceived lack of understanding or lack of tangible results. I was happy to continue making mistakes and learning from them.

4. Laboratory Reports

Having found a mode of 'life as a laboratory', I started to keep a detailed diary, keeping track of my daily practice, my dreams, my reactions during the day, my reflections on what I read and heard and felt. And soon I felt the urge to start writing lab reports. I had a double motive to do so: the obvious one was to share my experience with others, but it was equally important for me to find an ability to express myself clearly enough, as a test for my own understanding. I know from my scientific experience that the point of writing a clear article is not so much to provide proof of my own understanding of a piece of research; rather it is in the process of writing that my understanding crystallizes, by realizing precisely where my insight was still lacking.

In other words, to test my own understanding of what I had learned from my spiritual pursuits, I wanted to be able to formulate my insight for the most critical of audiences that I had encountered in my life: my fellow scientists. Not that I had much hope or expectation that I would be able to convince many of them that what I did was valuable, let alone that it was on a continuum with scientific research. I had no illusions along those lines. Perhaps science will grow into an open contact with methods that transcend its current objectivistic attitude, but I don't expect that to happen in my life time. Science is still young, only four centuries old, and I would not be surprised if it would take a few more centuries before the study of the subject will become as respected as the current detailed study of the objective side of reality.

My aim was not so much to be understood, as to be at least understandable. If I would feel that my laboratory reports would be understandable for my colleagues in science, I would be satisfied. And from there on, I would be delighted to engage in an open dialogue with those scientists who would be interested to discuss my views, and to compare it with their views in an open and respectful form of peer review – much as all research within science is (or should be) conducted. It was about ten years ago that I started to put my pen to paper, in an attempt to become understandable.

What do I mean with 'becoming understandable'? Perhaps the best way is to indicate what I consider ununderstandable. To tell my fellow physicists that I am searching for direct access to reality, for enlightenment, for my true nature, for emptiness, for the Tao, for God, or for light in the deepest darkness, all of that would not mean anything, at best, for the majority of my colleagues; and more likely it would mean something, probably something quite silly and strange. No, rather than presenting them with rather questionable labels, I wanted to give them some taste of my experimental approach to life-as-a-lab, and at the same time I wanted to give them a taste of my attempts to weave some form of theory around it, or at least to find some tentative way to connect my view with theirs.

5. Stepping Stones

With this plan in mind, I began to look for a connection between the Buddhist and Taoist contexts in which I had carried out most of my explorations, and the scientific mind set in which I could converse with my colleagues. I thought it would be better to start with theory, rather than experiment, since my theoretical views were more likely to form a continuum with theirs, while my experiential insights were running the risk of hanging totally in the air for lack of context to talk about them. So I started a search for stepping stones, to connect the Buddhist world of emptiness and a return to one's true nature with the physicists' world of wave functions and vacuum fluctuations.

My first attempt at finding a stepping stone brought me to Medieval mysticism. Returning to some of the reading I had done as a student, of Ruysbroeck and Meister Eckhart, I also read that wonderful book of an English anonymous author, the Cloud of Unknowing, and several others. To my surprise and delight, I felt very much at home. I recognized the feeling of intimate familiarity and sense of belonging to the world that they described, as I had felt so many years ago. But in addition, I now saw much more directly what they were talking about. Twenty years earlier I had read them as a prospective tourist, reading about a land I had heard about but not yet visited. This time, however, it was as if I read travel descriptions by very perceptive fellow travelers. In many ways they were more experienced and perceptive than I was, but at least they were writing about familiar terrain that I had began to traverse myself.

This was very encouraging, and at least I reestablished contact with my own European culture. But how to approach my colleagues with stories about a monk in Flanders and a cloud of unknowing? I had to find more stepping stones. My next reading brought me back to Socrates, the wellspring of rationality who so much inspired Plato and Aristotle, and through them our whole western culture. To my delight, I recognized in him, too, a clearly mystic element, rarely emphasized these days: Socrates is reported to be lost in trances for hours on end, in different situations, and his effect on people in his surrounding was not that different from that reported about zen masters and mystics of all stripes.

Moving closer in time toward the present, I picked up Spinoza's writing, and again I understood, far better than before, why I was so moved by him when I read his Ethica, at the end of high school. It was clear to me know: here was a meditator, someone who had seen into reality, really seen, and who tried to report what he had seen. Calm and cool as he tried to keep his writing, he did not succeed in hiding the fire of his insight. It was as if each page was breathing, as if the air was transformed with every paragraph I read.

So far so good, but alas, no cigar. How could I possibly consider myself to be understandable, if I would start writing about how Socrates and Spinoza were really mystics, and how their thirst for rationality was for them a direct expression of their mystic fire? Few of my colleagues would know Spinoza, and few would have read in-depth about Socrates. So I would have to start by explaining their method. What would be my odds, trying to express Spinoza's axiomatic approach to philosophy (in terms of theorems no less!) for my colleagues, or trying to impress them with the way Diotima urged Socrates to express his knowing that he did not know? I did not give myself much of a chance.

6. Landing in a Swamp

Surrounded by inspiration from Buddhism, Taoism, Medieval mysticism, and various philosophers, I decided to finally try my hand at an attempt to formulate my own view of the world. In doing so, I was hoping to convey my intuition as to how a fruitful dialogue could bridge the desperately disparate worlds of science and spirituality. Soon however, I became more and more disillusioned. Before trying to describe what happened, let me take scientific exploration as a point of departure.

While working on my astrophysics projects, all kinds of challenges would appear concerning the solution of various problems – but at least the formulations of the problems would almost always be clear-cut. Astrophysics has a solid foundation in the form of the framework of physics that comes with a well worked out methodology. Even more fundamental than a shared reliance on the basic laws of physics is the fact that the relationship between theory and experiment is agreed upon by all scientists. While there often are heated debates about controversies in any particular field of science, sooner of later the intersubjective procedures of peer review settle the issues, providing validation of theoretical and experimental results. Although there can be no strict proof that such agreements will ever lead to objective truths, intersubjective truths agreed upon by a large enough segment of the scientific population are generally considered to come close enough to the real thing.

While groping for more philosophical insights, I found no support structures of the type I had grown used to. Each great philosopher seemed to want to start from scratch, using the inspiration from earlier philosophers but not their frameworks. Each religious tradition also starts from what seems to be a completely different foundation. How to find a foothold, a place to start? As soon as I tried to summarize my own views in writing, I felt lost.

I had this vivid image of working in a castle, in the bulwark of science. During the day I would produce new bricks, carry them to the appropriate spot on the walls that were being built, and thus help to further construct the bulwark, by my own scientific research. But at night, often in secret, I would sneak out of the fortified area, and make my way to the woods, where there would be no fortifications, nor even paved roads. I would walk into the woods, carrying my patiently crafted brick that I wanted to contribute to the building of a new philosophical world view, safely tucked under my arm. I would look for a place to put it down, to help build a new structure. When I found a place that looked appropriate, in a clearing of the woods, I would hesitate for a moment, but then I would put my brick down on the ground, excited about the attempt to lay a foundation for a new approach to viewing reality.

Alas, no sooner had I put my brick down, or I would see it beginning to sink, slowly. The soggy ground in the forest would resemble that of a swamp enough to allow my poor brick to go under. A few bubbles would rise up as a last greeting, and gone was my brick, as if nothing had happened. With a dejected heart and muddy boots I would return to the bulwark of science, to start another day of quantitative research, wondering whether I would ever get a chance to get anywhere at all in contributing to a building of wider world views.

My science provided solid ground, but only for its own enterprise. Various other ways of knowing also seemed to provide a form of solid ground: the traditions of Buddhism and Taoism, for example, where contemplatives had built intricate systems to study body and mind in detailed experiential ways. However, I did not want to spend twenty years of my life trying to become an expert in those other areas as well, tempting as it was for me to do so. For one thing, I wanted to continue working in astrophysics; for another, it was not at all clear to me that it would help me to bridge scientific and contemplative approaches to reality by becoming more of a real expert in each area in isolation. Such a move would still leave a large gap between both terrains. How could I ever hope to cross that gap?

7. Phenomenology

At this point I had started to wonder whether I would ever find any suitable last stepping stone. I had seen ways to make steps from India and China and Tibet, over the last couple millennia, to Europe ancient and Medieval and into the early beginning of the Enlightenment. But how to get to the present? It was my discovery of Edmund Husserl that for me closed this last gap.

I must admit that ten years ago I had no idea of who Husserl was. I had of course heard of his (direct or indirect) students Heidegger and Sartre, and I later realized his influence when I realized that Derrida and Merleau-Ponty also had entered philosophy with Husserl as a starting point. While Husserl was one of the most influential philosophers at the beginning of this century, his fame quickly decreased after his death, in 1938, one year before the second world war started. He was a German Jew who refused to emigrate after the Nazis came to power. As a result, he was quickly isolated within the German academic world, and there was little continuity between his later research and the European philosophical scene after the war.

Husserl was the founder of the philosophical school of Phenomenology. His slogan was "Zu den Sachen selbst" (To the matters themselves), with which he indicated his wish to let the phenomena speak for themselves. In this sense he was in full agreement with what William James expressed, later in his life: "To be radical, an empiricism must neither admit into its constructions any element that is not directly experienced, nor exclude from them any element that is directly experienced." Husserl was indeed such a radical empiricist, but he managed to work his ideas out in far greater detail than William James ever attempted.

Husserl was an unusual philosopher in that he effectively modeled himself as a scientist, in using both theory and experiment, while letting experiment be the deciding factor. His laboratory method was what he called the 'epoche' (a Greek word indicating 'suspense of judgment'), a switch in attitude from the 'what' to the 'how'. Rather than taking the world for granted, while finding our way amidst the many things that populate our world, Husserl invites us to change our focus, in order to investigate how all those things appear. Instead of viewing our surroundings as populated by material objects, the epoche shows us to pay attention to how all those objects are given in consciousness. We do this by learning to suspend our implicit and tacit allegiance to all our underlying assumptions of what is really real.

Through the epoche, all that appears is seen and acknowledged as it appears, in its own structure of appearing. The trick is to refrain from tying down appearance immediately and prematurely to the usual external explanatory framework (of a physical world of objects, in which we possess a body with sense organs and a brain that gives rise to our consciousness that grasps the objects).

At first, it may seem to be very strange to 'put the world on hold,' to drop any belief in an objective reality as the prior and only 'real' form of reality. But there is nothing magic or special in making this shift. It is only the result of the shift that is remarkable, a form of amazement and wonder. In fact, reactions of such a type are the touchstone to check whether a shift really has been made, or whether an attempt to 'put the world on hold' has only been an intellectual game.

Many poets and novelists have testified to such a shift, a dramatic change in experience, away from a belief in a solid world in which we are anchored, and towards a completely open experience of the world as bottomless. Several philosophers, too, have given us an inkling of their experience along these lines. The problem is that poets typically give their experiential report without any theory, and that philosophers tend to present only their theoretical reflections while glossing over the experiential component that undoubtedly underpins their theoretical moves toward more open interpretations of reality.

8. Amazement

When reading Husserl, one is struck by the sense of honest amazement that is conveyed. An amazement about the way we make sense of the world, and a deep sense of surprise about sense, something we find everywhere but something we cannot catch. Like space, like time, sense is for us what water is for a fish. Our lives are embedded in it, given by it, irremovably linked to and through it. (Note: I use 'sense' here in its aspect of 'meaning,' and I do not imply any connection with 'sense experience' - the word sense conveys more of a real grasp of something than the somewhat abstract word meaning).

Sure, we can interpret our world as a world of things. But what is a thing? When we look carefully, then we find that what we considered to be an object appears in our consciousness as a bundle of meanings, draped around sensory impressions that are far, far less complete and filled in and filled up than the 'real thing' we feel to be present, three-dimensionally, continuous in time. What then remains of the solidity of the object? It is recognized in its givenness for us through the 'sense' of solidity we have. Its continuity? This follows from our 'sense' of continuity and identity. Its reality? Nothing but a 'sense' of reality. The indubitability of its reality? The only thing we have a real handle on is our 'sense' of indubitability of its reality.

Husserl himself did give ample indications of the fact that for him the epoche was a way of life; toward the end of his life he described it as a "complete personal transformation". And indeed, recognizing that we live in a world of sense can be a shocking experience. Not only do we find the world to be dissolved in sense, upon close inspection, but we find that we ourselves, too, are known to ourselves only as complex forms of sense.

One important point has to be emphasized here. When we take a turn toward experience as primal, rather than derived, it is not at all clear whose experience we are talking about. We normally assign experience to ourselves, to a person with a certain identity, playing all kinds of roles. But aren't all these aspects given as part of experience? After all, we can only know objects in the presence of a subject, just as we know ourselves as subject only through our interaction with objects, be they thoughts or things or other forms of appearance. And since this all leads back to experience, it does seem reasonable to start there, and to consider both subject and object to be attributes of experience, rather than the other way around.

So it would seem that the whole world dissolves into a world of experience. But that is not quite right. If we put on hold the notion of 'world,' 'person,' and 'self,' then we cannot label what happens as being the experience of a self. Yes, of course, things still happen, but we can refrain from calling it experience. What then to call it? How about calling it appearance. It is clear that something is going on. Something happens. Something appears. What appears? Appearance appears. That's all. Yet, as Husserl and James showed us, the field of appearance offers a wide realm for exploration. And for me, it proved to be wide enough to provide the missing link I was looking for, between East and West, between science and the humanities, and between academics and daily life.

9. An Ongoing Project

In the coming years, I plan to continue my study of Husserlian phenomenology, as one of the ways to try to ford the stream that separates the objectivity of science and the vividness of lived human experience. In addition, I would like to explore other stepping stones as well. I am glad that the SSQ program[1] has provided a forum for these type of explorations, and I look forward to future meetings, following the one where I will present this paper. Several years ago, with a group of colleagues we have started our own attempt to bring the scientist back into the picture, as a fully living human being; this has led to the establishment of the Kira Institute, which has organized a series of summer schools for graduates students on topics such as Ways of Knowing.[2]

Over the last few years, I have made some attempts to formulate my growing intuitions and ideas in the area of science and world views. In a meeting dedicated to the study of the limits of scientific knowledge, I have compared the study of experience with the cosmological study of space and time.[3] Briefly, space and time as such cannot be measured or captured in any way, but they form the condition of possibility for the existence of observable phenomena such as configurations and motions. Similarly, I have explored the notion of a third aspect of reality, besides space and time, that might provide the condition of possibility for consciousness and experience — understood in its direct first-person, subjective aspect, as opposed to a third-person objectivied description of experience. I have worked these

[1] Science and the Spiritual Quest; see web site http://www.ssq.net .

[2] See our Kira web site http://www.kira.org .

[3] Hut, P. 1996, Structuring reality: the role of limits, in *Boundaries and Barriers*, eds. J. Casti and A. Karlqvist (Reading, MA: Addison-Wesley), pp. 148-187.

ideas out further in a series of papers with a psychologist,[4] a philosopher,[5] and two biologists.[6]

A couple years later, at a Tucson meeting on the scientific study of consciousness, I have tried to describe three ways of looking at the world, in terms of matter, experience, and being.[7] Most recently, I focused on the matter versus experience aspects in an invited talk for the Husserl Circle.[8] These and other publications on related topics can be found on my web site http://www.sns.ias.edu/∼piet/publ .

It is interesting that we have such a fundamental choice in how to engage with reality. While we all live in the same world, our view of the world is very different depending on what we see the world as. We can view the world as made out of matter and energy, obeying scientific laws that may ultimately explain the functioning of our bodies, and through our nervous systems the functioning of our minds. Or we can view the world as given in and as experience, while considering all properties of the world as aspects of conscious experience; this is the starting point of phenomenology, in both their philosophical and psychological forms. Or we can view the world as a presentation of Being, as magically and freely appearing, with all our attempts to build up a structured understanding as conceptual overlays, icing on the cake of reality.

Starting from matter, from experience, or from Being, we seem to move in completely different directions. Is there any way in which these different approaches can compare notes, build up at least some form of respect for each other, and perhaps even learn from each other? My hope is that discussions between scientists, philosophers and psychologists, and practi-

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[4] Hut, P. & Shepard, R. 1996, *J. of Consc. Stud.* **3**, 313-329; reprinted in *Explaining Consciousness*, ed. J. Shear (Cambridge, MA: MIT Press), pp. 305-322.

[5] Hut, P. & van Fraassen, B. 1997, *J. of Consc. Stud.* **4**, 167-180.

[6] Hut, P., Goodwin, B., & Kauffman, S. 2000, in *Unifying Themes in Complex Systems,* Proceedings of the International Conference on Complex Systems, ed.: Y. Bar-Yam (Cambridge, MA: Perseus Books), pp. 259-268.

[7] Hut, P. 1999, Exploring Actuality through Experiment and Experience, in *Toward a Science of Consciousness III,* eds. S.R. Hameroff, A.W. Kaszniak, and D.J. Chalmers (Cambridge, MA: M.I.T. Press), pp. 391-405.

[8] Hut, P. 2001, The Role of Husserl's Epoche for Science: a view from a physicist, at the 31st Husserl Circle conference in Bloomington, IN.

tioners of contemplative traditions may lead to a new way of looking at the structure of our knowledge in these three areas. In each field, knowledge is gathered through active exploration, while attempts at 'grounding' knowledge are always mopping up operations, trying to bring more of a system in what may seem rather chaotic. Rather than comparing static ideas of what is commonly held to 'ground' an approach, we can go back to the phenomena themselves, while trying to put on hold even our most cherished beliefs of what lies 'underneath'.

Phenomenology, the detailed study of what presents itself in the way in which it presents itself, is implicitly the starting point of science. Theories are needed to interpret phenomena, but when experiment and theory clearly disagree, the experimental phenomena carry the day, and the theory has to be modified. Science uses working hypotheses, rather than creeds or dogmas. No matter how dogmatic individual scientists at times may sound, they (or if not they, then the next generation of scientists) will ultimately have to listen to the phenomena.

Living contemplative explorations are similarly based on phenomena, even though the methods of access and evaluation differ drastically. As in science, the danger of dogmatic stances is ever present. And here, too, progress depends on a letting go of prejudices. It is no coincidence that many mystics were branded as heretics, given that they often advised their students to let go of any preconceived ideas of God or reality. A deep devotion to the unknown and the open aspects of reality was what set them apart from traditional religious ways of life; a devotion they share in significant ways with scientists.

Whether philosophy can provide a phenomenological stepping stone between contemplative and scientific traditions remains to be seen. Many Husserlian phenomenologists seem to be more interested in historical text analysis than in actively extending Husserl's investigations. However, there are signs that Husserl's original spirit of exploration is undergoing a revival. For example, in the last ten years, a number of new introductions to his school of phenomenology[9] have appeared, which may inspire a new gener-

[9] For example, R. Bernet, I. Kern, and E. Marbach, 1993, *An Introduction to Husserlian Phenomenology* (Evanston: Northwestern Univ. Pr.); D. Moran, 2000, *Introduction to Phenomenology* (London: Routledge); J. Patocka, 1996, *An Introduction to Husserl's Phenomenology* (Chicago: Open

ation of students to take a truly fresh "beginner's mind" to the problem of communication between scientific and contemplative explorations.

Court); R. Sokolowski, *Introduction to Phenomenology* (Cambridge: Cambridge University Press).