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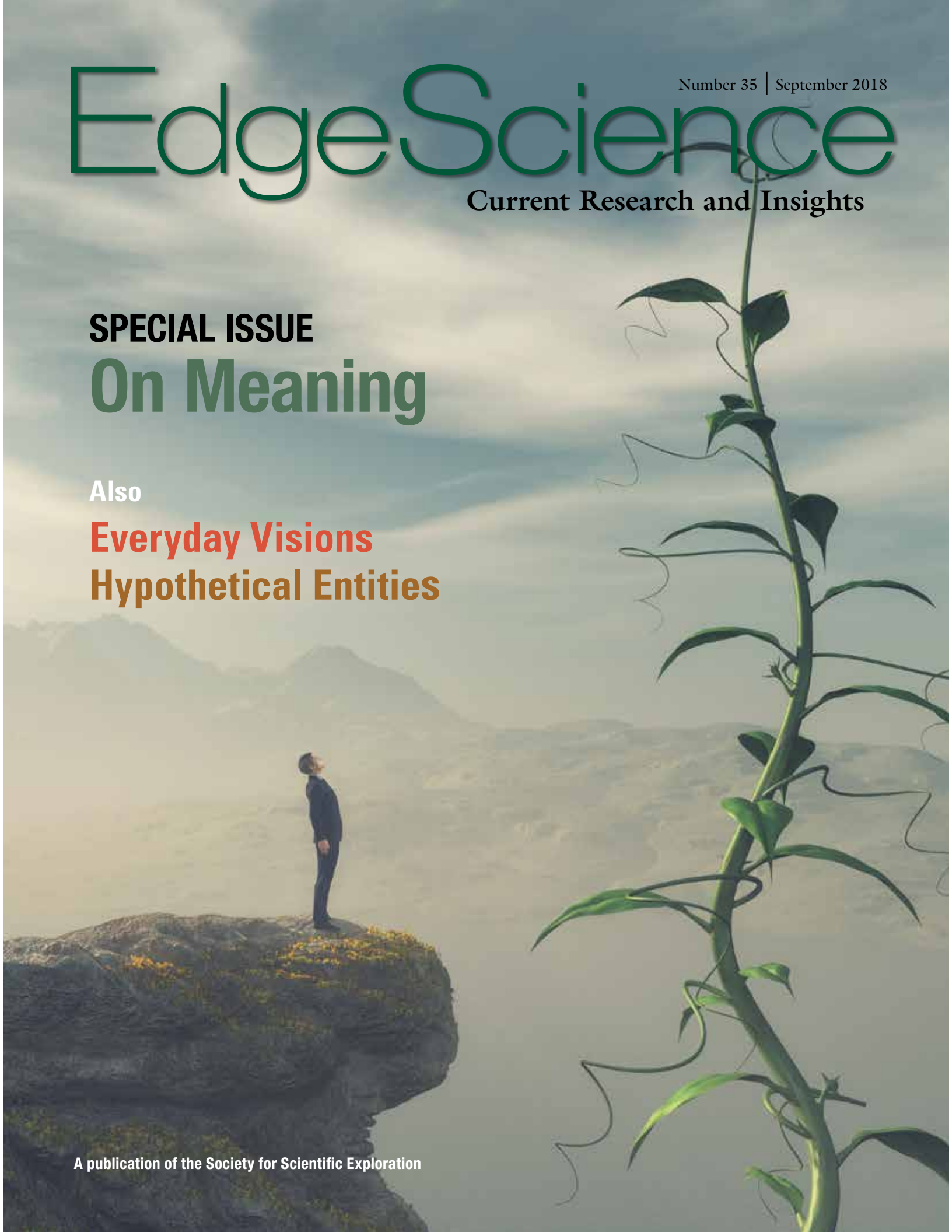
Current Research and Insights



SPECIAL ISSUE

On Meaning

Also

Everyday Visions

Hypothetical Entities

A publication of the Society for Scientific Exploration

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Why EdgeScience? Because, contrary to public perception, scientific knowledge is still full of unknowns. What remains to be discovered—what we don't know—very likely dwarfs what we do know. And what we think we know may not be entirely correct or fully understood. Anomalies, which researchers tend to sweep under the rug, should be actively pursued as clues to potential breakthroughs and new directions in science.

The Society for Scientific Exploration (SSE) is a professional organization of scientists and scholars who study unusual and unexplained phenomena. The primary goal of the Society is to provide a professional forum for presentations, criticism, and debate concerning topics which are for various reasons ignored or studied inadequately within mainstream science. A secondary goal is to promote improved understanding of those factors that unnecessarily limit the scope of scientific inquiry, such as sociological constraints, restrictive world views, hidden theoretical assumptions, and the temptation to convert prevailing theory into prevailing dogma. Topics under investigation cover a wide spectrum. At one end are apparent anomalies in well established disciplines. At the other, we find paradoxical phenomena that belong to no established discipline and therefore may offer the greatest potential for scientific advance and the expansion of human knowledge. The SSE was founded in 1982 and has approximately 800 members in 45 countries worldwide. The Society also publishes the peer-reviewed *Journal of Scientific Exploration,* and holds annual meetings in the U.S. and biennial meetings in Europe. Associate and student memberships are available to the public. To join the Society, or for more information, visit the website at scientificexploration.org.

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Cover image: Man on the edge of a cliff, Orla/iStock

Simon Young

Everyday Visions:
Why People See Impossible Things

I walked along the corridor and into my daughter’s room. For a second I stood at the door and observed my grandmother, who was standing above my daughter’s bed. I was surprised to see my grandmother because she had died ten years before, but strange as this may sound, I advanced. I knelt to be level with my daughter and when I looked up again my grandmother was no longer there. I was, above all, happy: my body, in fact, was aglow. My grandmother had been an overwhelmingly positive person in my life and, indeed, in the lives of all those she had known.

Now I am not “special.” People see “things” all the time. For the past six years I have, in fact, as a folklore historian, read obsessively about men, women and children who have encounters with angels, with demons, with aliens, with ghosts and, a special interest of mine, with fairies. Usually when scholars or New Age types write about such experiences they debate whether they are “true” or not. When I began to study this question and to publish academic papers describing such bizarre sightings—my first included a Victorian bathman’s run-in with a small tribe of elves in Ilkley (Yorkshire, UK)—I, too, was fascinated by the truth question. Six years on I am not really any closer to understanding what happens—my consolation is that the same can be said of those who have dedicated their whole lives to the matter. But I no longer think that the “truth” question is the right one to ask or at least not the first one. The crucial point is probably not *what* people see but *who* sees. Forget the archangel on the stairs or the boggart in the pantry. What is important is the individual who looks at and hears and (in some cases) smells the impossible.

An extraordinary thing is just how many people have these experiences. The best and most rigorously carried out survey was put together in Britain in the nineteenth century and included sixteen thousand interviews. The results suggested that perhaps ten percent of the population, sooner or later, have to deal with things that common sense and the laws of physics insist cannot be. A minority of these, today and in the nineteenth century, will have had habitual paranormal experiences: we call them, by turn, mystics or schizophrenics. Others, like myself, have one-off brushes that make a greater or lesser impression: after seeing my dead grandmother I went downstairs and—shallow as a puddle—read a comic and ate popcorn. But, ten percent... That means that about thirty million Americans can expect to meet with something anomalous in their lifetime: be these dead relatives, greys, Dartmoor sasquatch or, in one memorable case from Scotland, undine stallions in a waterfall.

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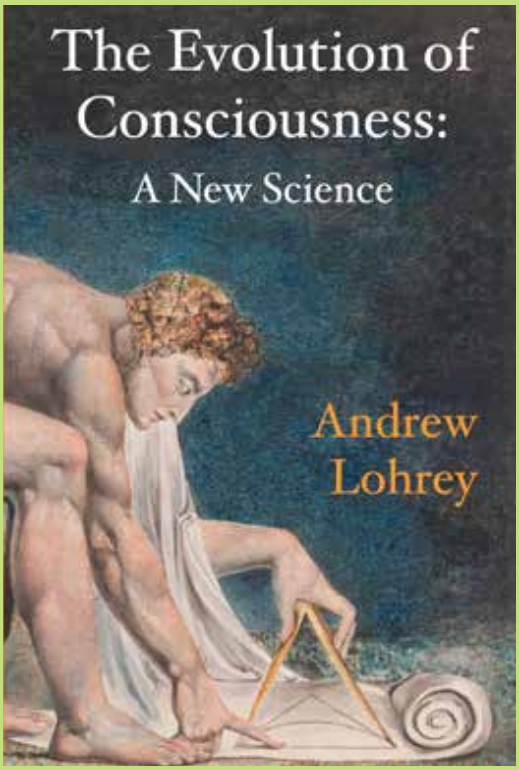
These ten percent (some surveys would push the number down to five percent, others up to twenty five percent) are not a miscellany. Many in this "seeing" category have a certain sensibility. This is not just a question of saying that person A or B is "uncanny," because many people who have such experiences are not. But one variable that often comes up is the ease with which someone can be hypnotized or fall into a trance: perhaps one of the reasons that children and drivers seem to be overrepresented in visionary matters. Individuals who have a rich fantasy life (can you close your eyes and picture your neighbor in great detail?), who can easily suspend their rational sides (do you get teary-eyed at the cinema?), whose imaginations are susceptible to triggers (do you taste a lemon if I show you a photograph of one?) are more likely to see the impossible. The "truth" question does not go away, of course. But it needs to be put under the yoke of personality.

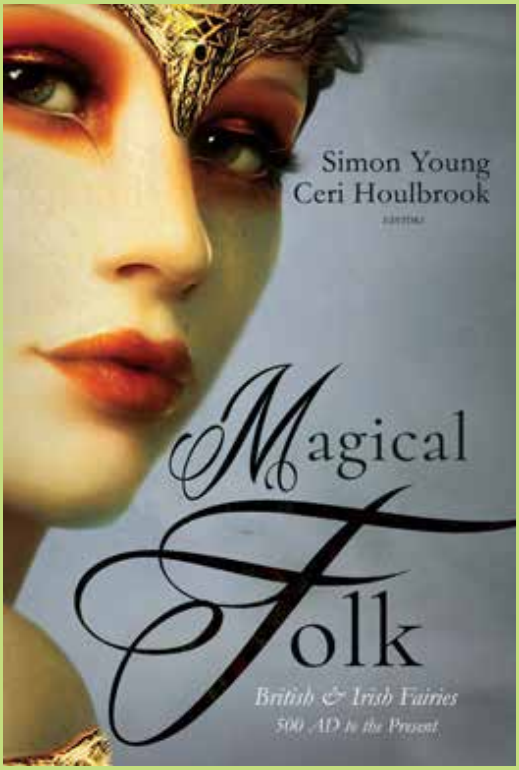
And, in fact, I told the story of my grandmother backwards because ghost stories work like this. But rewind not ten seconds, not thirty seconds, but a whole minute. Three crucial things happened, one after the other, before I came before my father's mother. First, I ran to my daughter's bed because she was crying, with all the tenderness that this wrings from a parent. Second, as my daughter started crying I was myself crying over Walt Whitman's lines that nothing really dies: "What do you think has become of the young and old men?" Third, I live in a house with three floors. I, aged then forty, and about ten pounds too heavy, had, in fact, to negotiate three flights of stairs to get to my daughter as quickly as possible. The experience of coming face-to-face with the dead took place, in other words, after a maelstrom of emotional and physical activity. To describe the event as I did in the first paragraph is to call a cut blossom "a flower," forgetting its stems and roots. Yet most strange experiences are described in just these limited terms.

There are two ways to look at my unusual chemical state as I went up toward my daughter's room. Possibly that state opened doors of consciousness and allowed me to see something that is normally invisible to me; or perhaps, instead, it simply helped my brain to create my grandmother. As a romantic materialist I would put my hand up for the second explanation, but it does not particularly matter. The magic quality of the experience remained with me through comics, popcorn and a long sleep. It was only in the morning that I realized something that should have occurred to me immediately, that my daughter, the girl my grandmother was watching over, carries my grandmother's name. Our brains throw up, in dreams and freak visions, static from our subconscious. But our conscious mind can turn the dial a little to the left or right and that static becomes music.

SIMON YOUNG writes on folklore history and the supernatural. He is the editor, with Ceri Houlbrook, of the recent collection: *Magical Folk: British and Irish Fairies: 500 AD to the Present* (Gibson Square: 2017).

Noteworthy Books





Andrew Lohrey

The Language Virus of Information Theory

In theory and practice most scientists fail to distinguish between "information" and "meaning." This has been a common confusion that can inhibit the advancement of scientific knowledge as well as our understanding of what it is to be human. This muddle means that "information" is poorly understood while the subject of "meaning," if thought about at all, is seen as a mystery. With this confusion traditional mechanical predispositions are reinforced to the extent that meaning and consciousness have been largely excluded from scientific studies. The theoretical physicist David Bohm (1917–1992) believed that meaning is the essential nature of consciousness (Hiley & Peat, 1991, 436). I agree. Hence, when meaning is assumed to be a mystery, so too is consciousness.

Let us begin by asking some pertinent questions about "information" theory. The Claude E. Shannon Award is the highest honor in the field of information theory. It was named after the man regarded by some as the father of the information age. In 1948 his influential article "A Mathematical Theory of Communication" (later made into a book) was first published, and in it Shannon laid out the mechanical and mathematical bases of his theory of information communication. His model involved a transmitter, channel and receiver, each of which reflected the then standard system within a Bell telephone exchange.

In Shannon's theory of communication, the transmitter produces a message that is sent through a channel or wire that alters the message in some way. The receiver then has to infer what would be the likely average information that was sent in the message. "Information" is a highly abstract notion as it is based on a probabilistic model and defined as the negative of the logarithm of a probability distribution.

What is missing from Shannon's mathematical theory of communication is the role that meaning plays in all communication. And while the transmitter and receiver of his theory can be a person or a machine, the role of a vital agent—and in particular of mind—has been largely eliminated. As a result, the calculated information content of the word "coming" is mathematically considered to be the same as the non-word "gnmioc." This is what Basil Hiley reminds us of in his 2005 paper "Process and the Implicate Order: Their relevance to quantum theory and mind." This serious inadequacy highlights the general problem of equating the negative and abstract equations of information content with what actually happens in communication exchanges.

Meaning is essential for us to understand information theory if that theory is to function as a theory. It is essential because it is impossible to exclude meaning from any word or discourse and that includes the various words and discourses of Shannon's information theory. Specifically, it is impossible to exclude meaning because random letters become words only when they carry the social meanings of a discourse that exchanges meaning. It is the meaning within a communication that represents the gold standard by which any discourse or communication is intelligible, can be judged, and understood. It is these same conditions that apply to Shannon's information theory, notwithstanding its reliance on mathematical "probabilities."

To deliberately establish a meaningful theory that sets out to explicitly exclude meaning is to embark on a fantasy. This is a mathematical and technological fantasy that attempts to unconsciously substitute the term "information" for "meaning." This fantasy has become widespread and is disseminated in almost every corner of science and popular culture, and its circulation represents what I would call a widespread cultural malaise. Its nature can be gleaned from the following statements:

- Information is a real and effective feature of the universe.
- The universe is an interconnected network of information and energy.
- The primary currency of reality is information.

These statements have been used by various yet widely different investigators: Ervin Laszlo (2004); and Peter Fraser, Harry Massey and Joan Wilcox (2008). These statements and thousands more like them are false because, when used to describe anything to do with communication or mind, the term "information" is, as a lawyer might say, *unsafe*—unsafe because it creates shadows that are called on to stand in for reality.

These shadows conceal meaning by pretending to be something they are not. What is it then that information theory pretends to be? The answer lies in a double bind: qualities of meaning are ascribed to information by the theory that denies having any association with meaning. What we are dealing with here is a language virus that, like a biological virus, needs a culture in which to grow. The culture in which

the virus of information theory has grown is the reductive and simple-minded materialism of mechanical science, and the outcome has been a widespread and inappropriate application of Shannon's theory and information vocabulary. This usage has had the effect of reinforcing the dualistic illusion of mechanical science that posits an objective material world that is separate from subjective minds.

The virus of information theory operates as a rhetorical device by innocently presenting a portion of the picture as if it were the whole, while concealing critical elements through elision or occlusion. Shannon's information theory treats the vital dynamics of communication as if they are a set of mechanical devices. As a consequence, his theory confuses the exchanges of meaning in communication with electrical exchanges. His theory has also laid the foundation for a more general concept of "communication" to be regarded as "the imparting or exchange of information." As communication is only ever an exchange between living organisms, communication is not and never will be an exchange between machines.

The structure and function of meaning as described in *The Evolution of Consciousness: A New Science* follows the framework of David Bohm's model of the implicate and explicate orders. With this approach we find that meaning has a gestalt structure involving implicit and explicit meaning. This gestalt comprises a non-local background context of implicit meaning (Bohm's implicate order) and a foreground of local, explicit, differential constituents (the explicate order). This gestalt of non-local and local components operates in all human meaning making and also in every communication. This structure indicates that every theory, statement, and communication will always involve a combination of local (explicit) as well as non-local (implicit) meanings. In addition, every communication is an animate exchange and therefore is not a mechanical exchange. Machines like computers cannot communicate; all they do is run on and exchange electrical charges.

If we take meaning's gestalt structure into account, there is only one feature of meaning that is formally recognized by information theory. This is the movements of explicit meaning (the explicate order) or what I call *explicit-to-explicit* exchanges. These represent our local conscious human exchanges involving distinctions and differences. While these explicit exchanges are prized by mechanical models of science, they represent only a minority of all the possible exchanges of meaning. This reliance on the movement of explicit distinctions and differences has meant that within information theory the notion of "noise" has been interpreted as an ambiguity to be overcome. As information theory does not take account of that large context of non-local implicit meaning, the natural uncertainty generated by the implicit meaning that is always embedded in every message or signal is treated as just so much "noise." What has this confusion led to?

Shannon's theory is concerned with increasing efficiency and reducing ambiguity in communication. A channel is held to produce ambiguity in a message sent from a transmitter, yet the theory has nothing to say about the natural ambiguity that is involved in the several layers of implicit meaning (cultural, linguistic, non-local) that are a large and inherent portion of all messages. To confuse these two, one mechanical and the other a natural feature of all expressions, is to begin to confuse a machine with an organism and in the process to confuse organic communication with mechanical exchanges. A typical outcome of this confusion leads us to believe that while computers can communicate, humans may just be less efficient computers.

A further problem with information theory is that the theory assumes that the receiver recognizes the "information" of the message as a choice between known possibilities. This choice relies upon probability statistics as a substitute for the cultural, linguistic, and individual richness that is inherent in every message and discourse. In essence, this is an attempt to define implicit meaning as no more than a range of probable explicit meanings. To assume that implicit meaning is simply unknown explicit meaning is to produce a category mistake.

The structure of meaning mandates that the explicit always arises from the implicit, and this means that while some aspects of implicit meaning can be made explicit, wherever explicit distinctions and differences exist they will always arise from a background context of implicit meaning. This natural order where implicit meaning has primacy is reversed by information theory with the assumption that the explicit distinctions of information have priority, and that they can exist without a background context.

To some degree almost every scientist has been infected with this language virus of information theory. Even scientists like John Wheeler have confused the role of information and meaning with the reductive formula "it from bit." How does the world (it) arise from the so-called substratum of a "bit" of information (Küng 2008: 72)? Also, David Bohm is not beyond using the term "information" in a manner that retards our understanding of consciousness and communication.

In their highly original book *The Undivided Universe*, Bohm and Hiley make the distinction between "active" and "passive" information. They state that "active information" operates in thought in ways similar to how it operates in the actions of the quantum potential. While this is consistent with their theory, it is a highly questionable statement, for "information," whether active or passive, should not be seen to involve meaning or be part of mind or consciousness because these have already been deliberately excluded from the classical understanding of information theory.

Yet the exclusion of mind and meaning from information theory has nevertheless led to those very factors being arbitrarily imported back into the vocabulary of information technology. Such reversals do damage to our understanding of information theory as well as to an intelligent comprehension of mind, consciousness, and meaning. The outcome is confusion. Bohm himself was somewhat critical of the passive nature of classical information theory. He pointed out that within the quantum field, exchanges of information actively occur without our knowledge, and so this kind of "active information" is different from the "passive information" associated with information theory (Bohm & Hiley 1995: 28–57).

But the term "active information" does not overcome the inherent problem of covertly reintroducing mind back into information theory when the theory excludes it. The word "active"

does not really help here, although it does provide a hint as to the vital agency within communication processes. Agency, however, does not fit with the mechanical elements of "information." Added to the confusion surrounding the use of "active information" is Bohm's phrase of a "form that in-forms." Yet only a *mind* can be "informed" or "uninformed" and such terms relate to the transformational processes of learning through education by a conscious being, all of which are mind conditions expressly excluded from the elements of classical "information."

So, what then are Bohm and Hiley referring to when they write about active information, and what are researchers in neuroscience referring to when they write about "brain information?" From the point of view of meaning, it does not really matter—in relation to physics, biology or computer science—whether we use the term "information" in a "passive," "active," or "inactive" sense. The basic problem when "information" is used to refer to communication is that such a wording splits subject from object while creating a fiction that separates explicit from implicit meaning. This separating function does not align with the reality of Bohm's interconnected universe or with the non-dualistic relationships of consciousness.

Since communication represents an exchange of meaning, in those instances where there is no meaning exchange we can say there is no communication. A key example of where there is no meaning exchanged and so no communication is when computers interact with one another. In these interactions there is no vital mind-to-mind communication, and so these machine interactions do not involve "understanding," "realization," "insight," or even "learning;" rather, the exchanges that occur within and between machines are a set of non-meaningful exchanges related to electrical circuits and charges.

Technicians and scientists may decide to call these electrical exchanges between machines "information," but this vocabulary too easily slips into a general confusion of mixing information with meaning, and then this incoherent blend is called "communication." This confusion is augmented by the literal rendering in which most information discourses are expressed.

The difference between a discourse that is rendered literally and one that is metaphoric—"the ship of state"—has to do with layers of meaning. A metaphor deploys more than one meaning, while a qualified statement suggests the possibility of other meanings. The discourses associated with "adaptive systems," "anticipatory systems," "artificial intelligence," "informatics," and "machine learning," to take some random examples, are for the most part applied literally. A literal rendering also says something about truth. It says, "the single meaning of this expression is unqualified and true."

We should resist the temptation to be led astray by this kind of thinking where the shadows of information are seen to be contained in communication or constituting primary and universal givens. One example of the extraordinary confusion within science between meaning and information was demonstrated in the well-publicized comments made by the theoretical physicist Stephen Hawking (1942–2018) who was reported on *BBC News* to have said, "The development of full artificial intelligence could spell the end of the human race." Such a view seriously fails to discriminate between the shadows and the real; that is, between the secondary computational languages of artificial intelligence and the infinitely complex, primary and vital intelligibility of meaning.

Meaning exchanges do occur between different people and also, in general, between organisms and their environment; that is, between the whole and the parts, as well as between the parts and the whole of Consciousness. Thus, what is necessary in any communication is an exchange of consciousness in the form of meaning. What is missing when we mistakenly refer to communication as "information" exchange is an appreciation of the cardinal distinction between the skeleton computational language used by information technology and the rich, ordered sensibilities of discourses that make and carry meaning between organisms.

The question often asked about locating the much sought after mysterious universal "information-generating process" can be answered simply by studying the meaning nature of consciousness. If in the future science should go down this track, it will find that it will be looking for something like a meaning-generating process, something like Bohm's quantum potential, or in terms of meaning, the potentials of one universal Consciousness. Thus, it is not the explicit, differential calculations of information that represent the primary currency of reality, but the meanings generated by mind and given by one Consciousness.

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Imants Barušs

Meaning Fields:

Meaning Beyond the Human as a Resolution of Boundary Problems Introduced by Nonlocality

Bill Bengston can heal mice that have been injected with cancer. The mice in a series of four experiments had an expected fatality rate of 100% within 14 to 27 days, yet when Bengston placed his hands on the mouse cages and engaged in a mental technique in which he rapidly imagined desirable objects or events, the tumors ulcerated, imploded, and disappeared, so that 29 of the 33 mice were restored to a state of health (Bengston, & Krinsley, 2000). This is an example of remote influencing, a nonlocal effect in which mental events have physical correspondences without any apparent ordinary physical mechanism through which such an effect can occur.

I think of remote influencing as the "output side," and remote viewing, the perception of events without any apparent ordinary physical mechanism through which that could occur, as the "input side." Examples from my own experience come from a remote healing study in which I used techniques derived from Matrix Energetics to try to influence participants in my study. From my home office, I would email a participant to say that I was going to begin a session for her. Then I flipped a coin. If the coin came up heads, I would go through the remote healing protocol, and, if it came up tails, I would do nothing further. Participants were asked to score their agreement with three statements: whether anything unusual had happened during that time, whether they had felt more fatigued, and whether they had felt more energized. The absolute value of the difference between being fatigued and energized was statistically significantly different between following through with the remote healing protocol or not following through with it (Barušs, 2013). In other words, participants appeared to be affected by what I was doing.

Bill Bengston

One of the more dramatic examples of apparent remote influencing occurred one night with Participant 05. In my notes I had written "I felt that something had come up with your health. I . . . was led to the lower back of your head. Possibly back teeth or jaw" (Barušs, 2013, p. 48) and used some techniques to try to clear the problem, although I could also "see" that I could not make the problem go away completely. Before she knew whether or not I had done anything, my participant had written "As for the session, it feels like it was an actual one. . . . I have had a lot of neck pain for the past several weeks, and today it seems to be almost gone" (Barušs, 2013, p. 49). Having heard from her, I sent her my description of what I had done and, after reading it, my participant wrote: "It is amazing how precise you were with the neck pain. I cannot believe the relief I feel. Whenever you perform these sessions, it completely transforms how I feel" (Barušs, 2013, p. 49).

I conceptualize each person as being in a dynamic interplay with the rest of the universe through the continuous input and output of anomalous interaction with it. Some people have no explicit awareness of these underlying processes and are probably ineffective at using them, whereas others have varying degrees of explicit awareness and ability. But it would appear that we are massively nonlocally interconnected with the rest of reality. With the accumulation of good evidence from both field studies and laboratory research, there is growing acknowledgment within the scientific community that this is, in fact, the case (Barušs and Mossbridge, 2017).

However, now we have a new problem, which we did not have before. We have a boundary problem. If all of reality is regarded as being connected through local action, then the boundaries of events are naturally established by their physical boundaries in space and time. In a nonlocal universe, in which consciousness can interact with anything, anywhere, and at any time, boundaries created by physical extension no longer have the power of containment. So what determines the boundaries of events? Let me introduce this problem by considering several examples where this becomes apparent.

Examples of Boundary Problems

The problem of determining boundaries becomes apparent in Bill Bengston's non-contact healing studies, in which not only the experimental mice but control mice that are not being treated remitted from cancer (Bengston, 2010). I was struck by

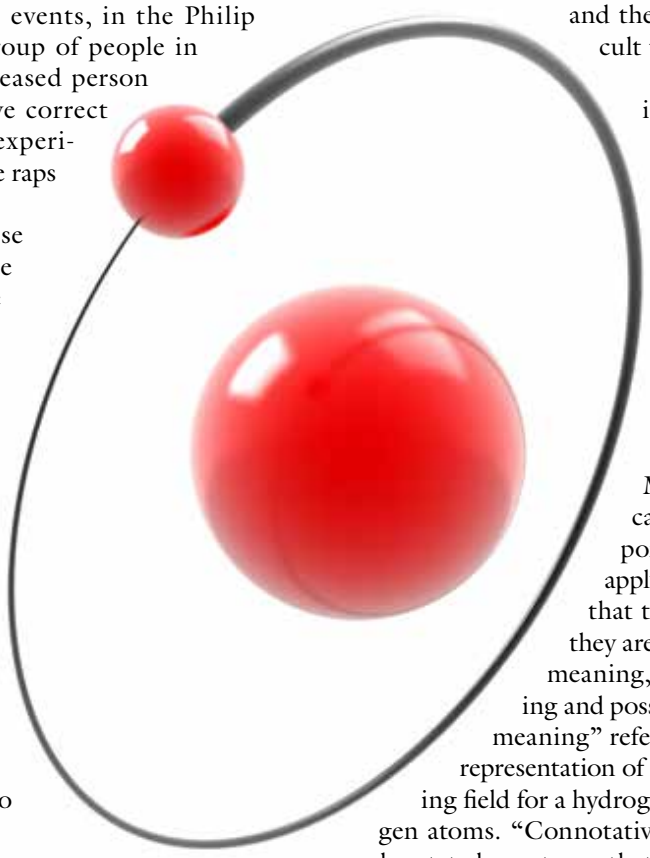
one particularly baffling such example. Bill told me that some students had placed a cage with a cancerous mouse under a lab bench without telling him; and that that mouse, without being treated or even without having received Bill's attention, had remitted. Why did healing extend to that mouse as well as the mice he was trying to heal? And why did the healing intention stop at that mouse rather than healing the other mice that were in reasonably close physical proximity to Bill? And, for that matter, why then did it not extend to all mice everywhere?

This is not just a problem for consciousness but for any nonlocal phenomena, which is to say, for any events that are linked across space and time without apparent locally causal mechanisms. According to physicist Lee Smolin, hydrogen atoms can recognize one another's histories, and if the histories are similar, then they can copy each other's properties. "There's no need for the two atoms to be close to each other for one to copy the other's properties; they just both have to exist somewhere in the universe" (Smolin, 2013, p. 161). Well, this is strange. How does a hydrogen atom reach out to other hydrogen atoms? How do hydrogen atoms know their own kind? How is a "similar" history recognized? How do they "copy" properties? And since when do atoms get to be psychic?

There are other examples. In quantum eraser experiments, a two-slit optical device switches between the presence and absence of an interference pattern based on the quantum states of an entangled photon in a separate stream away from the device, with no apparent mechanical action that could allow for such switching to occur (Walborn, Terra Cunha, Pádua, & Monken, 2002).

And, back to people-sized events, in the Philip experiment, in the 1970s, a group of people in Toronto created a fictional deceased person who was apparently able to give correct answers about himself to the experimenters through anomalous table raps (Owen, 1976).

What is common to all these phenomena is that the occurrence of the phenomena requires the recognition of specific knowledge without there being any physical mechanism through which the necessary knowledge can be conveyed. To explain these disparate examples, I propose the notion of *meaning fields* that carry the necessary knowledge and intelligently structure events in physical manifestation. If their ontological existence is unpalatable for the reader, then they can be simply regarded as a reasoning heuristic whose mechanism of action remains to be discovered.



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Meaning Beyond the Human

Materialism is so deeply ingrained in our Western intellectual tradition that we often do not recognize its presence in our thinking. So it is that we appear to naturally assume that nature is strictly mechanical and that meaning resides only in humans. So, for instance, we assume that the year 1864, or cancer, or Bill's non-contact healing experiment, has no meaning outside of the human assignment of meaning to it. For nature, there is no separation of itself into years, or cancer vs. non-cancer, and certainly no idea what belongs to Bill's experiment and what does not. But what if our assumption is false? What if meaning does extend beyond the human? What if nature were to somehow have inherent intelligence that is at least partially compatible with our own?

There are some precedents for meaning beyond the human. For anthropologist Eduardo Kohn, engagement in a field study in Ávila, Ecuador, led him to the realization that "encounters with other kinds of beings force us to recognize the fact that seeing, representing, and perhaps knowing, even thinking, are not exclusively human affairs" (Kohn, 2013, p. 1), so that, for instance, "forests think" (Kohn, 2013, p. 22).

Also, neuroscientist Christof Koch has had an intuition that "meaning" exists in the universe. In an interview in *The Atlantic*, Koch said: "It's just that I often feel—I don't know—I find it very difficult to talk about. I can't really describe it. I just feel the universe is filled with meaning. I see it everywhere and I realize it's a psychological mindset. I fully realize other people don't have this. I have it. It's very difficult to explain where it comes from. I just have this firm belief and the experience of numinosity. It's difficult to put into words." (Paulson, 2012)

And there has been increasing interest in extending the attributes of mind to non-sentient aspects of the physical universe (cf. Menary, 2010; Skrbina, 2005). In other words, my explicit extension of meaning beyond the human is congruent with some other contemporary efforts.

Characteristics of Meaning Fields

Meaning fields are fields in the technical sense that they are defined at each point in space and time and potentially apply to whatever is found in that space at that time. They are *meaning* fields in that they are capable of *denotative* and *connotative* meaning, as well as, probably, *inherent* meaning and possibly *existential* meaning. "Denotative meaning" refers to the events that are signified by a representation of them, so that, for example, the meaning field for a hydrogen atom would apply to actual hydrogen atoms. "Connotative meaning" refers to associations of denotated events, so that a meaning field for hydrogen atoms

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could operate in the context of all atoms and subatomic processes. It is difficult to denote the meaning of "inherent meaning," but I use that expression to refer to the essential nature that something has as itself that is not just its informational content. In the case of hydrogen atoms, there is an essence of what hydrogen atoms are. "Existential meaning" refers to the notion of existential purposiveness in the context of existential qualia. If a meaning field not only has essential nature but experiences that essential nature as itself, then it would have existential qualia. And if such qualia are experienced as being meaningful, then we would have the presence of existential meaning. In the case of hydrogen atoms, their meaning field could have a sense of its own existence and purpose. The first three types of meaning give meaning fields the capacity to create boundaries by parsing events, so that, for example, they "know" which mouse is in Bill's healing experiment and which one is not. I intend this in a strong sense, in that meaning fields have the ability to make, possibly non-algorithmic, judgments about what falls under their influence and what does not.

Meaning fields affect reality through whatever mechanism it is that human beings use when they are remote viewing and remote influencing. They structure the form that events take at any level of existence. They are interrelated in that they are both nested and overlapping. They are not only spatially nonlocal, but temporally nonlocal, in that the content of meaning fields can be modified by events from the past or future. Events are "tuned" to one meaning field rather than another. Meaning fields can interact directly with human meanings so that human beings can "tune" to different meaning fields as well as modify meaning fields according to some weighting algorithm. The "rules" by which meaning fields function are also meaning fields, which is to say that all meta-levels are meaning fields.

So, in particular, there is a meaning field for Bill's non-contact healing experiments. And there are interactions with meaning fields that can explain experimenter effects. For instance, control mice that were sent to unknown locations "far away" did not remit. According to this theory of meaning fields, the reason that they did not remit is not because they were physically removed, but because the physical removal created "psychological" removal so that they were no longer regarded as being part of what was happening in the laboratory. As another example, biology students whose mice remitted at

"By imagining that meaning exists beyond the human in the form of meaning fields, new ways of conceptualizing phenomena became available."

home but not in the biology laboratory had an overlapping meaning field with which to contend in the laboratory, namely, that within the discipline of biology there is widespread belief that such remission is impossible, thereby creating a meaning field that attenuates healing intention.

In the case of Smolin's "psychic" hydrogen atoms, there are meaning fields that govern the behavior of the hydrogen atoms. In quantum eraser experiments, the experimental results follow meaning fields created by physicists' expectations. In fact, a prediction that arises from this theory is that physicists can unwittingly create meaning fields that give rise to phenomena that are interpreted as the presence of particles whose existence physicists have predicted, not because they are actually there in the first place, but because enough physicists predicted their existence with sufficient intensity. Just as in the Philip experiment where nature reflected a fictional character back to its creators using table raps, so nature could be reflecting the existence of fictional subatomic particles back to physicists using the Large Hadron Collider.

Conclusions

The gradual proliferation of anomalies in which there appears to be application of knowledge without any apparent physical mechanism through which the knowledge could be applied has led me to rethinking the fundamental structure of the universe. By imagining that meaning exists beyond the human in the form of meaning fields, new ways of conceptualizing phenomena become available. In particular, it seems to me that as we conduct experiments, we are never just interacting with a mechanical system but, rather, with an intelligence that is responsive to the meanings that we attach to it. And if we query it the right way, perhaps we can get unexpected answers in return.

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‘REFERENCE POINT’

A review by Guy Lyon Playfair

A Good Detective Story

This unusual and absorbing book reads like a detective story, as it should, for that is what it is—the search for a plausible solution to one of the most controversial episodes in the history of psi research.

It began on December 8, 1937, with a telephone call to Harry Price (1881–1948), the highest profile psychical researcher of his generation, making him an offer he could not possibly refuse: to attend a meeting of a private home circle at which the materialized spirit of a six-year-old girl named Rosalie regularly appeared. No names were mentioned other than hers, and Price had to agree not to reveal the whereabouts of the private house somewhere in the London area where the sittings took place.

He duly attended the meeting, and the following day a number of his colleagues noticed that he seemed to be unusually affected by the events of the previous evening. “Shaken to the core,” said one. “Deeply disturbed, almost distraught,” said another, while his longtime associate Kathleen (“Mollie”) Goldney recalled that “he was more excited and shaken than I had ever seen him.” What can have had such influence on a man known for his willingness to unmask fraudulent mediums, which in his experience far outnumbered those such as Stella Cranshaw and the Schneider brothers Willi and Rudi whom he considered to be genuine?

A photograph of paranormal investigator Harry Price, taken by spirit photographer William Hope in 1922.

THE HERALD MAGAZINE

Apr. 3, 1948—Page 7

Harry Price, the famous psychic investigator, who died this week tells here of his most amazing experience.

I REALLY SAW A GHOST

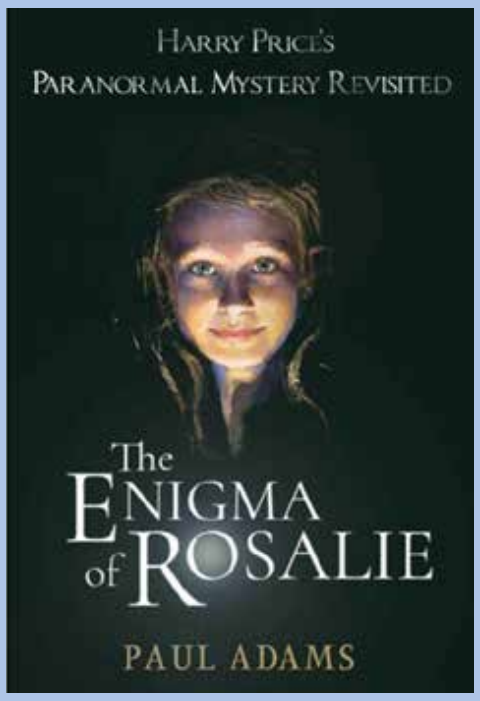
The Australian newspaper *The Herald* for April 3, 1948, published this article by Harry Price on the Rosalie séance a few days after Price’s death. Credit: Paul Adams.

To his credit, by the end of the day Price had written a 5,000-word report on what he had experienced. It had been an unusual seance, for Price had no idea who his hosts, Mr. and Mrs. X, or their guest Mme. Z, really were except that Mr. X was a prominent businessman and Mme. Z was the French mother of the deceased six-year-old who, he was assured, often dropped in at their meetings. The Xs’ teenage daughter and a young man Price assumed to be her boyfriend were also present.

Price was understandably somewhat befuddled by his evening’s work, which had begun with a thorough search of the whole house during which he sealed all the doors and windows, leaving him satisfied that there was nowhere for an accomplice to lurk. He was perplexed by the apparent absence of a medium, or any of the usual rituals of the Spiritualist meetings he had so often attended. He was impressed, however, by the arrival on the scene of Rosalie, accompanied by much weeping and wailing from her bereaved mother, who allowed him to examine the phantom by touch, which he did. He also noted that Rosalie, by the light of the luminous plaque he was also permitted to use, “looked older than her alleged years.” One way and another, he found himself wondering “if Rosalie was a genuine spirit entity or if the whole thing was an elaborate hoax.”

Only a second sitting in his well-equipped laboratory could settle the matter. It was one he particularly wanted to settle, as he faced an uncomfortable dilemma: Either the spirit world really existed, something he had always denied, or he had been hoaxed despite his long experience of revealing hoaxes inflicted on others.

Price’s account of his meeting with Rosalie was included in his book *Fifty Years of Psychical Research* (1939), which was published barely a month after the outbreak of World War II. It was generally well-received, reviews featuring such phrases as “erudite, critical yet vastly entertaining,” “comprehensive and



The Enigma of Rosalie: Harry Price's Paranormal Mystery Revisited by Paul Adams. White Crow Books, 2017.

well-documented," "stimulating and very interesting." There were minority dissenting voices, however. One suggested that the Rosalie episode might be one of "definite and rather brazen fraud," another finding it "a complete invention and unworthy even of Price," while Price's former colleague Eric Dingwall wondered "what is the real object of telling these tales?"

Following Price's premature and unexpected death in 1948, his reputation as Britain's leading authority on ghostly matters took some severe battering, notably in the attempted debunking of his best-known case, that of Borley Rectory (Dingwall et al. 1956), and later in Hall's (1978) shamelessly biased and vituperative biography.

Rosalie put in another appearance in a book by Dingwall and Hall (1958), described by Paul Adams as "a catalogue of missed opportunities which, if properly exploited, could have gone a long way towards solving the Rosalie case." Instead, it was "a superficially impressive but ultimately flawed and prejudiced examination." Adams pointed out that there were several witnesses still alive who could have given support to Price's activities at the start of the case, but none was consulted.

Fortunately for posterity, new researchers now entered the fray. One was David Cohen (1965), a factory worker from Manchester who headed a small group of like-minded enthusiasts in his area, and who decided to carry out his own search for the solution to the Rosalie mystery. He was later joined, independently, by fellow Society for Psychical Research members Richard Medhurst and Mary Rose Barrington, who tramped the streets of much of London in search of a house that fitted Price's description of the X residence (Medhurst 1965).

It was Cohen who obtained the scoop of his career when he managed to contact Rosalie herself, or at least the woman who had been masquerading as her, and to obtain her lengthy written confession, which Adams prints in full as Appendix B. This, if true (and there were those in the SPR who suspected otherwise), is a plausible scenario that answers many questions, including: Who were Mr. and Mrs. X and Mme. Z? Why were they so keen for Price to attend a seance, but only once and only if unaccompanied? Why were they so unlike all members of Spiritualist groups that he had encountered? What were they really up to?

Paul Adams tackles these and many other questions head-on, and his intriguing and fully referenced book makes lively, enjoyable, and often surprising reading.

Reviewers of mystery stories should not give away their endings, so this review will leave future readers with a brief trailer, from the letter from Rosalie to David Cohen: "It struck me as very amusing that Mr. Price should take so much trouble to seal the doorsand windows when he was actually sealing Rosalie inside the room."

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Guy Lyon Playfair (1935–2018) began his writing career in Brazil, contributing to *The Economist*, *Time*, *Business Week*, and the Associated Press, also spending four years in the press section of the U.S. Agency for International Development (USAID). He then joined the research institute founded by Brazil's leading parapsychologist, Hernani Guimarães Andrade, and began to explore the "other side" of Brazilian life as he described in his first book *The Flying Cow*, which became an international bestseller. He published eleven books on a variety of subjects, including *This House is Haunted*, *If This Be Magic*, and *Twin Telepathy*. He was for many years an active member of the Society for Psychical Research until his death in April of this year.

‘BACKSCATTER’

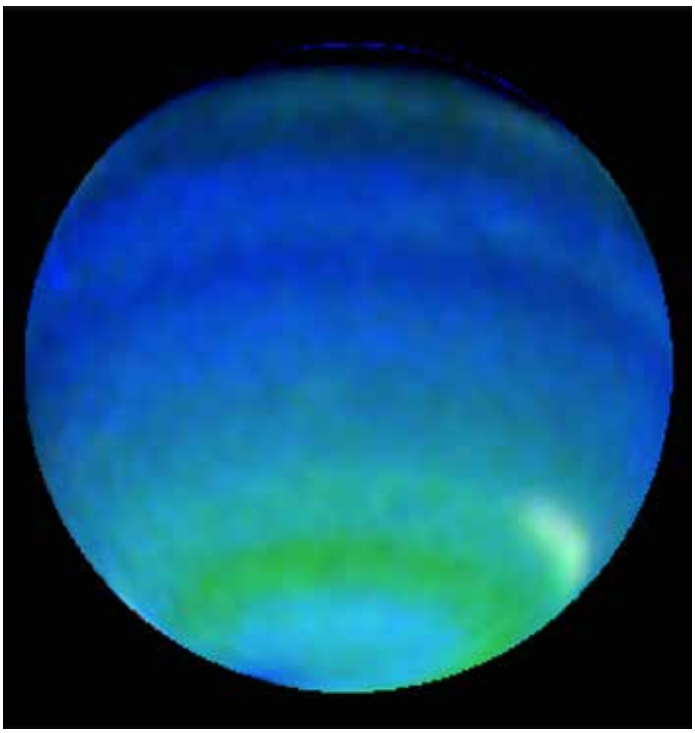
Paul H. LeBlond

The Life and Times of Hypothetical Entities

“Imagination is more important than knowledge. For knowledge is limited to all we now know and understand, while imagination embraces the entire world, and all there ever will be to know and understand.”
—Albert Einstein

Knowledge of the natural world is obtained by observation. Attempts at understanding the richness and variability of nature quite naturally lead to the formulation of theories that postulate relationships (such as forces) between events and objects or even the presence of hitherto undiscovered material objects: hypothetical entities. Some of these entities may eventually have their existence confirmed by more refined observations and become firmly established as part of our view of reality; others are eventually discarded in favor of more appropriate explanations; and some linger on within the hypothetical realm for lack of confirmation. The history of science is replete with examples of such entities. (As to non-material entities, they are not amenable to scientific confirmation and do not belong to this discussion.)

The classic success story for a hypothetical entity arises from the history of astronomy. Six planets, visible to the naked eye, have been known since antiquity, Saturn being the most remote from the Sun. In 1781, British astronomer William Hershel observed a moving star that he, at first, took for a comet. He proposed to name it *Georgium Sidus*, in honor of his patron, King George the Third. This name proved unpopular outside Britain, and by 1850 it was universally known as Uranus and recognized as a primary planet, beyond Saturn, and not, as Hershel had originally thought, a comet. Further observations led to better knowledge of the planet’s orbit, but there were features of its path that could not be explained within the framework of Newtonian celestial mechanics. French astronomer Bouvard suggested that perhaps the gravitational attraction of a yet-to be discovered body might be responsible. Soon afterwards, in 1846, astronomer-mathematician Urbain LeVerrier calculated where such a planet should be seen and communicated the information to German astronomer Johann Gottfried Galle at the Berlin Observatory. On the same day that he received LeVerrier’s letter, Galle found the new planet within one degree of its predicted position. The orbit was confirmed after further observation, and Neptune, as it was named, went from being—quite briefly, as it turns out—a



Neptune as seen by the Hubble Space Telescope.
Lawrence Sromovsky (University of Wisconsin-Madison), NASA

hypothetical to a real entity, whose existence was recognized by all observers. This discovery was a triumphal demonstration of the power of Newtonian mechanics and also of the role of international cooperation in the process of scientific discovery.[1]

We owe another example of a successfully predicted entity, in a completely different field of science, to Charles Darwin. In his 1862 book on the reproduction of orchids, Darwin describes the interactions between orchids and nectar-sucking pollinating insects, each species of flower being serviced by a moth with a proboscis specially adapted to the shape of the flower's nectary.[2] Having received a Madagascar orchid (*Angraecum sesquipedale*) with an extraordinary long nectar tube—"eleven and a half inches long, with only the lower inch and a half filled with sweet nectar"—he wonders: "What can be the use . . . . of a nectary of such disproportional length?" Inspired by numerous examples of specialized adaptation, he answers his own question: "in Madagascar there must be moths with a proboscis capable of extension to a length of between ten and eleven inches."[3] But he knew of no such moth in Madagascar at that time. Alfred Wallace, Darwin's colleague and co-formulator of the theory of evolution of species, enthusiastically supported Darwin's hypothesis, remarking in an 1867 article that the African sphinx moth *Xanthopan morganii* had a proboscis almost long enough to reach the bottom of the nectary. Wallace wrote: "That such a moth exists in Madagascar may be safely predicted; and naturalists who visit that island should search for it with as much confidence as astronomers searched for the planet Neptune—and they will be equally successful!"[4,5] It wasn't until 1907, however, that a variety of *Xanthopan morganii*, dubbed *praedicta*, was identified in Madagascar,[6] and 1992 that the moth was observed feeding on the flower and transferring pollen from plant to plant.[7,8]

Hypothetical entities had been suggested before, but never with such success. For example, 18th century chemists analyzing the nature of combustion had postulated the existence of a substance called phlogiston, which was supposed to be emitted by materials burning in air.[9] However, no one managed to measure or isolate phlogiston. By the 1780s, Antoine Lavoisier's quantitative experiments had revealed the role of oxygen and disposed once and for all of the need of phlogiston to explain the phenomenon of combustion.[10] Similarly, a hypothetical entity pertaining to both chemistry and biology was that of a vital force, proposed in 1815 by Swedish chemist Jöns Jacob Berzelius. Chemical (organic) compounds found in living organisms were supposed to be the product of a *vital force*; they did not obey the laws of chemistry and could not be synthesized in the laboratory. *Vitalism* has long been dismissed as a chemical or biological theory, as well as from modern evidence-based medicine.

The successful predictions of such disparate entities as a planet and a moth created powerful precedents for the invention of explanatory hypothetical entities. Further exploration of our solar system has revealed the presence of a number of trans-Neptunian objects, starting with Pluto in 1930. Some of the larger ones, such as Eris—similar in size to Pluto—have been named (for example, Sedna, Haumea, Makemake…), but most of them are simply referred to by number. As of 2017, more than 2,300 trans-Neptunian objects had been observed and listed in the Minor Planet Center catalog.[11] While none of these are massive enough to have significant gravitational impacts on their neighbors, recent analysis of a cluster of such objects suggests the presence of a large planet—up to 10 Earth masses—affecting their orbits.[12] Hypothetical Planet Nine orbits the Sun in 10,000 to 20,000 years, far beyond Pluto. Planet Nine has not yet been observed and remains a hypothetical entity, currently the object of sophisticated astronomical sleuthing.

Xanthopan morgani praedicta inserting its tongue into the spur of a virgin *Angraecum sesquipedale*.
Wasserthal, L. T. (1997), *Bot. Acta* 110, 343–359

Very few proposed hypothetical entities have been based on such meticulous quantitative considerations as those that led to the discovery of Neptune or to the suggestion of the existence of Planet Nine. There is, for example, no astronomical evidence requiring the existence of would-be planet Nibiru, which is based on imagination without scientific basis, and will remain more fantasy than hypothesis.[13]

Looking further, beyond our solar system, the observation of rotating galaxies has shown that in contrast to the familiar decrease in orbital velocity with distance from the center, as seen in our solar system, the rotation rate actually remains constant. It is as if there was more matter there than can be seen through telescopes. The postulated "dark matter" has not

yet been observed, and speculation as to its nature is a subject of intense research in astrophysics.[14] The recent discovery of a galaxy with little or no dark matter has complicated the issue.[15]

As in the exploration of the heavens, the progress of physics in the discovery of the intimate nature of matter has featured many hypothetical entities. Experimental work starting in the late 19th century gradually led to the discovery of the hierarchy of sub-atomic particles and phenomena with which we have become familiar. Wilhelm Roentgen's 1895 accidental discovery of X-rays opened the door to the idea of new kinds of radiation, soon to be extended by the equally accidental discovery of radioactivity by Antoine Henri Becquerel in 1896. Experiments by Ernest Rutherford and others soon led to a model for the structure of the atom, made of protons, packed tight in a nucleus, and electrons buzzing around it. There was a serious problem: atoms were mostly more massive than the number of protons they contained. Something was missing, and in 1932 Italian physicist Ettore Majorana postulated the existence of a neutral particle whose presence could reconcile theory and observations. Later that year, James Chadwick at the Cambridge Cavendish Laboratory demonstrated the existence of such a particle, the neutron, for which he was awarded the 1936 Nobel prize in physics.[16] Another successful hypothetical entity!

"The nature and very existence of hypothetical entities remain speculative until sufficient information is obtained. That is especially true for entities based on anecdotal evidence..."

At about the same time, Wolfgang Pauli suggested the need for yet another neutral particle to account for energy conservation in radioactive beta-decay. He also named it "neutron," and for a while there were two kinds of particles with the same name. But Enrico Fermi realized that they were quite different entities and suggested the name "neutrino" for the latter. Its existence was not confirmed until 1956.[17] Observation and logical hypotheses have continued to add to the zoo of fundamental particles, which are the building blocks of matter, culminating in the recent discovery (2012) of the Higgs boson, postulated as early as 1964 as a necessary component of the Standard Model of particle physics.[18]

Not every hypothetical entity put forward as an explanation of physical phenomena has successfully graduated to accepted reality, however. In spite of some initial confirmation, the N-rays imagined by French physicist Prosper-René Blondlot in 1903 were soon shown to be a subjective phenomenon. The incident is widely seen as an example of confirmation bias, with experimenters seeing exactly what they expected to see until someone pulled the plug.[19]

An all-pervasive but elusive hypothetical entity, long believed to be a necessary medium for the propagation of light was the "luminiferous aether." Light, seen as an electromagnetic wave, was thought to travel, like other kinds of waves (sound, water waves, seismic waves...), as an oscillation of a supporting medium: the aether. Observations (starting with the famous Michelson-Morley experiment) did not detect the presence of such a medium.[20] Light seen as a photon, a wavy particle, can travel through empty space and the aether has gone from hypothetical to historical.

One may distinguish two sources of motivation for the invention of a hypothetical entity. As in the case of the discovery of Neptune, the new entity may permit puzzling observations to fit within a solid theoretical framework. Even in the absence of a such a formal basis, a new entity may fit naturally within a corpus of known relationships, as with Darwin's moth. On the other hand, incomplete or partial observations may naturally lead to the invocation of a hypothetical entity. Paleontology offers numerous examples of hypothetical creatures, reconstructed from a few bones. While there may be little doubt as to the former existence of such creatures, there can arise serious debate as to their appearance and how they fit within the general scheme of life. Early reconstructions, such as the models displayed in the Crystal Palace built for London's Great Exhibition of 1851, were inspired by known living animals. The iguanodon was represented as a large bear-like creature with a horn on its nose (a misplaced thumb); the model iguanodon was large enough to serve as a dining room for 21 prominent scientists on New Year's Eve 1853–54.[21,22] A modern restoration has benefited from over a century of further discoveries and understanding of dinosaurian anatomy.[23] The hypothetical form of iguanodon has gradually developed into today's representation. This ongoing evolution is mirrored in the history of other fossil forms. For example, paleontologists still argue about the shape and habits of the giant swimming dinosaur *Spinosaurus aegyptiacus*.[24]

Anecdotal information on the nature and habits of elusive contemporary animals may also lead to their conceptualization as hypothetical entities, constructed on what little is known about them. In this case, not only the shape but also the very reality of such entities may be in doubt. This is the realm of cryptozoology, the study of animals—"*cryptids*"—known only from anecdotal reports.[25] Much interest has focused on a few charismatic creatures, including a variety of unidentified large marine animals fleetingly glimpsed but never captured. Zoologists are, of course, interested in acquiring further evidence of such creatures, and a few have systematically analyzed available reports, creating hypothetical animals from a synthesis of the observations of eyewitnesses and boldly attempting to classify them. Antoon Cornelis Oudemans[26] attributed

Dinner in the iguanodon, New Year's Eve, 31 December 1853.
The Illustrated London News

Modern restoration showing Iguanodon in quadrupedal pose.
Nobu Tamura/ Wikimedia Commons

sea-serpent reports to a giant pinniped, which he named *Megophias*. Bernard Heuvelmans,[27] working with a larger global database, distinguished many types of large marine cryptids, including long-necked" (*Megalotaria longicollis*) and "horse-headed" (*Halshippus olai-magni*) creatures. Edward Lloyd Bousfield and I[28] attributed most sea-serpent sightings in the northeast Pacific to a reptilian creature that we named *Cadborosaurus willsi*. Official naming and recognition of a new animal normally requires the availability of a specimen, and the proposed names and classifications merely raised the status of such cryptids from "Unidentified Swimming Object" to the level of "Hypothetical Animal" without gaining universal acceptance or settling the issue of their existence. The Kraken, legendary terror of mediaeval marine lore, is an example of a hypothetical marine animal, which, following examination of stranded specimens and, lately, observations in situ, has been recognized as a giant squid, *Architeuthis dux*.[29]

When it comes to terrestrial cryptids, the situation is much more controversial, especially when one speaks of human-like creatures, such as the North-American Sasquatch[30] or the Asian Wild Man.[31] These hypothetical creatures are the result of a long history of encounters and legends. Dedicated amateurs are passionately striving to prove their existence, roaming the forests and the mountains for evidence, currently consisting of tracks, eyewitness sketches, vocalizations, and even a most debated film.[32] Each group of researchers has its own theory of how the creatures fit into the scheme of life. It is not impossible that the hominins observed in Asia may be relic populations of Neanderthals, displaced into inhospitable areas over the millennia by the spread of *Homo sapiens*.[33] Reluctance to consider even the possibility of such a situation remains the prevailing scientific attitude. To admit the survival of such relic hominins, long thought to be extinct, would require a major re-evaluation of the history and place of *Homo sapiens* within human lineage—that's too big a paradigm shift for too little solid evidence. As to the Sasquatch—a relative of *Gigantopithecus*?[34]—a similar attitude prevails. Wildlife biologist John Bindernagel (2010) has analyzed the continuing rejection of the "North American ape hypothesis" in the context of similar scientific discoveries originally ignored because of the lack of theoretical

An undescribed bathypelagic nudibranch from Monterey Bay, seen below 1,000m. An example of an Unidentified Swimming Object: undoubtedly real but unidentified.

Robison,B.H., K.R. Reisenbichler and R.E. Sherlock, 2017. "The coevolution of midwater research and ROV technology at MBARI." *Oceanography* 30(4), 26–37. https://doi.org/10.5670/oceanog.2017.421

support.[35] Clearly, more compelling evidence will be required to promote acceptance of these hypothetical man-like creatures.

The nature and very existence of hypothetical entities remain speculative until sufficient information is obtained. That is especially true for entities based on anecdotal evidence, without compelling theoretical support, especially "wild men" and "sea-monsters." Claims made by over-enthusiastic amateurs are often found irksome by critical specialists; nevertheless, these hypothetical entities are heirs to a long and fruitful scientific tradition, supported by Einstein's famous aphorism about the importance of imagination.[35] The existence of Darwin's moth was confirmed by the capture of a specimen, later actually observed in action sucking nectar from its host flower. However, in the case of Neptune, given a strong supporting theoretical background, visual observations sufficed to convince astronomers of its existence and nature as a planet. There may be little doubt that undiscovered creatures still roam the seas; recent ocean exploration has revealed the existence of a plethora of previously unknown creatures.[36] That some hypothetical marine creatures actually exist is generally recognized as plausible, even probable, but still uncertain. Continuing anecdotal visual contacts will most likely not suffice to establish their existence. Even stronger evidence will be necessary for hypothetical Wild Men: specifically, specimens (or parts thereof) of solidly documented provenance, accessible to universal scrutiny. In the age of photoshop, a picture, or even a movie will not do.

This review of scientific hypothetical entities is offered in support of the work of cryptozoologists by situating their search for unknown creatures within the context of a well-established scientific tradition, through historical and contemporary examples.

A most controversial hypothetical entity: The Sasquatch. Frame 352 of the Patterson-Gimlin film. Roger Patterson, public domain

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