

Apparitions ‘R Us: Far more than a ghost of a chance

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Abstract: Ghosts and apparitions come in many different forms and their existence has been reported for as long as humans have been around. While a great deal of ‘superstition’ and outright silly beliefs have surrounded the phenomena for much of human history, some people, including a few scientists, have taken them seriously. During the past few decades, the question of the reality of apparitions has become even more urgent as science has matured and more scientists are considering the possibility that something or some part (at least) of human consciousness and/or personality survives bodily death. Science now needs to determine whether apparitions represent real physical ‘things’ or projections of a person’s subconscious on their perceived physical reality before it can move forward and explain them. Yet this question is almost impossible to answer with any certainty given the present paradigms of science. Science simply doesn’t know how to detect the physical presence of apparitions necessary to verify their reality. So the real question that scientists should ask is ‘how do we detect apparitions if they exist as real independent ‘things’ or entities, independent of any particular observer’s possibly biased sightings of them?’ Without anything else to go on, science needs some form of theoretical basis for the existence of apparitions to use as a guide to how to detect their ‘reported’ existence.

Introduction

Casper the friendly ghost? The Ghost Busters? Freddie Kruger? As if distinguishing the common hype from the reality of ghosts and apparitions was not already hard enough, it has become increasingly hard over the past few decades for a scientist to take the subject seriously thanks to Hollywood. The movie makers have seen to that by exploiting the concept of ghosts for their own profit line and profit has nothing to do with nor does it define physical reality. Unfortunately more information about ghosts now comes from Hollywood than just about any other source in our present culture and modern times, so Hollywood has effectively muddied the waters on what and how everyone thinks of ghosts. Furthermore, thanks to the popularity of a new generation of ghost hunter shows on television, aided by new and commonly available technology, the problem has been growing even worse, in as much as that is even possible. Although the point is debatable, these various popular modes of expression do far more damage

and harm to the scientific cause than good. Yet as unscientific and unrealistic as they are, these various avenues of entertainment also serve to stress the simple and elegant truth that we, as humans, have an extreme interest in the fundamental issues of survival and return. Our innate interest in these subjects seems to transcend any single religion and even the basic intuitive notions of belief and spirituality upon which the religious establishment is supposedly built.

Ironically, science has simultaneously progressed to the point where we are beginning to see the slightest glimmer of hope that science might perhaps offer some type of theoretical solution to the problems of survival and ghosts. Even though the two issues of survival and ghosts are technically different – the issues of survival and ghosts are sometimes related and sometimes not depending on the circumstances of any reported observation – science is now able to confront the concepts directly with some confidence instead of just denying or ignoring the validity of the observations. But that possibility assumes that science has the will and intent to investigate these reported phenomena, and that assumption is anything but certain.

The enterprise of science deals only with what can be confirmed as real and for better or worse science also defines what is real for science. Under these circumstances, science has managed to define ghosts and survival out of its lexicon in the past so science of the present just refuses to take a stand on these issues. Given this attitude, all the evidence gathered by non-scientists means almost nothing to scientists, if not a little less than nothing, until science can incorporate the concepts of survival and ghosts into their paradigms and that possibility is unlikely given the current prevailing paradigms. For the rare scientist who can get past the hype, the bias, bad science and publicity problems as well as the popularity of alternate non-scientific views of reality, a number of purely scientific problems still exist, including science's own poor attitude toward the phenomena.

Science sometimes outsmarts itself

As a first approximation, the current status quo presents scientists with a dual problem in the case of ghosts and apparitions. Science assumes that what is being observed in the material world of our physical environment is reality and all there is (or possibly could be) to reality. According to science, everything that is real must be objectively observable. In a very real although philosophical sense, science cannot technically 'prove' that anything is real and thus exists, especially you and I. 'Proof' is not part of the scientific program, nor has it ever been. Although 'proof' is not part of the scientific enterprise, the common thought outside of scientific circles is that if everyone just 'proves' the existence of ghosts by collecting more evidence then science will get on the band wagon and start studying ghosts. That is not the way that things work. Evidence is for a court of law, not for science, and is useless in the scientific laboratory where science verifies reality. Science develops hypotheses and theories to explain the data collected by observations of reality and then verifies its hypotheses and theories through further observations, experiments and predictions about reality that can be confirmed. So

then science cannot 'prove' the reality of either you or me or anything else for that matter, let alone ghosts and survival, according to its own definition of itself.

Science leaves 'proofs' of that type to the metaphysical insights of philosophers and merely assumes the existence of the material and physical reality which it is studying. So why is there even a problem with assuming the reality of ghosts? Simply because 'things' and events are either observed in the external world or experienced internally, if not a combination of both, and science has no way to distinguish between the 'reality' of completely internal experiences against the assumed reality of external observations – experience alone is not a suitable justification for assuming the external physical reality of the various 'things' and events experienced. In other words, science cannot determine if ghosts are created in the mind or actually exist in the external reality that science normally studies. This paradox is a fundamental problem for all of science, not just ghosts, and science tries as best it can to work around the paradox by the scientific method of developing better hypotheses and theories to explain our external world.

Within the context of science, a broad definition of 'observation' would include any input to the human mind from the external world via the five normal senses and not just sight. Observation in the broader sense includes experimental results and scientific measurements of quantities. The various types of 'measurement' made by scientists form the information and data bases upon which science is built. However, the term experience is usually defined or understood within a larger context that includes purely mental 'things' (dreams, imagination, memories, whether true or not, that can be distorted by the mind) that have not arrived in the brain from the external world via sensations. So the question about ghosts, at least as far as science is concerned, is 'are ghosts experienced or truly observed?' If ghosts are truly observed in the external world then they must have a physical, although not necessarily material explanation. However, if ghosts are 'experienced' they could just as well have a purely mental origin such as imagination, delusion, or even trickery.

Failing to take experience into account is not science's fault because science must only consider external possibilities when explaining external phenomena and the possibility that ghosts are a purely mental and thus internal experience that is not physical in any way has not been satisfactorily eliminated or explained. Unfortunately, some scientists use this caveat to completely ignore, minimize and even denigrate any scientific attempts to find a physical explanation for ghosts, which makes it even more difficult for any scientist who would like to take the subject seriously. Put in simpler terms, testimony derived from an individual's experiencing ghosts might be good enough in a legal sense for a civil court of law, but it is neither good nor precise enough for science.

Under these circumstances, the only way to establish a workable science of ghosts would be to assume that ghosts are both real and physical in nature, a move that could easily derail a scientist's reputation and career. If the external existence of ghosts could

be verified to the satisfaction of science and science were willing to pay attention to that fact, then science would be required to establish that they were sensed normally through the five common senses or paranormally by an as yet undefined, unconfirmed and unexplained sixth sense – at least regarding the scientific explanatory process depending upon hypotheses and theories. This last prospect is the most interesting since a sixth sense would imply the existence of either an ‘unseen universe’ or a portion of our normal physical universe that exists beyond the common material world of our five senses. Our five normal senses evolved so we could interact only with our normal material world. So a sixth sense would imply that we are reacting with, within or through something other than our commonly perceived material world. Any new sense that took advantage of this extra-sensory portion of the universe must have been evolved through some evolutionary advantage, and that would be a very interesting prospect for science to investigate because it ties consciousness and mind directly to the physical structure of the universe.

On the other hand, if ghosts are normally sensed within our external material world then certain criteria to establish their reality must be met to satisfy science: (1) they need to be observed by more than one person at any given time. They could not be observed by only one person while in the presence of others; and (2) they must be ‘measurable’ or at least they must interact with the physical/material world in such a way that either they or their interaction yields measurable results. Science needs more than just individual reports of people seeing or feeling a ghost’s presence. These are minimal requirements that would be extremely helpful to the scientific cause, but even greater corroboration and more ‘data’ gathering would be useful. In other words, ghosts would be legitimate subjects for study and theoretical speculation within the physical sciences (such as physics) if they could be detected simultaneously by as many different means as possible. Only this set of circumstances would rule out the possibility of interference by an individual’s mind and personality or outright dishonesty.

These criteria are extremely difficult if not impossible to overcome given our present state of science. However, that does not mean that some upcoming or future science and technology might not find a way to detect ghosts or their direct influences on the surrounding material world. If this were to occur, then science could gather real-time data on ghosts and come up with the necessary hypotheses and theories to explain them. On the other hand, science cannot sit around and automatically expect this to happen so it is not a realistic option at present. Although science cannot ‘expect’ this to occur, there is enough historical ‘evidence’ that science has now entered a new revolutionary stage of development to ‘hope’ it will happen in the near future. If nothing else, at least the newly evolving science of consciousness should shed some light on the problem, but unfortunately scientists who work in the field of consciousness studies and are more open than normal to the concepts of survival and paranormal abilities still tend to shy away from the possibility of ghosts.

Luckily, there still remains the possibility that ghosts are experienced paranormally if not by a combination of paranormal (via a sixth sense) and normal

sensations. As strange as this possibility might seem, it is probably the best bet for scientists to verify the existence of ghosts. If we assume that ghosts exist and that they are in some way related to the ‘survival of consciousness’, then a proper physical theory explaining consciousness and how consciousness could survive death could lead to new ways and methods to detect ghosts using new theory-suggested methods and technologies. In this case, a valid scientific and physical hypothesis or theory could also predict the physical circumstances by which ghosts could be detected as well as the means by which they could be detected.

So let’s just jump ahead into the fray, make a commitment, cut to the chase, proceed full speed ahead and just approach the combined problem of ghosts and survival – not only do ghosts exist as real physical entities but they are products of conscious survival past death – by forgetting all the other philosophical crap on which the scientific community and others are hung up. We only need to assume their reality to start developing a valid hypothesis or model of how they might work. This assumption would of course be sort of a worst case scenario for the presently ruling scientific paradigms, but it does give scientists and theoreticians something to work with. Then we can ask the simple question – how could ghosts be possible and what physical properties do ghosts display when they are seen or observed in the external material world without having any material content?

The answer is simple – they appear as materially real in our sight or vision! This means that they must either produce their own light or reflect light when interacting with our material-based environment. Furthermore, there is no data available, through either observation or measurement, that ghosts and apparitions have any materiality of their own and that presents another difficult practical problem for science. In fact, if they had any ‘materiality’ then everyone should be able to see them all the time. Simply put, only material bodies can produce or reflect light as far as is commonly known in science, which means that reflected light must be ruled out for the case of ghosts. So the next question becomes, is there any possible theoretical way that light can be produced by a non-material source? And the answer is yes!

Science also sells itself short from time to time

Light is normally absorbed and emitted by sub-atomic particles, atoms, or molecules within larger material bodies, but having none of those ghosts are left out. Light can also be emitted by either electrifying a gross material body (as in passing a current through the filament of an incandescent bulb) or heating the object until it glows by some other means (like the burning charcoal in a barbecue or the superheated gas in a flame). That possibility also leaves ghosts out. On the other hand, technicians create devices called radio transmitters to emit electromagnetic waves (light outside of the visible spectrum) by the forced vibration of electrons or other charged particles. But again that leaves ghosts out.

All of these methods are easily explained by the first two parts of Maxwell's electromagnetic theory which relates electric and magnetic fields to material objects. Electrically charged particles and objects that are moving in a specific well-defined manner create a varying electromagnetic field that spreads out over space in the form of light waves. According to the third and fourth parts of the electromagnetic theory a varying electrical field generates a magnetic field and a varying magnetic field generates an electric field. In fact, the light wave itself is a combined varying electromagnetic field whose rates of variation are well defined by their frequency of variation.

It may take a stretch of the imagination, but theoretically if a stable non-dissipating pattern of electric field variations could be established by synchronously combining it with a stable non-dissipating pattern of magnetic field variations, the resulting field pattern could produce light when interacting with the environment. It would then need to use energy in the environment to create an electromagnetic image that could be observed. Technically this is what happens when a radio (electromagnetic) wave hits an antenna. The incoming wave causes free electrons in the metallic antenna vibrate at its frequency, which is picked up and amplified to provide a radio signal although a stable stationary electromagnetic pattern of this type is still hard to imagine because it could not be associated with the energy with which a truly electromagnetic wave (traveling at the speed of light) is normally associated.

In another analogous situation, incoming light from the environment interacts with a pre-established pattern within a material medium to create a hologram. But once again the hologram is associated with a material medium even though the pattern is stable and stationary. What has to be done for the case of a ghost is to use material sources to create a hologram-like pattern which can continue to exist on its own merits after the material source of the pattern have been removed, like the case of a light wave spreading out from the source, but without spreading out over space until it is later 'witnessed' by observers.

This possibility is not completely unbelievable since electromagnetic waves themselves exist forever (if they are not absorbed by another material source) after their material source has been eliminated. However, such electromagnetic waves also spread out into space from their material source at the speed of light. So any pattern that could produce the waves, or on this case the ghost-hologram, would need to be confined or rather self-confined or localized in some manner to a particular volume of space. Unfortunately, I do not know nor have I ever heard of such a combined electric – magnetic potential field pattern existing independent of a material medium let alone one being confined in such a manner. What is theoretically possible in science is not necessarily true, but it can be true and become a reality if the proper circumstances are found or produced. In other words, extraordinary conditions for their production must be found before a ghost can be considered real even though this model does indeed indicate how a ghost might appear from the physical point-of-view, leaving only the source of the stable non-dissipating complex electromagnetic field 'pattern' to explain.

The next step in constructing a physical model of ghosts is really not that hard to find and it coincidentally also happens to answer the other questions about ghosts that deal with survival, intent and free will. If the ghost or apparition represents a real physical manifestation of a surviving human entity then its appearance would indicate that ghosts have awareness and free will, which are both clear indications of consciousness. If ghosts are real in that they can affect or influence our physical/material environment in some manner, then they must also be physical themselves although they cannot be material, nor need they be material. Electric and magnetic fields are surely physical but they are non-material, which also seems to fit the criteria specified for ghosts.

If ghosts exist as something more than just random patterns burned into a specific local environment by some very emotional event (such as an American Civil War battle or the Allied landing on the beaches at Normandy that are sometimes replayed by apparitions for observers in the dead of night), they must be able to produce light on their own by subconsciously interacting with the material environment at the time that the event occurred. In either case, this conclusion assumes that ghosts and apparitions are aware of either their surroundings or themselves at some level of consciousness and therefore have free will, indicating that a proactive mind and consciousness (not a zombie-like mind that acts without will or intention) survives death. These ideas are important because they imply the existence of an essential and fundamental relationship between ghosts, mind and consciousness.

The age old belief that ghosts haunt different locations (houses, cemeteries, boats or other 'objects') solely for the purposes of scaring the living does not necessarily indicate willful intent. On the contrary, any indication that we naturally fear ghosts or that they only haunt places for nefarious reasons is just untrue. This 'myth' perpetuates an unfounded association between ghosts and some abstract notion of evil, which does not hold water. If people are scared of ghosts then they are just scared of the unknown that the ghosts represent, not the ghosts themselves. In fact and science, if ghosts can affect or otherwise influence material reality in order to be seen, then they must also react to physical reality when they are seen and they would be more fearful of us than we are of them. There is thus neither need nor justification to fear ghosts, but that innate fear will not disappear until we finally comprehend and understand the phenomena, their significance and their natural place in physical reality.

But science eventually gets it right

Ghosts are just the potential field patterns of a person's mind and consciousness that survive death of the person's material body and subsequent detachment from the brain and body. This dualistic pattern exists in the single field as a special structure and thus in all four dimensions of space simultaneously, not just in the three-dimensional 'slice' of space that either contains or contained the material body and brain. The electric and magnetic fields that are associated with three-dimensional material bodies are fields of potential; they are not energy or force fields as commonly believed. That is another

myth. The field's potential only becomes potential energy and then kinetic or light energy when it interacts with other material bodies in the three-dimensional world. So potential is something like pre-energy or pre-force because it exists in the points of space before the interaction with matter that creates energy or force, which means that ghosts could be described as pre-light physical bodies in four-dimensional space or single field potential patterns that are normally non-substantialized in our three-dimensional space.

Ideally, complex stable non-dissipating potential field patterns such as the one described would not depend on energy for their existence, nor would they use energy or require energy in any manner and could therefore theoretically last forever. In physics and science, the whole universe, as far as is presently known, is constructed from three different potential fields that exist outside of the atomic nucleus. These are the gravity, electric and magnetic fields. The existence of exactly three fields is more than just a coincidence, because patterns in these three fields can account for exactly three different 'things' of great importance in our quest to understand the physical nature of ghosts – life, mind and consciousness.

According to normal science, that is, under the presently accepted paradigms of physics, electricity and magnetism were unified theoretically more than a century and a half ago, but gravity has defied all attempts since then to be unified with electromagnetism. Even Newton suggested a single common source for gravity, electricity and magnetism in the final edition of his *Opticks* of 1740, published after his death, even though the concept of a physical field had not yet been developed. So it is certainly not out of the question and it should be safe to assume that these three fields have already been or at least will eventually be unified in a single theory called the 'single field theory'. This accomplishment was Einstein's goal for the remaining three decades of his life, although he called it a 'unified field theory'. He thought of it as an extension and thus a combination of the three fundamental fields rather than a single field out of which the three common fields of gravity, electricity and magnetism emerge as individual and unique physical structures.

Matter in the form of the fundamental particles that come together to form nuclei, atoms and molecules, and thus all material bodies in the universe, are just a different type of unique structures within this single field, as is light itself whether the light is considered discrete as photons or continuous as waves. In other words, everything in our universe is just a different form or type of structure within this single field, including life, mind and consciousness. The single field gives everything in the universe its substantiality, thus fulfilling the ancient desire to find a single constant substance (from Thales' water to Aristotle's plenum) to define the universe, which along with space and the flow of time yields the concept of 'change' which characterizes the universe in the mathematical equations of physics.

The single field is completely four-dimensional in that it completely fills the greater four-dimensional space that is coupled to time via the quantum. The single field is not a 'quantum field' *per se*, but parts of the field can be quantized as the material

'things' that define the material reality that we normally observe as well as during 'action' and 'reaction' processes between the different 'things'. The quantum is the lower limit to material existence (material reality) and thus the lower limit to physical measurement, although it is not the lower limit to physical reality. We sense and mentally interpret the world as seemingly three-dimensional because the various bodies of matter by which we judge or form our mental picture of space (by relative positions) is limited to an existence within three dimensions only. Therefore everything that we can sense by our normal five senses must be three-dimensional in nature and anything else that is four dimensional or can be sensed four-dimensionally must be sensed by some extra-sensory means such as a sixth sense.

Four-dimensional space is still physical in every scientific sense of the word, but completely non-material except for the small portion that makes up the three-dimensional space (the home) of matter. This structure also means that the fourth dimension of space exists within every geometrical point in the embedded three-dimensional space of material reality, at least from our limited three-dimensional worldview, while our three-dimensional material generated space of experience is actually only a small portion (or rather a 'slice') of the overall four-dimensional space that is coupled to time. This geometrical structure forms both our observable and experiential realities, whether internal-mental or external-material, giving the universe its unique physical characteristics.

The single field that fills four-dimensional space is itself just pure undifferentiated potential, while the gravity, electric and magnetic fields that we sense, observe and measure in three-dimensional space are just different structures within the single field – they are various differentiated forms of the single field's potential depending on how they individually interact with matter and whether they interact with matter three- or four-dimensionally. This overall model is extremely difficult to mentally picture for two reasons: First of all, picturing four-dimensional space would constitute an attempt of the mind to picture itself as separate from itself while it is in truth not separate from itself. Even the attempt to do so would create a paradox that includes an ultimate mix of subjectivity and objectivity while the two preclude each other. And secondly, all of our experience with life and the external environment upon which our information about reality are dependent are limited by the learned three-dimensional perspective of the universe that results from the three-dimensionality of our normal five senses. Those senses evolved in correspondence with the three-dimensionality of matter so three-dimensionality is all that they could ever sense directly. They could not possibly sense anything else.

However, mathematics has given science a rudimentary logical picture of just such a universe, so the four-dimensionality of space can be physically modeled based on the appropriate system of mathematics or at least the model allows us to work and make logical assumptions about this new theoretical hyper-dimensional framework. The simple fact that we now have a working knowledge of higher dimensions, even as limited as that

knowledge is, means that our minds have already or are presently 'evolving' a sixth sense for interaction with that dimension.

Matter and energy within the single field conform to a specific group of interconnected particulate, atomic and molecular patterns of three-dimensional curvature in the higher fourth dimension that can be modeled using Einstein's general theory of relativity. Einstein's theory is usually associated with stars, star systems, black holes, galaxies and the universe as a whole, but it can be used just as well to model the material particles filling all of space on the quantum level of reality as restricted and modified by quantum conditions of individual particles as well as particle-particle and particle-light wave interactions. This overall structure is a direct product of the unified vision of physics that Einstein and others have sought for several centuries and as such this same structure forms the basis for solving the scientific mysteries of life, mind, consciousness, death, survival and ghosts.

Life, the 'vital force' or 'elan vital' that seems to exist beyond the mere mechanical structures (skeletal system, muscles, and organs), molecular structures, chemical processes (energy-conversion) and electrical impulses (nervous system and brain) of living organisms can be just as easily modeled as a single varying or undulating pattern using the space-time curvature of relativity. This complex 'pattern' of variations of curvature must be self-consistent, non-dissipating and stable over time due to its mere existence and thus is life itself. This continuous rippling pattern of curved space-time exists in and of every geometrical point within the organism or living body, including those points that lie between the fundamental particles that constitute the material mass (and weight) of the body. Since this complex stable curvature pattern is life itself, when life ceases at death this complex pattern is disrupted. It begins to break up and decay in a chaotic manner, allowing the ravages of time to take over. Simply put, life cannot maintain itself any longer or be maintained by any higher order physical patterns once death occurs. The curvature which connects all the individual particle curves of the atomic elements and molecules together just goes flat as the body decomposes. Death is the cessation of life marked by the breakdown of this pattern and there is no life after death because this pattern is permanently disrupted by death.

However, there are two other complex patterns that coexist with or rather overlay the basic life or matter-energy pattern. These are the electric and the corresponding magnetic patterns. The electric pattern has the same physical characteristics as mind and the magnetic pattern has the same physical characteristics as consciousness. The electric pattern is purely three-dimensional while the magnetic pattern is the corresponding four-dimensional part of a combined complex electro-magnetic potential field pattern. In the language of physics, it is a combined scalar-vector potential field pattern. The magnetic pattern (four-dimensional) has the ability to guide, regulate and organize the lower level electric pattern (three-dimensional), just as the electric pattern acts as a guide, regulator (coordinator of events and action-reaction processes) and organizer of the matter-energy

pattern, directing and connecting the many different chemical and physical interactions within the living organism.

The electric and magnetic field patterns are individual but co-existing structures within the single complex field pattern. They feed off of each other (they are mutually coherent) and interact according to the third and fourth laws of Maxwell's theory of electromagnetism and thus share a semi-independent status within the material body during life. Under these circumstances, the overall electric pattern is effectively mind and the magnetic pattern is effectively consciousness. So mind and consciousness are extended single field structures (they occupy space and time in a definable manner) and thus physical in nature although not material. They interact primarily through the brain because the brain has the densest concentration of electrical circuits (nerves and nerve endings) in the body, but technically the mind and consciousness incorporate the whole body which is an important point with regard to ghosts and apparitions.

Although the complex electro-magnetic potential pattern of mind and consciousness was originally generated according to the first two laws of electromagnetism which associated the electric and magnetic fields with their material sources, their mutual interaction allows them to exist somewhat (partially) separate from the material particles even while living. Thus mind and consciousness are not completely disrupted when the body dies (the life pattern is disrupted and dissipates), but survive intact according to standard electromagnetic theory because they are mutually coherent and internally (within their unique complex) stable and require no energy to remain so after they are first generated. The pattern only requires infinitesimally small amounts of energy to 'change' or vary internally at the quantum level of reality.

This combined stable self-sustaining complex electric and magnetic potential field pattern thus forms what could be called the afterlife body (which is still physical but non-material) of mind and consciousness of all living things, not just humans with human consciousness. Human consciousness is just the highest level of consciousness with which science is presently familiar and that perspective could represent no more than the fact that humans are defining what consciousness is. Once living beings have reached a human consciousness level or above, an awareness of the conditions of survival becomes a real possibility for the surviving 'entity'.

All those old stories that we are really light beings and survive death as light beings are not so farfetched after all. Technically, this afterlife body is not light *per se*, at least not until this body interacts with the three-dimensional material world to produce light, because light has or carries energy and energy is associated with materiality and only the normal three dimensions of space as related to the flow of time. It would be more accurate to say that this afterlife complex pattern of mind and consciousness is a pure single field potential pattern, a stable complex pattern of electric and magnetic potential, until it interacts with three-dimensional space in time and/or matter. It is at this moment in time when the potential pattern interacts with the material world that ghosts and apparitions can appear and be observed by everyone. So it seems that this theoretical

model conforms quite well to the original prerequisites needed to scientifically conceptualize a real physical ghost. However, this particular physical model yields a great deal more than originally bargained for.

Without going into too many lengthy details, many other suspected characteristics of ghosts and apparitions are predicted by this model. For example, apparitions (rather than ghosts) are sometimes 'seen' by an individual during NDEs (near death experiences) and DBVs (death bed visions). In both cases, all 'evidence' of the events comes from the individual uncorroborated testimony of the experiencer, which is highly questionable by science and far less than ideal for scientific purposes of measurement and collecting verifiable data. This situation is tragic since a lot of information is lost to science because of the restrictions of science, but then without such restrictions science would not even be possible. It is something that we all have to live with and try to work around by theoretical means. Yet this model can explain why only one person 'sees' the apparitions.

According to this physical model, the near death state under which NDEs occur vastly weakens the link between the electro-magnetic field pattern (mind and consciousness) and the matter-energy pattern (brain and body) enhancing the semi-detachment which allows the NDE to proceed. The near death state also quiets the normal and constant din of sensory input through the five senses to the brain allowing the sixth sense acting through the consciousness to take over and dominate the mind. This allows the individual ND experiencer to 'see' or sense apparitions and the other reported characteristics of the NDE with their 'mind's eye', or rather more directly through the still active consciousness independent of the brain and body. DBVs come about in a similar manner. In this case the connection between the matter-energy pattern (brain and body) and the electro-magnetic pattern (mind and consciousness) is only 'loosened' by the foreknowledge of the impending death, which is preparing the body and brain for ultimate shut down and death. When so loosened the dying person's consciousness is more susceptible to sensing 'things' (apparitions) in the higher-dimensional single field.

Given the proper physical conditions it is even possible for people to 'see' ghosts that are 'haunting' a specific location. People not only see stationary images of the dead that they call ghosts, but the ghosts sometimes move along predetermined paths (like the proceedings of a play or movie) or seem to move through space in a random manner. Motion is normally associated with material objects, but since motion just means relative changes of position against the constant flow of time the motion of a ghost or apparition does not require the application of a locomotive force. In other words, some form of holographic image that varies over time (a holomovement) could have been imprinted into the background material environment that replays itself by interacting with similar environmental variables to display the haunting for anyone who might be present to see.

All matter shares the same four-dimensional space-time continuum and thus similar types of matter-energy and electric-magnetic patterns. However, the normal patterns of inanimate matter do not rise to the level of forming a complex system of matter-energy and electro-magnetic potential patterns that characterize living organisms,

i.e., animate matter. Therefore, during very traumatic and emotional (highly energetic) events, the sequence of space-time variations of a dying person or group of people can force a holographic imprint of the events into the four-dimensional extensions of the inanimate three-dimensional surroundings without affecting the three-dimensional physicality of the material environment. These imprints could not be detectable by any known physical measurements, but under proper environmental conditions they could replay themselves as a play-like haunting that individual observers could witness.

Furthermore, this model explains other non-apparition related phenomena that are normally related to the existence of consciousness. The higher dimension of space is both outside of our bodies and inside of our bodies simultaneously, inside every point in our bodies at the same time. This radical notion cannot be completely understood without an extensive background in advanced mathematics and the related physics, although it is commonly known to mystics who have experienced the phenomenon as 'enlightenment' or 'satori'. This is why mystics distinguish between the 'self' that you see in the mirror (the three-dimensional self that demonstrates a human level of conscious awareness according to normal psychology) and the 'true self' you cannot see in the mirror (because it is the corresponding four-dimensional physical extension of the three-dimensional material self). The 'self' is a three-dimensional image and product of the brain while the 'true self' is the four-dimensional mind and consciousness itself, *i.e.* what survives death and has the ability to create ghosts and apparitions under favorable physical conditions.

Conclusion

Part of the beauty of this theory is its obvious ability to account for a number of different phenomena and physical effects, but that advantage does not address the original goal of predicting methods to detect ghosts. At the level of this forum no methods of detection or verification have yet presented themselves. However, the overall theory upon which this physical model is constructed does suggest methods of verification (which are beyond the scope of this paper) in the form of specialized electronic devices that can now be constructed. So the problem of detection and verification may well solve itself.

Another problem rests in the simple fact that the existence of a higher dimension of space was assumed. Many scientists do not nor will not accept this hypothesis because the fourth dimension cannot be directly observed. While this is true, the effects of the higher dimension have already been 'observed' in the existence of Dark Matter and Dark Energy, but these phenomena have not yet been accepted as examples of the higher dimension by the vast majority of scientists. Thus we have a new paradox: Scientists who deny the possibility of a fourth spatial dimension do not realize that they are also denying the observational 'evidence' (of ghosts and other phenomena) that would suggest or even confirm its reality. However, this may not be a real problem as a thought at first.

The higher dimension of space merely offers a convenient way to explain the concept of the magnetic vector potential whose complex pattern has been associated with

the mind and consciousness of living beings. The vector potential actually exists whether it is explained by the hyper-dimensional hypothesis or not. In fact, the existence of the magnetic vector potential and the subsequent difficulty observing it has already been explained within the context of the quantum theory. So the model that mind and consciousness can be equated to the complex electrical (scalar) and magnetic (vector) potential patterns associated with living beings is not absolutely dependent on the hyper-dimensional hypothesis (or assumption), even though the four-dimensional model more easily explains various aspects of mind and consciousness.

In fact, the direct detection and verification of ghosts and apparitions due to predictions made by this four-dimensional single field model could actually help to verify if the fourth dimension of space is real or not because it offers a way to differentiate between present quantum explanations of the vector potential and the single field explanation. This model of consciousness and ghosts could thus provide a classic case of two alternate theories competing against each other to determine which better represents reality and which does not.

And finally, there is one last sticking point to the scientific understanding and explanation of ghosts and apparitions as well as other aspects of mind and consciousness that is offered by this model. One final question needs to be considered – Does everyone or even anyone really want ghosts explained by science? Do not answer this question, even to yourself, without thinking about it first. If science does explain ghosts and apparitions to everyone's satisfaction, then the mystery disappears and many people do not want the mystery to disappear.

Bibliography

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Professor Beichler has taught Physics, Mathematics and the History and Philosophy of Science at colleges and universities for the past two and a half decades, but is now retired. Since retirement, he has been writing and publishing papers and books about his theoretical work. He obtained his PhD in 1999 from the Union Institute and University in Paraphysics, a new branch of theoretical physics. His doctorate is the only such degree from an accredited university in the world. Professor Beichler designed his own course of study for the PhD by combining past advanced degrees and doctoral work in both Physics and the History and Philosophy of Science with new studies in Parapsychology. He previously published and edited an online journal, *Yggdrasil: the Journal of Paraphysics*. His primary area of theoretical research is Cosmology where he explains Dark Matter and Dark Energy as well as fundamental Physics where he explains the nature of life, mind, consciousness and matter. He and will soon apply these findings to develop a new

physical model of the atom. All of these advances are applications of a fundamental theory of physical reality called 'single [operational] field theory' or SOFT, which he has developed. SOFT utilizes a five-dimensional Einstein-Kaluza space-time geometry as expressed in the general theory of relativity that has been modified to include the quantum and quantum theory. Explanations of paranormal phenomena as well as the survival of consciousness emerge naturally from this space-time structure. Professor Beichler has published two books on these subjects; *To Die For: The physical reality of conscious survival*, which gives a thorough explanation of his theory of consciousness and survival in laymen's terms, and *Evo; The next step*, a geek SciFi novel that applies his theoretical research to a fictional story about the end of the Homo sapiens and the emergence of their evolutionary replacement Homo paradoxus.