

Strange facts in search of a theory

By James E. Beichler

The definitive psi

The science of physics is built upon observation, definition, measurement and noting patterns of action which can be explained by hypotheses, testing those hypotheses, building theories and expanding those theories to cover more and more phenomena. Definition is an important and integral part of the process. In fact, definition lies at the very basis of the scientific method. Without strict and precise definitions, the quantities to be measured in the pursuit of science could not be measured and more precise definitions allow measurements to be further refined. If a quantity cannot be precisely defined, then precise measurements cannot be made and patterns of action cannot be described in enough detail to build accurate theories. In a broad sense, the history of any branch of science can be characterized and portrayed as the progression and refinement of the definitions that form the basis of that field, and the parasciences are no different. So, a precise definition of psi, the quantity to be measured in parapsychology and paraphysics, is necessary for the further development of these sciences.

Earlier this century, Rhine established the basis of the new science of parapsychology by defining psi accurately enough to be measured, if only by statistical methods. Before Rhine accomplished this feat, no direct measurements could be made and most of the psychic studies depended on anecdotal evidence, observation alone.

Although the early investigators had carried out experiments, psychical research was not at that time primarily an experimental science. The tendency was to regard the accumulation and validation of large numbers of reports of ostensibly paranormal events as the right way of finding out about psi, while experiments served the subordinate purpose of providing convincing evidence of the occurrence of telepathy or other psi-phenomena. A more completely experiment-oriented approach was set into motion in 1927 when the first university laboratory for the experimental study of the subject was started at Duke University in North Carolina under J. B. Rhine. From that time, parapsychology, like other branches of scientific research, used experiment as a means not merely of verifying the fact of psi but of finding out about its nature and properties. (Thouless, 16)

The evolution of psychic studies to an experimental science moved parapsychology to the third step of the scientific method as listed above. The previous study of psychic phenomena had only progressed to the observational phase although there were attempts to develop hypotheses to explain the observed phenomena. Even today, the study of psi phenomena and the fledgling attempts to develop a theoretical basis for psi has only moved into the pattern recognition and hypothesis building stages of a science.

The field of parapsychology is littered with hypothetical structures to explain the psi process, or rather some features of it, but there is no comprehensive theory of psi. The lack of such a theory has caused scientists to waste valuable time on 'proving' the existence of psi. Gerald Feinberg expressed this opinion over two decades ago (Feinberg, 24), yet scientists are still trying to 'prove' the existence of psi. But there is a basic precept in science that will not allow any proof of the existence of psi, nor should it. Nothing can be proven to exist from a philosophical point of view, so why should psi, which seems to be the subtlest of all influences, be susceptible to 'proof' when nothing else is so susceptible. And knowing that nothing can be absolutely 'proven,' why is a 'proof' of the existence of psi even being demanded? There is something fundamentally wrong with scientific attitudes toward psi phenomena that needs to be addressed by the scientific community as a whole.

In view of this lack of both a 'proof' as well as a comprehensive theory of psi, scientists have sometimes resorted to redefining psi or inventing an alternative word or phrase to replace the term. There are criticisms of the use of the term psi that reflect the concern that words like psi, ESP and PK are already theory laden. Such words are thought to convey a particular but unwarranted point of view, attitude or theory that may or may not be valid. Use of the term psi is associated wholly with parapsychology and thus stresses the purely mental aspects of the phenomena in question, while the physical aspects of the process are rendered subsidiary or secondary to the mental manifestations. Edwin May has recently criticized use of the term psi as not precise enough for quantitative measurement, (May, 1995) but his alternate use of the term 'anomalous' lacks even the precision of so scientifically vague a term as psi.

The modern trend toward the use of the phrase 'anomalous phenomena' instead of 'psi phenomena' suffers the same problem as the older idea of 'paranormal phenomena.' Anomalous phenomena are those phenomena and events that do not fit the preconceived theoretical framework of normal science. On the other hand, what is paranormal goes beyond what is normal within the wider framework of naturally observable (and thus perceivable) phenomena, regardless of any theoretical framework induced upon normalcy by science. In either case, not all paranormal and anomalous phenomena are psychic in nature. Psi, no matter what the faults with the term, distinguishes a particular class of anomalous and paranormal phenomena that are associated with mind.

Psi phenomena or events follow specific patterns as reflected in the fact that they these phenomena have distinguishable properties. These properties separate psi from other paranormal and anomalous phenomena, so psi is a more precise term than either 'anomalous' or 'paranormal.' The problem is that psi is not, nor has it ever been, designated as a measurable quantity. Some scientists do not like the term because it does not specifically refer to a 'thing' that is directly measurable. Instead, psi is more of a classification of subtle processes that have common characteristics. The processes are characterized in the first approximation by their association with mind, but the term does not imply any specific theory of mind. Nor does it limit theories of psi exclusively to a quantity of mind alone.

Further problems with psi are inherent in the possible dual nature of psi phenomena as manifested in the physical world. Some psi processes exhibit a mind/mind interaction while others exhibit a mind/matter interaction. This inherent duality will probably have a simple unified explanation as is assumed by use of the word psi to cover both types of phenomena, but the phenomena are qualitatively different at the common level of reality where psi manifests. These two types of psi are termed Extra Sensory Perception (ESP) and Psycho-Kinesis (PK) phenomena, respectively. These classifications of psi actually predate the concept of psi as a unification of the common elements of all such phenomena. ESP and PK phenomena were found to have enough common characteristics that it was decided to group them together under the single banner of psi.

Another term that will sometimes be met with is one originally suggested by Dr. Wiesner and myself. We were inclined to think that there might be no real difference between what were called telepathy, clairvoyance, and precognition, that they might be the same capacity working under different circumstances. We suggested that this capacity might be indicated by the Greek letter (psi) which would also have the advantage over such terms as ESP that it implied no theory about the psychological nature of the process but could be used merely as a label. This suggestion has been widely taken up and the term 'psi-phenomena' is as well understood (at least in the United States) as the term 'paranormal phenomena'. We also suggested that this Greek symbolism might be extended to cover the difference between ESP and PK, the former being called (psi-gamma) and the latter (psi-kappa). This suggestion has not, however, been generally accepted. (Thouless, 1-2)

By Robert Thouless' own testimony, he and Wiesner adopted the term psi because it was not 'theory laden' and thus "implied no theory about the psychological nature of the process." The term psi filled a perceived need, so the scientific community adopted it.

The use of other terms to replace psi is premature at best. To use another term now would be just as improper as using the term psi if it were ever demonstrated that a more accurate term was available. Granted, psi is bound to a psychological viewpoint of the phenomena in spite of Thouless' intent, but substituting another term would only cloud the issue and detract from the obvious connection between mind and psi. It has not been demonstrated to anyone's satisfaction or notion of sufficiency that psi is a physical quantity rather than psychological, even though the two could someday prove be one and the same at a more fundamental level of reality. So a more physically oriented term than psi is unwarranted. Psi is whatever scientists choose to make it, within the restrictions set by nature, but not within the restrictions set by human philosophical notions.

The only thing that is truly evident is that psi must be determined by its properties, in lieu of a precise definition of psi. Without reference to its properties, psi is just an empty category of phenomena that may or may not be related, even though the existent evidence strongly implies that a single idea rests behind all psi phenomena. Both Feinberg and Henry Margenau have stated that the properties of psi must be emphasized rather than the statistical 'proofs' of its existence that have dominated research because science will never accept the reality of psi based upon experimental 'proofs' of its existence. Especially when these proofs are statistical in nature.

My point is simply this: in order to study these obscure things, you must practice selectivity and concentrate your attention upon instances where positive results are incontrovertible and, of course, demonstrably free of fraud. I believe that as long as you go around making statistical studies everywhere and on everybody, you are not likely to be convincing for a long time to come. (Margenau, 1982, 119)

Margenau actually went further than Feinberg to state what is only implied in Feinberg's criticism, the necessity of a theory of psi before the scientific community can take the concept seriously.

Now, the second thing you need is theory. No amount of empirical evidence, no mere collection of facts, will convince all scientists of the veracity and the significance of your reports. You must provide some sort of model: you must advance bold constructs - constructs connected within a texture of rationality - in terms of which ESP can be theoretically understood. (Margenau, 1985, 120)

Their opinions are all the more relevant since both men are respected physicists. Neither could be considered a parapsychologist or paraphysicist. The primary purpose of more than a half century of experimental research on psi is not to 'prove' the existence of psi, as it may well seem, but to ascertain the properties of a scientifically viable process in nature which has been dubbed psi. Nearly all researchers of psi seem to have forgotten this fact in their rush to overcome emotional and biased criticisms of the concept.

A property by any other name...

The actual properties of psi follow the same pattern of dualism that distinguishes the major categories of psi, the 'mind to mind' and the 'mind to matter' connections in nature. So a theory of psi as well as a physics of psi must distinguish, as effectively and accurately as possible, which characteristics are physical and which are biological and/or mental. Purely mental features of psi hinder the development of a physical theory, just as purely physical characteristics cloud an understanding of the mental models of psi. For example, the effect of personal or cultural biases on psi hits during experiments has no bearing on a physical theory of psi at the present level of understanding the process. On the other hand, physics cannot ignore the mental or seemingly mental aspects of psi, but a physical theory does not need to include them directly. A physical theory of psi can be based upon the purely physical properties as long as there is a justification for doing so at a later period of development in the theory when all properties must be explained by a comprehensive theory of psi.

Carroll B. Nash, a biologist turned parapsychologist rather than a classically trained psychologist, is one of the few scientists to summarize and enumerate the various properties of psi, even among those who work in the field of parapsychology. He has concluded that

Psi appears to require life or mind; to be generally unconscious; to be unlimited by space, time, or physical causality; to act sometimes precisely and specifically and at other times without spatial and temporal precision; to lack reliability and durability; to act

holistically; to be teleological and need fulfilling; and to be a two-stage process. (Nash, 1986, 213)

Determining properties for psi depends on an unwritten assumption that psi is a separate 'thing' that can be characterized by specific properties. The situation is similar to that of the early development of a concept of space during the middle ages. The Aristotelian view that space was nothing, literally a "no-thing," guaranteed that space could not be reduced mathematically for physical analysis. That viewpoint changed forever with the Newtonian concept of absolute space and again later with the Einsteinian view of relative space-time. Newton's absolute space was essentially a "nothing," an empty container separate from the material bodies it contained, but it was not a "no-thing" so it could have physical properties. These new views did not just appear at a specific point in time but were the crowning achievements of evolutionary processes in human thought. The same is true in the case of psi. If something has properties, then it cannot be a "no-thing" and it must exist. Margenau and Feinberg understood this simple notion, at least at some very basic and probably unarticulated level in their own minds and consciousness. Establishing the properties of psi is more important than proving the existence of psi because the properties will lead to a tangible theory of psi which would not be possible unless there were something to the concept.

Harvey J. Irwin, a psychologist, has failed to find specific 'properties' or characteristics for psi. Instead, Irwin describes the "character of performance" in an "experimental ESP task" which displays "certain consistencies in individuals' patterns of performance." (Irwin, 84) It would seem that he does not completely accept the notion of a separate thing called 'psi' which he would be forced to accept if he gave it properties. He implies that the phenomena represent a specific and undetermined process or group of processes rather than a specific 'thing' called psi. His "patterns" include the bi-directionality of ESP or psi-missing, consistent missing, the focusing effect, position effects and decline effects, clustering, the differential effect, displacement, inherent response bias and variance effects. These are some of the same patterns/effects by which Nash chose to characterize psi. But Nash sees these patterns as specific properties indicative of psi. Irwin further notes that PK is also bi-directional, demonstrates the focusing effect, differential effect and displacement. Whether PK involves displacement and clustering is still an open question, (Irwin, 129-130) but not beyond possibility.

Nash considers these same effects as characteristics of psi. He further finds enough similarities between the "patterns" or properties that he draws conclusions regarding the relationship between them, while Irwin seemingly refuses to draw any specific conclusions, especially any which would relegate these effects to anything but an independent existence. Irwin does, however, note that there is a "reasonable degree of consistency and coherence in the process-oriented data" that he presents. (Irwin 105) Within certain constraints, including the possibility of cheating, Irwin concludes that "the available data nevertheless might offer some encouragement to researchers who believe that the concept of ESP is viable, and certainly they provide foundations for theory building." (Irwin, 105) This statement is as close as Irwin will come to admitting that he

is discussing specific characteristics and properties of psi and that a single theory to describe the phenomena could be possible.

Nash has also added psi masking, the relative weakness of psi, holism and the holistic shift, the teleological or goal-oriented nature of psi, diametric, memory relations and other characteristics to his list of psi properties. The list is fairly comprehensive. However, some of these features could be combined as different aspects or results of a single physical property. Holism implies a physical field effect, as does the goal-oriented nature of psi. In a normal physical situation, a process can be reduced to a cause-effect relationship between objects. According to Newton's third law of motion, there is an equal and opposite reaction to every action. But the field does not act in that manner. Material objects do not come into physical contact within the field, but interact over longer distances of physical separation via their fields. The third law is integrated into the field point of view such that the action/reaction sequence becomes the physical equivalent of an infinite regress and emerges as a mutual interaction between the fields emanating from two or more bodies.

In holism (or wholism), an action/reaction sequence cannot be reduced, but must be considered as a whole, the complete and complicated group of interactions in an extended concept of field. The goal of any physical interaction process is related to the field from which it emerged, it is a part of the field because the action and reaction are not separate as in the strictly Newtonian viewpoint. This is further related to the concept of a diametric whereby "the components constituting a complex *target* situation are apprehended by *extrasensory perception*, the *cognition* is achieved in a single act rather than by a step-by-step process." (Thalbourne, 20) In other words, a target is sensed as a whole not as a group of individual components. This property implies a holographic view of psi, which is again like a field.

Nash also lists another characteristic, which he calls the 'gestalt.' The 'gestalt' resulting from the psi process is an alternate way of interpreting and expressing the field concept.

Psi acts as or causes a gestalt, either in the sense of a gestalt being an integrated whole that is more than the sum of its parts, or in the meaning of a gestalt as being a pattern within the whole. In the first meaning, psi acts as a gestalt or whole in operating holistically. In the second sense, psi causes a gestalt or pattern of hits and misses when it produces a position effect, e.g. episodic decline or terminal salience. Psi's characteristic of producing a pattern is not always the same as its acting holistically, as a pattern could result from psi acting separately on each of the events composing the whole. (Nash, 201)

Nash's description of the gestalt as "an integrated whole that is greater than the sum of its parts" is very field-like because a field is represented by field strengths at every point in its domain. The field is greater than the sum of its parts, the individual points of space. While Nash's various properties are not strictly physical, they are mental properties which characterize how psi is cognized, they still imply that psi acts in at least a manner which is similar to the effect of a physical field.

The two-stage process described by Nash is also quite informative. In the first stage the information is received or "becomes accessible without sensory mediation." The second step consists of cognizing the event by "normal mediation of the information ... through ordinary physiological machinery." This property implies that the psi process is split into two distinct parts, the actual sensing or reception of the psi signal followed by a separate process by which the sensed signal is cognized. This two-stage process therefore offers a good approximation of the dichotomy between the physical and mental aspects of psi without actually requiring separate mechanisms for the transmission and interpretations of the psi signals. Sensing the affect of psi or detecting the signal could represent a completely physical/biological action while the second stage process of cognization would be strictly psychological. For his own part, Irwin fully recognizes both the value and significance of a theory of psi as well as the separation of the detection and cognization processes. When he summarizes the various theories of psi, Irwin groups them as theories of psi mediation (based on the detection/transmission stage of psi), theories of the experiential phase of psi (based on the cognization stage of psi) and theories that encompass both stages. Quite simply, the various theories of psi reflect the characteristics and properties of psi that have been developed from experiment and observation.

The significance of the viewpoints of these two scientists reaches several levels. The books in which their views are expressed are two of a very small number of textbooks that have been written for students of parapsychology. So their opinions will help to influence and shape the opinions of future parapsychologists and scientists. On still another level, the slight differences in their philosophical handling and presentation of the data reflects their training in two different fields of science, biology and psychology. The biologist Nash is more inclined to put his faith in properties and theories, while Irwin, the psychologist, is hesitant about committing himself to defining and listing specific properties of psi. Irwin deals with indefinable and nonspecific quantities such as mind, the subconscious and subliminal perception while Nash works with definable and quantifiable cells, organs, organisms and animate bodies. In other words, the philosophical viewpoints of these two men reflect the very dichotomy that is inherent in the psi process, the mental/psychological versus the material/physical/biological. Yet these two men come to very nearly the same conclusions, in so far as it can be said that Irwin has reached specific conclusions about psi and the categorization of patterns/properties.

Both scientists unintentionally belittle the purely physical attributes and properties of psi. For his part, Nash lumps all of the physical properties into a single property called "physicality," as if a living body itself is not physical.

In the sense of being independent of space, time, and physical causality, psi is non-physical. Physical causality presumes transmission of energy over time and space between the interacting bodies. Although control of psi has not reached the degree of precision that would permit determination of the duration of time between a psi cause and its effect, psi's apparent independence of physical causality suggests that, for it, cause and effect may be simultaneous. That psi is not a physical force in the classical sense is indicated by the failure of metal chambers and Faraday cages to prevent its occurrence,

even though they are impervious to the transmission of most electromagnetic waves.
(Nash, 1986, 185-186)

Nash has a very narrow view of the limits of physics, and probably little knowledge of the science itself. There is no evidence that psi is "independent of space, time, and physical causality," only that psi does not interact with space and time in a normal manner. ESP and PK certainly exhibit physical properties that seriously challenge our present scientific views of space, time and causality, but psi events occur in physical space-time so they cannot be "independent" of space-time. Nash also claims that psi has a property which he calls "physicality," but then claims that "psi is non-physical" in the very first sentence written to explain "physicality." This statement would seem to contradict his idea of "physicality." Nash's "physicality" actually represents a whole group of physical properties of psi rather than a single property or characteristic of psi and Nash belittles the role of physics in explaining psi by lumping the various physical properties together in this manner.

For his own part, Irwin does not list either physical properties or "patterns" of psi in his discussion of ESP and PK, even though PK is generally considered at least partially physical. The physical properties that Irwin considers are only listed as explanatory notes for the "mediation" theories that he summarizes. A "mediation" theory explains how information is "mediated between the environment and the individual" in either direction. (Irwin, 150) In this manner the process of mediation would seem to circumvent any need for a physical theory. However, There is a great gap in Irwin's logic on this point. His "mediation" process might possibly explain the connection between mind and environment, but it does not explain how the information travels through the environment extending between individuals, which would still be a physical process. In fact, the theories that Irwin misconceives as explaining his "mediation" process are actually those theories that are strictly physical and explain how the information or psi signals travel through physical space and time. Irwin's decimation of a connection between physics and parapsychology is very nearly complete, but it leaves insurmountable theoretical, philosophical and practical gaps in his overall concept of reality, whether or not psi is part of that reality.

The physics of psi fails no better in Nash's view. He neither circumvents physics by inventing something new to replace physics nor does he cast it aside altogether.

Although psi may not be encompassed by the present boundaries of physics, changes in the concepts of the latter science may eventuate its inclusion of paranormal phenomena. Conversely, if mind proves to be basic to matter and physical phenomena are found to be only special manifestations of psychical activity, the science of psi will subsume physics rather than becoming encompassed by the latter. (Nash, 1986, 186)

Nash does not seem aware of the consequences of any possibility that "psi [would] subsume physics" if mind were proven to be basic to matter. If mind were basic to all matter, then physics would explain mind, not the reverse. Even before that could happen, all matter would have to be proven to have life since psi is "life or mind requiring" even though there is no evidence that inanimate matter is animate. Again, Nash has not

considered the consequences of his belittlement and neglect of the purely physical properties of psi by assuming a possibility that physics could become a branch of biology. This can be compared to Irwin's ignoring the physical properties altogether except for the fact that Irwin was obligated to include physical theories of psi in his textbook less it be considered incomplete.

Granted, the line of demarcation between the physical and mental aspects of psi is blurred at our present state of knowledge and may actually be an artificial boundary erected by the human inability to comprehend an alternate view, but it is at least necessary to draw the line and make the distinction at this time to better understand psi. Other scientists and investigators do not run into this problem since they list the properties of psi relative to the various theories of psi that they are summarizing. Perhaps this very problem is the reason why more scholars do not just list all of the properties of psi together without further explanation.

Physical properties at last!

Several authors have summarized the various theories of psi in comparative studies (Rush, 1986; Rao, 1978; Chari 1972, 1974, 1977), and each categorizes the theories as physical, mental, a combination of both, or a variation upon this same theme, as did Irwin. Grouping the theories along these lines provides at least circumstantial evidence that the distinction between the mental and physical aspects of psi is quite pervasive even though that distinction remains unrecognized by a portion of the parapsychological and scientific communities. In fact, a 'defacto' discipline of paraphysics has emerged from psychic research even if it has been neither designated nor recognized as a distinct discipline of science. The non-recognition of a physics of psi stems at least in part from the unorthodox nature of the physical properties, which have so far been associated with psi.

The physical properties of psi are far more clear-cut than their psychological/biological counterparts. That is the nature of the beast. They also have a much stronger experimental base than many of psi's mental features because they deal with quantities that are not as vaguely defined as mental properties. But the physical properties seem to fly in the face of standard scientific beliefs about the nature of space-time as described by physics. As best as can be determined, psi displays no attenuation, no exchange of energy, intervening bodies or physical fields do not block its transmission, it seems to act without regard to the normal flow of time and defies common sense causality. The fact that psi seems to defy so many commonly held beliefs about our normal physical reality has allowed scientists like Nash to declare that psi is probably non-physical but still has a property of "physicality." Under these conditions, psi is either assumed to be either a non-physical (mental) quantity like thought or our 'present physics' cannot explain psi. Since our 'present physics' cannot explain or otherwise accommodate psi, it is assumed that future advances in physics will expand the framework of space-time and our knowledge of physical reality so psi can finally be incorporated into a 'future physics.'

Nash's conclusion did not include all of the known physical properties of psi when he spoke of the "physicality" of psi. Since the physical characteristics of psi go against the grain of space-time, Nash collapsed or combined them into the single statement that "In the sense of being independent of space, time, and physical causality, psi is non-physical." However, Nash was undoubtedly aware of the individual physical properties in order to come to that singular conclusion. His own research on the attenuation of psi over distances was fundamental according to Scott Rogo.

The pioneering work in this quest [the question of how distance would affect psi] was carried out by Dr. Carroll Nash, a biologist who tested PK subjects at different distances from the target area. His first experiment showed no correlation between distance and success at PK between three feet and thirty feet from the experimental area. Nash's second experiment fared little better. Other distance tests failed to show that PK attenuated with distance as would be expected had a conventional physical force been operating. (Rogo, 216)

The lack of attenuation of psi with distance is the most obvious of its physical attributes. Yet, it is only indirectly implied by experiment. With attenuation, a signal's intensity would normally decrease with distance because the energy of the signal spreads out as a spherical front emanating from the signal's source. The energy at any point on the spherical front, or sectional area of that surface, would then decrease as the inverse square of the distance. The inverse square law is a fact of the geometric structure of normal space.

Although the distances used in Nash's experiments were relatively small, the attenuation should have been significant. If the psi signal attenuated with distance, psi reception should have been $(1/10^2)$ one one-hundredth as strong at thirty meters as it was at three meters, a ten-fold increase in distance. Since it is assumed that the number of psi hits depends upon the strength of the signal, the number of psi hits would have a marked decline at the greater distance, but this did not occur. An alternative would seem to be that a point-to-point transmission (similar to a laser or maser beam) occurred, which is never assumed in psi research because of added difficulties in the possibility. Another alternative would be to assume that psi does not attenuate and therefore does not work in our three-dimensional space, as do other influences and actions, i.e., psi is not affected by the inverse square law. And finally, there could be a small threshold energy which is necessary to initiate an action (such as conscious thought) in the brain for cognition and the energy did not decrease enough in the extra distance tested by Nash to fall below the threshold. This alternative would merely imply that greater distances be used to test the property of non-attenuation.

There have been many other experiments that test for physical attenuation. Taken as a whole, these other experiments confirm that psi does not attenuate with distance. John Palmer gives an excellent summary of these experiments and has come to the same conclusion.

Generally speaking, the experimental evidence indicates that ESP can occur at great distances and does not decline with distance. These findings do not fit well with most hypotheses that physical energies mediate the transmission of extrasensory information.

Indeed, the information transmission model itself may be erroneous, a point I will return to at the end of the chapter. (Palmer, 77)

Still other tests of attenuation have been conducted. Vasiliev carried out many such tests in Russia and more recent tests were made with experiments in remote viewing. The remote viewing tests of attenuation were conducted by Puthoff, Targ and May at SRI as well as Jahn and Dunne at Princeton, among others. Their conclusions are fairly consistent in stating that psi does not display attenuation with increased distances.

Palmer has taken the notion of a lack of attenuation to the next level and related it to the energy content of the psi signal. As Palmer points out, the idea of attenuation is intimately bound to the concept of energy and energy transfer between objects.

If one accepts the possibility that a person can obtain information about distant events without use of the known sense, it is tempting to speculate that some transmission of physical energy is involved, even though that energy may have yet to be discovered by scientists. One probable implication of most theories of ESP assumes such transmission is that receptivity should decrease as physical distance between the subject and the target stimulus increases. (Palmer in Krippner, 73)

The very notion that "physical energies" are somehow involved in the transmission of information in the form known as psi causes problems for the physics of psi because there is no evidence of energy exchange during psi events.

In order for a signal to 'travel' through space-time, from point-to-point or event-to-event, an energy must be associated with the signal. As has been noted, energy would 'dissipate' under normal physical conditions during the transmission process and the psi 'signal' would degrade. But this does not seem to occur with psi. "Communication, for example, requires energy; yet no known energy appears to account for ESP." (Rush, 281) One explanation for this anomaly would be that psi somehow utilizes energy from the immediate environment of the psi 'event,' but energy for ESP communication derived from the environment would break the second law of thermodynamics, it would be negentropic. The problems are even greater for PK phenomena. For an object to move psychokinetically would require large amounts of energy and reported materializations would take insurmountable amounts of energy according to Einstein's formula for the energy equivalent of matter. Psi does not exhibit any energy transfer, nor have experiments or observations revealed any correlation between mass, weight and force (Rogo, 215) Margenau and others have pointed out that quantum mechanics and the concept of virtual particles violate the conservation of energy of the sub-microscopic level of the quantum, so there is some precedent for psi's violations of the physical rules governing energy, but that is a far cry from accounting for the large amounts of energy required for macroscopic manifestations of psi during psychokinetic events. ESP could require smaller amounts of energy than originally thought given a quantum cascading process of firing neurons as postulated by Sir John Eccles (Eccles, 1952), which would be helpful, but even accounting for that small an amount of energy remains troublesome for science.

Both space and energy are intimately related to time. Space is coupled to time as an equal but semi-independent partner in the continuum while energy describes the time variance of momentum or simple matter in motion. Psi seems to defy our common sense notion of both space and energy; therefore the same must be true of time. But this is difficult to demonstrate experimentally, philosophically or conceptually. There are two aspects of time that are significant in the study of psi. One relates to space and the other to energy. In the first, the transmission time of a psi signal seems to be instantaneous. This fact corresponds to the non-attenuation of the signal as it travels through space. Attenuation assumes a finite or measurable time of travel as well as distance of travel. This means that the signal has a definable and identifiable (at least in theory) instantaneous speed. Non-attenuation would be akin to an instantaneous transmission of the information carried by the psi signal, which leads to an infinite speed within the normal space-time framework.

The experimental evidence for the instantaneous transmission is much weaker than that for the other attributes of psi because of practical problems coordinating procedures to 'simultaneously' send and receive signals over long distances. The process of experimentally coordinating signals by their times is itself limited by the speed of light, even though psi may or may not be so limited, so evidence is only scant at best. Therefore, there is no definitive experiment that can test the amount of time it takes psi to travel between people or events, there are only suspicions based upon other facets of psi. However, in all probability the existence of precognition renders this a moot point since psi signals flow to and from the future equally in the case of precognition. It would certainly seem that psi is not time dependent if precognition is real, and there is enough scientific evidence to accept the reality of precognition. It is with precognition that the second aspect of time comes to affect psi.

The normal progression of time, from past to present to future, requires that an event is initialized before it occurs. This natural sequence in the temporal duration of an event is known as cause and effect, or causality. The initializing action is the cause and the result is the effect. Normal Newtonian physics does not distinguish a preferred direction of time, but does rely heavily on causality. Time can be either positive or negative and not corrupt the Newtonian equations of motion. The only recognition of the forward progress of time in all of physics comes with the concept of entropy. Otherwise, the forward progression of time is an observed phenomenon only. Entropy naturally increases as time progresses forward, so entropy has come to be called 'time's arrow.' Nothing else in physics distinguishes this same progression of time toward the future. But entropy also entails the concept of energy. Energy dissipates or spreads out in correspondence to increases in entropy. There are two ways to define entropy, one as the ratio of the energy change to the energy content of a system and the other as the increase in disorder of the system. So time seems to be related to the natural tendency of energy to dissipate as in an attenuating wave front. If there is no attenuation, there is no natural energy dissipation; there is no time and no increase in disorder or entropy, at least as far as physics is concerned.

Since entropy is the only element in physics that distinguishes the forward progression of time, precognition could be possible in any non-entropic state and life is negentropic. However, precognitive knowledge of an event, psychically received information about the event before it occurs, places a conceptual burden upon causality that science cannot ignore. Precognition implies that causality can be violated at any level of physical reality, only it is more difficult at higher levels than the quantum because of the complicated entanglement of the larger number of quantum events in higher level systems. With precognition, information about an event can be gained before the event occurs which violates causality. Information about an event can also be gained outside of the light cone (in a non-precognitive manner) of an event, but after or simultaneous to the event if the psi signal is instantaneous. In this case, causality is again violated. The physical paradoxes or anomalies that these acts represent could well be attributable to the lack of understanding of time by science, but still be psi related. The true nature of time is one of the great-unanswered questions of all 'time.'

Granted, there is a strange parallel between the possibility that psi is transmitted instantaneously, the lack of attenuation and the lack of any evidence of energy transfer during a psi event, but there is still more to be considered in the equation. Another equally strange but related property further supplements these factors or properties, adding to the confusion. Psi can neither be blocked nor diminished by intervening material objects or physical fields. In psi experiments, the separation of subjects is to be expected to circumvent cheating, many times by placing them in different rooms or locations. In such cases, walls do not seem to inhibit the reception of a psi signal.

Remote viewing has been successfully completed with objects or locations on the other side of the earth, so the intervention of the earth between the subject and object of the remote viewing does not seem to have interfered in any manner with the phenomenon. In the summer of 1976, specific experiments in remote viewing were successfully undertaken with the "outbound experimenters" located in a cave at a depth of 200 feet. From this and similar experiments, it was concluded that remote viewing "is not inhibited by a matter (gravitational shield) or electromagnetic shield." (Rauscher, 88) Remote viewing has been found to be neither spatially nor temporally dependent. Physical distances ranging up to thousands of kilometers do not "lessen the accuracy [or resolution] of the perception." (Puthoff and Targ, 1979, 45; Targ, Puthoff and May, 92,101) In all of these cases, there are material objects and physical fields between the subject and object of the experiment. Yet there is no evidence that changes have occurred in the reception of psi, at least no regular pattern of variation has emerged due to the existence of intervening objects.

The principle of least action would seem to indicate that the psi signal follow the shortest path through space between the subject and object in any experiment, so it would be hard to justify a belief that the psi signal does not go through the earth during experiments with greatly separated subjects and objects. On the other hand, radio signals can follow the curvature of the earth to some degree and thus be detected at much greater distances because they are sometimes reflected between the ionosphere or clouds and the surface of the earth. Therefore, they can travel over greater distances past the horizon of

the earth. One of the first physical 'theories' of psi postulated that electromagnetic signals were sent and received by the brain. If psi were electromagnetic in nature then psi could follow the curve of the earth in this manner rather than pass through the earth in a straight line. Yet many experiments have been conducted with the subjects of the experiments placed in Faraday cages, which would block most normal electromagnetic waves. In all of these experiments, no appreciable differences were detected between receivers subjected to electromagnetic wave blockage and those not so subjected. So it is assumed that psi is neither electromagnetic nor blocked by intervening material bodies or fields.

There is a strange consistency in all of this. Since space, time, attenuation, energy and causality are so intimately bound together, it would seem, or one would almost expect, that if one were violated all would be violated. This is the case with psi and it causes grave problems for any physics of psi, especially as an experimental science. If psi were only independent of one of these aspects of physical reality, then science would immediately suspect that the fault lay in experimental procedures because each of these facets of reality are so intimately woven together. But since psi violates all of these facets of physical reality, a pattern emerges. This either means that psi does not exist (as the critics claim) or that psi is so fundamental that it is intimately interwoven into the very fabric of reality. It would either be more fundamental than the structure of space-time itself or the space-time framework that we accept in physics is woefully incomplete as it now stands.

It is at this juncture of reasoning that psi enters physics on its own accord, naturally, since both experiments and observations are beginning to demonstrate that physics is woefully incomplete in many respects. It had long been thought that physics could not account for psi. However, according to Puthoff and Targ this trend is "not at all consistent with the framework of physics as currently understood. In this emerging view, the often-held belief that observations of this type are incompatible with known laws in principle is erroneous, such a concept being based on the naive realism prevalent before the development of modern quantum theory and information theory." (Puthoff and Targ, 62) The most straightforward manner by which psi is entering physics is through the seeming necessity of a fundamental interaction between consciousness and matter when the wave packet of quantum mechanics 'collapses.' Beyond this, experimental procedures, which indicate that consciousness can act non-locally, imply something very like psi is interacting with matter at the quantum level of reality.

Some physicists believe that the reconciliation of observed paranormal functioning with modern theory may take place at a more fundamental level - namely, at the level of the foundations of quantum theory. There is a continuing dialogue, for example, on the proper interpretation of the effect of an observer (consciousness) on experimental measurement, and there is considerable current interest in the implications for our notions of ordering in time and space brought on by the observation of nonlocal correlation or "quantum interconnectedness" (to use Bohm's term) of distant parts of quantum systems of microscopic dimensions. The latter, Bell's theorem, emphasizes that "no theory of reality compatible with (quantum theory can require spatially separated events to be independent," but must permit interconnectedness of distant events in a manner that is contrary to ordinary experience. This prediction has been experimentally tested and

confirmed in the recent experiments of, for example, Freedman and Clauser. (Puthoff and Targ, 63)

So, it would seem that physics can now cope with psi and should be able to account for psi within its worldview. However, physics has been unsuccessful in that attempt in spite of some very interesting and provocative hypotheses. Some minimal theories have been able to account for some types of psi functioning, but no single theory has been able to account for all the facets of psi and no theoretician has yet tried to tackle all of the physical properties of psi so far enumerated within a single theoretical model.

Since the preceding physical properties of psi have not yet resulted in a comprehensive theory of psi and cannot lead to a method of experimentally verifying psi, they imply the necessity of determining other physical properties to help isolate and define psi. On the other hand, if psi is so fundamental to nature and physics cannot accommodate psi, as physics is now understood, then physics must take psi into account in any future advances within its overall model of nature. Rush has stated this paradox in another manner, relating it to the normal way in which experiments are conducted. A physical experiment would normally proceed with all of the possible variables that can affect the outcome of the experiment fixed except the one that is being tested. But since no physical variables seem to affect psi, then science is unable to experimentally confirm the existence of psi even though the violation of all of these various facets of physical reality is itself a pattern which could lead to a physical theory of psi. As Rush states, "That familiar procedure has not worked for psi phenomena because of one stark fact. *No physical variable has been shown to influence the scoring rate in psi experiments.*" (Rush, 281) Rush further attributes the skepticism of most scientists toward psi and parapsychological claims to the fact that "psi phenomena appear to be indifferent to physical constraints." (Rush, 281) Experimental verification of psi must therefore depend upon either a theory of psi developed to take into account the stated physical properties or other evidence for psi linked to other properties than those already stated.

Footprints in the sand

Fortunately, psi leaves specific 'fingerprints' in physical bodies that cannot be attributed to other causes, or perhaps 'footprints' would be a more appropriate term. The term 'footprint' denotes both a signature-like uniqueness as well as a direction of movement toward a goal or endpoint, in this case, a physical theory of psi. These 'footprints' occur for both ESP and PK phenomena, which also tends to confirm the basic assumption that a single underlying commonality such as psi exists for all of the forms of paranormal phenomena being studied. Various ESP phenomena are accompanied by physiological changes in human bodies, even when the psi signals are not mentally cognized. Not only do these physiological changes confirm a paranormal interaction or connection between the sender and a recipient, they also indicate that the physical connection associated with psi is prior to the cognization of psi. They further confirm the two-step process described by Nash.

The other 'footprint' is clearly evident in the PK effect known as 'spoon' or 'metal bending.' 'Metal bending' and similar phenomena have been severely criticized by skeptics and other scientists as tricks played by magicians and hoaxers, but perhaps the greatest 'proof' of the reality of these phenomena comes in the post-event analysis of the psychokinetically deformed material bodies which cannot be replicated by magicians. Submicroscopic analysis demonstrates abnormal features in the metal, which cannot be explained by normal physical processes. Given the results of the post-event analyses of psychokinetically altered metal, the explanation that seems to best fit 'metal bending' phenomena can only be that something has occurred that is beyond the normal physical limits of nature.

The classic studies testing the body's physiological response to psi were made with a plethysmograph. This device measures changes in blood pressure (flow) or shifts of blood volume to various parts of the body. Changes in either blood volume or flow cause vasoconstrictions and vasodilations in the blood vessels to any part of a body, such as a finger. Emotion can also cause vasoconstrictions. S. Figar used this physiological response to emotion in the 1950s, as did E. Douglas Dean (Morris, 65-66) and Nash at a later date, to test for emotional responses to psi signals. Emotionally laden events or pictures shown to one person caused unconscious physiological responses in the subjects who were connected to the plethysmograph. Some measured vasoconstrictions were quite strong (Rogo, 112) and clearly indicated the influence of psi. Since these early attempts were made, the experimental base has been expanded and includes other physiological responses, such as Electroencephalograph (EEG) readings and Galvanic Skin Response (GSR).

In summarizing and evaluating all of these tests, Palmer has concluded that the EEG results were inconclusive, but "the presence of some positive findings should encourage further research." (Palmer, 197) The EEG results are not without inherent problems that skew the results. The EEG tests relationships between electrical activity in the cerebral cortex and cognitive processes, so there is no simple and conclusive way to differentiate between physiological responses to psi and normal, abnormal or paranormal cognitive responses. In other words, poor results with EEG experiments are quite likely due to psychological interference since there is no way to shield or otherwise eliminate the psychological affects of cognitive processes from the background of the recipients inherent mental activities. Robert Morris has pointed out that "the EEG results considered as a whole are confusing," (Morris, 67) but given the type of responses elicited by the EEG this finding should not be unexpected. This problem does not exist with plethysmograph readings which measure completely autonomic responses which have very little to do with purely psychological responses.

GSR is also considered an autonomic response, but the results of skin resistance tests are "less encouraging" than the plethysmograph tests. Palmer's conclusions on the combined results of both types of autonomic responses to psi were less than clear.

Autonomic responses to remote stimuli of emotional salience to agent and/or percipient have been demonstrated with a fair degree of consistency in properly designed

experiments when the measure is the plethysmograph, but not when it is the GSR. Although I am by no means an expert in autonomic physiology, I know of no physiological reason to expect different results with these two measures. (Palmer, 196)

But GSR is susceptible to a far greater amount of mental control and interference than blood volume changes, so it is harder to isolate psi effects from non-psi effects in the skin resistance tests than it is in blood flow tests. The really significant result noted by Palmer is that emotionally salient information evoked a much greater psi related response. ESP phenomena leave a temporary emotional 'footprint' in the body of the person experiencing the paranormal event. In theory, there should be other methods of varying reliability that can be applied to investigate this 'footprint' in further detail as well as study its characteristics. These three types of physiological response do not limit the possible unconscious responses that can be tested by scientists, but other types of tests and physiological procedures will not change the final conclusion regarding the emotional nature of the responses. They will only confirm what is already known although they could refine our knowledge about the results. Similar tests have also been conducted on other animals and plants, but only in humans is there a chance to differentiate between cognitive and physiological responses with anything close to certainty, so the other tests are not pertinent at this time.

The major difference with the PK version of the 'footprint' is that it is a permanent alteration in the atomic structure of the inanimate 'recipient' of the psychokinetic action. 'Metal bending' and similar phenomena are the results of directed psi action on inanimate objects. The psi signals affect their targets by an unknown 'mechanism,' but the 'footprints' that they leave in their wake should demonstrate the characteristics of the 'mechanical' process of psi action. The use of the word 'mechanical' in this context is not meant to imply a Newtonian or any other theory-laden process. It is used merely for lack of a better word. All that is known about the 'mechanism' of PK is that it either does not utilize any normal energies or it uses energy in a manner that is wholly unknown and unsuspected in modern science.

Quite a number of strange effects resulting from PK incidents of 'metal bending' have been reported and investigated. In some cases, metal has not been so much bent as it had been "churned up," displaying extensions and contractions "at closely spaced intervals." The French researchers Grussard and Bouvaist have also reported that the structure of metal "is sometimes changed by metal-benders even when no measurable plastic deformation has taken place" (Hasted, 105) demonstrating that atomic and molecular changes had occurred but had not been great enough to deform the piece of metal as a whole. In other cases, poly-crystalline metals have simply been fractured paranormally with no other dramatic alterations discovered. (Hasted, 108)

Wilbur Franklin conducted extensive microanalyses of pieces of metal bent by Uri Geller. Mr. Geller became quite famous for his paranormal abilities and underwent scientific testing during the early 1970's. His performance for scientists was neither spotless nor without controversies, but he did exhibit some scientifically viable results

and he renewed scientific interest in what has become generally known as macro-PK phenomena. (Beloff, 199)

The detailed metallurgical analysis of three fracture surfaces in two metallic specimens broken by, or in the presence of, Mr. Uri Geller revealed two distinct types of fracture-surface microstructure in the SEM photographs. One type appeared quite similar to normal room-temperature ductile failure caused by mechanical loading, except for a viscous appearance at the bottom of a small lateral crack (see Plates 10 and 11). In the second type of fracture surface, the predominant microstructures were not typical of ductile failure, fatigue, stress-corrosion, or shear failure, nor of room-temperature cleavage. In the platinum specimen, which exemplified the second type of fracture, localized regions of two types were observed on the same fracture surface only 0.02 cm apart. One region looked like ductile failure in an area that had been heated to the point of incipient melting (see Plate 15; the melting point of platinum is 1773 degrees C). The second region looked like low-temperature cleavage, with inclusions or vacancy clusters also appearing in the field of view (see Plates 16 and 17). These observations, which are not typical of SEM fractographs of failures by mechanical loading, indicate that the cause of fracture was not mechanical in nature nor was it a result of usual mechanical methods of fracture. In fact, the possible methods of, reconstruction of the fracture surface in the platinum ring by known techniques seem to require procedures such as partial cleavage at liquid nitrogen temperature (-195 degrees C) followed by ductile failure of the noncleaved portion and subsequent exposure of this portion to a small beam from a powerful laser in selected regions and a shear force in other regions. Such a project would not only be difficult to carry out, but could not, in fact, be conducted unless a number of people actually perpetrated fraud. (Franklin, 14)

It is important in this and other cases of 'metal bending' that the 'footprint' left in the metal is evidence of some abnormal process which does not match any that could be duplicated by normal physical means. Franklin clearly found that some of the materials he examined "indicate that the cause of fracture was not mechanical in nature nor was it a result of usual mechanical methods of fracture." Cases such as this offer the only real evidence, more-or-less the proverbial smoking gun, of some type of paranormal activity. Franklin concluded that "The evidence ... indicates that a paranormal influence must have been operative in the formation of the fractures." (Franklin, 14)

Similar results have been found in the paranormal fracturing of crystals. Scientists have conducted electron microscope examinations of the cleavage surfaces of such crystals and discovered abnormal cavitation "as though some atoms have disappeared locally." (Hasted, 108) Hasted speculates that the PK effect involved in splitting crystals paranormally must include some type of atomic teleportation. There is a great deal of anecdotal and eyewitness evidence of teleportation, levitation, apports and other mysterious appearances dating back to the days of mediumistic spiritualism, but never has such solid scientific evidence of teleportation been offered. These results are difficult for many scientists to accept and even some in the parapsychological community have mixed feelings about the authenticity and meaning of these phenomena. On the other hand, 'teleportation' at the subatomic level is not completely unknown in modern physics. It is known as the tunneling effect in quantum mechanics, although it is considerably more difficult to explain the 'teleportation' or tunneling of whole atoms, which are groups of quantum mechanically entangled particles. Yet the 'footprint' left in the PK altered

specimens offers a form of hard evidence of paranormal activity and possible tunneling initiated by psi, which is lacking elsewhere in psi research.

There are many other PK related phenomena that have garnered a great deal of attention by scientists and non-scientists alike. These include everything from paranormal healing to deflecting magnetic compass needles, influencing liquid crystal thermometers (Beloff, 208) and poltergeist activity. But no other PK activities leave a permanent paranormal 'footprint' as do the 'metal bending' and related phenomena. Many of these phenomena are the hardest of all psi phenomena to accept because of the lack of any energy signature in the process. It would not be inappropriate to use the term 'fantastic' to describe these claims, but the microscopic evidence is difficult to refute. As Franklin has so aptly commented, the 'footprints' would be very difficult to manufacture by other than paranormal means and could only occur non-paranormally if "a number of people actually perpetrated fraud."

The picture that emerges regarding the psychokinetic 'footprint' is one of sheer structural randomness at the atomic level in fracturing, stretching or bending material objects. Dislocation, the churning effect and the structural differences between contiguous localized regions reported by Franklin all have an air of randomness rather than the application of a single overriding and overpowering physical process, as if anything necessary to reach the goal of altering the material was allowable at the atomic/molecular level of the material. Hasted has also commented on the primary nature of dislocations resulting from psychokinetic intervention. "In these modified regions the crystals of metal show a large increase in the density of dislocations, and there are other effects as well. It seems that the occurrence of dislocations is a primary event brought about by the paranormal action." (Hasted, 106)

In one reported case of 'metal bending,' a brittle metal alloy, which could only be deformed (bent) under normal conditions over a long period of time during which a smaller constant force is applied, in a process called 'creep,' was bent by PK. If a greater force were applied over any shorter length of time, the metal bar would simply break. Yet the bars were bent paranormally without breaking in far less time than normal mechanical forces could have bent them. (Mishlove, 1993, 277-278) Since the brittleness of the bar is literally a function of the internal atomic/molecular structure of the metal, the bars could only be bent in the manner described by such a PK process involving alterations in the bars structure at the atomic or subatomic level. These results indicate that PK acts at the sub-microscopic level of material reality even though the PK events are perceived and interpreted at the macroscopic level of physical reality. This is the lesson that is taught by the PK 'footprints.' It supports the other properties of psi, which indicate that psi operates at the most fundamental level of physical reality.

ESP has been described as a goal-oriented process that acts holistically. It would seem from these various characteristics of psi, embodied in the 'footprints' left in both animate and inanimate material bodies, that PK is also goal-oriented and acts holistically. The mind of a person who wishes to affect a material object psychokinetically merely thinks of the goal of bending or stretching the object and the atomic structure of the

object alters by some unknown 'mechanism' to accommodate that goal. This action is holistic rather than reductionistic simply because the perpetrator of the act is not consciously aware of altering the internal atomic structure of the specified object. Indeed, consciously altering the object at the atomic level by sheer thought would require a far more acute and accurate knowledge of the nature of the atomic structure of the object than is presently known by the most advanced scientists.

The wholism of this action indicates that psi acts as, and probably is, a field phenomenon or process. The wholism of PK also fits well with the holistic emotional 'footprint' that characterizes subjects who have experienced ESP events and, of course, the goal-oriented and holistic psychological characteristics of psi. All of these properties indicate that psi is a field phenomenon while there is more direct evidence to support this conclusion.

The fact that Kulagina's often misses the mark, so to speak, once again indicates that PK is not so much a mental force but some sort of field. Forwald has suggested this in his PK work, and the experiments with Stella C. and Ingo Swann also support this theory. Lastly, poltergeists seem to be shifted about by a moving field. In Kulagina's PK, photographic paper placed under the target objects have often been found clouded as though some force field had affected it. The field theory of PK was further substantiated by experiments with an American counterpart to Nina Kulagina, Felicia Parise. (Rogo, 223)

Notwithstanding Rogo's elevation of the field effect or property of psi to a theory of psi, his narration still indicates the validity of viewing psi as a field phenomenon. He further explains that Miss Parise was able to deflect a compass needle and when the compass was taken away and then returned to the same spot, it was again deflected, as if she either established an independent field or disrupted the normal magnetic field at the location in space where the compass had originally stood. Photographic film placed at different locations around Miss Parise were fogged, with the greater amount of fogging appearing the closer the photographic paper was placed to Miss Parise. (Rogo, 223) These results further indicate the field like nature of psi. Graham and Anita Watkins also performed tests on anesthetized mice, which were prematurely awakened by ESP suggestion from gifted agents. These experiments confirmed a 'linger effect' which has also been attributed to the field nature of psi. (Rogo, 224) When all is taken into consideration, the field nature of psi seems to be fairly well established by experiment.

The strangest facts one could imagine

From the study of psi phenomena, a specific set of physical properties has emerged. While these properties are non-physical in a sense, they are not affected by the same physical restraints as most other properties of nature, they are consistent and seem to be intimately interwoven. In other words, when these various properties are taken together as a whole they suggest a number of different patterns of action that should lead to a viable physical theory of psi. The physical properties of psi can be enumerated quite thoroughly and simply as follows:

- (1) Psi is not restricted by the normal limits of time.

- (2) Psi is not restricted by the normal limits of space.
- (3) Psi can act non-causally.
- (4) Psi cannot be blocked by matter or other physical fields.
- (5) Psi does not attenuate with distance from a source.
- (6) Psi does not carry nor does it display any exchange of energy with its environment.
- (7) Psi is a goal-oriented process.
- (8) Psi acts holistically.
- (9) Psi acts in the manner of a field.

These properties clearly suggest that psi acts at the most fundamental levels of physical reality, so psi should not be dismissed as a myth or superstition. In essence, the fact that psi even has physical properties demonstrates the reality of psi and the fact that psi acts at the most fundamental level of reality means it is something that cannot be so easily grasped, realized, reduced or understood. Psi is among the subtlest of physical actions so it only rarely manifests itself at the macroscopic level of reality and thus seems to act randomly and unpredictably.

It is only as physics itself reaches into the most fundamental aspects of reality that it finally comes to the point in its own evolution where it can deal with the reality of psi. This idea has been expressed by others, although never as forcefully and fully as the idea has been expressed here.

Modern physics has reached the stage where the clear outlines of a new world-view and methodology are visible, and these provide an "integral understanding" of the world and its psychological and mystical background. With wider acceptance of such world-view and methodology, new fields of research may be expected to open out, and parapsychology may be considered to have become an established science. (Whiteman in Wolman, 751)

While reduction is the way and method of science, it ultimately leads to wholism. In order to understand psi, it must be reduced if only momentarily and the physical and mental aspects explained separately before they can be understood together as a whole. Parapsychology has been unsuccessful in explaining psi because it has traditionally worked at cross-purposes with the physics of psi. It is generally understood that "We have no comprehensive theory accounting for all the reported physical, physiological, and therapeutic effects of psi." (Chari in Wolman, 807) However, the reason for this lack of a theory has never been adequately defined or explored. All things taken into consideration, it would seem that the failure to separate the physical and mental properties of psi has at the very least unnecessarily complicated the search for a theory of psi if not prevented the development of a theory. Once the physical and mental aspects of

psi have been separated and individually considered the science of psi will begin to progress at a much more rapid rate than ever before and a complete theory of psi will emerge.

This article is copyrighted but may be quoted, copied and circulated freely as long as the text is unchanged and the author given proper credit. No one may charge any type of fee for copies of this material without permission of the *Yggdrasil's* publisher.

Last Updated 6 January 1999

E-mail comments and suggestions to Jim Beichler, editor, *YGGDRASIL*, at

jebco1st@aol.com

[Top of Page](#)

[YGGDRASIL Homepage](#)