
CHARACTERISTICS OF PSI COMMUNICATION

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In the broader definition of communication as being transfer of information, all paranormal mediation is psi communication. However, in the narrower sense employed in this article, communication consists of transfer of information between cognitive individuals. Not included in psi communication under this definition are clairvoyance from inanimate object to mind and psychokinesis from mind to inanimate object. It is not known whether psi communication is accomplished by a telepathic effect on the percipient's mind or by a PK effect on his brain. However, as telepathy, clairvoyance and psychokinesis may be no more than distinctive conditions under which a single underlying psi-function operates, there may be no need to attempt to distinguish between the characteristics of psychic transmission with each of these three modalities of psi.

To be effective, psi communication must impart a message, i.e., convey meaningful information. It must consist of more than a mere correspondence between the targets the agent sends and the symbols the subject calls. To my knowledge, a message has been conveyed by psi in only two experiments. In one of these, Milan Ryzl (1966) reported the transmission of a message with the Czechoslovakian subject Stepanek. By means of the repeated-guessing technique, five three-digit numbers were transmitted without a single error. Because Stepanek's psi ability was expressed by identifying whether the white or the green side of a concealed card was uppermost, the target number was encoded into a certain sequence of green and white sides, and the subject was asked to ascertain by ESP the color of the uppermost sides of the target cards. After the colors of the targets were determined by majority vote analysis, the color sequence was decoded into a number sequence. In the other experiment, the word "peace" was transmitted by a similar method (Carpenter, 1977).

Psi transmission may be manifested in several ways, as will be discussed in this paper. One of these is in preverbal communication between mother and child. The American psychiatrist Jan Ehrenwald (1955)

postulated an early mother-child relationship of symbiosis or mutual benefit, with telepathy playing the most significant part. The American psychiatrist Berthold Schwarz (1961) assembled a collection of ninety-one incidents in which he or his wife ostensibly served as the telepathic agent with his daughter when she was between one and three-and-a-half years old. Paranormal communication between mother and child also apparently occurred in the case of a feeble-minded, nine-year-old Latvian girl named Ilga. Although the child was unable to read under usual conditions because of word blindness, she was able to recite what was written in a book gazed at by her mother in another room (Bender, 1938).

That psychic communication may occur spontaneously is indicated by the many cases which have been reported, 15,000 in the collection of Dr. Louisa Rhine alone. Although such cases cannot be considered to constitute proof of paranormal transmission because of the possibility of chance coincidence, poor observation, faulty memory and deliberate fraud, it was because of such claims that man was led to test for psi experimentally. Because psi communication has been established as occurring in controlled tests in the laboratory, it is reasonable to assume that some ostensibly paranormal spontaneous communication is actually due to a psychic factor, although it may be impossible to determine whether or not any given spontaneous experience is paranormal.

Spontaneous psi communication may take the form of an impression, a dream or an hallucination. In many cases, the agent in the transmission may lack even unconscious intent, whereas the percipient always shows some degree of motivation (L. E. Rhine, 1956). However, many instances of ostensible paranormal communication have been reported in which the agent seems to be an important participant in the process. The following is an example, from the author's collection, of ostensible psi communication initiated by the agent and taking the form of an impression in the percipient. "When I was in high school, I was organist for two Episcopal churches. This meant traveling from one town to another with the priest. After the second service my mother would pick me up at noon or a little after. One morning the priest informed me that the second service would begin and end a half-hour earlier. I had no time to call my mother, nor did anyone else. All through the service I kept thinking, 'Mother, come for me at 11:30.' As church let out I dashed out to find my mother waiting. Her first words were, 'Well, here I am.' She then recalled a previous experience we had during World War II. My father was in the Navy, stationed in Gulfport, Mississippi. My mother and I were

traveling down to see him. Mother had written him to meet the bus at a certain time. En route, however, we were able to get connections which would get us there five or six hours earlier. Mother told me to think very hard of Dad. We both thought very hard, and sure enough there he was to meet the bus. He said he just knew we would be on that bus."

Ostensible psychic communication in the form of a dream is illustrated by the following case from the author's collection. "I read a story late one evening before going to bed which made a great impression on me. When I retired, my husband was sound asleep. The next morning he told me about his dream which was unusual because of the infrequency of his dreaming. I couldn't believe my ears because of its similarity to the first page of the story I had read the night before. My husband dreamed that he was driving along a deserted stretch of road. It was dusk and he could only see within the area of his headlights beam. As he rounded the curve, his headlights flashed on a creature that stood upright on the left side of the road, and the lights flashed in its green eyes. The thing, which resembled a dragon, looked at him in the glow of the headlights and scampered up the embankment. In the story I had read, a young man was riding in his car on Arizona desert. It was dusk and he could only see within the beam of his headlights. He rounded a curve and in the beam cast by the headlights he could see two creatures on the left side of the road staring at him with green eyes. They looked like dragons. As he came close, one scampered up the side of the road and the other followed."

Spontaneous psi communication in the form of an hallucination is usually auditory or visual, but may be expressed by means of some other sense modality instead. The following is an account from my files of a somatic hallucination. "During World War II, I was in London and worked at the Church Canteen after working hours. While there I became very attached to Teddy and his wife—he was a British soldier. He was much older than I and had no children of his own. I think I felt he had taken the place of my father who had passed away when I was seven. It was at one of these dances that I experienced a terrific burning sensation over my face, hands and arms and I mentioned it to my partner who was Teddy's buddy. The pain was almost unbearable. The following day my partner called me to say that at the exact time I had experienced the burning sensation a gas tank had exploded burning Teddy's face, hands and arms."

In some cases an out-of-body experience may provide a means of communication by psi. In this experience, the individual in a dreaming or waking condition not only feels that he has left his physical body, but may see it as if from a distance. The experience may occur spontaneously but, in some individuals, may be induced. In certain

cases an apparition of the person having the out-of-body experience is seen by an individual at the spot where the out-of-body experiencer seems to be. In several nineteenth century experiments an individual succeeded in making his apparition visible to another (Tyrrell, 1953). In a recent experiment reported by Robert Morris (1974), a kitten in the room to which an out-of-body experiencer attempted to project himself, decreased its activity to a statistically significant extent during out-of-body periods in comparison with control periods. The most parsimonious hypothesis for paranormal out-of-body experiences is that they are the result of ESP by the out-of-body experiencer and by the individuals who perceive his presence at a distance from his body.

Psi communication is not limited to humans, but may occur between man and lower organism. In a study of the horse Lady, who could spell out the answers to questions by using her nose to point out letters and numbers, the Rhines (1929), by carefully guarding against the possibility of giving sensory cues, tentatively concluded that the horse responded to paranormal communication. In another study, the experimenter gave silent commands to a dog who obeyed although the experimenter's head was shielded from the animal's view to prevent sensory cues (Bechterev, 1949). One command was to go to the side of the room, jump upon a chair and paw a portrait on the wall.

Whether communication by psi can take place between living individuals and spirits of the deceased is a question yet to be satisfactorily answered. Reports of such events occur as far back as biblical accounts. One of these describes what may have been an early forerunner of a modern spiritualistic seance. Saul, king of the Jews, engaged in ostensible paranormal communication through the witch of Endor (I Samuel 28:0-15) with the dead Samuel, although Saul had earlier tried to suppress psychically gifted persons, Saul was correctly informed through the communication that he and his sons would die the next day in a battle with the Philistines.

In the sixteenth century, the mathematician John Dee at Cambridge University held seances in which ostensible paranormal communication with spirits took place. The communicating spiritual beings were not human spirits, and some of them were said to be angels (French, 1972). The idea of communication with distinctly human spirits established itself in the popular consciousness in the eighteenth century through the teaching of the Swedish philosopher Emanuel Swedenborg, who had dreams and hallucinations in which he engaged in paranormal communication with the deceased (Toksvig, 1948).

As a force of some magnitude, however, spiritualism had its beginning in 1848 in Hydesville, New York, in the house of the Fox family, whose members were disturbed by continual rappings

(Podmore, 1902). It was soon discovered that the rappings consisted of two raps for "yes" and one rap for "no" in answer to questions supplied by members of the Fox family and visitors. The signals declared that a murdered man was buried in the cellar. Subsequently, the skeleton of a man was said to have been found buried near the cellar in a space between two walls. Rappings followed the two Fox sisters even when they changed their residence. A system was devised based on raps in answer to the letters of the alphabet, and some of those who sat with the Fox sisters found that they had similar powers. The movement spread until in a few years hundreds of mediums were conducting thousands of seances across the United States and Europe. Even after many tests had indicated that the raps were not produced by normal means, the Fox sisters confessed to fraud and then retracted the confession. Such instability is a frequent characteristic of psychics and, although it compounds the difficulty of evaluating the phenomena associated with them, it does not of itself negate their paranormality.

Sometimes messages received by an Ouija board or a planchette purport to come from departed spirits. A message written by a planchette used by a female participant and Hensleigh Wedgwood, brother-in-law of Charles Darwin, purportedly came from a deceased female by the name of A. Grimbold (Myers, 1893). According to the message, she had been burned at the stake in March, 1605, for being an accomplice to the murder of her mistress, Mrs. Clarke, in Leicester. The murder was carried out by two men—Bradshaw and Harrison. The latter was A. Grimbold's lover and had promised to marry her if she helped. Bradshaw was hanged; however, Harrison was released through the aid of powerful friends. Through advertising in newspapers, Wedgwood was able to locate a little-known book on the history of Leicester which corroborated the existence of Alice Grimbold and the events in the message written with the planchette almost three centuries later.

Throughout the first third of the twentieth century, several English-speaking psychics in different parts of the world, some of whom had not met one another, produced statements by means of automatic writing or automatic speaking, each of which alone had little meaning, but which complemented one another and were found to be interconnected (Salter, 1948). These cross-correspondences purported to emanate from some deceased psychical researchers as an attempt to provide evidence of their survival. While the cross-correspondences might be explained by unconscious telepathy between the automatists, no parallel is known for telepathy on such a large scale or with like complexity.

The personalities of the ostensible spirits expressed by some mediums may closely resemble their former living characteristics. The "spirit" of George Pelham, manifesting through the American medium Leonore Piper, picked out 30 of his former friends from 150 persons who had sittings and made not one mistake (Hodgson, 1898). He spoke to them of their common memories and reacted towards them as the living George Pelham would have done. That the personality communicating through the medium is not necessarily that of a deceased individual, however, is indicated by communications from fictitious persons and from individuals later discovered to be still alive (Flournoy, 1900). The English parapsychologist Soal (1926) had conversations with a communicator in several seances, only to find out three years later that the individual who was presumed to be deceased was still living.

Some mediums have one or more controls or spirit guides who purportedly relay messages from other deceased individuals or regulate the direct communication of these entities through the medium. In order to determine whether the personalities of the medium, the control, and the spirit communicators are measurably different, Whately Carington (1935) applied Carl Jung's word-association tests to each of them. A list of words is read to the subject, he replies with the first word he thinks of and his response time is measured. A reaction pattern characteristic and distinctive of the individual is formed. The response times of the medium and her control to given words were found to be negatively correlated. The counter-similarity was judged to indicate that the psychic revealed a different side of her own personality in the control than that which was present in her normal state, and that the control was a secondary personality of the medium probably formed around a nucleus of repressed material. Unlike the control, the spirit communicators did not display any personality relationship with the psychic. However, the fact that a given spirit communicator did not show a similarity of response with different mediums lessens credibility for their autonomy.

Secondary and multiple personalities are known to develop in some individuals with hysteria. Sybil had 16 alternating personalities each appearing one at a time and some being unacquainted with others (Schreiber, 1973). The appearance of spirit personalities in mediumship bears some resemblance to the occurrence of multiple personalities in hysteria. Some of the spirit personalities are subconscious dramatizations of the medium based on information normally or paranormally obtained. Whether any of them are due to spirits of the deceased is a question awaiting further evidence.

Psychic phenomena purportedly due to spirit influence are also interpretable on the basis of the super-ESP hypothesis (Gauld, 1961). According to this hypothesis, such phenomena result from the use of a virtually unlimited range of ESP by living individuals, sometimes in combination with a personality constructed in the psychic's unconscious mind. With no known limits to ESP faculties, any document, object, or bit of human knowledge, even if it is only in someone's unconscious mind, may be accessible to the percipient. Because the existence of spirits has not been established, and because ESP and the human dramatizing ability are known facts, the super-ESP hypothesis may be more parsimonious than the spirit hypothesis. According to the principle of parsimony or Occam's razor, entities, e.g., spirits, should not be postulated to explain a phenomenon that can be accounted for without them.

Proponents of the spirit hypothesis, however, point out that ESP has not been shown to be capable of producing paranormal phenomena with the complexity of, for example, the cross-correspondences. According to them, it would require a sophistication of ESP far beyond that for which there is present evidence. They maintain that the spirit hypothesis requires fewer unsupported assumptions to explain certain paranormal phenomena than does the postulation that the psychic events are produced by complex paranormal interactions of minds at an unconscious level. They, therefore, hold that the super-ESP hypothesis is not as parsimonious as the spirit hypothesis.

Some of the characteristics of psi transmission have been revealed by experimentation. On the basis of classical physics, paranormal communication may be extraphysical, in the sense of being independent of space, time and physical causality. Experiments have failed to establish a decrement in psi communication with distance or with time. That psi is not a physical force is suggested by failure of metal chambers and cages to prevent its occurrence, even though the containers were impervious to the transmission of most electromagnetic waves. Although psi is not encircled by the present boundaries of physics, changes in the concepts of the latter science may eventuate in its inclusion of paranormal phenomena. On the other hand, 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.

The information that is transmitted by psi may be incomplete or modified in its manifestation. In tests of paranormal communication with drawings as targets (Warcollier, 1938), changes in their extrasensory perception included the following: (1) Either the idea or

the form of the target was perceived without the other. (2) Only a fragment of the target picture was perceived. (3) Important elements of the picture were juxtaposed. (4) Certain portions of the picture were inverted. (5) Elements of the target picture were reorganized into an identifiable form different from the original configuration. (6) The target picture was elaborated. (7) The target picture was transformed into a different but visually similar image. (8) The target picture was represented symbolically or by an associated idea.

Experiments indicate that certain characteristics of the percipient may affect psychic communication. Sex, age and intelligence may have qualitative effects on paranormal transmission, but they are not limiting factors to its occurrence. Paranormal communication has been found to occur in both sexes, at all ages and throughout the range of human intelligence. Certain attitudes and personality traits of the percipient have been associated with communication by psi. These include mood, motivation, emotional stability, extraversion and belief in ESP. One direction of each trait results in a positive manifestation of psi and the opposite tendency results in no psi transmission. Experimental evidence also indicates that psi communication may be facilitated by relaxation and by hypnosis.

Experimentation has also revealed characteristics of the agent affecting paranormal communication, and they have been found to be similar to those of the percipient, e.g., mood, motivation and belief in ESP. The emotional relationship between the agent and the percipient is an important factor in psi transmission, the success of the communication being higher when either the agent or the percipient likes the other and highest when they have mutually favorable feelings. An increase in the number of agents has been reported to favor psi transmission (MacFarland, 1938); however, any improvement that may ensue has not been found to be proportional to the number of agents used.

Experiments indicate that psi may be voluntarily directed to a particular target; however, it may be unconscious either with respect to the subject's intent to use it or with respect to his cognizance of success in its use. In the first case, the subject employs psi without conscious intent, i.e. it is nonintentional, although it may be used to fulfill a need or desire. In the second case, he uses psi intentionally, but without consciousness of whether or not he is succeeding.

Several studies indicate that ESP may be used unconsciously to fulfill a need or desire. In one of them (Cox, 1956), it was found that significantly fewer passengers traveled on trains on the days of accidents than on comparable days. Although some of the passengers

may have consciously precognized the train wreck, most of them presumably avoided the train on that day without realizing their true motive.

That psi may be used intentionally, but without consciousness by the individual of whether or not he is succeeding, is indicated by the fact that, when making his call, he is usually not conscious of whether his attempt at intentionally expressing psi has been successful (Woodruff and George, 1937). On the other hand, the fact that some experiments using immediate feedback of success to the subject have resulted in a higher level of scoring (Targ, Cole and Puthoff, 1974) indicates that the subject may be conscious of applying psi. If the subject did not have some consciousness of his mental or physical state when he was using ESP, he would not be able to learn to improve its use by causing the mental or physical state to occur again. Such success in the positive reinforcement of psi suggests that subjects can learn to communicate by paranormal means.

In experimental tests, psychic communication is generally found to have a low degree of efficiency even with successful subjects. For example, the highest of Rhine's exceptional subjects had 50 percent more misses than hits. Furthermore, paranormal ability fluctuates, and its occurrence is unpredictable even in gifted psychics. The expression of psi generally undergoes a chronological decline, and may even be expressed negatively to produce scores significantly below mean chance expectancy, a phenomenon observed with sufficient frequency to be given the special name of psi missing. Frequently, however, the score will increase in the terminal part of the experiment or experimental division to approach its initial level.

Both psychical and physical theories have been offered to explain psi communication. The fundamental concept in psychical explanations of paranormal communication is that of a cosmic consciousness or an absolute, an ancient mystical idea which has persisted into the age of science. The German philosopher Edward von Hartman (1855) suggested that in ESP the mind of the seer is in connection with the absolute and, through the absolute, with other individual minds. The American philosopher and psychologist William James (Murphy and Ballou, 1960) believed that all individual minds are linked together by a common universal mind of which each individual mind, in a conscious state, is unaware, but which is accessible to all subjects in a state of trance.

Physical theories of psi transmission have involved both electromagnetic waves and elementary particles. It was early postulated (Ochorowicz, 1887) that psi communication is the result of electromagnetic waves produced by the brain of the agent and received by

the brain of the percipient. Brain waves were finally identified by the German neurophysiologist Hans Berger in 1928. However, because they cannot be registered at a distance greater than a few millimeters from the head, he proposed that paranormal communication is accomplished by psychical waves (Berger, 1940). Later it was suggested that psi communication is accomplished by extremely low frequency (ELF) electromagnetic waves (Hogan, 1967). Such waves are not stopped by metal chambers and cages and travel completely around the earth with almost no attenuation. Hence, their proposal as mediators of psi avoids the failure of psychic transmission to be hindered by metal containers or by distance. It is theoretically possible that brain activity of the sender could be transduced into electromagnetic waves and that these electromagnetic waves could be transduced into brain activity of the percipient, thereby accounting for paranormal communication. However, it is not apparent how electromagnetic waves that can penetrate a metal enclosure could sufficiently interact with matter to mediate psi, or how they could account for clairvoyance or for precognition.

Several physical or quasi-physical elementary particles have been postulated as the means of paranormal communication. Electrons that travel to the brain of the percipient from the brain of the agent were suggested as the conveyor of ESP (Forel, 1918). The neutrino was also postulated as the carrier of psi (Hammond, 1952). The neutrino may be the most ghostlike of all the elementary particles as it has virtually no physical properties—no mass, no electric charge, no magnetic field. A neutrino travels with the speed of light and can go entirely through the solid body of the earth as if it were so much empty space. Tachyons, particles with an imaginary mass and traveling with a velocity greater than that of light, have been considered as possible carriers of ESP information (Chari, 1974). Similar particles, called psitrons, were also proposed as bearers of ESP information (Dobbs, 1965). As they have mathematically imaginary mass, they can traverse space with a velocity exceeding that of light without frictional loss of energy. If captured by critically poised neurons in the percipient's brain, they might then trigger off a chain reaction of neuron discharge. The postulation of particles that are not intercepted by matter avoids the difficulties afforded the electromagnetic-wave hypothesis by the ineffectiveness of physical shields and the absence of distance attenuation. However, it is not apparent how particles that are not stopped by matter could be stopped by the percipient's brain.

Another physical explanation of psi communication avoids the criticisms of ESP mediation by electromagnetic waves or elementary particles. It lies in quantum theory. According to quantum mechanics a

physical system, e.g., an atom, has an infinite number of states that are continuous, are spread out in space, and compose a state vector or wave function called psi (not to be confused with the psi of parapsychology). The physical system is not in one of these states alone, but in the totality simultaneously. When measurement is carried out on the physical system, it undergoes a sudden discontinuous change—a collapse or reduction of the state vector or wave packet into one of its component states. Only when a measurement is performed—that is, when it is observed—does the physical system enter a single one of its component states. No energy is transferred in this process.

The American physicist Evan Walker (1975) identified the combined consciousness of the coupled observers with the hidden variables that are believed by some quantum physicists to be responsible for state-vector collapse. In acts of psi, the consciousness of the percipient and the consciousness of the agent are hypothesized to act together to select the particular state into which the wave function of the percipient's or the agent's brain is collapsed. Among those possible states of the brains of the percipient and agent is one in which the call and the target are alike. Because the hidden variables are independent of space and time, they can effect the collapse of state vectors of systems that are spatially and temporally separate. Thus, equating the combined consciousness of the observers with the hidden variables provides an explanation for psychic communication. It would be but a step further in quantum theory to conclude that quantum events cannot occur without an observer and that they are the products of observing consciousness. Should physics take this step, it would find that its basis in the scientific hierarchy was constituted by the science of psi.

That physics is on its way to taking this step is indicated by five of seven recent experiments on photons and protons, the results of which, according to the American physicists John Clauser and Abner Shimony (1978), are explainable only by action at a distance (psi in parapsychological terms) or by abandoning the realistic view of the physical world in which external events are assumed to exist whether or not they are observed. In these experiments, the two members of a pair of photons or protons were brought together and, in that state (according to quantum mechanics) had opposite spin directions, although it was undetermined which of the two particles had an up spin direction and which had a down spin direction. The two particles were allowed to separate and, when upon observation the spin of one of them was determined either to be up or down, the spin of the other was found to be in the opposite direction at a later moment when it too was observed, although until the latter observation was made the spin

direction of the second particle was undetermined. Thus, the spin of the second particle was determined by an observation of the first particle even though at the time of the observation the two particles were separated by a considerable distance. Although the observation of the first particle did not interact with the second particle, it determined its spin direction. According to these two physicists, only two conclusions are possible. Either the spin of the second particle was instantaneously determined when the spin of the first particle was observed, or the spin of the second particle was not determined until it, too, was observed. In the first case, instantaneous action at a distance (*author's insert* parapsychological psi) would have to be accepted. In the second case, the assumption of the reality of the particle before its observation would have to be replaced by the view that its existence was brought about by its being observed. In that case, in my opinion, mind would be basic to matter, and parapsychology would underly physics in the scientific hierarchy. It appears to me that the results of these experiments, instead of supporting the Cartesian dualism of interaction between mind and matter, are consistent with the metaphysical concept that mind is the cause of matter and matter is the product of mind.

Parapsychology and quantum mechanics appear to be merging in their depiction of the nature of reality. In their confluence, the universe takes the form of a multiplicity of holistically related events each of which occurs only at the moment it is observed, the observations being spatially and temporally independent of the location of the observers, whose minds are coupled into a single unit. Perhaps, there is but one mind, the universe consisting of it and the observations it makes. The postulation of one mind of which the minds of individuals are facets avoids the pitfall of solipsism and provides an explanation of the existence of physical events before humans evolved to observe them. The relationship between such a mind and God is a theological rather than a parapsychological question.

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DISCUSSION

BYERS: Do you assume that there is any utility in carving up the world so that we can make a distinction between theological and parapsychological? Are these not questions of how the show works?

NASH: No, but some people have a theological frame of mind and they have to be satisfied as to the scientific viewpoint. I hope not to infringe on their territory.

BYERS: Are you going to allow the world to be carved up into territories like that?

NASH: I don't think it's the province of the scientist to attempt to tell the theologian what he should think. I certainly would resent it if they told us what to say.

ULLMAN: I'm happy to see your comments on the possible hints we may get from these formulations by physicists that might be helpful to us in understanding paranormal phenomena. But wouldn't you say that if you're moving in the direction that postulates this different order of existence—this order of a universal mind or perhaps, in another physicist's (Bohm) terminology, an enfolded order, or an implicate order or a non-manifest order—then, in a sense, the question of communication is irrelevant; that the information is there and is there everywhere.

NASH: Yes, I think, however, we would have that question concerning our own minds; how do we communicate within our own minds? How does one part of our mind communicate with another part? For example, if we can call up a memory which is in one part of our mind into our consciousness, that would be, in a sense, communication. I think if there were one mind, that would answer the problem of communication, in that it would make it seem to be the same problem that occurs in explaining communication within parts of an individual's mind. It would explain communication between different minds because there would be only one mind.

STORM: The problem is with what an observation is and if this is a reasonable picture, then are we observations and if we are, of what mind?

NASH: Well, my concept would extend this theory to the universal mind, which I presume is what you're postulating. You would be an

observation of that mind, but at the same time your mind would be a part of it. I don't think there would be much difference between your mind and the universal mind. I think individual minds are like tips of icebergs protruding from an underlying universal consciousness. So I would not think there would be a need to distinguish what part of the mind is observing what other part.

STORM: Would there be any principles or rules that would restrict what we would anthropomorphically call possible observations?

NASH: I would think not. That would be up to the universal mind. Whatever it dreamed up to observe would be observed and we would call that physical reality.

RUDERFER: When you discussed the collapse of the state vector, you said "No energy is transferred in this process." This is a common error in interpreting what happens. I discussed this with Walker a few years ago at some length, and I insisted that if there was an information transfer there had to be an accompanying energy transfer, and he insisted that there was no physical correlation with this collapse of the state vector. But, he did finally state that there was a physical correlate, and that was that the observer and the receiver had to meet at some time before or after the event. In other words, the world lines of the observer and the receiver had to cross at some time. That's a physical event. Well, as soon as you admit that, of course, then you have to raise the question, "Well, what happens when they meet that affects the observed event?" So, it is not really correct to infer that there is no energy transfer in these interpretations. There is something missing in the quantum theory interpretation which is not yet revealed.

IRWIN: I'd like to comment on your coverage of accounts of ESP in terms of physical or quasi-physical elementary particles. You tend to reject these accounts on the basis that it is not apparent how particles that cannot be stopped by matter (such as a Faraday cage) could be stopped by the percipient's brain. Is it possible that the motion of particles is itself associated with a field-like effect? That is, although the particles are not actually stopped by the brain, might not they produce a field effect upon the brain as they pass through?

NASH: I think that that is a valid suggestion. I conceived of electromagnetic waves as occurring within an electromagnetic field, and in that case, what you're suggesting would be covered by the electromagnetic wave hypothesis.

IRWIN: Well, the field may not be electromagnetic, but certainly some sort of field effect might occur.

NASH: I don't think that there are any known physical fields other than electromagnetic and gravitational. You could postulate gravity, which has been done, as a mechanism for psi mediation.

MORRIS: In your description of a universal mind as an observer, would you feel it would be necessary to have someone else observing the universal mind?

NASH: No, I think that Broad answered that question when it was postulated by J. W. Dunne, who had precognitive dreams which turned out to be true and he felt that he could travel back and forth in space as an observer, but then it was argued that there had to be an observer of the observer in an infinite regress. C. D. Broad, Professor of Philosophy at Cambridge University pointed out that such a regress is not necessary.

MORRIS: But that would have been an argument conducted without reference to the interaction of an observer with the collapse of state vectors, so we'd have to ask whether that argument would apply in this kind of circumstance, because that's really where you're bringing in the observer now.

NASH: In other words, you're saying that there has to be an observer of an observer. I just don't follow that argument. My intuitive inability to follow it is supported philosophically by Broad.

ULLMAN: You make a point about how infrequently conscious, meaningful messages can be transferred by this mechanism. Do you have any idea as to why we have this mechanism in the first place—this psi communication?

NASH: I think it has biological survival value. For example, one might save his life by ESP of events that are taking place around him.

ULLMAN: I agree with you that there is an adaptive purpose somewhere hidden in the picture. The only point I want to make is that psi doesn't seem to be a mechanism for conveying information very clearly or effectively. But it does seem to have an alerting or arousing function of some kind. I think that, perhaps, it does that more effectively than transfer meaningful information.

STORM: On the need for an observer of an observer, in institutional, orthodox Christian tradition as elaborated, say, by Thomas Aquinas, this problem was dealt with by proposing that there was an ultimate observer who was able to observe himself perfectly. He was separated from himself in this act of observation by something which was called the Holy Ghost. The Father was the observer; the Son was the

observed, and the relationship between them was the spirit. I've always resonated to that. It's amazing that this need for an infinite regress into observation was dealt with by Thomas Aquinas and others in the Scholastic period.

BARKER: You cited Louisa Rhine's statement that the percipient always shows some degree of motivation. There's a particular susceptibility to influence him. How does this relate to the observer and the mind? What is the function, then, of this motivation—the activation of psi communication?

NASH: I would say that in that case the percipient would be the observer as the cause of the psi effect; the agent might not be involved at all. The percipient might be reading the agent's mind thereby producing the psi effect. You wouldn't have to have an agent for a paranormal event to take place, and in that case, the percipient would be the observer who collapsed the wave packet and caused the event to occur.

BARKER: One of the most striking features of many of her cases was that the supposed agent was completely oblivious to his role in psi communication, and was doing something completely different from what the percipient was perceiving at the time.