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ARCHAEUS

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EDITORIAL

WELCOME to the first issue of ARCHAEUS. If anything other than the Archaeus idea unites the content of the articles in this issue, it is that they all discuss what the authors have actively been doing in very recent months: hands-on involvement, if you will. ARCHAEUS is not a journal of mainstream science. For the most part, the facts presented are controversial, and considerable work remains to be done before any of these ideas become firmly accepted and noted in the pages of traditional science—whatever that was or will be.

Although one would expect the effects of electromagnetic (and electric and magnetic) fields to be less controversial than, say, hypnosis, such does not appear to be the case. A great deal of heated debate is currently going on about what, if any, significant effects ELF and microwave radiation have on biological systems. If one reads König, et al., Biologic Effects of Environmental Electromagnetism one gathers that little has been established with certainty. On the other hand, the present writer attended a recent military-sponsored meeting at the V.A. hospital in Loma Linda, CA, on the subject of microwaves, solitons, and related topics.. At the conclusion of the meeting, serious consideration was given to drafting a letter to the President of the United States, similar in significance to the letter from Einstein et al. to President Roosevelt regarding the possibility of developing a "terrible new weapon"—the atomic bomb. In the present case, the terrible new weapon involves the interaction between EM fields and biological systems. ELDON BYRD reviews recent developments in these areas.

JACK HOUCK, father of the "warm-forming" (PKMB) party, discusses his model in this issue. Those of us who have conducted metal-bending parties are convinced that something extraordinary is going on and that this phenomenon has profound and highly tangible implications for modeling the relationship of mind to world. (Historically, since Descartes, anyway, mind has had no relationship to the world, and much of science since then has been devoted to exorcising this "ghost in the machine.")

That a mental image can affect matter comes much closer to home in the very impressive work of KAREN OLNESS. Karen's use of imagery in a biofeedback/hypnotherapeutic context has produced extraordinary results in her work with children. In fact, even if one is—or especially if one is—a dyed-in-the-wool naive materialist, the extension of image-effects from the "machine-body" to a stainless steel spoon should present no contradiction. It becomes a problem like any other. ...

JIM McCLENON, master of the painless hotfoot, at least sometimes (we were sorry to hear that his participation in the fire-walking trials in Sri Lanka, perhaps the most demanding of all, resulted in injury to Jim), considers the "Leidenfrost effect" to be of marginal value in explaining this highly repeatable paranormal phenomenon. This is one that even Randi couldn't explain on the program "Magic or Miracle." Randi didn't even mention the Leidenfrost effect.

And, speaking of Randi, the article by TOM RICHARDS points out, with clear documentation, one of the many, many doubtful aspects of the claims of Randi's Project Alpha group. Having been a peripheral

observer at one of the Mike Edwards/Steve Shaw performances here in Minneapolis, I can say that huge discrepancies between the facts and their reportage occur when Edwards, Shaw, and Randi try to describe them. One can definitely conclude that their intense will-to-believe (disbelieve) utterly disqualifies them as reliable observers.

Finally, in relation to the Allan Detrich interview, I have always felt that perspectives on the personalities and backgrounds of those producing extraordinary phenomena, as well as of those witnessing them (especially Ufos) are of vital importance for arriving at the origin and nature of these phenomena. The phenomena in question do not even have to be valid for such background material to be of importance for future research. Oddly enough, this idea has not caught on, perhaps because skeptics feel they might be subject to the same examination.

—DENNIS STILLINGS, Editor

ARCHAEUS

The term ARCHAEUS (ar-KAY-us) was first used by the great sixteenth-century physician Paracelsus (who, incidentally, founded magnetotherapy) to designate "an invisible spirit ... universal in all things, ... the healer, ... the dispenser and composer of all things." The Archaeus *is "the hidden virtue of nature" and the "invisible sun"; in another reference, the* Archaeus *is "he who disposes everything according to a definite order, so that each comes to its ultimate matter"; further, "The anatomy of the* Archaeus *is the anatomy of life."*

IMPLICATIONS OF NONLINEAR INTERACTIONS IN BIOLOGICAL SYSTEMS

Eldon A. Byrd

Summary

RECENT work has revealed the ability of low-intensity, nonlinear, extremely-low-frequency (ELF) and low-intensity ELF pulse-modulated microwaves to influence various physiological and behavioral processes in cells, tissue, animals, and humans. Major shifts in calcium efflux occur with fields that produce very small gradients in the extracellular space surrounding cell membranes. The extracellular fields are about 10^{-7} V/cm, far below transmembrane gradients of 10^{3} V/cm associated with a typical synaptic depolarization. This implies that cells can act as sensitive detectors of ELF signals. This apparent capability has led to specific alteration of cell function, including hormone and insulin decrease, accelerated wound healing and bone growth, interference with nerve conduction, entrainment of cell transcription processes, and alteration of brain chemistry. Engineering implications of the technology for medical use are discussed along with some experimental results obtained by the author.

Introduction

Recent observations (1–15) point to the conclusion that investigation of nonlinear molecular information transfer processes will provide a fundamental quantum mechanical model of the life processes. As a consequence, medical and physical science should achieve new levels of control over tissue growth and regeneration, the development of malignancy, antibodies, and perhaps almost all basic chemical processes. Because of the universal nature of the fundamental mechanisms, an immediate consequence will be a substantially extended understanding of information transaction, storage, and retrieval in the brain.

Nonlinear wave mechanisms have been proposed in areas as diverse as particle physics and physical chemistry on the one hand, molecular biology on the other. This major interdisciplinary convergence of biological and physical science portends a quantum jump in knowledge that may be unparalleled in recent history.

Electrical Properties of Cells

ONE of the most remarkable properties of biological material is that it maintains an electrical potential difference of about 100 mV across biological membranes. It is well known that this voltage is involved in nerve conduction, but all cells apparently maintain this voltage, leading to the high field of 10^{5} V/cm within the membrane, whose thickness may be of the order 10^{-6} cm. Such a field leads to strong electric polarization of materials within the membrane.(1)

Natural electric polarization of living systems is one of the basic properties of their structural organization.(2) Coherent electric vibrations in living matter may be produced by field processes. Cell membranes contain a considerable number of proteins dissolved in them, so that small sections of the membrane (e.g., between two proteins) are able to vibrate separately from the rest. The membrane is very strongly polarized electrically in a field of 10^{5} V/cm. Hence, excitation of vibration of a particular section of the membrane is associated with a vibrating electric dipole. Vibrations with shorter

wavelengths (higher frequencies) also exist. Individual proteins within the membrane will also be strongly polarized, and their oscillations may give rise to oscillating dipoles.(1) .

The dielectric behavior of biological systems in conjunction with nonlinear excitation can give rise to solitary, nondispersive waves (solitons) in membranes and proteins. More than 90 percent of living matter consists of polar molecules of proteins, nucleic acids, lipids, carbohydrates, and water. Depending on certain microscopic properties, the supply of energy may either make a system hot or result in the creation of a new type of order.(1)

EXPERIMENTAL data and theoretical assumptions make it possible to assume the presence of an unusual union of chemical and electrical processes in the domain of natural electrical polarization of biological structures. On the one hand, the electrostatic field of a cell is generated by chemical changes of molecules involved in the enzyme reactions. On the other hand, the strength of the generated field is sufficient to change the pattern of these reactions by affecting enzyme activity. Thus, there may be an interaction of processes of field generation and chemical changes of molecules, i.e., an interrelated cycle of electrochemical processes. In this case, the change in the electrical component of the cycle should cause a change in the chemical component, and vice versa. These changes will not exceed boundaries that are incompatible with the biologic functions of the domain. Therefore, it can be assumed that when the field strength changes above or below a certain level, directivity of metabolic processes is altered; the predominance of catabolism yields to anabolism, and vice versa. For this reason, the biologic function of the domain undergoing changes automatically stabilizes at certain levels that are necessary to support normal vital activity.(2)

Field-Biosystem Interactions

NONLINEAR field phenomena can control essential chemical processes in living cells. This has been demonstrated by Adey, Bassett, Wachtel, and others. (3–8, 24)

A review of the American, Soviet, and other literature has revealed the ability of low-intensity nonlinear ELF and low-intensity ELF-pulse-modulated microwaves to influence various physiological and behavioral processes in cells, tissue, animals, and humans. Verbal reports at various national and international symposia have echoed the literature and have further strengthened the concept that it should be possible to construct devices capable of producing weak fields that will influence living systems very selectively. Additional research is necessary, however, to gather sufficient data and refine theory to the point at which good predictive models can be formulated and electromagnetic field parameters can be properly characterized.

Direct interaction of weak microwave signals with neuronal synaptic function has been demonstrated, both on tissue in the laboratory and in animals.(9, 19)

The nonlinear response implies that pulsed radiation may yield a response different from the response obtained by continuous radiation of the same mean intensity. Thus, continuous radiation may have zero response, whereas the maxima of pulsed radiation may yield a response.(l)

Solitons

POSSIBLE routes have been explored in an attempt to elucidate mechanisms of field interactions with biological processes. Many involve the concept of nonlinear soliton-type waves. An essential property of a field is that it can carry energy, just as a particle can. Soliton waves are nondispersive and, therefore, give up essentially none of their energy during propagation, thereby allowing an energy transfer

from one point to another with no input required.(1) Nonlinear terms in field equations (such as Maxwell's and Schrödinger's) can arise from imaginary components of space and time. These terms give rise to coherent non-dispersive signals that retain their identity over nonlocalized space and time.(11)

The fundamental action of electromagnetic fields on living organisms must ultimately be understood as arising from an interaction between the organism's constituent molecules and the electromagnetic field. Nonlinear mechanisms play a crucial role. Solitons may be involved in such diverse functions as muscle contractions, proton transport, and gating of ionic fluxes across membranes.

The available evidence on the nature and sites of electrochemical nonlinearities in biomolecular systems strongly suggests that these nonlinearities arise from nonlinear waves acting as signal processes along linear macromolecules, such as helical proteins. Solitary waves may also act as energy-transporting devices along biological macro-molecules. Electromagnetic energy may be converted to soliton-conducted energy as a transductive step. These solitons propagate along the molecule, exhibiting threshold and "window" characteristics in relation to the exciting energy. As transductive coupling of exciting events at cell membranes, they offer a vehicle for highly selective relationships to low-frequency periodicities in the electrochemical environment, and in the transmembrane coupling of cell-surface events to specific intracellular enzyme systems.(17)

Recent developments in the physics of polymers have raised the possibility that several quantum mechanical effects may play a significant role in the biological functioning of proteins and DNA. The basic physics may be understood in terms borrowed from particle physics. Fundamental excitations may behave as quasi-particles, such as phonons, excitons, or polarons. Dynamically stable interactions of phonons and electrons in polyacetylene, for example, account for the unusual properties of this material, and may allow it eventually to be used as an information storage and retrieval device.

Experiments

MORE than 20 years ago, the Soviet researcher B. B. Kazhinskiy (12) described theory and experiments concerning living-system superconductivity, magnetic field influences on DNA, and the influence of externally applied weak electromagnetic fields on living systems, from isolated tissue in laboratories to human beings. He produced experimental evidence that the external electromagnetic field surrounding an animal's nervous system produces a marked effect on the performance of the nervous system. He also constructed electronic circuits from living material. He extended his ideas and experimental evidence to include specific neuronal structures in the human peripheral nervous system, which he thought could serve as detectors and amplifiers for electromagnetic signals. In the intervening years, it has been repeatedly demonstrated that cells can sense the electromagnetic environment and respond to changes in it of 10^{-7} V/cm—three orders of magnitude lower than self-generated fields. Thus, cells can act as sensitive detectors of ELF electro-magnetic signals, with S/N of about 1000:1; i.e., they can pick a signal to respond to that is buried in "noise" a thousand times more intense than the signal. Thus, cells must have narrow-band-filtering capability. (4–7, 10, 13, 14) Brain tissue, in particular, responds to weak (less than EEG strength) fields in "windows" of frequency and intensity to both electric and magnetic signals, but more markedly to magnetics. (14–17) Predictive models exist, still a bit rough in their refinement.(3, 17, 19)

Calcium plays an important role in the biochemical and biophysical functions of many types of cells. It is a coupling factor between excitation and contraction in muscle and in glandular secretion, and serves as an intermediate in hormonal action on several target organs such as the heart, bladder, and bone cells.(16) Baywin (13) points

out that major shifts in calcium efflux occur with fields that produce very small gradients in the extracellular space surrounding cell membranes. The extracellular fields are about 10^{-7} V/cm and of ELF frequency. They are thus far below transmembrane gradients of 10^3 V/cm associated with a typical synaptic depolarization. Moreover, the gradients induced in the extracellular space along the membrane surface would be about 10^3 times larger than any transmembrane components of the same field.

ADEY, Frey, Delgado, Persinger, and the Soviets have reported influencing animals with weak ELF fields. (1, 6, 7, 13, 17–22) The effects range from alteration of the firing rates of neurons in the brain, calcium-ion binding disruption on cell surfaces in the brain, to response time, ambulatory alteration, respiration rate changes, heart-rate changes, making animals respond to "motor" commands (like grooming or grimacing), and even putting the animal to sleep. (17) Again, magnetic fields seem to have more effect than electric fields.

Most of the literature concerning the exposure of animals to microwaves is concerned with ELF pulse-modulated microwaves. Frequencies in such signals are a function of pulse width, amplitude, rise and fall times, and other parameters. Thus, unless Fourier transforms of the signals are determined, it is not possible to characterize the signals properly. Sylvia Filton-Jackson has reported (17) that spectral components in the kilohertz range appear to cause effects selectively in bone tissue.

Behavior modification in animals as the result of weak (as low as 10 $\mu w/cm^2$) microwaves have been reported. (8, 19) These include induction of grooming responses, altered heart and respiration rates, epileptiform seizures, and various others. The lower the power, the more immediate the effect, provided an effect was present. Because the levels are so low, the nonlinear mechanisms obviously involved preclude meaningful reference to power density and SAR as measures.

Also noted (19) is an adaptivity of animal brains to the signals. The greatest response occurs on first exposure (usually of a few seconds' duration); repeated exposures yield a decreasing effect.

We have demonstrated that Mast cells (a particular type of cell occurring in large numbers in the brains of mammals, including man) can be degranulated in rats, causing stores of histamine, heparin, and other substances to be dumped into the brain. Unpolarized and vortex type magnetic fields were employed, with the vortex fields yielding the most significant results. Various frequencies from 0.5 Hz to 9 Hz and various intensities from 1 μT to 1000 μT were tried. The maximum effect occurred at 0.5 Hz and 10 μT.

A total of 10 human subjects was used in an experiment (adhering to strict official human use guidelines) to determine if weak nonlinear ELF magnetic fields at specific frequencies could entrain their electrical brain rhythms. There were five males and five females, ranging in age from 25 to 70 years. Data were placed on magnetic tape. Entrainment/alteration of the EEG occurred in about one-half the runs.

Implications

IT IS clear that there will be direct applications of this work in achieving a far deeper understanding of the fundamental nature of matter, and that this understanding will expand the horizons of both physical and life sciences as well as impact on biomedical engineering. This technology addresses totally new perceptions of the behavior of populations of atoms capable of acting as quasi-particles through nonlinearities in their interactions. Once formed, these quasi-particles can persist for very long periods.

Electromagnetic field interactions in natural and artificial macromolecular systems have already identified highly important amplification processes that involve both nonlinear and nonequilibrium mechanisms. These interactions have been observed in tissue cation binding and

release, and in the binding and release of neurotransmitters, hormones, and antibodies. Therapy of wound healing and fracture union has been identified as highly susceptible to weak field exposure. Additionally, there are advances expected in the following areas:

production of monoclonal antibodies
understanding of cellular organization
synergistic effects with drugs
cancer chemotherapy
biorhythm control
drugless treatment of illness
action of hormones, antibodies, and neurotransmitters
enzyme activation and inhibition
genetic manipulation using external fields
slowing of ageing
microelectronics
structural materials
coatings
energy production, transmission, and transformation
control of chemical processes

IN SHORT we may well be at the threshold of a sweeping new vista in biology, medicine, and the physical sciences (including the engineering aspects) with few parallels in history.

I should like to thank W. Ross Adey and A. F. Lawrence for helping me to express some of the concepts presented here.

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CONCEPTUAL MODEL OF PARANORMAL PHENOMENA

Jack Houck

THERE is no question but that today's "hard" science has progressed to the point where it can describe our everyday reality very well. Much progress is now being made in the human, or "soft," sciences as well, and many models have been formulated in an attempt to expand the currently accepted understanding of physics, a so-called hard science, to include studies of human consciousness.

For the past seven years, I have been particularly interested in trying to understand and explain those paranormal phenomena that have been labeled remote viewing, telepathy, mind-reading, psychometry, psychokinesis, and psychic healing.

When a literature review and experiments suggested that there might well be something to paranormal (sometimes referred to as "psychic") phenomena, we turned our efforts toward solving the problems of improving the reliability of experiments in these areas as well as applying and understanding the phenomena. The initial experiments were in remote viewing which involves a subject attempting to "project his mind" to a far-off location and to describe the scene there. (1) Dr. Harold Puthoff and Russell Targ of Stanford Research Institute International relabeled clairvoyance and out-of-body or astral travel as "remote viewing," because this term is a less glamorous, more accurate one and dissociates remote viewing from the occult.(2)

Remote Viewing

THE conceptual model described in this paper was developed as a result of experiments conducted. Most of the ideas incorporated in this model are not new; almost all of them have been presented before. The model simply integrates them and provides an interface for the many models previously formulated. After it has been tested further and refined, this model could be a powerful link between the hard and soft sciences.

The underlying concepts of this model are as follows. The human brain is both a transmitter and a receiver of information; further, the scope of the brain is not limited simply to one human body. Information about events in all space and time is stored all around us, and the mind accesses this information. The brain receives data both from our physical senses and from this stored information and processes it as a very advanced computer would. The brain/mind can tune into any information in this storage system when given specific instructions about space and time. The more specific the instructions about the information desired, the better the quality of the received (or retrieved) information.

Experimental observations made since 1980, when the model was developed, have suggested that all paranormal phenomena could be explained by using the same concept.

When careful attention is paid to the environment (i.e., by providing a nearly sensory-stimulus-free, dimly lit room with no pictures on the wall, no unusual smells, and no noise), I believe that anyone can experience remote viewing with the aid of a skillful interviewer. He asks questions that allow the remote viewer to be open to perceive the information from all the senses (visual imagery, sounds, smells,

feelings, and tastes); a number of researchers call this faculty remote perception (3, 4)

The data reported at the time of the remote viewing can often be accurate, but related to some other time at the target location. Further analysis suggests that reported data correspond to a time at or near the time when a peak emotional experience occurs at that location. These time shifts, which may occur both forward and backward in time, are one reason why this type of experiment has been difficult to replicate. Techniques for diminishing these difficulties are discussed throughout this paper.

Once the remote viewer is reporting data from the target location, he has, so to speak, complete mobility around the target. He can go above it to look down on it and can move all around it. He can also pass freely through walls. At times the remote viewer perceives things to be a different size from what he would normally perceive them to be. This is easily corrected by asking him to be his normal size, and then things will appear the same size as usual. The more specific the interviewer's instructions about the location of the target, the time for which the information is desired, the size the remote viewer assumes at the target, and the type of information wanted, the more successful the remote viewing becomes, and the better will be the quality of the data reported. (For example, the subject might be given the location of a person, or latitude and longitude coordinates, or a photograph of the earth's surface; asked for information a month from now; requested to assume normal size at the target; and asked to "see" the target.) Some results have been astonishingly accurate.

The psychological environment of a remote-viewing experiment is also very important. The interviewer must be supportive of the remote viewer and have some rapport with him. An understanding of neurolinguistic programming (5) can be very useful to the interviewer with respect to working with the remote viewer's primary brain-sensory processing system. Experimenters who doubt that remote viewing will work generally find that it does not work for them. If you want good remote-viewing results, you must know that it works and must concentrate on getting good data. It is a technique that can be taught; performance does improve with practice.

Warm Forming

ON THE basis of the early experience with remote viewing, I predicted that psychokinesis or PK (mind interacting with matter) could also be better controlled by creating the proper environment (in this case, by creating a peak, emotionally intense situation), having the individual connect his mind with the object to be affected, as in remote viewing, and then commanding it to do his will.

In January of 1981, I began experimenting with this idea by conducting "PK Parties."(6) Close to 90 percent of all the people attending these parties (approximately 1500 people of all ages and types, at 60 parties) have learned to bend metal using PK with a process called warm forming. This term suggests the slight temperature increases noted in the metal when it is ready to bend, and also dissociates warm forming from the occult. Approximately half the people who have learned how to warm-form retain the skill even outside the party atmosphere. These PK parties have been replicated over 100 times by other researchers with similar results. Many more parties are being planned by other researchers, because they are reliable demonstrations of PK.

Metallurgical analysis of warm-formed metal has shown that the two most important characteristics of metal that is easily warm-formed are the number of dislocations (i.e., broken crystal structures along the metal grain boundaries) it contains and a low thermal conductivity. Another key factor is that the individual must be consciously willing to warm-form the metal. He must make a mental connection with the object to be bent and deliberately will it to bend. After a brief

interval, the material becomes soft from internal heating along the grain boundaries. Then a little force will accomplish the bend. Metal with low thermal conductivity stays soft (warm) for only 5 to 15 seconds; thus the most difficult task is finding the right moment to add the extra force. Many brittle and otherwise physically unbendable objects, such as plastic ware, have been bent at these parties. A few pieces of stainless steel tableware that have been warm-formed have then broken with a loud popping sound. Some objects, which had large internal stresses and a large number of dislocations, have been bent while being held in one hand and not touched with the other hand. One individual has recently been able to hold a piece of tableware in two hands and actually pull it apart. There have also been reports of other objects in the room bending by themselves, without being touched at all. This effect is probably due to existing stresses in those objects.

In both remote viewing and warm forming, one may occasionally observe what the researchers refer to as "the first-time effect." A person may get dramatic results the first time he attempts one of these activities, but fail the next time he tries. This occurs because, after bending the piece, he analyzes what he has done and, failing to understand it, becomes a little frightened. The conceptual model of the phenomenon presented in this paper may give people confidence that there can be a scientific explanation for the phenomenon, and it is hoped that this model may help reduce the "first-time effect." Many people also seem to improve their skill by attending PK parties, which indicates that training is possible and that psychokinesis, like remote viewing, can be taught.

In addition to the remote-viewing and PK experiments, observations have been made of a number of psychic activities by individuals who seem to have unusual talents in mind-reading, telepathy, and psychometry. These activities also seem to conform to the conceptual model here presented.

The Brain A Conceptual Model

WITH the conceptual model of a brain transmitting and receiving information that is stored all around us, a question naturally arises as to where this information is stored. The answer to this is not known. It is interesting to note, however, that our human senses perceive, for example, only a very small portion of the electromagnetic spectrum. This is not to suggest that the information-storage system necessarily lies in the known electromagnetic spectrum. To my knowledge, no instruments other than the brain have been able to measure or contact this storage system directly. There are instruments that seem to respond to human will or register when a paranormal event occurs, but it is thought that this is due to PK.

There is much research currently going on in the area of brain function. The biochemical, quantum mechanical, and holographic models of the brain all have made great contributions to our understanding of how it works.

The model of the brain presented here is simplistic by comparison, but will be adequate to help us understand paranormal phenomena. This model uses the analogy of a digital computer for most brain functions: it takes information from both the physical body sensors and from external information-storage system, processes it to produce what we perceive as sense data, and further processes this information by doing what we call thinking, analyzing, comparing, and reacting. The output then goes into the information-storage system (i.e., the memory) and to the reporting system (i.e., speech, muscle movements, etc.).

This model of the brain is shown functionally in Fig. 1. The physical sensors are listed on the left-hand side of the figure. The output of each sensor is represented as if a single signal S were coming from it, with the subscript B to designate it as coming from a physical (body) sensor. The signal from the nose is designated as 1;

from the tongue, as 2 ; from skin and nerve endings, as 3 ; from the ears, as 4; and from the eyes, as 5. Each of these siga1s goes into the corresponding brain cortex for processing, as shown in Fig. 1.

As stated previously, the mind seems to be capable of reaching outside the physical body and acquiring information in all sensory channels from remote locations outside the body, as far as the other side of the earth—or anywhere in the universe. This is represented in Fig. 1 by a set of signals S with the subscript E to designate that it is from sensors external to the human body. These sensors are numbered in the same manner as the physical sensors. These external sensor signals seem to enter the brain and be processed by the corresponding physical sensory cortices; it is as if the cortices were unaware of the source of the signals they receive. It appears that people sometimes experience both signals, one overlaid on the other. For example, what some people see as an "aura" may be the result of an overlay of signals from both the physical eye and the external visual sensor. It is as if the signals for each sensory type are added together before being processed by the appropriate cortices. They are brought together as shown in Fig. 1 and are then added together. For most people, the signals from the body sensors are strong, compared with the external sensors, when they are awake. During sleep, the signals from the body sensors are relatively weak, and the external signals may be strong enough to be detected and processed. Normally, people do not make specific requests of the mind before and during sleep; thus the mind may be randomly accessing the information-storage system and combining that information with memory data from its own "world line" (its space-time history). When a person undergoes an out-of-body experience, he perceives being out of his body, with his mind functioning in his "astral" head. Sometimes a person "sees" the physical body as separated and distinct from the "astral" body, which may look very similar. I postulate that that person's physical brain is still doing the data processing and that his physical sensors have become very weak as compared with the external signals.

For remote viewing, we attempt to minimize the signal from the body sensors, while maintaining enough signal to keep the remote viewer attached to "this reality," and—using a technique described later—we try to maximize the external signal. That technique involves starting with the "slow" senses first. Smell, taste, and touch seem to have slow discrimination rates (for example, it takes a relatively long time to distinguish one smell from another), whereas hearing is fairly fast, and vision is very fast. For that reason, the apparent discrimination rate of each of the senses is shown in Fig. 1.

The output of each sensory cortex is the perceived sensory information. Once the sensory information is processed into detectable sense data, the central cortex is then thought to process the information by thinking, analyzing, comparing, and reacting. It is well known that all these activities should be minimized in order to get good remote-perception data. I am speculating that memory is stored outside the brain and is associated with each person's world line or space-time history. Thus, a central cortical task of comparing requires the brain to make a request of the information-storage system for some information, and that information will come into the brain through the use of the external sensors, as previously described. This suggests that the external signals from an individual's own world line are much stronger than the signals from other information in the information system. While the information is being processed in the central cortex, the brain can also report the information in the form of speech or of muscle movements, such as writing or jumping (once I jumped out of my chair when I saw a tennis ball coming right at me). These results are then filed into the information-storage system, defined as the space-time unit (STU) This filing is the brain activity analogous to the activity of a transmitter.

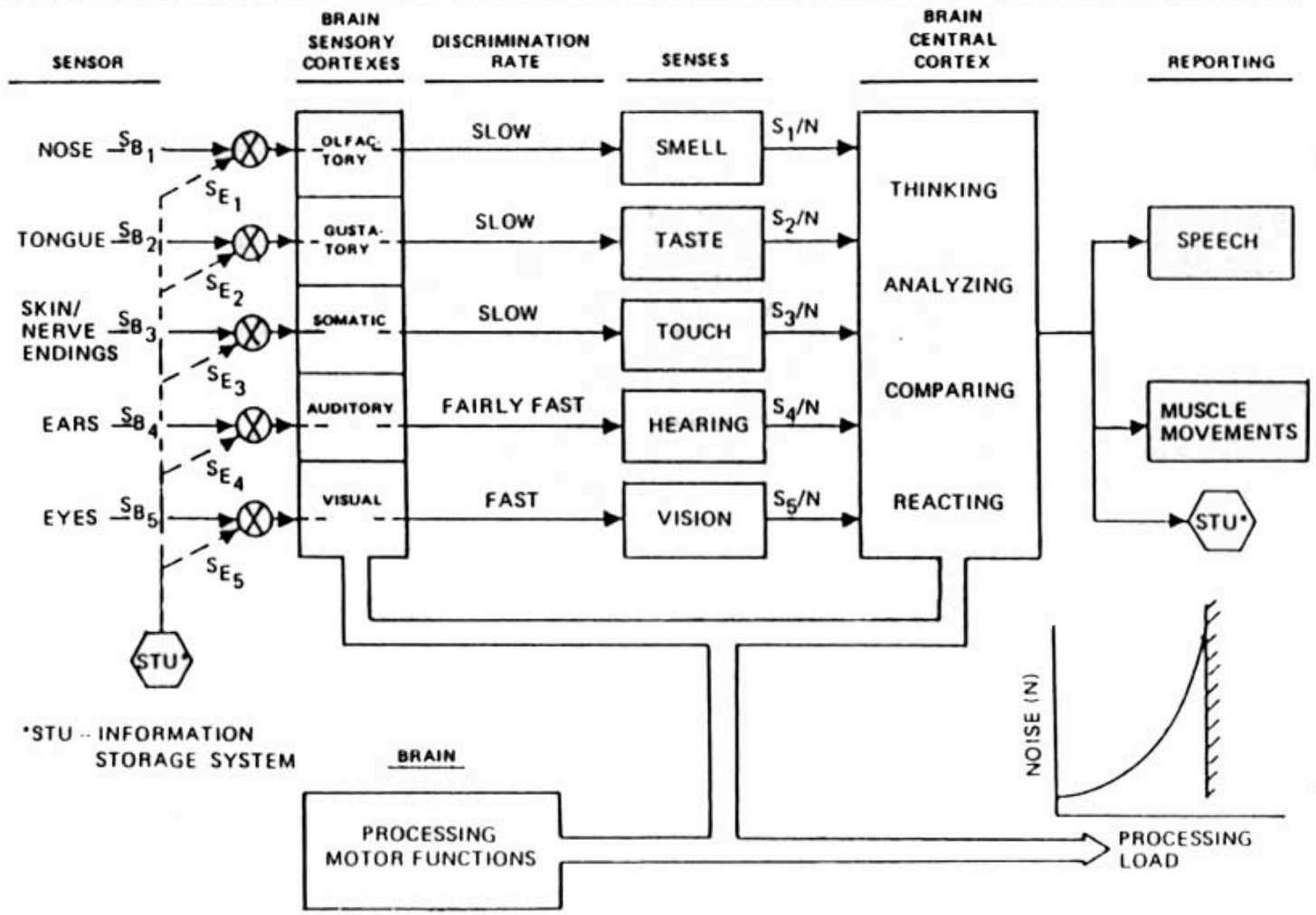

Fig. 1. Human brain and interaction with the senses.

ANOTHER important concept associated with this model is that "background noise" is generated that is proportional (perhaps exponentially proportional) to the amount of information processing going on inside the brain. Throughout Fig. 1, channels from each of the major information-processing activities are shown accumulating the amount of data processing into a total processing load from the brain. The small graph in the lower right-hand corner simply illustrates that this background brain noise level is a function of that total processing load at any instant in time. The background noise N is relatively weak when compared with the normal signals from the physical body sensors. Sensor systems can detect a signal only when that signal is sufficiently greater than the noise (the signal has a greater signal-to-noise ratio) such that the processing technique being used can find the information in the signal. Radar sensors typically have a detection threshold that requires a signal-to-noise ratio of about 14 decibels and requires approximately a 20-decibel signal-to-noise ratio for accurate target tracking. Thus, getting good remote-viewing data and achieving success in any other type of perception activity requires three things: (1) the signal from the physical body sensors must be greatly reduced, (2) the signal from the information-storage system must be maximized, and (3) the background noise must be minimized by reducing as much of the brain's processing activity as possible.

The signal from the body sensors can be greatly reduced by placing the subject in a dimly lit room with no pictures on the wall, no unusual smells, and no noise. The processing load from the brain's motor functions is also reduced when the subject is sitting down in a relaxed environment. The load from the central cortex can be reduced by training individuals to minimize those activities. Meditators train themselves to blank out their thoughts and not to analyze or compare when in a meditative state, thus reducing the processing load of the central cortex. As mentioned earlier, the interviewer and remote viewer should work as a team; the interviewer can take over many of these central cortical activities and thus relieve the remote viewer of them. Finally, one can work around the processing load from the sensory cortices by starting the remote viewer off with a request that asks for data only from the slow senses ("smell the perfume of Ms. X at this time"). Most of the techniques being given apply only to the "average" person. There are individuals whose minds continually have good access to this information-storage system and who have trained themselves to process the external information fairly efficiently.

In order to demonstrate how to work with the senses, three plots are shown in Fig. 2. These give a subjective assessment of how the signals for both the body and external sensors vary in the physical brain with time during a typical remote-viewing session. Included also are the background noise and the most important parameter, the signal-to-noise ratio. The uppermost plot (Fig. 2a) contains three lines. The longer dashed line represents the accumulation of signals from all the physical body sensors. This is done only for simplicity in presentation. At the beginning of a remote-viewing session, the remote viewer is brought into a relatively sensory-stimulus-free room that has a comfortable chair, a table, paper and pen, and recording equipment (in an inconspicuous place). As the subject relaxes for approximately 15 minutes, the accumulated signals from the sensors decrease. Similarly, in the middle plot (Fig. 2b), the background noise N is shown decreasing. The rate of drop is not as fast as that of the-body sensor signals, because the processing from the central cortical activities continues after the bulk of the sensory input has diminished. At the bottom of Fig. 2c, the signal-to-noise ratio history is shown. When the remote viewer is relaxed, about 15 minutes after entering the room, the interviewer makes the specific request for information from the slow senses. A typical request might be: "Please describe how it feels to be at a northern latitude of 22 degrees,

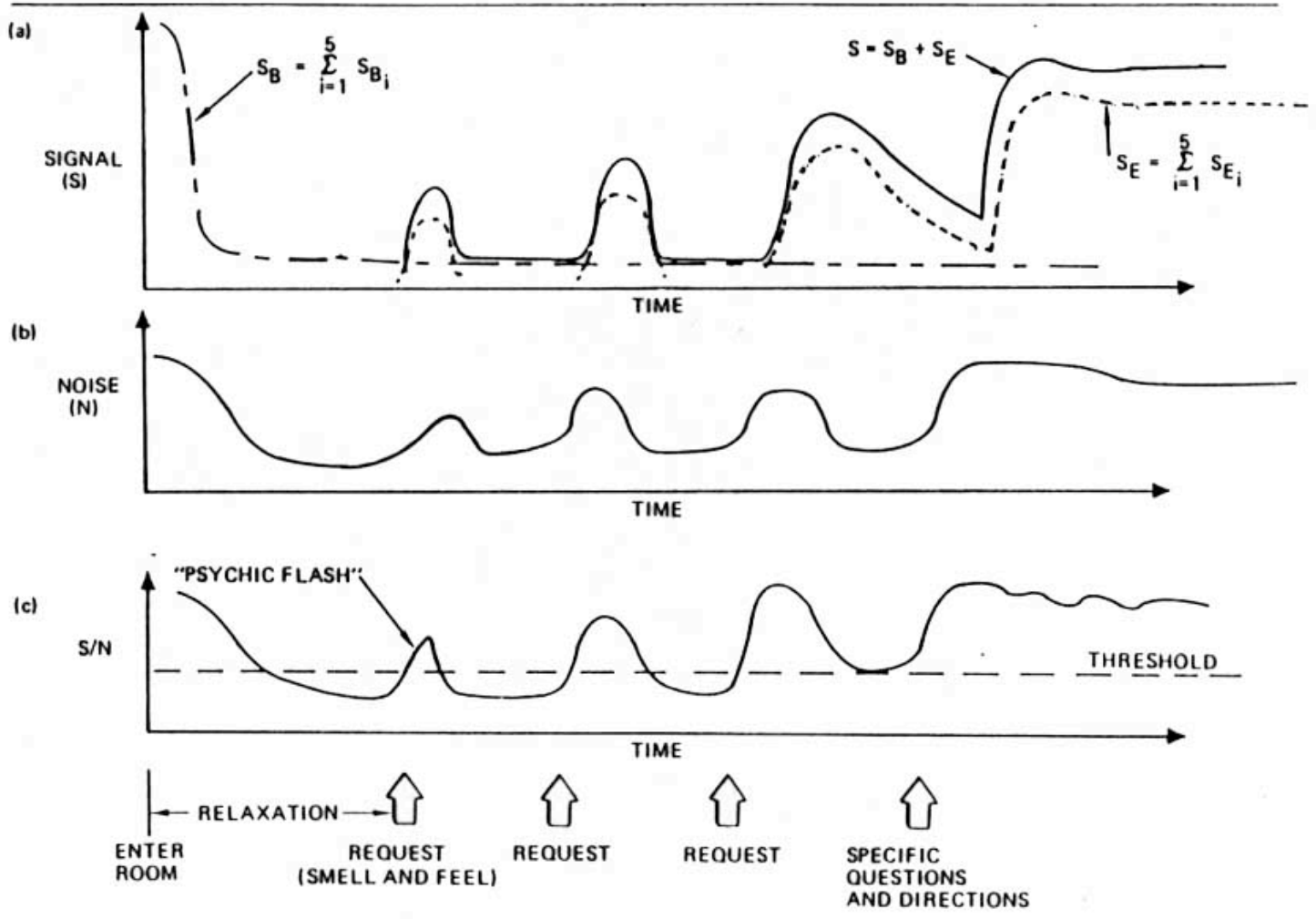

Fig. 2. Possible brain signal and noise during remote-viewing sessions.

19 minutes, and 48 seconds, and an eastern longitude of 31 degrees, 36 minutes , and 54 seconds. Be there at this time and be your normal size." (That target happens to be Abu Simbel, on the northern shore of Lake Nasser in Egypt.) It then seems that the mind reaches out into the information-storage system, and information from the external senses may come into the brain of the remote viewer. It is not necessary that the remote viewer understand the meaning of latitude and longitude The increase in the signal from the external senses is shown in Fig. 2a with a short dashed line. This line represents the accumulation of all the external signals. The solid line represents the total signal input S, which is the sum of the body sensor signals and the external sensor signals. The background brain noise must increase as a result of the new input information being processed, as shown in Fig. 2b. As the external data comes in, often the background brain noise increases rapidly. Even though the signal-to-noise ratio begins to rise, it almost immediately drops, as shown in Fig. 2c. This is what psychics call a "flash." If the remote viewer continues to analyze the information, the information will become distorted by information from his "world line" or memory. If the remote viewer does not get any information, he is requested just to continue to relax and not to think. In either case, after about a minute, another similar request is given by the interviewer, still asking for information from the slow senses. Each time this request is repeated, it seems that the external information signal becomes stronger and is more detectable and understandable. Only after the information begins to come clear does the interviewer ask for auditory and then visual information. Once the signal-to-noise ratio seems strong enough so that the remote viewer can freely move around at the target location, then the interviewer can stop making the specific requests about the target location, time, and scale size and begin to talk to the remote viewer as if he is actually at the target. The interviewer must be careful not to lead the remote viewer, and it is best to ask questions that clarify what the remote viewer is reporting. (For example, a clarifying instruction might be, "Zoom in and describe in more detail the building you mentioned.") On occasion, I have had to make the initial specific request four or five times before moving to the type of questioning just described.

It is also possible that the remote viewer may spend too much time drawing what he sees, and he may drop out of the state (i.e., his external information signal-to-noise ratio may drop below his detection threshold). It helps to give him feedback to build his confidence that the process works. This feedback also files the correct information on the remote viewer's time line for future reference as a memory. It is not recommended that a remote viewer do more than one experiment a day, because of the time shifts.

FIG. 3 is a schematic of the information-storage system that we have been discussing. Assume that all information about space and time (past, present, and all possible futures) is contained in the large ellipsoid. The ellipsoid is simply meant to be symbolic, representing all information over all time. This volume of information has been designated a space-time unit (or STU). A two-dimensional plane is used to represent our three-dimensional physical reality at the current instant of time. It passes through the STU perpendicular to the time axis (the major axis of the ellipsoid). The intersection of this plane and the surface of the STU is a circle, as shown in Fig. 3. The area inside this circle represents our physical universe at the current time. Planes parallel to the one shown would represent other times (either past or future). Thus, a line perpendicular to these planes is a time line.

Note that an infinite number of planes, at all different angles, could have been passed through this STU. A skewed plane would represent a three-dimensional space, acting over a range of our time. Suppose that unidentified flying objects (Ufos) are in a different

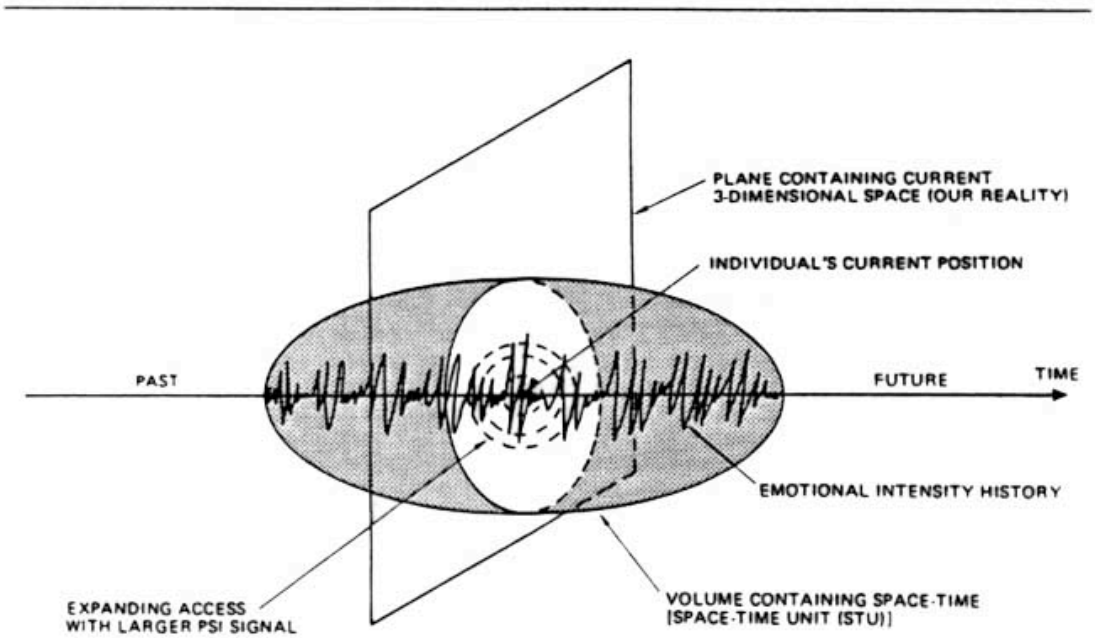

Fig. 3. Conceptual model of space-time relationship.

reality, represented by a plane moving along its time axis but skewed to ours. Occasionally the two realities would intersect and, in effect, materialize a Ufo into our reality. Some people like a concept of nature in which there is no time. In this model, that would be equivalent to being on the surface of the STU and having access to all information inside it, independently of time.

If you think of yourself as the central point on the plane inside the STU at the present time, you have a time line through you—your world line. Your mind has access to all information in the STU in both space and time. This is represented in Fig. 3 by circular dashed lines, in the form of an expanding sphere surrounding you, depicting your mind's access to the STU. Meditators report that, as they go deeper into meditation, they feel as if they become one with everything around them. As your external sensor signal-to-noise ratio becomes greater, your access into the STU becomes greater. Even though electromagnetic radiation is limited to the speed of light within the circle representing our physical reality, there is no reason to believe that information transfer within the STU is limited by the speed of light. Most researchers do not believe that remote viewing is limited by distance, and I suspect that the same holds true for psychokinesis.

Emotional Intensity

ALL these ideas, in one form or another, have been presented before by others. One thing that I have noticed, however, is that there also seems to be some type of modulation encoded on the time line of each person, each object, and possibly each atom—a modulation that is somehow proportional to emotional intensity This is shown in Fig. 3 as a wavy line along the time line.

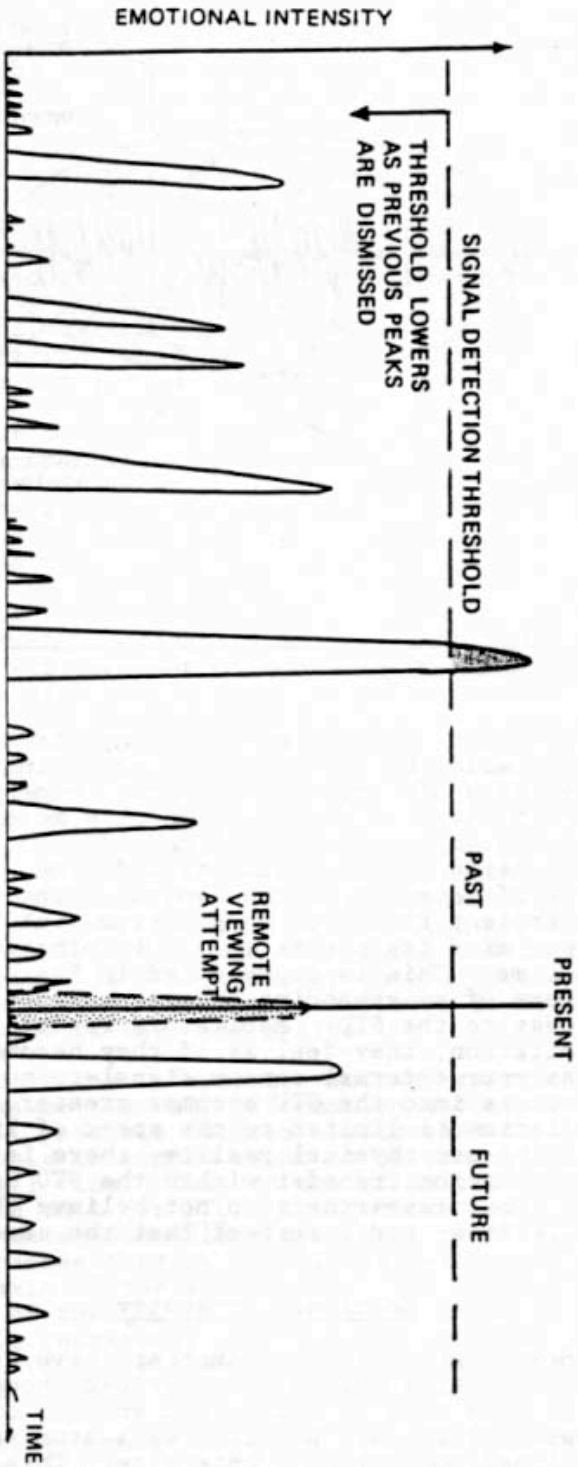

Fig. 4. Emotional modulation on the time line.

Normally one thinks of emotions as belonging only to human beings and animals. I have postulated, however, that emotional intensity applies to all things, including inanimate matter (the rocks inside Mount St. Helen's, for example). Fig. 4 represents the history, or modulation, of emotional intensity on a time line of some target at a remote visual location from a remote viewer. The emotional intensity of the remote viewer (and probably of the interviewer) during the attempt is superimposed on the time line of the remote object, as shown in Fig. 4, with a dashed peak located at the present time on the figure. Assume that, at that point in space or on the time line associated with the target, there has been a huge emotional experience such as a roof that collapsed and killed 1000 people, as represented by the large peak of emotional intensity in the past in Fig. 4. In the example, the remote viewer's mind would go to the specified point in space and search in time for the peak emotional event. This process is much like a sophisticated radio that searches for the peak radio signal intensity and then locks onto that frequency. Once the radio carrier frequency is selected, the information carried on that frequency is heard. Once the mind locks onto the time of a peak emotional event, the complete set of information is available to the remote viewer's external sensors at or near the time of the peak event. This data can be very vivid visual imagery, which usually has a three-dimensional appearance, much like that of a hologram. In an example like that shown in Fig. 4, a remote viewer can unlock his mind from that peak event by releasing those thoughts, then let his mind search for the time of the next-highest peak. This is analogous to what meditators do when they put aside thoughts that enter their minds. If this process is repeated, the remote viewer will eventually focus on the highest remaining peak, at which he will receive another set of remote-viewing data. There might even be some kind of weighting function that amplifies the emotional peaks lying near the present time. Usually, the remote viewer can feel that the information is near the present time and can proceed to access the desired information.

In psychometry, an individual touches an object and lets information come into his brain that is stored in the STU on the time line of that object. Subjects usually pick up information near peak emotional events. I once had the privilege of observing Dr. Charles T. Tart, of the University of California at Davis, conduct a telepathy experiment similar to the one documented in ref. 7. At the sending end of the experiment, he acted like a cheerleader and had everyone shouting instructions to the receiver, who was located in another building but could be seen on a television monitor. The receiver carried out the shouted instructions accurately. This, combined with an analysis of the implications of Fig. 4, helped me realize that creating a sufficiently high emotional peak at either the target or the perceiver end of an experiment may produce information with minimum time shifts.

As I examined this concept further, I realized that all paranormal phenomena seem to behave in this way. For example, when Dr. William Tiller was at Stanford, he performed a PK experiment in which a discharge tube did not become activated until 10 minutes after the operator began to attempt to affect it, but continued to discharge for 10 minutes after the operator was told to stop. Other examples come from people who do "past life" hypnotic regressions. They find that their subject's mind goes either forward or backward in time and accesses information near an emotional experience, usually the death of the person whose life produced the information. They find that they can move the subject forward and backward in time around that point and even go on to other "lives." Sometimes the first information may seem mundane. A good hypnotist will move the person a little forward in time and find the peak event. This suggests that there are errors in the mind's search system in time. Both positional (spatial) and temporal errors occur in remote viewing. Part of the technique for reducing these errors involves being very specific with the space and time requests and being able to move the subject's mind in both space and time to find the desired information.

Quantum Mechanics and the Model

CONCEPTS from quantum mechanics can be used to explain the proposed model more fully. Quantum mechanics is used to make statistical predictions of what will be observed. The statistical distribution of possible observations is represented by the Schrödinger wave function. When an observation is made by any type of instrument as well as by the human senses, the wave function is collapsed to some new state. In the center drawing in Fig. 5, an individual is seen observing an airplane, and thus collapsing, or participating in the collapse of the wave function in order to see the airplane and its surroundings. The suggestion is that all minds participate in a consensus reality (8) and that everyone observing the same airplane sees the same airplane. In this model, the observer's brain files this information into the STU, where it is also stored by any other observers. The STU keeps all the records of every event; in Fig. 5 this record-keeping is represented by little circles going up from the current observation. As previously discussed, when the individual wants to access a memory, his mind searches back through his world line in the STU to sense that information. His external sensors acquire that information, which he senses in his brain, much like a hologram, with the data being processed as previously discussed. All sensory information from that memory can be accessed. When looking into the future, the mind again accesses an event, usually at or near an emotional peak. The wave function for that time and place contains the likelihood for all the possible events based on all the information in the STU at the current time. As shown in Fig. 5, when the mind goes into the future, it observes and temporarily collapses the wave function to a possible

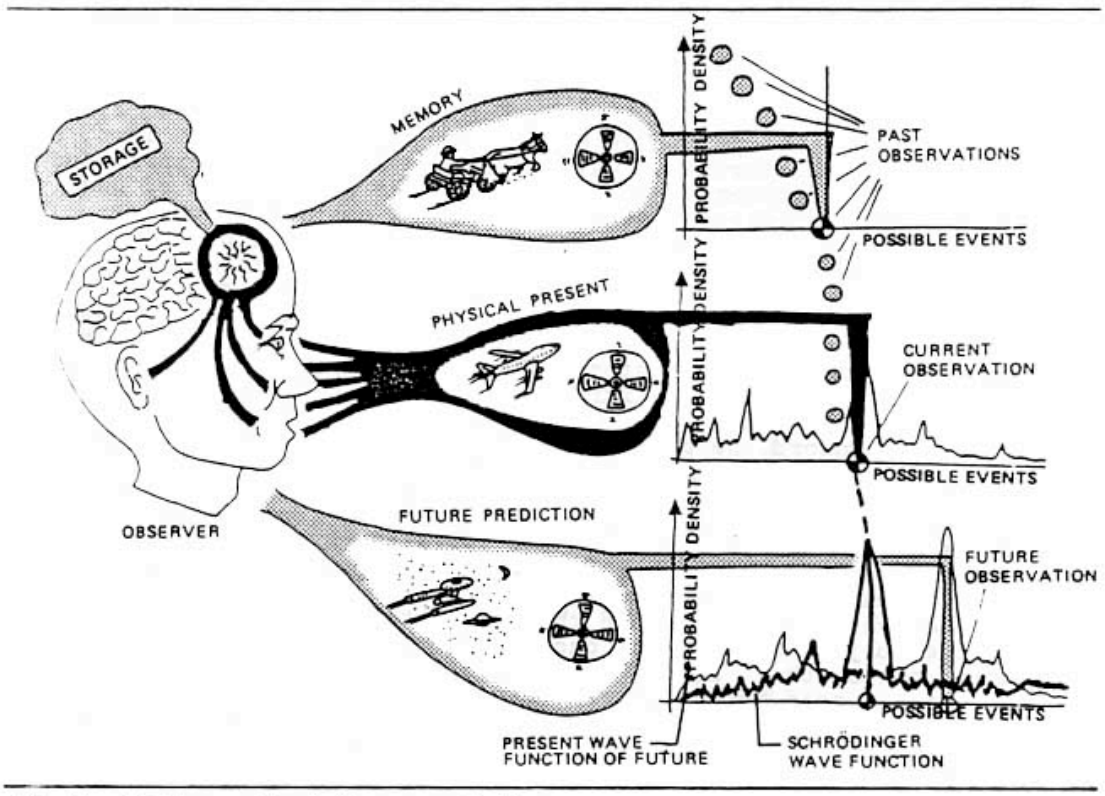

Fig. 5. Quantum mechanical representation.

event. These data are seen within the brain with the same clarity as a memory because, again, the external sensors are acquiring the information as before. These data are also filed into the STU on the individual's world line and may affect his future actions. Often future events are dependent on the actions of many people, any of whom can change their minds because they have free will. Thus, as real time marches on, the wave functions of future events are constantly being changed to reflect their probabilities based on current realities.

When the time of a previously predicted event finally arrives, the state to which the wave function will collapse when observed by the physical sensors may be quite different than what was anticipated. This concept was first suggested to me in a conversation with Dr. Henry Stapp of the Lawrence Berkeley Laboratory.

Space-Time Map

AFTER additional reading and discussion of theoretical models with other researchers, I realized that my map of the STU (Fig. 3) is commonly shown by others in two dimensions, a time dimension and a space dimension used to represent all three physical dimensions. This is shown in Fig. 6. Also shown, at the location corresponding to the individual's present location, is the physicist's "light cone," which defines the space-time zone in our reality, which is bounded by the

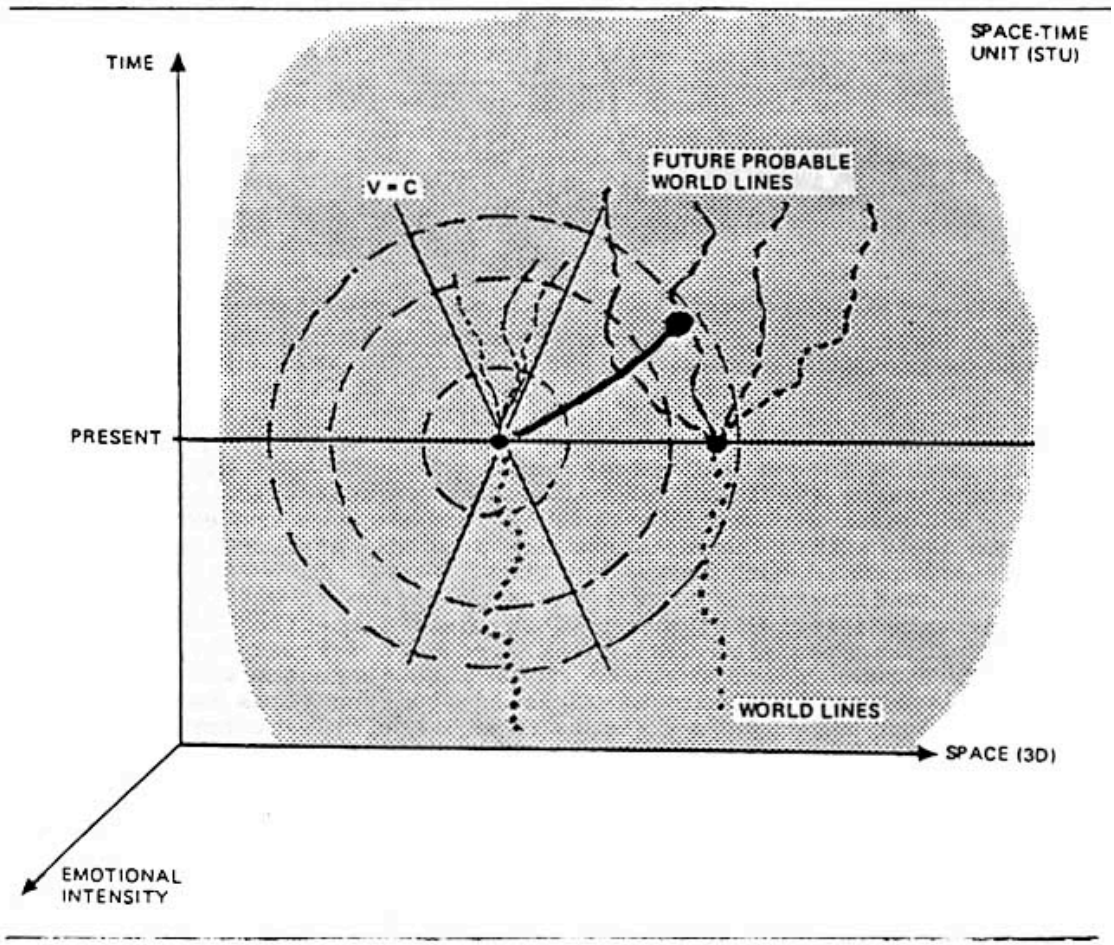

Fig. 6. Space-time map.

speed of light. The superimposed circles represent the human mind's expanding access to the STU as the individual allows himself to be in the state where the signal-to-noise ratio of the external sensors is high. In that state, an individual can have instant access to any other world line in the STU at any time—past, present, and probable futures.

Dr. Elizabeth Rauscher of the University of California, Richmond Field Station, has an eight-dimensional space-time model, which uses complex geometry (9). This model begins to provide a mathematical formulation for the connectivity between world lines on this map. Her model was originally developed to explain remote-viewing data. The key parameter, which has been missing from the physicist's space-time map, is another dimension, shown as being orthogonal to the space and time dimensions in Fig. 6. This dimension is proportional to emotional intensity. Fig. 7 illustrates what this might look like as a three-dimensional surface. (The axes have been rotated for this presentation.)

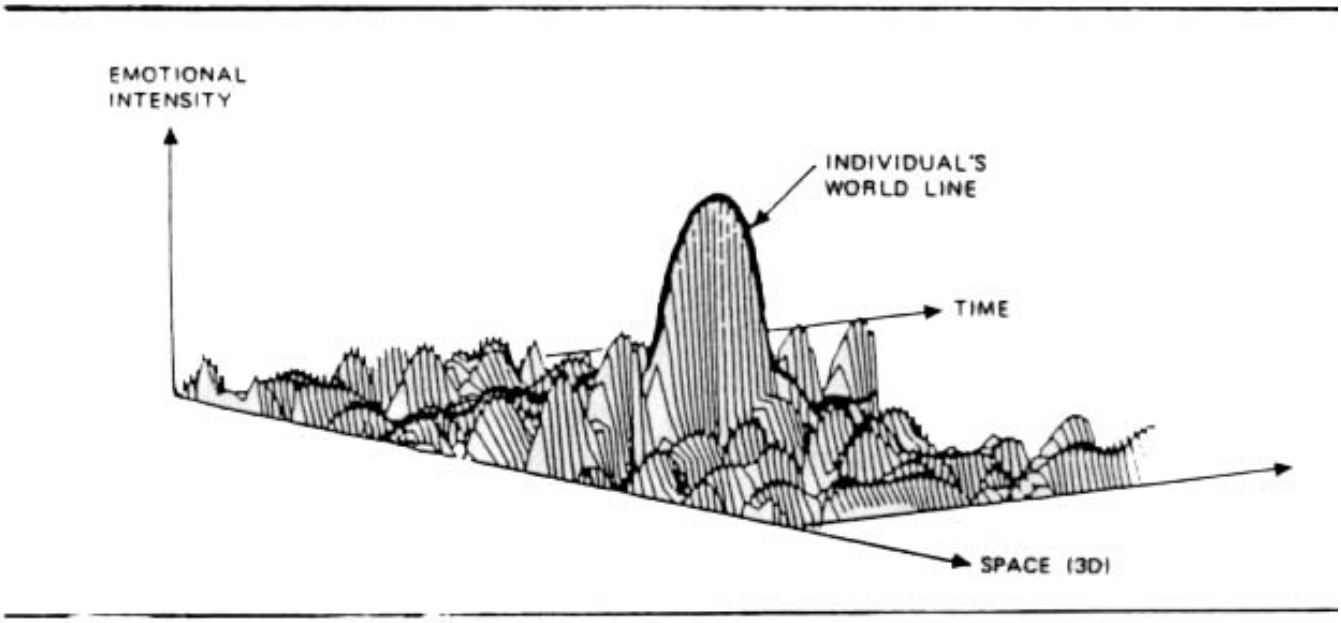

Fig. 7. Subjective time experience.

It is common for an individual during sleep to have his mind zero in on a big, nearby emotional event, such as a plane crash, even when it is a future occurrence. This happens because the external sensors are very active during sleep and pick up large emotional peaks that are displaced in both space and time.

Fig. 7 also illustrates a possible explanation of why people sometimes experience a series of events with their perception of time dramatically distorted from real clock time. In February 1971, I was driving past Sylmar, California, on the way to conduct a missile test. At 6:05 a.m., the car began to shake as if all four tires had gone flat. Time began to move very slowly, and 1 could see every detail as the car swerved all over the road. When the car stopped, I realized that a big earthquake had occurred. As shown in Fig. 7, this was a peak emotional event. My world line must have climbed to create a surface stretched in the direction of the emotional intensity, and the subjective time experienced along the world line was long when compared with the clock time.

Psychokinesis and the STU

MOST of this discussion has been about how the mind reaches out into the STU to receive information. For psychokinesis, the mental connection must also be made, but in addition you must tell the material what you want it to do. (At PK parties, for example, I ask everyone to concentrate on the metal to be bent, then shout out, "Bend") In some unspecified manner, the "system" translates this goal or thought into the physical mechanism necessary to accomplish that goal. The intensity of the specific command is important. As indicated earlier, creating an emotionally intense situation helps the event occur near the current time, which then provides feedback to the individual. In my opinion, most of the energy used in accomplishing a PK task comes from within or around the object being affected.

A simple analogy is shown in Fig. 8 of a television communication system. The television station wants to send a picture and sound to its TV viewers. The information is collected and superimposed on electromagnetic radiation sent from the TV station antenna. At the viewer's home, the antenna on the roof picks up a very weak signal, which is delivered to the TV set by the antenna wire, and the TV set displays the information as a picture. The real power or energy used by the TV set to accomplish the goal of displaying the picture is provided by the local power company in the form of electricity.

The actual energy required by the person to connect his mind to the object and command it to bend is very small. The real energy for PK is provided locally. In the case of metal, the dislocations provide the heating along the grain boundaries, which allows the grains to slip. Sometimes this heat along the grain boundaries is so intense that the metal becomes molten and occasionally even turns into gas. This is why there are sometimes fractures of the metal, accompanied by a loud noise. Sometimes a PK event is accompanied by a rapid temperature drop of 10 to 20 degrees in the air around the specimen. The energy is apparently being taken out of the local air. The amazing thing is that the PK operator does not have to specify where the energy is to come from; the "system" provides that detail.

Summary

FIG. 9 is just another way of displaying this conceptual model. The brain is shown acting as a tuner through the STU, providing the receiver for the mind that is collecting external information and maintaining a channel that carries instructions to affect an object remotely. The medical community might look into the idea that the receiver in a senile person's brain continues to be quite functional, but that the transmitter, the information-filer, is malfunctioning. This may explain why recent data filed in the STU in such persons is not retrievable, while older data is easily retrievable. This may also provide new knowledge about which portions of the brain are related to the memory-transmitting and -receiving functions. Many people believe that this model can be extended even to include creating one's own future.

The purpose of this paper was to provide a conceptual model of brain/mind functioning that includes paranormal phenomena. It has been suggested that all paranormal phenomena work in a similar manner. By creating a peak emotional experience, the experimenter can cause events to occur at the present time, providing feedback and good test results, so rare in parapsychological research. This concept has been tested by having PK parties, which have been very successful and are replicable. (10)

I did not attempt to provide the data necessary for proof in this paper. The model lacks complete mathematical formulation and an expansive data base drawn from a large number of good experiments. The literature provides much good data, as well as a huge amount of anecdotal information. My ideas have come from an assessment of this

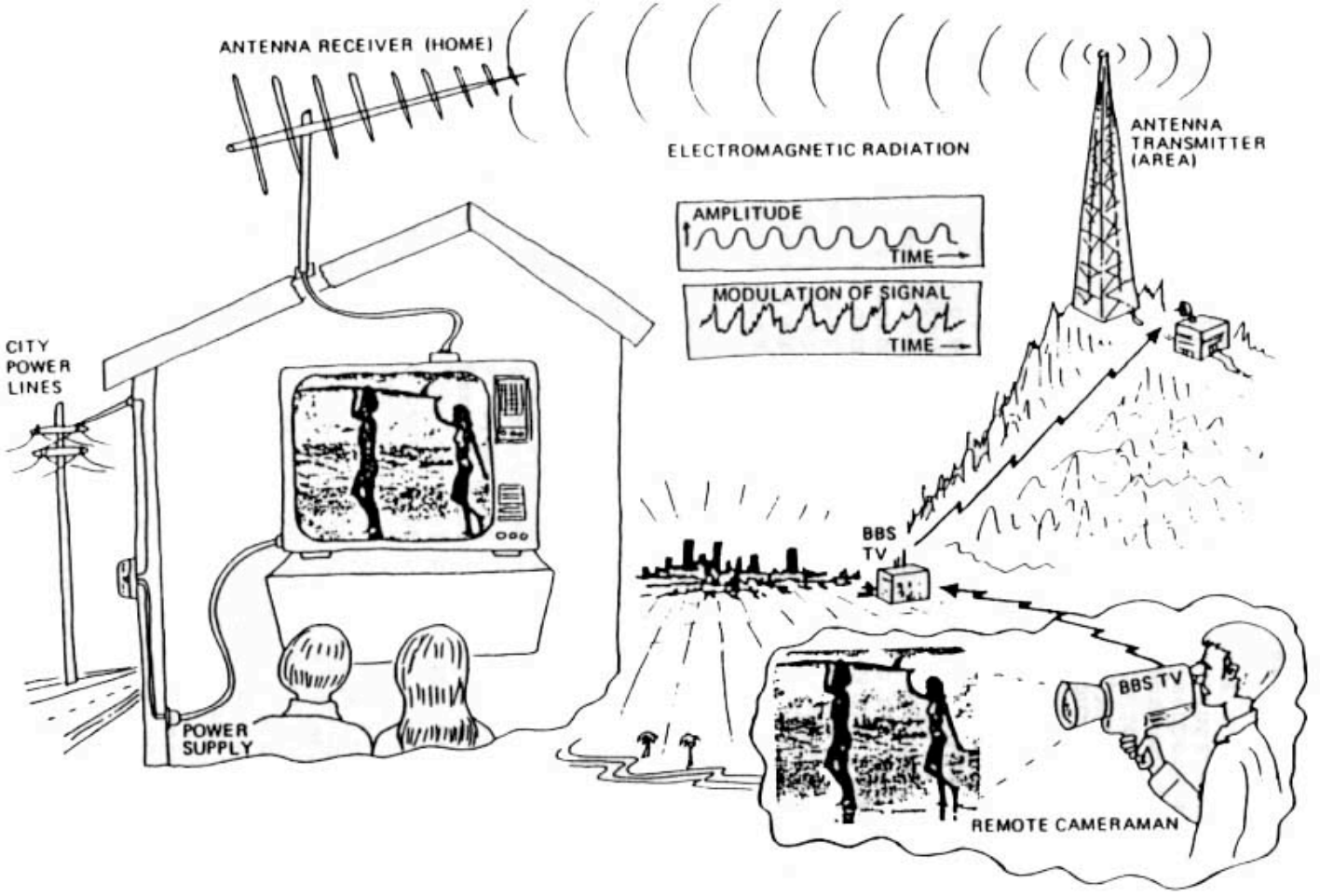

Fig. 8. TV communications system.

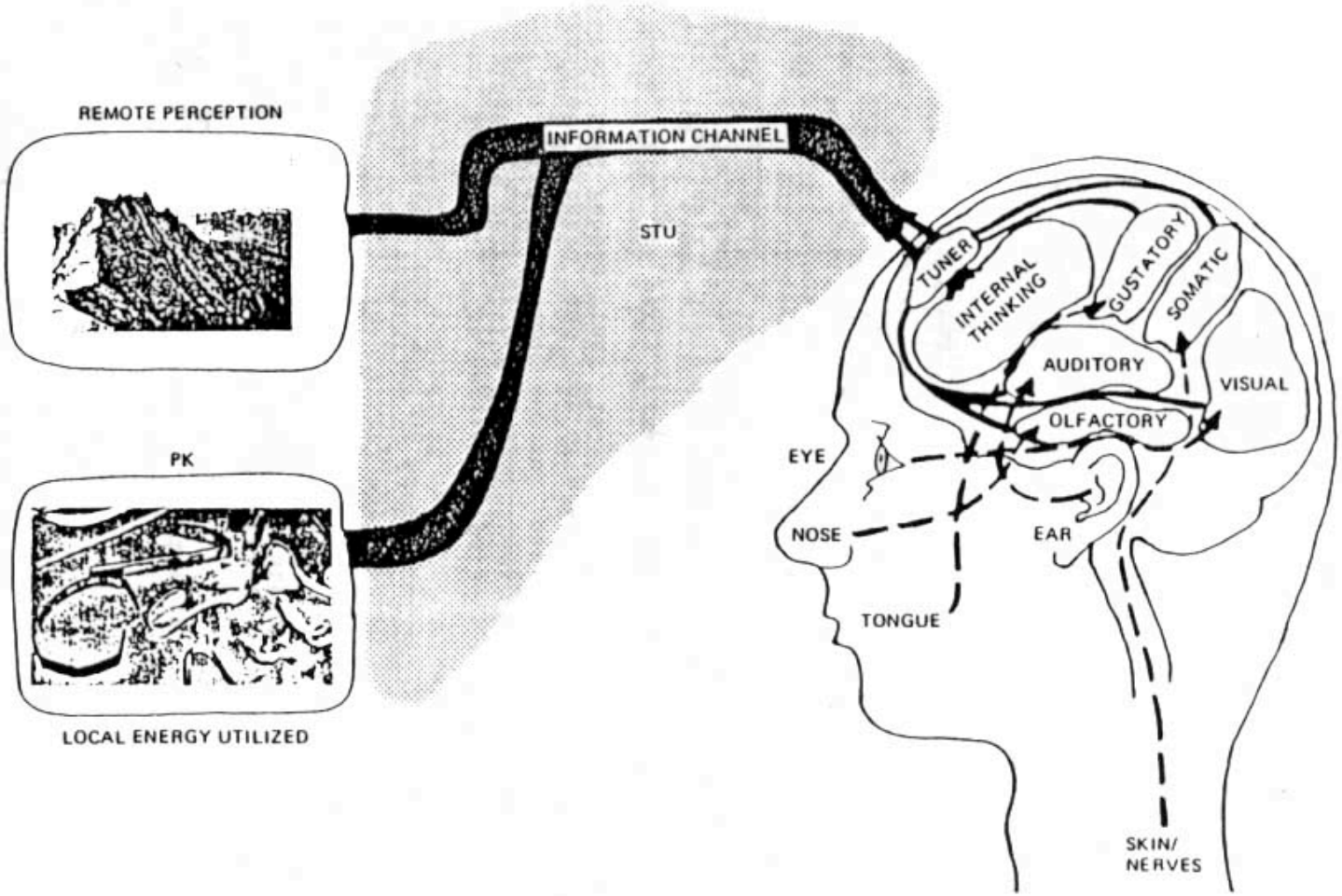

Fig. 9. Thought transfer.

literature, from experiments, and from observations of psychically gifted persons learning and performing many "unbelievable" feats.

Many ideas have been presented here that are testable. I hope that they will be tested, and that investigators will provide feedback to the community of researchers. I was confident that there must be a scientific explanation for these phenomena, and this confidence led me to develop this model of how all our brains/minds work. May this pave the way for an even better understanding of our nature.

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FIRE WALKING AT MOUNT TAKAO

James McClenon

FIRE WALKING has been performed in modern times in Greece, Bulgaria, Spain, Haiti, Polynesia, Australia, Africa, China, Japan, Ceylon, India, and (by Indian immigrants) in Mauritius, Trinidad, and Natal. Ritual fire-handling is also practiced in numerous localities, for example, by various independent "free Pentecostal" Holiness groups in southern Appalachia.(1)

On March 13, 1983, I participated in the fire-walking ritual, the hiwatari at Mount Takao in Japan. This ritual is conducted yearly by the Yakuo-in temple at Mount Takao, for the purpose of training yamabushi or mountain priests who belong to the Shingon sect of Buddhism.

The day that I attended the ritual, the weather was cool (approximately 50 degrees) and it was drizzling.

The ceremony began at 1:30 p.m. and involved a dramatic ritual. Officiating monks brandished swords in a ceremonial fashion, shot sacred arrows, and led the 50 or so participating monks in chanting Buddhist sutras. At 2:09 p.m., a huge pyre of wood, 8 meters square, was set on fire. Special nedegi (ceremonial wooden boards) were later added to the blaze. It is believed that human ailments, which had been transferred to the boards, would be destroyed in the fire.

After raking out the coals and throwing ceremonial salt on them, the officiating priests led the yamabushi all barefoot, across the embers. The time was 3:11 p.m. I joined the lay people, who were welcome to follow the priests. I took off my shoes and socks and stood among the crowd, waiting to cross the embers. It appeared to me that the people who had walked before me had trampled out two "pathways" in which all the glowing embers had been extinguished. "This looks fairly easy," I thought to myself.

I WOULD evaluate my state of mind as highly excited, like that of a person who is about to jump out of an airplane with a parachute. The continual chanting of the priests contributed to this feeling of excitement. Since an altered state of consciousness is a possible explanation for the fire-walking feat, my state of mind may have been an appropriate one.

As it came close to the time for me to cross the coals, when two people were ahead of me in line, a priest raked out the coals to make an even bed. "This is going to be very interesting!" I thought. A priest threw more ceremonial salt onto the bed of coals, vaguely establishing new "walking lanes." I was standing behind a very old woman who walked very slowly, and I set out, following her across the coals. It required less than half a minute to cross the bed, but I believe I would have walked much more rapidly if I had had the chance. As I crossed the hot embers, I felt nothing. After completing the

fire walk (3:19 p.m.), I inspected my feet. They were red and numb from the cool air and the drizzling rain, but unblistered. A priest gave a special blessing to all those who had participated in the purifying fire walk. Although the rain prevented many people from attending, over a hundred lay people did participate. I heard of no one getting burnt.

VARIOUS explanations have been offered to explain the nonblistering of human feet during fire walking. Coe (2) and Walker (3) suggest that a thin layer of water vapor forms under the soles of the fire walker, protecting his or her feet from blistering. This theory is based on the "Leidenfrost effect": that is, when you drop water on a stove that is sufficiently hot, the liquid rolls around on the stove, dancing on a thin layer of vapor. If the stove is not hot enough, the water immediately vaporizes. It is suggested that a similar barrier protects the fire walker's feet.

Coe, who has engaged in many fire-walking and -handling feats, has modified his previous opinion regarding the Leidenfrost effect. In 1978, he stated that trance states of mind can aid in conferring immunity to burns, since he has determined that he falls into a trance while attempting such feats. (4) Kane's observations of the various Pentecostal Holiness groups, which practice ritual fire-handling, also support his belief in the necessity of the trance state. My opinion is that I was not in a trance while undertaking my fire walk.*

The psychical researcher Harry Price organized a series of fire-walking tests during the 1930s. (5–9) These tests indicated that fire walking was not a trick and that it is performed in a normal manner with chemically untreated feet. Moisture on the feet was believed to be a disadvantage, since it could cause hot embers to adhere and cause blisters. Price, therefore, rejected the Leidenfrost effect as an explanation for not blistering. He believed that the low thermal conductivity of burning wood embers and the short time of contact between foot and ember surface explained the success of the fire-walking feat. He believed that confidence and steadiness in walking were important, since he considered fire walking a gymnastic activity. Immunity was felt to be somewhat limited, since participants in these demonstration tests could walk a maximum distance over the coals of 12 feet, taking four or fewer steps, and maintain a total time of contact with the ember surface of less than 2.2 seconds without getting burned. The researchers did not believe that a special mental state was required, since untrained Englishmen successfully performed these walks. It would seem that the feats described by Coe (4), Kane (1), Freeman (10), Hansen (11), and numerous others far surpass those witnessed within Price's series of experiments. Coe, for example, describes taking 60 continuous steps across a pit that had reached a temperature of 1200 degrees F. Freeman describes a 20-yard fire walk in India.

My fire-walking experience can contribute only slightly to the body of knowledge that has accumulated regarding fire walking. I observed that the coal bed did not appear particularly hot, because of the drizzling rain and the thinness of the bed. It took only 1 hour and 2 minutes for the thin wooden logs to burn down sufficiently to be raked into a bed of coals. This indicates the relatively small amount of lumber that was involved. Although I did not measure the coal-bed temperature, I would guess that it was much cooler than those described in typical fire-walking tests (430 to 800 degrees C., in Price's tests).

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* "Hysterical anesthesia" has been suggested as an explanation for the non-blistering of tissue during the fire walk, but this label fails to explain the phenomenon adequately. It is of interest that, to the alchemists, "cases of human skin becoming resistant to fire ... implied an inner stability of the flesh resembling, in alchemical jargon, that of gold" (Elémire Zolla, "The retrieval of alchemy," Parabola 3, 3 (1978): 71). —ED.

The Leidenfrost effect, when demonstrated under controlled conditions with a metal plate, requires a plate temperature of 200 to 250 degrees C. before the plate is hot enough for the effect to occur. At the Mount Takao fire-walking ceremony, the coal-bed temperature was constantly dropping. As walkers trampled out the coals, and as the rain extinguished the fire, we could expect its temperature to decline. The original yamabushi walkers performed an "extraordinary" feat in traversing the coals, since the embers were still glowing red. My crossing, however, was only moderately extraordinary. Paths of black ash had been trampled out; although the priest raked in new embers, these had most certainly declined in temperature by the time I ventured out. The last of the lay people walking the coals faced the least risk of being burned, since the "fire-walking lanes" had by then become completely established. I would speculate that, at some point during the afternoon, the surface temperature was below the 200 to 250 degrees C. required for the Leidenfrost effect to occur.

ALTHOUGH I remain uncertain as to the exact process associated with the fire-walking phenomenon, I have ceased to believe in the Leidenfrost effect as a sufficient explanation for the fact that the walkers' feet do not blister. I had previously considered it the most probable explanation. The possibility still exists that a combination of theories may explain the fire-walking ability. The Leidenfrost effect might protect fire walkers who must contend with extremely hot beds of coals. Low thermal conductivity and short time of contact between the feet and the embers might explain results obtained on cooler surfaces. It would seem logical to believe that individuals who achieve the proper (hypnotic?) state of consciousness might reduce their probability of receiving burns. Furthermore, no theory satisfactorily explains in a scientific manner the numerous cases in which some fire walkers have been burned, while others remained unharmed. (1,5,10,12) The Mount Takao ceremony is notable in that I have not heard of anyone having suffered burns on the feet. I would speculate that the relative coolness of the ember bed and the fact that "walking lanes" had been trampled out by the experienced yamabushi contributed to this admirable safety record.

The pyre is ablaze.

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IMAGERY AND AUTONOMOUS CONTROLS IN CHILDREN

Karen Olness, M.D., F.A.A.P.

DANNY, age four, was watching the monitor showing his peripheral temperature measurements. The numbers moved up rapidly as he said, "I'm thinking of something real hot, real hot, standing on the sun." He paused and continued pensively, "I'm wondering, how does the thinking get all the way down the arm to the hand to make the numbers go up?"

I answered, "I don't know. That's a very important question. Maybe when you grow up, you'll be the one to figure it out."

Danny nodded. Solemnly he replied, "Probably I will!"

A FOUR-YEAR-OLD boy had hit upon a generic question that does not occur to many adult scientists. An adult, when pressed for an explanation of the process, may agree that negative thinking—worrying or fretting—is associated with a physiologic response that may become predictable for that individual. Soon after he begins to worry, he becomes aware of flushing, perspiring, wheezing, epigastric pain, urinary frequency, a headache, or some other physiologic response. But most adults do not connect the act of thinking in a certain manner with a physical response. The possibility of reversing one's thinking habits, and concurrently reversing a negative physiologic process, was not suggested to me as a child and is not a concept commonly perceive by adults in the Western world.

In controlled studies, our research has documented the abilities of children to control certain physiologic processes voluntarily that were previously believed to be autonomic. As children succeed in accomplishing the desired control, they often describe images that arose spontaneously, which they used to effect the changes. Images vary from child to child; they are unique and unexpected. Experimenters are becoming convinced that understanding the source and nature of these images is more important than concentrating on the machines to which the children are connected; the machines only reflect a change that is triggered by the images.

There is ample anecdotal and clinical evidence that images of childhood are relevant to behavior and creativity in adults. In his book of essays, The Origins of Knowledge and Imagination Jacob Bronowski presented a case for imagination as the common source of all creativity.(1) He has also suggested that limitation of freedom of childhood imagination has inhibited the progress of all civilizations.(2) Gerald Holton, in The Scientific Imagination, found themes from childhood imagery in the adult discoveries of famous scientists. He analyzed relationships between their choices of imagery and their scientific pursuits.(3) Although discoveries may be made in childhood, they require formalization before they can become meaningful in adult life. Albert Einstein devised imaginary experiments from boyhood on, and he was wonderfully ignorant of the facts on which they were supposed to bear. For example, Einstein said that he discovered the theory of relativity by picturing himself riding on a ray of light. He noted that words did not play a role in his thought process.

POET, artist, and philosopher William Blake considered imagination to be vital to the real man. His Songs of Innocence and Songs of Experience have as a central theme the child who is lost and found. Symbolically, to Blake, the child represents imagination that is beyond parental or adult comprehension. Perhaps it need not be so, however. The writer and illustrator of children's books Maurice Sendak has observed that

> imagination as it relates to the child is, to my mind, synonymous with fantasy. Contrary to most of the propaganda in books for the young, childhood is only partly a time of innocence. ... Imagination for the child is the miraculous, freewheeling device he uses to course his way through the problems of every day. ... It is through fantasy that children achieve catharsis.(4)

Unstructured play by children reflects active imaging and relates to coping, creativity, and competency. Children often act out fears and concerns in play. This gives them "psychological distance," and they can use the distance to overcome fears and solve problems comfortably. The ability to maintain perspective or psychological distancing, which is so well represented in playfulness, requires nurturing from infancy to old age. The imagination of children can be nurtured or suppressed, but our culture seems better at suppressing than at nurturing it. For this reason, it may be useful for those who work with children to analyze their own images and their own playfulness. It is a striking fact that it was children who led adult researchers toward the experiments that may refine our knowledge of imagery and document its relationship to body function. As we began to incorporate the tool of self-hypnosis into clinical practice of pediatrics, we were frequently challenged by the children's descriptions of the imagery that they claimed as their reason for success at controlling body functions. This led to a series of controlled experiments that demonstrated some of the surprising abilities of children who can voluntarily control functions previously believed to be under autonomic control only. The results of these studies strongly suggest we reconsider the automatic characterization of some human physiologic functions as "autonomic" or "involuntary."

Review of Experiments

ONE of the earliest studies related to psychophysiologic controls in children was a biofeedback series done by Hunter, Russell, and Russell in 1976.(5) He studied 60 children, aged 7 to 9 years, half of whom were learning-disabled. The experimenters gave verbal instructions to children about controlling their fingertip temperatures, including suggestions about warmth and coolness. When children successfully changed fingertip temperatures, the biofeedback machine translated the changes to motion, so that a toy locomotive was forced to run around a track. Many children were successful at this—and, interestingly, the learning-disabled children in the group achieved a greater degree of control than did normal children. Brown (6) reported studies involving cardiovascular biofeedback with children, and Connors (7) also reviewed a number of biofeedback studies with children. None of these studies, however, described the specific images used by children to achieve their physiologic changes.

Our first work in this area was in the use of ano-rectal sphincter feedback training for children who had severe fecal incontinence.(8) The first group was composed of children who had been born with imperforate anus and suffered from fecal incontinence as a complication of what was assumed to be inadequate sphincter controls. Subsequently, we worked with children who had had years of constipation, functional megacolon, and eventual soiling.

For the experiments, each child lay on an examining table with visual access to a biofeedback machine. Plastic cards demonstrating

games were placed over the oscilloscope screen, and a balloon device was placed in the child's anus. The balloons were inflated within the anus at the level of the internal and external ano-rectal sphincters. Experimenters then encouraged the children to make pushing motions in order to develop control of defecation. Feedback came as the oscilloscope tracing followed the desired pattern, e.g., making baskets, going to the moon on a spaceship, hitting a bull's-eye, or making a soccer goal. After working with a few patients, we decided to ask the children to make their own drawings on the plastic sheets that were placed over the oscilloscope screen. We received drawings of flowers, animals, roads, and houses, and the children imagined their own games as they learned control of defecation. Children as young as four years old were captivated by the game feedback and were willing to create their own games. In our first reported group, 47 out of 50 children learned to have voluntary bowel movements through this method.

SUBSEQUENTLY, in a controlled study (9) , we demonstrated the ability of children to control peripheral temperature both with and without self-hypnosis exercises. Likewise, we demonstrated the ability of children to put brainstem audio-evoked potentials under voluntary control, both with and without self-hypnosis exercises.(10)

In these studies, when asked to attempt a specific task related to autonomic controls, children have been successful, both with and without formal self-hypnosis or guided imagery exercises. It is evident, however, that those children with past successful experience in applying self-hypnosis achieved a larger number of successful results, and also more precise results, in the experiments described, than children who had not had such experience. Preliminary analyses of data from children attempting control of transcutaneous oxygen flux and electromyographic responses are consistent with the proposition that experience in application of self-hypnosis leads to a greater degree of success. We have followed many children into adolescence, and have noted that they retain such self-hypnosis-facilitated skills as pain control, peripheral temperature control, and control of habit problems. We have not followed any children into adulthood. It will be important to determine whether such skills acquired in childhood will endure.

IN our experiments, control subjects are asked to undertake the designated task without any suggestion about how it should be accomplished. For example, the experimenter might say, "Please make your fingers warmer." As noted, many controls are successful. When asked how they achieved the requested response, they spontaneously describe the use of imagination.

A five-year-old boy, after raising his fingertip temperature, said, "I thought of sitting on the sun." A girl who increased her transcutaneous oxygen flux spoke of tiny balls of oxygen rolling to her skin surface and making a big pile like a big pile of oranges.

We have worked with children who have hemophilia, primarily to teach them pain control and relaxation techniques.(11) Although we have not suggested that they can stop their bleeding, because we have no documentation by measurement of clotting factors to indicate that this is possible, many of these children spontaneously claim to stop bleeding through their use of imagery. One child said, "I thought of little planes flying through my bloodstream and dropping bombs of Factor VIII [the missing factor] whenever a bleed started."

Theories and Speculations

RECENT neuro-ophthalmology and pharmacology research has led to the ability to trace the transduction of light by the retina of the eye a neural impulse; its transmittal to the occipital lobe of the brain; and interpretation of the light as an object or a color. But we are a long way from tracing the impulse associated with an internally generated image and the subsequent physiologic response to that image.

Recently, in our weekly hypnosis seminar held at Minneapolis Children's Health Center, we asked participants (psychiatrists, psychologists, and pediatricians who are personally skilled in self-hypnosis and who apply hypnotherapy in their clinical practices) to enter an altered state of consciousness and attempt to develop a possible explanation for the pathway from image to physiologic response.

Eleven professionals were asked to relax during 20 minutes of music, to enjoy the images inspired by the music, and to avoid directing their thinking to any particular area or problem. They were told that, after a time, they would be asked to address a problem and write down whatever solution occurred to them, rapidly and without cognitive analysis of its meaning. After 20 minutes, when all participants appeared to be well into their trance states, they were asked to continue to enjoy their mental images and feelings while allowing part of their mind to consider what might be the mechanism by which thoughts are transmitted to have an effect on physiology such as the increase in peripheral temperature or decrease in blood pressure.

AFTER everyone had completed this exercise, the written comments were read to the group. There was a consensus that each participant had had a profound experience, and it was noted that there were similarities among recorded responses to the problem. Some representative written comments include the following:

It arises from the connection in the pontine area connected with lower brain stem controls which recruit waves. This is the intimate connection between the mind and brain.

Thought triggers electricity? Impulses (waves) which attach (are directed) to a central nervous system or central someplace which is disseminated to a particular part of the body until change occurs. These electric impulses (waves?) are blocked by stress and tension and allowed to flow freely to create change when body is relaxed.

Thought electrons can be two places at once, diffuse, a wave and a particle. It is in the land between physical and metaphysical. Thought = gravity = a force. We know it waves, see its effects, and how? I don't know ... if we can know. It may give a dimension we do not understand … a sense like not seeing infrared rays but UV light …

A motion of action on levels. It is a letting-go, opening-up, wavelike action ... a response like a floating dock on the water moving, rocking gently ... a response to the wind moving the water moving the dock. It is all connected without effort letting go so the connection can happen. It is a natural connection between brain and body. Warmth, sun, rocking water.

Permissive automation. Allows itself to develop wherein desired side effect becomes a natural concomitant. Visual. image of a beautiful crystalline structure with a pattern of light flickering through it.

Energy, if smooth, drives the hypothalamus, clicks into receptors and moves on through "conventional" nervous pathways to the cells. The heat comes from increased intracellular action in an extremity.

… Waves ... flowing ... free flowing through, could be recepted.

PHYSICIST John Wheeler has said:

> Today no mystery more attracts the minds of pioneers from the field of molecular biology than the mechanism of brain action. Many workers from fields as far removed from one another as neurophysiology, chemistry, circuit theory, and mathematical logic feel that the decisive step forward is waiting for an

idea, an as yet undiscovered concept, a central theme and thesis. Whatever it will prove to be, we can believe that it will somehow touch the tie between mind and matter, between observer and observed.(12)

Just as Einstein, Mozart, Bohr, and many other creators found answers through spontaneous imagery, the "as yet undiscovered concept," to which Dr. Wheeler referred, may appear in the images of someone who is in an altered state of awareness, just letting it happen without cognitive inhibitions. The choice of images generated in the central nervous system by children or adults must occur on the basis of memory or fantasies and storage of visual, auditory, tactile, or olfactory perceptual experiences. Are these necessarily stored within the human body? Does the universe contain another storage place beyond our present comprehension? Do children have an apparently easier path from the image to the physiologic control because they have had fewer years in which to accumulate relevant and nonrelevant stored material? Is their access to such material easier because their processing is somehow more efficient? Is abstract reasoning a block to this process in adolescents and adults? Recent electroencephalographic studies from Eastern Europe strongly suggest that the altered state of consciousness known as hypnosis is associated with right-brain function. Do children have more effective right-brain controls?

ANALYSIS of the spontaneous images produced by the professionals in our uncontrolled experiment lead one to speculate that images are vibrating forces of specific amplitudes and strengths, which can cross synapses in electrical form and convert to a neurotransmitter, which then initiates a cascade of events culminating in a physiologic response. How many vibrations are there? How many neurotransmitters? How can children demonstrate such precise control over this process? Why do these tasks seem more difficult and less successful when the subject "tries hard"?

Ultimately, the human form is a composite of vibrations in atoms, molecules, and other intellectual abstractions, which have assumed cellular form but are nonetheless composed of myriads of vibrations. Negative thoughts and images expressing anxiety translate to observable negative physiologic responses. In the experimental setting, we have demonstrated that planned, positive images also translate to positive physiologic responses previously believed to be involuntary.

One wonders how long the health-care industry can go on using crude diagnostic and treatment methods that do not consider variables of image-generated effects on physiology, drug absorption, drug transport, laboratory values, nutrition, cardiovascular responses, respiratory responses, immunologic responses, and neuro-muscular responses. When we solve the problem of relationships between patients' images and their responses to treatment, we will also have to consider the relationships of the therapists' own images to their decision-making and other variables in patient care.

PERHAPS we will learn to preserve imagery skills developed in childhood and become a society of adults who are increasingly successful in self-control of physiology. Logically and cognitively, it seems that this will require thousands of detailed experiments that study variables of age, development, medications, the presence of adult coaches or therapists who relate to children, climate, classroom teaching methods, the effects of television, genetic factors, remote-viewing skills, diet, biorhythms, and other variables not yet known. On the other hand, the answer may simply come floating into someone's consciousness, an unexpected but welcome image

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A CASE OF SEALED-CONTAINER PK INDICATIVE OF GROUP GESTALT

John Thomas Richards, Ph.D.

IN FEBRUARY 1983, the psi research community was shocked and saddened I when they heard anti-psi prestidigitator James "The Amazing" Randi, and his fraudulent metal-benders, Steven Shaw and Michael Edwards, announced that they had hoaxed various psychical researchers into believing that the two young men were genuine psychics. During broadcasts on the Today television show and an NBC special, "Magic or Miracle," Randi and his Alpha Project associates claimed repeatedly that they had fooled the parapsychologists and that, therefore, they had proved that parapsychology is a claptrap science undeserving of the name of "science" at all. As most in the field realize, the stated aim of Randi and his CSICOP organization (Committee for the Scientific Investigation of Claims of the Paranormal) is to discredit parapsychology and psi research and have this field of inquiry dropped from the American Association for the Advancement of Science.

It would be simple and satisfying to admit that I was fooled by Shaw and Edwards and then let the matter drop. But the facts of the case are more complicated than that. I have witnessed phenomena in their presence which I do not think can be explained as merely the results of stage-magic trickery. Certainly, when they bent spoons and keys that they were allowed to touch directly, it is quite possible that they could distract the attention of an investigator and substitute a "palmed" spoon, bent in advance, for the experimenter's spoon. Metal-bending under conditions in which the subject, not the investigator, determines the protocol is always suspect. Metal-bending when the object is inside a sealed container is quite a different matter.

I have already reported an instance that I observed at the McDonnell Laboratory for Psychical Research in St. Louis,* when Steve Shaw gestured at a sealed test bottle across the room, containing loose pipestem cleaners, which bent into a remarkable stick-man figure. (1) William Edward Cox, a well-known parapsychologist associated with the Foundation for Research on the Nature of Man, had prepared the bottle carefully. He affirms that it could not have been unsealed and resealed without showing traces of fraudulent activity—not even if Shaw, Edwards, and Randi had all three taken turns in trying to foil his seals and built-in "booby traps." If Shaw now says that the bottle was opened fraudulently, however, it would take an expert to show that it had not. Although Cox is such an expert, the typical reader or televiewer is not, and many would prefer to believe that a minor prestidigitator could fool an experimenter than to believe that PK had actually taken place.

The case I now report is indicative of genuine PK activity—even though it, too, is associated with a confessed fraud, Michael Edwards.

This experiment was conducted in Minneapolis, Minnesota, on Nov. 6, 1982, when Edwards was in town to be interviewed on film for Alan Neuman's motion picture The Psychic Connection. Edwards agreed to

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* Richards, John Thomas, SORRAT a history of the Neihardt psychokinesis experiments 1961–1981 (Metuchen, NJ: Scarecrow Press, 1982). Avai1able for $17.50 from Scarecrow Press, Inc., 52 Liberty Street. Box 656, Metuchen, NJ 08840.) See pp. 262–263.

meet with us in the evening to participate in a psychokinesis experiment, which was held at my motel room. Participants/experimenters were Dennis S., Gail D., Alice T., Lynn B., Loren P., Walter U., Mary Jo U., Michael Edwards, and myself, with Dr. Otto S. joining the group after the major phenomena had already taken place.

On October 25, Edwards had telephoned Walter U. and me and told us of a vivid dream he had experienced. In this dream, he claimed, he had stroked one of Cox's test bottles, and the pencil stub it contained had drawn a yin-and-yang symbol, and the pipestem cleaners had bent together to form an oval. Knowing this, Cox had sent with me a carefully sealed brown glass test bottle almost identical to the one that Shaw had claimed to have affected, since Edwards was already familiar with this sort of bottle. Walter had also brought another of Cox's test bottles, which he had used in an unsuccessful attempt to have Shaw and Edwards cause metal-bending under sealed conditions at a symposium in Madison, Wisconsin, two months earlier. Each bottle contained two straight pipestem cleaners, an open safety pin, a slip of paper with Cox's signature, and a pencil stub. Both the bottles were sealed with Cox's tape and a special plastic string, which Cox had obtained in Switzerland and is quite uncommon in the United States. The string was tightly affixed to prevent the tape from being removed, while the tape held the caps on the bottles. The strings were knotted in a special manner known only to Cox, and the ends were melted into the knots so that they could not be untied. The string was also sealed to the tape with clear, marked epoxy glue. There were other internal security features, known only to Cox, which if disturbed would indicate to him that the cap of a bottle had been removed. The two bottles were in plain sight on the motel room dresser, and the participants examined them.

Earlier, Edwards had been allowed to examine the test bottles, which were used as illustrations or stage properties during the motion picture filming. He had been given every opportunity to attempt to open the bottles. He may have intended to enter a bottle by fraud, but doubtless found the task impossible.

AT THE beginning of the session, at 8:37 p.m., Walter handed one bottle to Edwards (Fig. 1), and Loren handed the other bottle to Alice (Fig. 2). At 8:50 p.m., Edwards complained that he "felt nothing" from his bottle, and asked Alice if she would exchange bottles with him. Alice complied. Fifteen minutes later, after stroking and holding the test bottle that Alice had handed to him, Edwards announced that the psychokinetic activity had been accomplished. We all examined his bottle and discovered that the pencil stub had written a yin-and-yang symbol lightly on the paper, the safety pin had snapped shut, and the ends of the pipestem cleaners had bent together and twisted themselves to form an elongated oval shape. Edwards accepted our hearty congratulations, taking credit for producing the phenomena. Later, he claimed that the sealed-bottle test was accomplished by misdirection and stage magic, even though Cox affirmed that the seals and internal hairs were undisturbed.

Close examination of one of the photographs that I took during the experiment, before the exchange took place, however, reveals that the ends of the pipestem cleaners in Alice's bottle, which she is gripping, have already twisted and hooked together to form the upper part of an oval (See Fig. 3.) Activity was already taking place at this time, before Edwards exchanged bottles with Alice. None of the participants seemed aware of this slight bending, because we were all concentrating on the bottle in Edwards hand and watching him put on his "metal-bending" show.

At the time, all the participants/experimenters assumed that Edwards had paranormally created the phenomena inside the bottle, both the metal-bending and the pencil movement and markings on the slip of paper. After all, he was the one who had told us, in advance, of his alleged dream; in effect, he predicted accurately what would occur

Fig. 1. The test bottle that Edwards hel
during the early part of the experimen
It is unaffected by any PK activity.

Fig. 2. Alice holds her test bottle. Note that no PK activity has yet taken place inside it.

and took credit when it did occur. Again, when Randi proudly announced that Shaw and Edwards were his agents, sent to undermine the parapsychological community, everyone assumed that Edwards had somehow circumvented Cox's seals, since there was in the bottle, as predicted, a yin-and-yang symbol (expressing the eternal battle between good and evil, appropriately enough!) and pipestem cleaners bent to form an oval; there were no random PK effects inside the sealed bottle (Fig. 4). Whether he did it through psychic ability or by trickery, then, Edwards was generally given credit for his feat. Since he later announced that everything he did, he did by trickery, then genuine psychokinesis might be discounted in this case—were it not for the fact that Cox knows how to seal test bottles quite securely, so as to rule out the possibility of any fraud by Edwards, his mentor Randi, or any of the legion of more competent stage magicians working today.

ONE photograph thus disproves both of Edwards' claims—that he was a psychic and metal-bender and that he was a competent illusionist. (We must not forget that a stage magician can create convincing illusions only when he is allowed to use his own equipment. Even the finest illusionist, who claims to be able to catch a bullet in his teeth, will ask that a volunteer from the audience use only the gun provided by his assistant, which is loaded with blank cartridges. He will never allow a policeman to volunteer, for example, who would use his service revolver and live ammunition!) Yet the photograph clearly shows that

Fig. 3. Michael Edwards concentrates on his bottle, in which nothing has occurred. Observe that the ends of the pipestem cleaners in Alice's bottle (lower left) have already twisted together to form the upper part of an oval, before Edwards has had the opportunity to take control of this bottle.

Fig. 4. The test bottle in which PK activity took place. Note that the seals remain intact.

PK activity had begun before Alice and Edwards exchanged bottles, and that it was taking place in the bottle that Alice, not Edwards, was holding. Until they exchanged bottles, Edwards had had no opportunity to commit any fraud, even though the lighting was quite dim for enhancement of the psychologcal set necessary for group rapport and relaxation, which is valuable in enhancing a psi-active mood. Does this elimination of opportunity for fraud mean that Edwards did, indeed, bring about some of the psi effects by paranormal means?

This may, of course, be true. It is more probable, however, that Edwards is not a psychic at all, but, as he admits, a clever fake and liar. Falsus in uno falsus in omnibus: he should no more be believed when he claims to be an impossibly clever trickster than when he claimed to work psychokinetic miracles. We must not fall into the either/or fallacy when the source of PK is still enigmatic.

Dr. Kenneth J. Batcheldor supplies one possible answer to this enigma. (2) As is widely known, Batcheldor had an experimental group to study levitation, and he encouraged members of the group to cheat, in order to break down the "denial syndrome" present in most subconscious minds, which blocks the free flow of psi. (Very few people will admit that they have any psychic ability whatsoever.) When the participants were allowed to believe that someone at the table was cheating, they could accept table movements as being produced by trickery; then, gradually, experimental conditions were tightened until they precluded fraud. By that time, the participants were so used to the movements of the table that they were not alarmed when real psychokinesis occurred and the table rose into the air.

The same principle is present when the well-known "Geller effect" occurs: after a spoon-bending by an acknowledged metal-bender, many people in an audience frequently find that their own spoons have bent, or their watches have started, simply because the metal-bender (real or fraudulent) is present and acting as a sort of scapegoat, someone whom they can unconsciously "blame" for the paranormal activity. This activity frequently continues when the metal-bender is no longer present, sometimes persisting for a considerable period after his performance. The same holds true when a television audience sees a metal-bending show; the viewers' own latent metal-bending abilities are allowed to surface when the mental censor (which says that PK is impossible) is temporarily stifled by the perception that metal-bending is happening before their eyes.

In SORRAT, I discuss John G. Neihardt's concept that a group of people in a condition of rapport may also achieve paranormal results, because a sort of Gestalt occurs unconsciously among the group members, allowing PK and other psi phenomena to take place.

By combining these two concepts, then, which do not contradict one another, the sealed-bottle test results may be explained. The experimenters had seen Edwards bend spoons; although we can admit now that he was tricking us, we assumed at the time that he was a genuine metal-bender. We all knew that Steve Shaw had allegedly formed the stick-man figure in the McDonnell Laboratory test, and had produced other test-bottle results (and some of which doubtless were effected by real PK activity, despite later claims of fraud). We knew from experience that PK could occur. Edwards had predicted, by relating his alleged dream, what would take place inside the bottle.

The group was able to experience good rapport among the members. The dim lighting helped to create a willing suspension of disbelief, while the security of the seals on the test bottles removed fears of fraud. We all knew what Edwards had said he had dreamed, so we were more willing to accept a yin-and-yang figure and an oval shape formed out of pipestem cleaners than we would have been to consider any other PK activity in the bottle. Edwards was present to be "scapegoat." We were in a united, eager, anticipatory frame of mind, ready to accept paranormal activity. All of us—with the possible exception of Edwards—expected him to produce PK.

AS A consequence, Edwards—if he was really a disreputable trickster all along, instead of a genuine psychic—was probably the most astonished person in the room when he saw that PK activity had taken place in the bottle that Alice was holding. Keeping cool, he asked to exchange bottles with her; whether he calmly watched the activity occur inside the bottle or whether he saw that it had already occurred and proceeded to claim credit where no credit was due, it is impossible to know. One may imagine what Randi thought when Edwards reported back to him, in effect: "I was unable to open the bottle because Cox's seals were too good, yet what I told those dumb people would happen, did happen!"

What has occurred since I have informed selected experimenters about the photograph showing early PK activity during the experiment is what one might predict. Both Cox and I have received abusive letters telling us that we are either dupes or frauds and attempting to intimidate us to changing our affirmations. Cox has expressed his amusement, and he continues to verify the fact that no one could have entered his test bottle without leaving traces, and that there were no traces.

I am not at all amused, nor am I intimidated. Randi is an illusionist, and illusionists create illusions. No doubt, Randi could have a film produced showing Shaw and Edwards opening and entering—a sealed bottle that looked like one of Cox's bottles. This would not mean that they had been able to do so. A film could show the minister of your local church dancing naked down the main street of the town— but this

would not mean that the minister really had done so! Illusion and truth are two different things, and the American psychical research effort has only been made stronger by Randi's efforts to discredit it.

NOTES

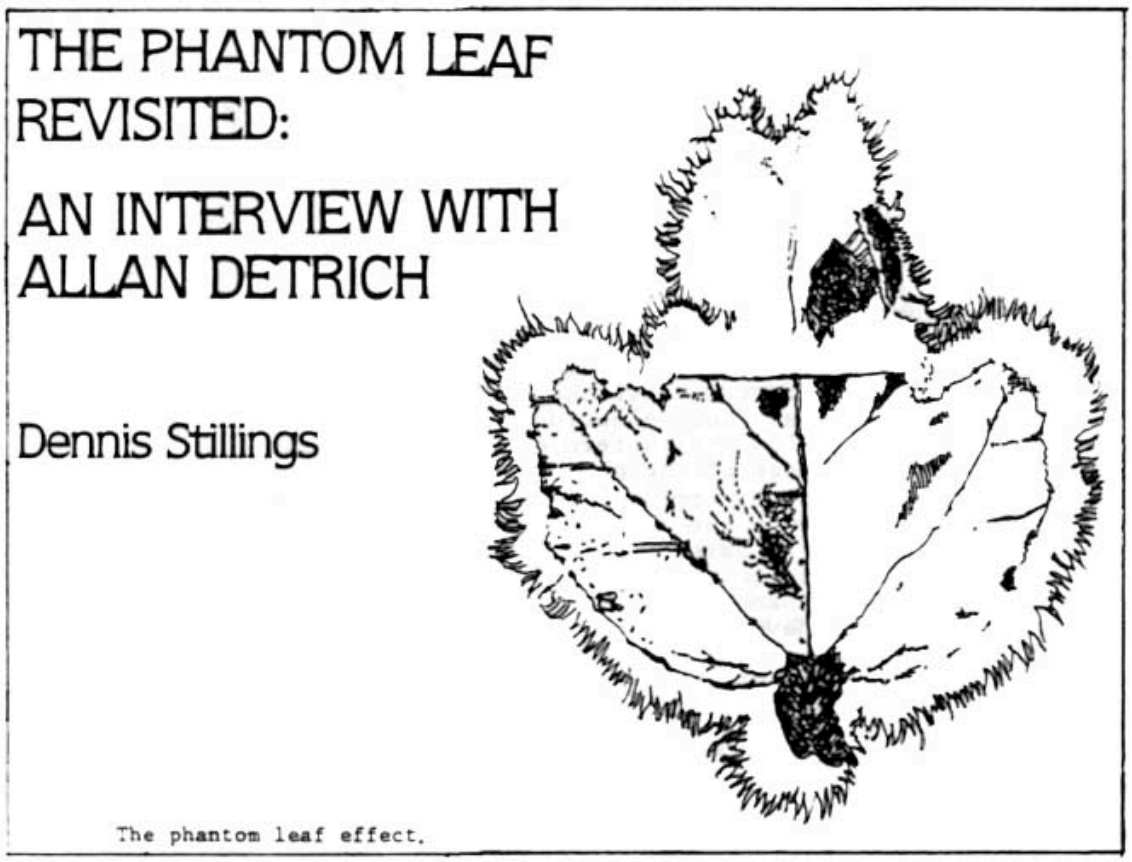
1. Richards, John Thomas, "The incident of the bottled stick-man," Archaeus Project Newsletter 2, 5 (1983): 5–9. P. 6 contains an excellent photograph of the stick-man in the bottle.

2. Batcheldor, K. J., "PK in sitter groups," Psychoenergetic Systems 3 (1979): 77–93.

THE PHANTOM LEAF REVISITED:

AN INTERVIEW WITH ALLAN DETRICH

Dennis Stillings



The phantom leaf effect.

MODELS of psychic phenomena in terms of traditional electromagnetics have not proved to be very helpful. The apparent absence of 'inverse square law" effects and the inability to insulate against psi effects seem to preclude an electromagnetic interpretation of psi. ELF waves, both more persistent and more penetrating than higher-frequency radiations, are being considered as psi carriers, but the low "hit rate" implied by this form of transmission makes ELF models problematical. Highly speculative quantum models have been developed, but the results remain to be seen.

There is little doubt, however, that psi can produce effects in the electromagnetic domain. The electronic voice phenomenon gives clear evidence that psychic forces can act on magnetic fields. The phantom leaf phenomenon demonstrates a mediumistic effect, in which psychic forces are able to order photons in a strong electrostatic field in such a way as to reproduce the original, whole form of a mutilated leaf on photographic film.

Tom Bearden, in The Excalibur Briefing states that specific discharge patterns of Kirlian photography are often produced by "kindling bioenergy [psi] into the first biofield (electromagnetic field)." (1) Technical details regarding this "kindling" effect are also discussed in The Excalibur Briefing and in his other papers, in which he proposes fundamental revisions of electromagnetic theory, revisions that allow for the inclusion of psi phenomena. (2)

As I have indicated, I believe the phantom leaf to be a mediumistic phenomenon. Allan Detrich is a very good medium. He is also a highly talented photojournalist (who ranked thirteenth in Ohio at age 19), a vocation to which his interest in producing phantom leaves runs a poor second. For more than 8 years, since he was 12 years old, Allan has been extraordinarily successful at producing phantom leaves, be-

ginning with his very first attempt. Not long ago, under the supervision of paranormal investigator John Hubacher, Allan produced more than 200 clear and complete examples. In some cases, 70 percent of the leaf had been removed. Allan's own apparatus for achieving these effects is quite primitive.

FOR those who are not familiar with Kirlian photography and the phantom leaf effect, a short explanation is due. Kirlian photography, or high-voltage electrophotography, is the use of electric currents in the 12,000- to 25,000-volt range to produce the image of an object on film. A flat electrode is covered with a dielectric (to give even charge distribution). The film is placed on the dielectric, the object to be photographed is placed on the film, and—under darkroom conditions—the object is submitted to a high-voltage discharge for a short period of time (from milliseconds to 2 full seconds). This produces an effect known as "cold electron emission" with accompanying photo effects that follow the pattern of the object like an aura, the light generating an image of the object on the film surface. (3)

In the case of the phantom leaf, a top portion or segment of the leaf is cut away prior to the experiment. (This portion may vary from between 5 percent and 70 percent of the leaf.) The stem portion of the leaf is then placed on the film, and the Kirlian procedure is applied. Most of the time, for most people, only an image of the cut leaf is found on the developed film. On occasion, however, and in the case of Allan Detrich up to 80 percent of the time, an image of the stem portion and of the missing section are both found on the film when it is developed.

Allan Detrich has taken his talent to New York (the International Kirlian Research Association) and to California to work with John Hubacher, and he has received mention in Thelma Moss's highly popular work The Body Electric (1979). Allan is easy-going and personable and readily admits that he is "not very scientific." The phantom leaf, however, as it takes shape on Allan's film in the developer, is a gross fact, produced by him almost at whim, in full view of anyone who cares to watch.

WHAT the phantom leaf is, in itself, remains a mystery. It appears to be a very observable example of the "subtle body," the concept of which has been with us since ancient times. (4) There do not seem to be precise experimental conditions that will produce the phenomenon on demand. On the contrary, the phantom appears to be dependent on the same, as yet largely undetermined, variables as metal-bending, telepathy, and other psychic phenomena.

Allan Detrich thus appears in the role of medium to a phenomenon that is relatively responsive to physical conditions, yet is ultimately dependent on those same elusive factors that plague the whole field of psychic research. On the other hand, psychic phenomena, in their own good time, seem to be emerging into the world in increasingly tangible and reproducible ways.

While the scientific minds of our time try either to deny the reality of these phenomena or to fit them into some cosmic, but bloodless, algebraic quantum mechanical scheme, the new thing seems to be more at home with certain individuals—such as a young man with a sense of ludus puerorum,* living in Xenia, Ohio.

* "Child's play"—the alchemical expression for the simplicity at the heart of the quest for the Philosophers' Stone.

INTERVIEW

DS: Have you done any phantom leaves lately?

Allan: I haven't done anything serious since last February. Never seem to lose my touch, though (Laughs).

DS: Have you ever lost your touch?

Allan: Yeah, I did. I gave a lecture on the phantom leaf phenomenon at school a month and a half ago and tried a couple of phantom shots with Kodak Instaprint film, and I did one that was just sort of ... and one good one. The school kept it. They've got it framed up on the wall.

DS: What's your procedure?

Allan: I just put it down, emulsion side up. Then I put the stem half of the leaf on top of that to make the exposure. You need a somewhat longer exposure with this film because it's slower than TriX. Then I roll out the emulsion with a rolling pin. I used to have Polaroid-type rollers for this purpose—now I just use a rolling pin.

DS: What did they think of this at the school?

Allan: They didn't know what to think. They knew I had done phantoms but they had never seen it done in front of their faces before. They couldn't believe it.

DS: [Was this done for the] photojournalism people?

Allan: It was for a medical technical class. They do color photography a lot and sometimes they bring in people to give lectures on various topics.

DS: Were any faculty members there?

Allan: Well, they usually have a few medical teachers [there].

DS: Who do you work for?

Allan: The Daily Gazette in Xenia. I'm the photographer up there. I was out shooting the football game today and I had to shoot a couple other things. I just worked my butt off. I had about fifteen hours' overtime this week. They complain about me taking overtime hours, but they give me so many assignments. ...

DS: When did you start doing Kirlian photography?

Allan: When I was twelve or thirteen.

DS: So how many years have you been doing phantoms?

Allan: I'm nineteen right now, (so) six years. It started as a science project and I took it to State three years in a row and got perfect forties. The phantom leaves really amazed people. They'd never seen this stuff before.

DS: What did they have to say about it?

Allan: Lots of 'em were really skeptical. Well, I guess I didn't get forties every year; one year I got a thirty-five. The judge really cut me down because I did the project on the phantom leaf. He said the aura patterns can be left on the film by high-voltage transmissions from electric wires. He didn't know what he was talking about. That really cut me down—that he said that and didn't know what he was talking about. It was apparent that he would have used anything to disprove the reality of the phantom leaf.

DS: A lot of people wonder why the phantom itself produces an aura. The phantom produces an aura that looks just like the one surrounding the leaf tissue.

Allan: Well, if it didn't produce an aura, you wouldn't be able to see it. (Laughs.)

DS: Yes, but it's the same kind of aura. It looks the same in all respects.

Allan: Some of the stuff John [Hubacher] and I did out in California, you couldn't even tell where we cut the leaf off.

DS: How many attempts did you have to make to get your first phantom?

Allan: Got it on the first try.

DS: The first time you tried it, you got it?

Allan: Yeah. … I really didn't know that much about producing phantoms. I had just read a little about it and I didn't know it was that hard to do, so I just went out and did it. Nobody told me I couldn't. I think that's the bad thing about such things; everybody thinks it's so hard to do, and they just don't try. They have a bad mental attitude about it. I think producing the leaf phantom depends on the attitude.

DS: Do you have a feeling that occurs when you have a bad run of phantom attempts?

Allan: Yeah. … You know, when I was doing this for science projects, I'd go down and do twenty, twenty-five leaves. I'd just go down to the darkroom with the leaves and start taking pictures. On a bad night I would get seven or eight out of twenty. On a good night I'd get eighteen out of twenty.

DS: Did you ever notice any particular feeling when you felt you weren't going to get a phantom before you even tried?

Allan: Well, it's not like I felt I wasn't going to get one. It's just sometimes I just get tired of doing it, and then it doesn't happen as much. I've done so many of them, it's nothing new to me anymore. That's why I don't keep working on it all the time.

DS: There's a big phantom-producing effort going on up in Montreal right now. Some people from India.

Allan: I think I met them in New York. I took a hundred phantoms to New York when I went there. I have their big writeup on how they had it all figured out, and they had four or five examples of phantoms in their collection, so I kind of blew 'em away.

DS: They had it all figured out? They had all the parameters down pat?

Allan: They said they had it all figured out, then somebody else tries it, it doesn't work, and then they have a problem. The quality of my stuff was way beyond theirs.

DS: Does the machine used to produce the photos make any difference?

Allan: We did it with an ordinary line-powered transformer.

DS: And have you used John Hubacher's equipment?

Allan: We used his and we used mine. We built one for the IKRA [International Kirlian Research Association] exactly like mine, which really didn't turn out to be exactly like mine, because such machines are hard to reproduce exactly. And I've done the phantom on that one. Warren Kurtz came down from New York and spent a weekend at my house. Got thirty or forty that weekend.

DS: How did Warren Kurtz do?

Allan: He didn't get any at all. And we just did the same things, side by side. He couldn't do any.

DS: Do you have any particular feeling for plants?

Allan: I've grown up with plants, 'cause my mom's always had 'em around the house. I'd go around raping her plants, taking all the leaves off, and I'd just say, "Mom, I'm going to go down and take some pictures." She'd say, "Don't take them off this one!" She works at a greenhouse. She designs floral arrangements and is always bringing home plants. I'd just go around the house picking off leaves from all the different plants.

DS: Do you do most of your experimenting at home?

Allan: Yeah, except for the couple of hundred I did out in California with John over a three-day period. I had intended to spend a weekend at the beach while I was there, but no .... I spent the weekend in the darkroom!

DS: That was selfish of John. He's out in California all the time. (Laughter.)

Allan: We filmed the television show "In Search Of" when I was out there. We did the filming at the California Acupuncture College. John did something on acupuncture, and they did phantom leaves with me.

DS: What kind of quality did the Indians get with their pictures?

Allan: They just cut pie-shaped sections out of the leaf and hoped the space would fill in.

DS: Hoped it would fill in?

Allan: Yeah. I sometimes cut up to 70 percent off my leaves.

DS: Of course, pie-shaped cuts will always fill in if you hit the leaf with enough voltage.

Allan: I know. Maybe I can find their paper when we go back to my place. They really didn't have anything substantial.

DS: I've made a lot of attempts by cutting different geometric configurations out of leaves and sometimes I would get a lot of "crud" formation, especially at night. I never got anything impressive. But you can always fill in the holes and slices if you turn up the juice—

Allan: Not with my machine! I don't have enough power to do that. I use twelve thousand volts for one to two seconds.

DS: In all my tries, I only got a couple of pictures with a hint of a start of a phantom. You could see a small extension of the vein structure past the edge of the leaf tissue. Nothing anyone would take as real evidence. I ran five hundred attempts with no real luck, but then I read about someone who did five thousand shots before he got the first phantom.

Allan: You did five hundred? I never had the money to go to extremes like that. (Laughs.) I'd have to save up my allowance to buy film. So I put it to good use when I used it.

DS: Yeah, that would be about sixty dollars' worth of four-by-five.

Allan: I've got some Ektachrome phantoms I'd like to make into wall murals. I'll show them to you later. I got the light table from the Gazette so I'd be able to show you the transparencies. I have some color negs and gobloons of black and white negatives.

DS: Does your mother run a greenhouse?

Allan: Well, she works at one.

DS: Did you ever work there?

Allan: No. I did a couple weekends of carry-out, but that's about it. No work with the plants or anything.

DS: Do you have any plants?

Allan: No, I don't have any in my apartment; I just moved a couple of weeks ago. I left all of them back at the other house. I only had a couple, anyway.

DS: Do you have any interest in psychic phenomena in general?

Allan: Oh yeah, I'm into that. I've got about 120 books on various things like Bigfoot and the Loch Ness Monster, possession, all the weirdo things. ... I'm kind of leery when it comes to dealing with overly skeptical people, like the ones I'd run into with my phantom leaf exhibit. Some people would really back me, then there'd be one or two who'd say it was all fake—'cause you always run across those. One of my favorite sayings is by Albert Einstein—I have it on a poster. It says: "Great spirits always encounter violent opposition from mediocre minds." I always wonder how these people, you know, how they think anyone would fake this stuff. There's no money in it." (Laughs.)

DS: I talked to your dad a couple of weeks ago, and he mentioned that you did something with mercury.

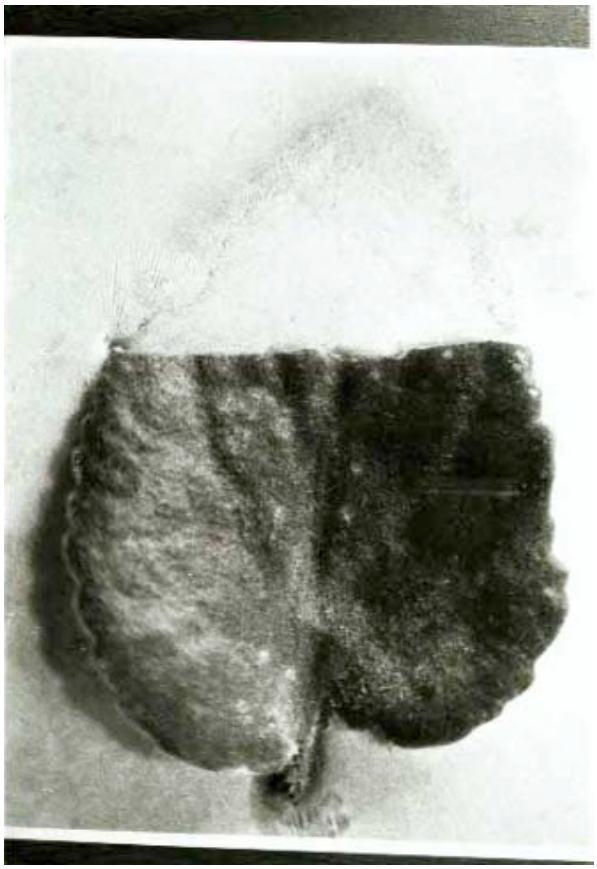


Fig. 1 Phantom leaf effect produced in mercury.

Allan: Yeah, you'll like that.

DS: You have a picture of that?

Allan: Yeah, I have a picture of the leaf and of the phantom on talcum-dusted mercury [Hg]. I had to set up a camera over the leaf. That's one that'll blow your mind. It's indisputable evidence, really, over and above any Kirlian picture you'll ever take. Not too many people have seen it. (See Fig 1.)

DS: The image is on the dusted mercury?

Allan: Yeah, it's imprinted in the talc. You can see the total outline of the leaf.

DS: Fantastic.

Allan: I was just thinking one day, "What could you do to … " —we did something in science class once, using surface tension, floating pins—"why couldn't you do this with a phantom, if there really is something there?" So I just went home and tried it, and it worked out. Most of the time you can't really get a full image, but this ... You can see little indentations, but this one time it was just total, full.

DS: Easy on film, too, this way.

Allan: Yeah. I just use my thirty-five-millimeter camera and put it over the image and shoot.

DS: This is relatively permanent, actually, since the phantom is shown in the talc, right?

Allan: Yeah, as long as you don't bump it.

DS: So—how do you do that? You put the plate of mercury …

Allan: I just took a shallow dish and poured mercury in it, sprinkled talcum powder on the top and then blew it off, to get a real thin layer over the surface, and just laid the leaf down on the surface.

DS: Do you use any electricity?

Allan: No, no electrodes, no electrical input.

DS: The phantom just forms on the surface?

Allan: Yeah, it just forms on the surface. … You know Alfred Benjamin?

DS: Yeah.

Allan: He experiments using liquid crystal. Well, we did some stuff out there [in California]—tried the phantom, using liquid crystal. We cut a leaf up the center and put the electrode on it, and you could see the phantom, not real clear, but you could see the outline. That's when I was out there with John [Hubacher]. We went with Thelma [Moss] up to Alfred's and did some experiments together, all of us. We tried the liquid crystal, and it worked.

DS: You put the leaf on liquid crystal and then—

Allan: —shocked it electrically. Alfred turns on the electricity for a certain period of time, and then he has a thirty-five-millimeter camera set up above the experiment. Then he snaps the shutter at a certain point. That's what he does with his blood experiments. So we tried the same procedure with a leaf. That even showed up a little bit.

DS: Again about the mercury setup: you just pressed the leaf on the surface?

Allan Yeah. This was one exceptional time, though. It doesn't do it every time. I tried it maybe seven or eight times; and I got this one good one. I tried it several times afterwards and it didn't show up ... all the time.

DS: There could be a charge on the surface of the mercury induced by blowing the talcum across the surface, but this might vary a great deal according to conditions, humidity, and so on.

Allan: Possibly. I'm no research scientist; I want to make that clear. (Laughs.) I just go down to my basement and start doing stuff. I haven't kept that many records or anything.

DS: You don't know of anyone else who's had a lot of luck in getting the phantom? How about John?

Allan: That's why he likes me so good! I'm his bud 'cause I can do phantom leaves! (Laughter.)

DS: Didn't John get any phantoms?

Allan: No, he didn't get anything worthwhile.

DS: That's too bad.

Allan: Well, one of these days, someone else, maybe … We thought maybe Thelma Moss) did one, but then we couldn't find the other half of the leaf. She did a rose leaf, cut it in half and took a picture. It looked like the phantom was there, but we couldn't find the other half of the leaf for comparison. So, you know, she might have got one, but that's the only close one anyone else got out there.

DS: Do you have any particular type of leaf you favor?

Allan: Can't think of one. Any leaf that will fit on a four-by-five negative. I did some phantoms with John on eight-by-ten negs and I got five phantoms off the same leaf, every five minutes, until the phantom just disappeared. John still has those.

DS: Did you ever do any phantom attempts with both halves of the leaf on the film?

Allan: I did one when Warren [Kurtz] was up here. We cut a leaf in half and took a picture, then we put the stem portion of the leaf on one side of the film and cut another part off the top half and laid the remaining middle portion on the other side of the film, leaving the top portion out of the picture. (See Fig. 2.) The stem portion didn't create a phantom, but an arc traveled from the stem portion to the top cut edge of the middle portion and generated a phantom of the missing top portion!

DS: What if both halves generated phantoms? That would be a real problem. Have you ever tried experiments using the top half of the leaf, rather than the stem portion?

Allan: No, just the stem half. I'm not very scientific, I guess. Never really thought about doing scientific research.

DS: I have thought of a number of related experiments. But it would be too bad if it ended up that only you, or only a small handful of people, can do this. The process appears mediumistic. ... There do not seem to be any specific parameters involved.

Allan: Well, no machine ever turns out the same as any other even if you use the same parts.

DS: But if you can produce these phantoms on your machine, or on John Hubacher's or the IKRA's, what's the difference, if there's a difference?

Allan: Yeah, I know, that's what I mean. … Somebody tries to build one like mine, to copy mine, because it works, [and] their machine won't be exactly like mine, but so what?

Fig. 2 Biopiasmic arc or probe develops to the right or the lower portion of the cut leaf. This leaf had been cut into three parts before the picture was taken, and the tip section was removed from the experiment. This "probe" enters the mid-section of the leaf (at left-hand arrow) and generates the phantom of the remaining tip section of the leaf (between arrows).

DS: Do you think psychokinesis might be responsible for the phantom leaf? That maybe you have a talent for mentally exposing film so it looks like a phantom leaf?

Allan: I'm very interested in PK. John told me to try PK on a pin suspended in a pop bottle, but I could never move it. I figure, if I can't move a pin mentally, I can't be doing all that stuff on film.

DS: Do you find any relationship between phantom leaf production and time of day or time of year?

Allan: No. I've done it any time of day or year and under a wide variety of weather conditions.

DS: I heard stories that the only really good time to do phantoms was in the early spring. ... I got this probably because you were out in California doing these early last spring.

Allan: I was in California during April, I think. There are more leaves during the spring; maybe that's the basis for this rumor.

DS: They probably have a different idea of leaves and springtime in California.

Allan: Yeah, they've got leaves all the time.

DS: The Californians don't see the leaves come and go as we do out here. They may have some belief about mystical life-forms arising with Aries, or something like that. You worked with the dying leaf effect, right? Until the phantom failed to appear. You did this several times?

Allan: Yeah, the phantom lasts for about twenty-five to thirty minutes.

DS: Your dad mentioned that you then see the phantom flare up, sort of "go nova," at the end.

Allan: Yeah, there's a flaring at the end, like it's the leaf's last gasp. It's like when my hamster died. It went around like nuts first, it was so energetic before it died. Maybe that's related, I don't know. It s just another one of those mysteries, I guess. Anything you look at, there's something you can't explain.

NOTES

1. Bearden, Thomas E., Excalibur Briefing (San Francisco: Strawberry Hill Press, 1980), p 85.

2. Ibid., pp. 85–88; see also Bearden, T. E., "Comments on the new Tesla electromagnetics. Part I: Discrepancies in present EM theory," typescript, 1982. "Toward a new electromagnetics. Part III: Clarifying the vector concept," typescript, 1983. "Toward a new electromagnetics. Part IV: Vectors and mechanisms clarified," Proceedings, 1983 Annual Conference of U.S. Psychotronics Association, Portland, OR, July 23–24, 1983.

3. Though reductive attempts have been made to explain the "aura" effect by citing known facts about electrical coronas (see, e.g., Boyers, David G., and William A. Tiller, "Corona discharge photography," Journal of Applied Physics 44, 7 [1973J: 3102), the fact that not only the leaf tissue, but the phantom, produces an aura presents a few problems.

4. For a discussion of the nature of the phantom from a historical point of view, see Stillings, Dennis, "The primordial light: Electricity to paraelectricity," 1982. (Available from the author.)

NOTES ON CONTRIBUTORS

ELDON A. BYRD, B.S. in Electrical Engineering (Purdue University), M.S. in Medical Engineering (George Washington University), has been a physical scientist with the Naval Surface Weapons Center since 1973. His postgraduate work has been in medical engineering. In addition to his work in biomedical aspects of E1 radiation, Eldon is well known in psi circles for his considerable work with Uri Geller from 1973 (see his article "Uri Geller's influence on the metal alloy nitinol" in Panati, Charles, ed., The Geller Papers [New York: Houghton Mifflin, 1976]) to the present. His work has also included a study on the telemetry of brain waves and work on human-plant communications.

JACK HOUCK, B.S. and M.S. in Aeronautical and Astronautical Engineering (University of Michigan), has been a systems engineer at an aerospace company in southern California since 1961. Jack Houck pioneered the technique of psychokinetic metal-bending (PK), using the "warm-forming" party format. Jack has done perhaps more than anyone to show that PK is a talent to be found in almost anyone to some degree. The PK party, using the collective emotional states of some 10 to 40 or more people, promises to be one of the most reliable sources of measurable psychokinetic events and obviates the problem of searching for supertalented individuals.

JAMES McCLENON, Ph.D., is an instructor of sociology with the Asian Division of the University of Maryland and was granted his Ph.D. in 1981. He has been a member of the Parapsychological Association since 1981, and has published various research reports in the Journal of Parapsychology and in Theta: The Journal of the Psychical Research Foundation. He is the author of Deviant Science: The Case of Parapsychology, which will be published by the University of Pennsylvania Press in 1984.

KAREN OLNESS, M.D., F.A.A.P., is Director of Research and Behavioral Pediatrics, Minneapolis Children's Medical Center and Hospital, and Associate Professor of Pediatrics, Family Practice, and Community Health at the University of Minnesota. Karen's affiliations, activities, and publications are too numerous even to begin to list them here. Her work has been chiefly in the areas of biofeedback and hypnotherapy. She is currently working on remote viewing in children, under a matching grant from Loren Parks. (See Book Reviews section in this issue, p. 56.)

JOHN THOMAS RICHARDS, Ph.D., teaches English at Columbia College, Fort Leonard Wood, MO. He is the author of Luminous Sanity: Literary Criticism Written by John G. Neihardt (1973); SORRAT: A History of the Neihardt Psychokinesis Experiments 1961–1981 (1982); and Rawhide Laureate: John G. Neihardt. A Selected Annotated Bibliography (Metuchen, NJ: Scarecrow Press, 1983). (See Book Reviews section of this issue, p. 55.) Since Dr. Neihardt's death, Tom has been the chief spokesman for the Society for Research on Rapport and Telekinesis (SORRAT). The phenomena developed by the SORRAT group under the guidance of John G. Neihardt (author of Black Elk Speaks a book that made a considerable impression on C. G. Jung) continue to manifest themselves primarily at Skyrim (Neihardt's farm), Tom's home in Rolla, and a few other places. Tom Richards has taken on the responsibility of introducing

investigators to these phenomena and keeping records of paranormal events. While a good deal of controversy surrounds the reports of macro-PK experienced by SORRATs, it is this writer's opinion, based on observation, that at least some of the phenomena may be genuine.

DENNIS STILLINGS, B.A. in Philosophy and Mathematics (University of Minnesota), has spent some 20 years investigating various aspects of the paranormal, particularly in relationship to Jungian psychology. From 1969–1980, he developed the collections of the Bakken Library of Electricity in Life, an institution devoted to the study of electricity and magnetism in relation to biology, medicine, and cultural transformation. He has spent the last two years developing the Archaeus Project.

BOOK REVIEWS

The Divining Hand: The 500-Year-Old Mystery of Dowsing
by Christopher Bird. New York: E. P. Dutton, 1979. Pp. xi + 340. $13.50.

THE alternative, and more personally interesting, subtitle of this encyclopedic work is "The art of searching for water, oil, minerals and other natural resources or anything lost missing or badly needed."

As the latter subtitle suggests, this is a book with a long fuse. Unlike The Secret Life of Plants which Chris coauthored with Peter Tompkins, a book that immediately captured the public imagination. The Divining Hand comes up in conversation more now than when it first came out. The book is dogging the establishment's heels.

This doggedness has paid off. Earlier this year, the World Bank's monthly magazine, The Bank's World responded to a World Bank-hosted-lecture by Chris by featuring dowsing as a cover story for their next issue (volume 2, number 5, 1983).

Chris Bird is possessed of a healthy skepticism. Claims of dowsers and theories about the mechanism of dowsing are examined and assigned the appropriate amount of doubt or belief earned. The book begins with an elaborate but to-the-point history of the subject. (Chris did much of this research at the Bakken Library in 1977. I was director then, and the library was still part of Medtronic, Inc.) The rest of the book discusses not only "water-witching" but dowsing for lost people and objects, the use of dowsing in mining and the military, and a variety of scientific studies and models for the mechanism of the dowsing reaction. Non-psi theories fall afoul of map dowsing—in which the dowser dowses a map of the terrain in question, without actually going there. Dowsing is represented as a blend of the psychic and the physiological, as a bridge from the biology and the biological needs of man to the secret resources of nature. Perhaps the traditional sign and instrument of dowsing, the forked stick held in the hands, symbolizes a right-minded attitude of prayer in which the split between mind and earth unites and the aeons-old love-attraction of earth for man is re-established with a gift.

Rawhide Laureate—John G. Neihardt: A Selected Annotated Bibliography by John Thomas Richards
Metuchen NJ: Scarecrow Press, 1983. Pp. (1), xvi + 3-169. $15.00.

IN psi circles Tom Richards is best known as impresario of the ongoing paranormal activities at Skyrim and for his well-known account of the events occurring there over a 20-year period (SORRAT: A History of the Neihardt Psychokinesis Experiments 1961–1981)

John G Neihardt (1881–1973 is best known for his work Black Elk Speaks (1932). Remaindered in the United States at that time, but recognized as important in Europe, Black Elk Speaks came to the attention of Carl Jung. Correspondence was initiated between Neihardt and Jung, who even directed someone to go to the United States to study Neihardt and his work more closely. (The correspondence between Neihardt and

Jung is now at the University of Missouri in Columbia. None of the letters appear in the Princeton University Press edition of Jung's correspondence.)

Tom Richards' bibliography gives one access to Neihardt's early discussions of psi and the work of the group he founded, SORRAT. One of the most important references is to a tape on ESP and related phenomena made by Neihardt himself. This tape is apparently available through the New Frontiers Center (Friendship Farm, Route 1, Oregon, WI 53575)

In this writer's opinion, serious evaluation of past and current events at Skyrim and the claims of Richards and others must be examined in the context of the development and direction of SORRAT under Neihardt himself. Examination of the citations in Rawhide Laureate and of the Jung-Neihardt correspondence, in relation to Richards' lengthy account, may well give a better perspective through which to view and evaluate the SORRAT phenomena.

Hypnosis and Hypnotherapy with Children, by G. Gail Gardner, Ph.D., and Karen Olness, M.D. New York: Grune and Stratton, 1981. Pp. xvii + 397. $29.50.*

THIS the first and long-awaited comprehensive text on hypnosis and hypnotherapy with children. The authors, a child psychologist and a pediatrician, convincingly show that the use of imagery and imagination is highly important in child hypnotherapy. Imagery can help the child to distance himself from his physical pain (for instance, in cancer and in burn cases). It can help him/her cope with a great variety of emotional problems and master them. The authors use imagery in creative ways with children and show the reader how to do it. The imaginative method must be tailor-made for the individual child's personal style and needs.

The book is divided into two parts: Part I deals with aspects of ego strength of children that can be usefully employed in hypnotherapy (urges for stimulation, for mastery, for being well, for social interaction; and the child's inner world of imagination). Nineteenth century practices of hypnosis with children, hypnotizability of children at various stages, and a good number of permissive hypnotic induction techniques for children which the authors themselves have developed are also presented in Part I.

Part II of the book describes methods and techniques of hypnotherapy for children suffering from psychological disorders, learning and performance problems, pediatric medical problems, or physical pain, as well as for those who have to face surgery or are terminally ill. The specific areas in which future research is needed are also pointed out. Again, most of the imaginative hypnotherapeutic methods described have been invented by the authors.

As appendices two children's hypnotic susceptibility scales have been reprinted in this book: Perry London's Children's Hypnotic Susceptibility Scale (1), and Arlene Morgan's and Josephine Hilgard's Stanford Hypnotic Clinical Scale for Children. (2)

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*This review, by Erika From, was originally published in Imagination, Cognition and Personality 2,3 (1982–83): 269–270. Reprinted here by permission of the publishers.

The authors have done a scholarly job of collecting and discussing critically the existing literature for each and every type of emotional or physical illness in which hypnosis has been used to help children. From their own vast experience as hypnotherapists of children they have added a great many case reports giving the concise wording they used for each type of illness with a number of possible or helpful varieties in the wording. It is always their intent to adapt to the personal needs of the child, to get the patients' confidence, and to remind them that if they use their own imagery and other cognitive skills they possess but may not be aware of, they have the ability for coping with and mastering their problems. Hope, joy, and a deep trust in the child's ability to help himself—with the therapist's role being merely that of guide—pervade the book. Hypnosis and Hypnotherapy with Children is written in an eminently readable, clear, crisp and precise style; and at the same time with enormous warmth for, love, and understanding of children. Unfortunately, the authors deferred to an editorial assistant for compiling the Authors' Index. As a consequence, half of the references mentioned in the text are missing in that index. But the book is well printed and aesthetically its layout is very pleasing. This book will become required reading for all child hypnotherapists, and is also to be recommended enthusiastically to all those who are interested in the workings of the imagination and its uses in problem solving.

NOTES

1. London, P., The Children's Hypnotic Susceptibility Scale (Palo Alto, CA: Consulting Psychologists Press, 1963).

2. Morgan, H., and J. R. Hilgard, "Stanford Hypnotic Clinical Scale for Children," American Journal for Clinical Hypnosis 21 (1979): 155–169.

—Erika Fromm, Ph.D.
(University of Chicago)

UFO-Dynamics: Psychiatric and Psychic Dimensions of the UFO Syndrome, by Berthold E. Schwartz, M.D. Moore Haven, FL: Rainbow Books/Betty Wright (2299 Riverside Drive, PO Box 1069), 1983. 2 vols. Book I: pp. xxxviii + 39–301. Book II: pp. 302–561. $19.95.

ONE can leave aside the question of the "concrete reality" of Ufos—the nature of their "reality" is completely unknown, although some good theories exist (l)—and there is still a great deal of important material left to discuss. Ufos are most generally assumed to be the interstellar vehicles of E.T.s. There are, however, a few of us who believe the evidence for terrestrial origin of these phenomena to be not only more convincing, but more interesting. If we discount the scenario of "plasmoidal space critters" living at the fringes of the earth's atmosphere, and leave aside the equally bizarre (perhaps more bizarre) hypothesis of simple hallucination, we find we have a vast array of psychological questions to answer, questions that need not be reductive or "nothing but" in nature.

The psychological approach can vary widely. The origins of saucer "fantasies" have been ably traced to folklore (2), to mythology (3), and to the psychic background of religion. (4) This has been done so convincingly that even the most "objectively real" Ufo contact cases can be seen as experiences of a living mythologem that has a very substantial PK component. (This may be a definition of existence itself, generally speaking, but let's drop that for the time being!) What this mechanism is may be the profoundest of modern spiritual mysteries.

Another, less cosmic, psychological approach involves an examination of the psyches of those purporting to have witnessed Ufo and Ufo-related events. Berthold Schwartz's book provides a rich resource of such investigations. Dr. Schwartz's recounting of Ufo contacts and the physical and psychological circumstances surrounding the events is good enough to give me the feeling that something was creeping up behind me, at least during the time I was reading Book I. The sections on the Men-in-Black and preserved Ufonauts didn't help my nerves, either.

An example of the excellent thinking in this book may be taken from Chapter 8, "Woodstock UFO Festival, 1966—I":

> The understanding of antigravity is central to the supposed method of UFO propulsion and such UFO-related effects as presumed levitation, telekinesis, and poltergeist phenomena .... Although the physics of antigravity and of UFO-related phenomena has been explored with the electromagnetic and electrostatic hypotheses …· little has appeared on the possible psychiatric aspects of people who are part of such events. (p. 140)

> In psychiatric practice the symptom of weightlessness, or antigravity, is not common; yet it is not unknown. It is related to depersonalization, which is seen in a variety of neurotic and psychotic patterns and which can also occur in otherwise healthy people following severe emotional stress. (Ibid.)

From a psychological point of view, such comments lead us to see in much of the Ufo phenomena the projection of inner contents—personal or archetypal—into an external event. Note that it is usually an aspect of the personality that has a relationship to the extrapersonal that allows the archetypal event to manifest. Perainger has an excellent model for this process, which uses, as the triggering external event, electric fields generated by (among other things) rock stresses:

> Human bioelectrical systems, when in contact with such a field, would react by producing in the percipient "dream-like states ... or intervals of unconsciousness." The consciousness might be inundated by stored images "that he or she cannot control."(5)

These images, of a personal and/or collective mature, are projected into the environment in such a way that they are indistinguishable from reality.

It is arrogant, of course, to dismiss the E.T. hypothesis absolutely. On the other hand, whether or not a saucer lands "on the White House lawn" (which would be the only real proof of the hypothesis), the psychological approach will survive and remain valid because almost every aspect of Ufo encounters is embedded in the mind, in human psychological responses of a predominantly religio-mythological nature.

Berthold Schwartz's impressive two-volume work represents one of a small handful of resources with which one may begin to examine the "reality" of Ufos in a productive, here-and-now manner. The first scientist, even if he be of mediocre ability, who enters that saucer on the White House lawn, will <u>know</u> more in 30 seconds than the sum total of supposed "knowledge" about E.T.s to have accumulated over the last 40 years.

NOTES

1. See Bearden, Thomas I. Excalibur Briefing. (San Francisco: Strawberry Hill Press, 1980); and see especially Persinger, Michael A., and Gyslaine F. Lafreniere, Space-Time Transients and Unusual Events (Chicago: Nelson-Hall, 1977).

2. Vallée, Jacques, Passport to Magonia: From Folklore to Flying Saucers (Chicago: Henry Regnery Co., 1969).

3. Nugent, Anthony, "Quicksilver in twilight: A close encounter with a hermetic eye," SPRING: An Annual of Archetypal Psychology and Jungian Thought (Irving, TX: Spring Publications, 1978).

4. Jung, Carl G., Flying Saucers: A Modern Myth of Things Seen in the Skies, in Civilization in Transition (Collected Works vol. 10) (New York: Pantheon Books, 1964).

5. Persinger and Lafreniere, quoted in Fitzgerald, Randall, The Complete Book of Extraterrestrial Encounters (New York: Collier/ Macmillan, 1979). Persinger's theory, and those of many others, are summarized in Fitzgerald's very useful work.

—D.S.

EDITORIAL NOTE: FIVE BOOKS THAT REENCHANT THE WORLD

BERMAN, Morris. The Reenchantment of the World. Ithaca, NY: Cornell University Press, 1981.

WATSON, Lyall. Lightning Bird. London: Hodder and Stoughton/Coronet, 1982.

WATSON, Lyall. Gifts of Unknown Things. London: Hodder and Stoughton/Coronet, 1976.

VALLEE, JACQUES. Passport to Magonia: From Folklore to Flying Saucers. Chicago: Henry Regnery Co., 1969.

BEARDEN, Thomas E. Excalibur Briefing. San Francisco: Strawberry Hill Press, 1980.

THE first book, Berman's The Reenchantment of the World put me in a state of near-schizophrenia for three weeks. Having flattered myself on having gone beyond old-paradigm, materialist/mechanist thinking, I was rudely awakened by Berman to the fact that, if I was in the New School of the Aquarian Age, I was in kindergarten. Berman was the inspiration for Roger S. Jones's Physics as Metaphor and both books take an extremely "radical" view of the intimate relationship between mind and world.

To paraphrase Stephen Potter, "Thank God there's no mention of quantum mechanics" —well, not a lengthy mention, anyway. Read this one and come see me.

Two gentler, but very moving, works by Lyall Watson weave many of the ideas found in Berman into "real-life" situations. Lightning Bird describes the incredible, but factual, adventures of Adrian Boshier, who ventured alone, unarmed, and on foot into the African bush. Although subject to severe epileptic seizures, Boshier won the respect and trust of the African people, and was initiated as a witch

doctor. The Africans' interpretation of Boshier's epilepsy is of high interest. One of Boshier's favorite pastimes in the bush was to wrestle and capture bare-handed large venomous snakes.

Gifts of Unknown Things might be considered a companion volume to Lightning Bird. In Gifts, Lyall Watson takes us to a small volcanic island in Indonesia and discusses psychic healing, death, ESP, and power spots within the context of the life of the mysterious dancing girl Tia.

Passport to Magonia is a remarkable book by Jacques Vallée, which relates Ufo phenomena to traditional science. Its basic premise is that traditional ideas of "the little people" and their kin may be applied convincingly to Ufos, Sasquatch, Bigfoot, and the rest. In other words, both these creatures and the creatures of folklore are expressions of an underlying reality coming to life again in our own time. This is a book that I deeply regret not having read until this year.

The last book, and the weirdest, is Tom Bearden's Excalibur Briefing. This book, dressed out in all the trappings of electromagnetics, quantum theory, and mathematics, purports to give a comprehensive theory of the paranormal. As such, strictly speaking, it fails: not because it is wrong (who can tell?), but because the author is still talking to himself. (In his later writings, this has changed.) The work is opaque with jargon and incredible intuitive leaps. If, however, one can look beyond the trees to Tom's great forest, one sees a giant metaphor embracing mind and matter, created by one of the great extraverted mystics of our time.

ARCHAEUS