

The Physical Basis of Intentional Healing Systems

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ABSTRACT

A relatively strong literature describes anomalous effects in laboratory experiments where human participants attempt to change the behavior of physical systems by mental efforts. Parallel experiments show that information can be acquired about distant locations shielded from any normal access. Such research is considered as a model for the general class of distant healing research, for which only a few direct and well-controlled experiments are available. While there are important differences between the laboratory and clinical research, certain commonalities also exist, and these may help to illuminate mechanisms and advance understanding of the practical applications.

Examples of experimental healing research are presented in the context of a survey of laboratory and field studies of anomalous interactions of mind and machine, studies of biological systems, and remote perception. A brief discussion of the attempts to develop a theoretical background for the anomalies associated with consciousness is followed by consideration of implications and possible applications.

The Physical Basis of Intentional Healing Systems*

1. Introduction

The concepts which now prove to be fundamental to our understanding of nature ... seem to my mind to be structures of pure thought, ... the universe begins to look more like a great thought than a great machine.

James Jeans, in *The Mysterious Universe* (1)

As our depth of scientific understanding increases, the physical world reveals a fundamental unity and interconnection that belies a surface appearance of mechanical discreteness and separation. Predating modern physics by many centuries, the basic assumptions underlying healing and medical traditions in most world cultures include an intuitive recognition of physical wholeness or oneness and a view of the world as deeply interconnected (2). Many alternative therapies draw from these traditions, sharing the conviction that the mind can contribute directly to the healing process. While mind and consciousness are not included explicitly in current physical models, a growing number of physicists are seeking ways to do so, motivated in part by a solid body of experimental evidence that human intentions can transcend spatial and temporal barriers (3, 4).

Alternative healing models and practices based on intentionality are difficult or impossible to explain within the limits of contemporary scientific understanding. Inter-

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cessory prayer, shamanic healing, therapeutic touch, and distant healing all appear to be capable of augmenting and hastening the healing process, but without any obvious candidate mechanism. Other more conventional practices also are enhanced by poorly understood complements such as the placebo effect or “positive thinking.” Although underlying mechanisms for the alternative therapies remain elusive, there are some shared elements: The common context includes the *disorder* prompting concern, and the potential structure or *information* that is required to restore the system. The healing seems specifically to be a function of an *intention* to heal, and the intentional modalities all share an effort to establish a connection or *resonance* between healer and healee.

Some insight into possible mechanisms may come from an instructive literature of experiments studying direct interactions of human consciousness with its environment, all of which share this set of common elements. Most of the experiments are based on devices embodying some form of randomness or disorder and are designed specifically to detect a transfer of information via the intervention of conscious intention. On a broader scale, in modern physics, there is an explicit interconnectedness at the subatomic level that may be suggestive of similar subtle interactions and influences among macroscopic physical systems. At the same time, chaos theory models the capacity of subtle influences to evoke massive effects in natural systems characterized by nonlinear dynamics, suggesting the functional equivalence of information and energy. Pervasive interconnections, conveying information and influence, eventually may be seen to have a primary role in certain forms of intentional healing.

In support of this possibility, basic research in a number of laboratories over the past few decades has provided an accumulation of scientific evidence that human

consciousness and intention can alter the behavior of physical systems and access physically isolated information in an anomalous manner. In these experiments, there appears to be an information-bearing “nonlocal” connection of the consciousness to physically and temporally separated people or devices that is analogous to and may serve as a model for the anomalous and unexplained connections that are central to many systems of healing. The laboratory findings that demonstrate anomalous interactions of human consciousness with physical systems are persuasive, and in clinical application, with its intrinsic importance and meaning, we frequently observe improvements attributable to alternative and complementary practices, and occasionally see healings that seem “miraculous.” Yet, we are only at the beginning of a search for clear explanations. The value of laboratory research is that it can be designed with a sharper focus on mechanism and understanding, whereas in real-world healing applications, the essential motivations necessarily must be toward the wellbeing of the people involved. With intentional healing as a context, this chapter describes a body of experiments exploring the relationship of mind and the physical world, and some rudimentary theoretical models attempting a reconciliation of anomalous effects of consciousness with modern physics.

2. Experimental Healing Research

Objective evidence, documented more fully elsewhere in this text, is accumulating that healing and improvements in well-being occur as a result of interventions such as intercessory prayer, non-contact therapeutic touch, and various forms of distant healing (5). Two related questions arise immediately: “How do these procedures work?” and “How can we improve them and increase their benefit to patients?” The first implies a theory that explains mechanism and allows testable predictions. The

second depends in part on the first, but also permits purely empirical extension via trial and error and the accumulation of experience.

We have only intuitive and speculative ideas of the physical basis of alternative and complementary healing. A number of informal models or theories serve as a helpful background against which practitioners work, but they typically are not amenable to scientific study, although they pass a pragmatic test of usefulness by guiding the procedures of healers. For example, in non-contact therapeutic touch, “energy” and “energy fields” are an important part of the descriptive language, even though no measurement technology has been found to document a corresponding phenomenon. The terms are acknowledged to be metaphors that are used effectively in training and in the imagery employed by practitioners. More important aspects of the Therapeutic Touch model are the explicit descriptions of “centering,” seeking “resonance,” and holding the “intention” to help and to heal (6). In intercessory prayer there is an invocation of an external source by most practitioners, an effort to access a higher power, with the prayer acting as a channel for its application (7). Notably, there is again a central role played by a “healing intention” to focus and manifest the healing power. Similarly, in the distant healing methodology taught by LeShan (8), the healer seeks “oneness” with the universe and thereby with the healee, and there is a well-defined set of exercises designed to promote this state. The state of oneness is conceived as providing an opening or channel for communication of the healer’s intention.

These examples, and virtually all of the class of alternative healing modes that function without apparent physical connection or mechanisms, share the common elements of a healing intention and a sense that some form of resonance may establish a channel for communication of that intent, even though they may differ considerably in

other aspects of their definition or conduct and in their tentative theoretical explanations. Laboratory research on the direct interaction of human consciousness with the physical environment, and related research on the anomalous communication of information across spatial and temporal separations, address the same issues at a fundamental level. These relatively simple experiments are analogous in principle to various aspects of healing work, and studies with such systems may provide an effective approach for learning more about the conditions that are conducive to healing and working toward explanatory models.

3. Anomalous Interaction Research

Over the past 60 years, a scientific enterprise addressing possible extraordinary capacities of human consciousness such as telepathy and psychokinesis has progressively matured into a set of experimental designs with excellent controls and a high degree of replicability. The advent of computer technology, together with long years of experience and critical assessment, has produced a class of experiments that are reliable and capable of producing large databases exploring a spectrum of physical and psychological parameters. We will examine a small number of these experiments in some detail and supplement this necessarily limited survey with summaries of other relevant material including recent meta-analyses that address the quality of the research as well as its overall weight of evidence.

3.1. Mind/Machine Experiments

One of the most extensive databases available for our purposes has been produced in the Princeton Engineering Anomalies Research (PEAR) laboratory (9). This program was established in 1979 by Robert G. Jahn, who was then dean of Princeton

University's School of Engineering and Applied Science. The research program has focused on two general classes of experiments and the iterative development of a theoretical framework for refining the experiments and eventually explicating the results.

In a set of experiments addressing anomalous interactions with physical devices, human operators are assigned an operationally defined mental intention to influence the performance of various machines whose outputs are controlled by some sort of random process. The research program has explored electronic, mechanical, optical, and fluid dynamic sources, at both microscopic and macroscopic scales. By far the largest component of the program is a series of experiments with microelectronic random event generators (REGs) that produce a sequence of random binary events — 1s and 0s — that are accumulated and automatically recorded as “trials” while the operator attempts to influence the outcome to higher or lower values. Most simply put, REG experiments are much like asking someone to produce more heads, or more tails, while flipping an unbiased coin. Electronics and computer technology allow this conceptual coin-flipping to proceed at high speed, with extremely reliable and accurate counting. It allows immediate and powerful feedback on performance, thus providing information and motivation potentially useful for improving performance. It also allows the accumulation of very large numbers of trials and the accompanying statistical power to distinguish an effect that is very small from background noise.

Although other sources of randomness, including radioactive decay rates and pseudorandom algorithms, may be employed, the benchmark experiments use a commercial, microelectronic random noise source designed for critical applications in government and industry. High quality electronic components and failsafe designs en-

sure that samples from this “white noise” source are truly random, forming an independent and unpredictable binary sequence. Extensive local calibration tests are made to verify that the equipment performs as expected, and that the data conform to the appropriate theoretical statistical models.

A trial in the REG experiment is defined as the sum of 200 bits from the random sequence, resulting in an expected trial value of 100, with variance 50. A pre-specified number of such trials (typically 1000) is generated in each of three conditions of intention for a replication of the basic experiment, which takes about an hour to complete. The participant’s instructions are to think about and mentally intend or wish for the REG to produce bit sequences with means higher or lower than chance expectation, or to generate baseline trials. In its basic form this is a very simple experiment, with a null hypothesis that these three conditions will produce indistinguishable results, given that the only difference among them is a mental state — the intention. The contrasting experimental hypothesis is that the high and low intentions will correlate with deviations of the nominally random sequence.

Over a period of 12 years, 108 individual operators accumulated 1262 experimental replications comprising over 5.6 million trials assessing the effect of operator intention, along with the effects of various secondary parameters, such as individual differences among the operators, location of the operator, type of random source, type of feedback, length of runs, and changes in the effect over time (10). The integrated or cumulative deviation of the results from chance expectation in the full database is displayed in Figure I.2.1. Analysis of variance shows a strong correlation of anomalous results with operator intentions, with a probability against chance of approximately 2×10^{-5} . While the correlation of results with intention is relatively con-

sistent overall, detailed examination reveals an internal structure that is dependent on some of the other parameters. The high statistical significance is associated with an overall effect size on the order of a few parts in 10,000, ranging up to a few parts in 1000 for certain data subsets. There is a significant difference among the operators that is suggestive of individual performance “signatures,” primarily due to certain individuals who are consistent over many replications, although they do not generate extraordinary effect sizes. When two people co-operate in the experiment, the effects are larger than those for individuals if they are an opposite-sex pair, especially if they are a “bonded” couple, but same-sex pairs thus far have shown small, nonsignificant effects (11). Interestingly, the co-operator results are not a simple combination of individual effects, but instead apparently are characteristic of the pair.

It is especially noteworthy that the local and remote databases (with the operator up to thousands of miles from the device) show similar patterns of interaction with intention, and exhibit virtually identical effect sizes, suggesting that the anomalous correlations in this experiment are insensitive to separation between the person and the machine. A small subset of these remote trials also is offset temporally by times ranging up to 48 or more hours, with the operator giving attention to the experimental intentions before or after the data actually are generated. Again the correlation with intention persists, and the size of the effect is undiminished (12).

The PEAR REG research does not stand alone, but is one program among many that replicate seminal work by Helmut Schmidt (13, 14). A meta-analysis published in 1989 (15) found 597 related studies by 68 investigators over a period of 30 years. The composite database showed an essentially constant effect size over the years, unaffected by a significant increase in the rated quality of the experiments. The overall effect,

while very small, showed a 15-sigma deviation from chance expectation.

The experimental designs and analyses in this research paradigm incorporate extensive contributions from skeptical and professional assessments of previous research. They specifically exclude various conventional or artifactual explanations for the deviations from chance expectation, including machine bias, informed optional stopping, data selection, selective reporting, and cheating, leaving firm evidence for a broad array of operator-specific anomalies in experiments of this class.

3.1.1. Field REG Studies

Capitalizing on miniaturized electronics, REG devices have been brought out of the laboratory for “field” studies, in which the REG appears to respond to coherence or resonance in groups of people. Ten applications in a variety of settings ranging from business meetings to religious ceremonies show a composite deviation with a probability against chance of 2×10^{-4} (16). The strongest effects appear when the groups become emotionally or cognitively coherent and share a group identity or resonance, and especially striking cases tend to have some unifying thematic or ceremonial aspect. For example, the most consistent anomalies among the ten applications are found in a long series of recordings at ritual gatherings of a pagan religious group.

Although this is a new area of study, other investigators have done closely related work. For example, Radin and colleagues have correlated the anomalous behavior of REG devices with very large-scale cultural activities such as the concentration of attention on live TV broadcasts, especially major events such as the Academy Awards. In studies more directly related to healing applications, they have found significant correlation of REG deviations with rated levels of group coherence produced during training workshops for an alternative therapy called Holotropic Breathwork (17).

Despite their relatively short history, these studies help to triangulate the evidence that consciousness can directly interact with its environment, and they suggest that bonding or resonance among individuals may create an efficacious group consciousness. They corroborate, as well, the indications that consciousness effects are nonlocal.

3.1.2. Biological System Studies

The mind/machine experiments have some strong parallels to the healing paradigm, as discussed earlier, but there is an even closer analog in a small literature of otherwise similar experiments that use biological systems as the target of intention. A number of investigators have studied the effects of conscious intention by unselected individuals and by healers on various living systems. For example, Nash showed that the growth rate of bacteria could be influenced by conscious intention in controlled double-blind studies (18). Grad watered seeds with saline solution that had been either “healed” or not, and in a careful, double-blind design, found that the healed seeds were more likely to sprout and grow successfully (19). In a series of studies using mice, Grad and colleagues showed that dermal wounds healed significantly more rapidly when treated by healers, in experiments that controlled for artifacts such as extra warmth from the hands (20). Braud found a highly significant reduction attributable to the effect of intention in hemolysis rates of the participant’s own blood cells held in a saline solution (21).

Still closer to clinical research are studies that examine whether physiological measures in humans might be susceptible to distant influence. Dean and Nash found that vasomotor activity measured by plethysmograph increased when an agent in another room attended to names of emotional importance to either the agent or re-

ceiver (22). Autonomic nervous system activity was addressed in studies reviewed by Braud and Schlitz, where skin conductance was measured in the target person while an influencer in a separate room sent calming or activating thoughts and wishes (23). These investigators also operationalized the notion that we can “feel” someone staring at us by setting a video camera to show the target person on a monitor to a distant starrer. Simple physiological measures showed significant and characteristic variation during the staring periods, compared with randomly interspersed controls (24).

These biological system studies have been replicated by independent researchers, and they are a promising avenue of research that lies between the mind/machine experiments and direct clinical studies with human patients. It is important to note that these studies, which are quite analogous to the mind/machine research, have considerably larger effect sizes. This could suggest that the mechanisms are fundamentally different, but it may be that biological systems are inherently more amenable to subtle influences, or it may be easier for consciousness to interact or resonate with a living organism where the task seems more relevant and important.

3.2. Remote Perception

The second major component of the PEAR program is an experiment in remote perception which involves two people, one called the “agent” and the other the “percipient.” The agent visits a location and spends about 15 minutes emotionally and cognitively immersed in the scene in an effort to provide a link for the percipient, who at a different location attempts to envision or imagine the scene. The targets may be chosen randomly from a pool prepared by a third person, or, alternatively, when an agent is traveling on an unknown itinerary, a target can be selected by prespecifying a date and time for a trial, and accepting the agent’s location at that time as the target.

The percipient freely describes his or her impressions of the target, and both participants are encouraged to make notes and sketches (the agent may take photographs). Finally, both are required to answer a set of descriptor questions which provide data for a quantitative evaluation.

Space considerations preclude giving illustrated examples, but the remote perceptions sometimes bear a striking resemblance to the target. The information most often is global and holistic rather than analytically precise, though there are occasional exceptions where the description is remarkably detailed. For example, in one case a percipient wrote of “Rocks, with uneven holes, also smoothness; height; ocean — dark, dark blue ... a lighthouse? — tall structure — round with conical roof; high windows or window space with path leading up to it; or larger structure similar to a castle ...” Beyond this allusive description, an accompanying sketch shows a castle abutment. The target was the ruins of Urquardt Castle on Loch Ness in Scotland, and the percipient was in New York, some 3500 miles away. The description was generated 14 hours after the target visit.

A percipient in Wisconsin described “... Some kind of circular shape. Almost like a merry-go-round or a gazebo. A large round thing. It’s round on its side, like a disk, it’s like a round thing flat on the ground, but it seems to have height as well. Maybe with poles ... Water again. Some quick impression of a fence, a low fence ... steps sort of lead up to like a path or walkway. Like a boardwalk. And there’s a fence along it. There’s people walking along it, and there’s vertical lines along that walkway...” This is part of a nearly pictorial description of a tower restaurant near a bridge on the Danube river in Bratislava, Czechoslovakia, more than 5000 miles away, and the perception was recorded nearly 24 hours before the agent visited the scene.

Occasionally there are startling details, as in one curious case where the agent forgot the trial and did not go to the assigned, randomly chosen target. At the arranged time the agent was visiting an artist's studio that previously had been a tile factory, where a prominent work in progress was of an Archbishop in full regalia, including his "shepherd's crook" (its proper name was unknown to the agent). The percipient accurately described a large, vine-covered, red brick building cluttered with unique and interesting objects, including many sculptures, and mentioned someone holding a "crozier" — the shepherd's crook.

Of course not all the perceptions are so impressive, and in some cases there is no detectable resemblance between the percipient's response and the nominal target, but the trend toward apparently accurate perception is borne out by the objective analyses (25). The primary goal in this research program has been to develop a sophisticated analytical methodology to replace the human judging process, and thereby to facilitate more precise quantitative assessment of results and their correlation with various experimental parameters (26). Both participants answer the same set of 30 binary descriptor questions asking, for example, if the scene is hectic or calm, if straight lines or curves predominate, if height or depth is important, etc. Using these, an algorithmic comparison is made of the perception with the target as encoded by the agent at the scene or with an encoding by the person who prepared the target pool. The analysis proceeds by constructing a square matrix of scores calculated by comparing each perception against all targets in the given dataset. The properly matched trials (on the main diagonal of the matrix) are evaluated by comparison with the distribution of off-diagonal, mismatched scores, and a robust statistical score can be calculated to represent the anomalous information transfer in the matched target/perception pair.

The total database of 336 formal trials, shown in Figure I.2.2, provides highly significant evidence that information is acquired by the percipients, with a composite Z-score of 6.36, which corresponds to a chance probability on the order of 10^{-10} . Comparison of subsets reveals that the overall yield is an accumulation of small contributions from the majority of the participant pairs, rather than from a few outstanding efforts. Most of the variations, such as the method of choosing the target or the particular scoring algorithms used, do not affect the scoring level significantly. Again, the most striking finding relevant to our purposes is parametric evidence that the degree of anomalous information transfer is unaffected by spatial and temporal separations. Regression modeling establishes a significant mean shift, but provides no evidence for a decline of scoring with increasing distance, up to several thousand miles. Similarly, there is no evidence that scoring is related to positive or negative temporal separations of the perception effort and the target visit, up to as much as a few days.

As with the REG studies, the results in this experimental program are quite consistent with those in independent but related research by other investigators. A comprehensive assessment of a long-term, government-funded program at SRI International and SAIC, using much the same experimental approach, shows similar overall results and statistically equivalent effect sizes (27, 28). A laboratory variation called the “Ganzfeld” experiment uses a soundproof room and reduced sensory stimulation for the percipient (receiver), while a sender in an isolated room views pictures or video clips that the receiver attempts to describe. Typically, the target is one of four selected randomly from a large pool, and the average success rate of the percipients in matching their experience with the correct target is about one in three. More detailed analyses show differences among subgroups, including evidence that artists and musicians may be especially successful, with scoring rates as high as 50%. A meta-

analysis of these experiments shows an overall “hit” rate of 34%, while the chance expectation is 25% (29).

4. Theoretical Background

There are no widely acknowledged theoretical models to explain these laboratory results, but a number of serious efforts have been made. Probably the most frequently invoked mechanism in models attempting to explain intentional healing is some form of energy, in fairly explicit analogy to the familiar energies of sound, heat, light, and other electromagnetic fields. As a metaphor, “energy” is part of the lore and wisdom of various anomalous healing modalities, but it is difficult to find descriptive detail or any objective measures. When there is detail, for example in descriptions of auras, it appears to be uniquely experiential and subjective. The term “subtle energy” is widely used, but on close examination, it appears to be a label for a variety of anomalous observations and does not have a clearly specified or generally accepted physical meaning (30). For proximate healing interventions such as Therapeutic Touch or Laying-on-of-hands, electromagnetic or chemical fields seem reasonable as potential mediators, but for any of the intentional healing modalities that transcend space and time, conventional energy-based models are inadequate.

There is good evidence that the anomalies studied systematically in the laboratory cannot be accommodated in models that depend on mechanical, thermal, or electromagnetic physical energies, including those generated by the human body and nervous system. The effects are not diminished by distance, whereas physical fields typically manifest a characteristic decrement in proportion to distance, and the anomalous interactions seem not to be prevented by any form of shielding, while most physical energies can be readily deflected or absorbed. Most difficult for energy-based theories

to accommodate are the laboratory findings that indicate anomalous influences may traverse temporal barriers.

How can separated bodies or systems with no connection, nothing between them, become a single interacting system? Modern physics offers several intriguing possibilities. For example, quantum theory suggests that physical systems are accurately described with wave functions that are fully probabilistic, and remain undefined until an observation is made, resulting in a “collapse” of the wave function into specific eigenfunctions. The standard example is Schroedinger’s famous cat, whose fate is determined only when we open the box to observe whether it is alive or dead. Similarly, some theorists suggest that the results of an anomalies experiment are determined only when an observer collapses the wave function describing a range of real but unmanifested possibilities, including those so unlikely that they are characterized as anomalous (31, 32). The concept of the zero-point field suggests that the physical vacuum and all interstitial “space” is filled with fluctuations of potentially interacting fields. The quantum fluctuations of virtual and real particles give rise to interference patterns that specifically link separated submicroscopic particles, and this, in turn, implies a functional interconnection on larger scales (33, 34). A consequence of this quantum inseparability is that physical systems exhibit a quality of wholeness, as suggested in Bohm’s work (35). While not explanatory in a mechanistic sense, such models bring consciousness into the picture with an efficacious role. They suggest that we, as observers, are a necessary ingredient in the determination of physical reality.

Extensions of this modeling approach consider more directly the information theoretical aspects of anomalous interactions. In a version of quantum theory that em-

phasizes the interconnection and wholeness of the physical world, Bohm describes a particular form of “active” information that is potentially present everywhere, but which is active only where it is meaningful (35). Thus, a healing intent may be available as an information resource having nonlocal, universal extent, with the need for healing providing the meaning, and hence the resonant channel, through which the information becomes active.

Taking consciousness as a form or manifestation of information, Jahn and Dunne suggest a metaphoric extension of quantum mechanical principles into the consciousness domain (3, 36). Consciousness is regarded as both particulate and wavelike, in analogy with quantum mechanical descriptions of matter and energy. In its nonlocalized, wavelike manifestation, it is unbounded and can penetrate barriers and resonate with other consciousnesses and the environment, thereby acquiring or inserting information that is unique to the interacting system. Based on this metaphor, Jahn and Dunne suggest possible mechanisms for anomalous influence. For example, they invoke the quantum mechanical principle of indistinguishability to help understand bonding. When molecules are formed from atoms, the constituent elements lose their identity and from this loss a classically anomalous “exchange force” results, producing a strong covalent bond. Analogously, through a sacrifice of conscious individuality, a unifying resonant bond may be established with another consciousness or a physical system, allowing the acquisition or insertion of information. Viewed as an influence of one system on another, this would be anomalous, but in a coherent, unified system, information is distributed throughout. The merging of subjective identities with each other, or with the environment, enables the transfer of objective information manifesting as coherence between previously separable constituents, yielding a total system within which entropy is reduced (37). While these suggestions may seem abstruse, the

fundamental principles are parallel to those involved in common interactive experiences such as falling in love, or creating a work of art, or enjoying the beauty of a sunset.

5. Applications and Implications

It is not difficult to envision mechanisms for self-healing through meditation, imagery, and positive thinking, because the mind and body are directly linked in an enormously complex network of neurophysiological and biochemical interactions. Mental states such as an intention to be healthy or to get well are an intrinsic addition to the information that shapes and controls the physical and chemical interactions, helping to promote a restoration of balance and appropriate structure where an injury or illness has interfered with normal, well-ordered functioning.

The research on anomalous interactions provides intriguing evidence that a nonlocal intervention such as intentional healing may contribute similarly to the continuing exchange of information that is essential to maintaining the integrity of living systems. The experiments show persuasively that anomalous effects occur across significant spatial separations, although we must acknowledge that the effects are very small when we consider applications; it is unlikely that a practical garage door opener or TV remote control will be built soon to take advantage of these findings. On the other hand, such devices are at the simple end of a spectrum where biological systems and consciousness define a much more complex opposite pole. Living bodies, with homeostatic, immune, and nervous systems that epitomize the realm of applied nonlinear dynamics are intrinsically susceptible to influence from small inputs and are able to identify and amplify the most subtle of inchoate patterns and information. Biological systems utilize random processes and uncertainty to maintain the highest level of sensitivity to

subtle changes in the environment. They are reactive on the finest scale to information that reduces entropic disorder and provides an increment of structure and predictability, yielding a stable internal milieu and successful interaction with the environment. In this context, we see that healing a wound or recovering from an illness is dependent upon the generation or addition of appropriate information to help restore order and structure.

Long-range interactions between antibody and antigen, and enzyme and substrate suggest nonlocal effects and fields that process and utilize structuring information at a fundamental level. Healing cascades that are beginning to be well characterized in ongoing medical research illustrate the hypersensitivity of biological systems to information and may be especially productive targets for anomalous healing research involving direct assessment of quantity and efficiency in the production and transport of inflammatory mediators. When a wound occurs, a highly specific recruitment process begins as the cut disrupts the structure and spacing of endothelial cells in vascular tissue, resulting in the production of chemotactic endothelial attractors, lymphokines, and platelet activating factors. These bring to the wound precisely the required mediators for the healing process, including white cells, lymphocytes, and neutrophils (38). Thus, the healing is a function of a structured chemotactic field that induces a spatially distributed cascade of production and transport, in a process that intrinsically is very sensitive to small informational influences of the order of those found in anomalies research. Such intrinsic functional sensitivities may be the matrix that allows intentional healing to operate across time and space by means of an anomalous acquisition or transfer of information. Of course this anomalous healing information constitutes only a part of the healing process, but a growing body of high quality controlled studies (5, 7, 39) strongly indicates that it can be an important, potentially crucial element in

health maintenance and in the illness recovery process.

The experiments we have reviewed show that human consciousness can affect physical systems by imparting information directly, bypassing the usual physical mechanisms, and that information may be communicated over vast distances and across temporal barriers. As Jahn suggests, discussing the relationships of information, consciousness, and health, “[The] anomalous phenomena we have been studying may be an indicative microcosm of a much broader genre of human capacity — the capacity to create, to order, to heal.” (37)

An injury or disease manifests as a disturbance or disorder in a system that, when healthy, is magnificently structured and orderly. It is, on the other hand, so complex that its function at the fine scale is beyond our full scientific understanding, as in the extraordinarily precise homeostatic control of the body, or in the exact mechanisms of mending and regeneration when we are injured, or in the creation of ideas. When there is a disruption, and healing is required, the need is for additional order, the infusion of information. Of course consciousness is nothing if not a manifestation of information, and in its creative and structuring capacities, it is ideally suited as a reservoir for the processes that sustain and restore health and wellbeing.

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Fig I.2.1 Figure Caption

Fig. I.2.1: REG experiment. The dotted curve shows the cumulative deviation of results from expectation (horizontal dashed line) in the direction of operator intention. The solid curve shows the locus of the one-tailed 0.05 probability for so large a deviation as the database size increases.

Fig. I.2.2 Figure Caption

Fig. I.2.2: Remote perception experiment. The dotted curve shows the cumulative deviation of the trial Z-scores from expectation (horizontal dashed line). The solid curve shows the locus of the one-tailed 0.05 probability for so large a deviation as the database size increases.

Fig I.2.1

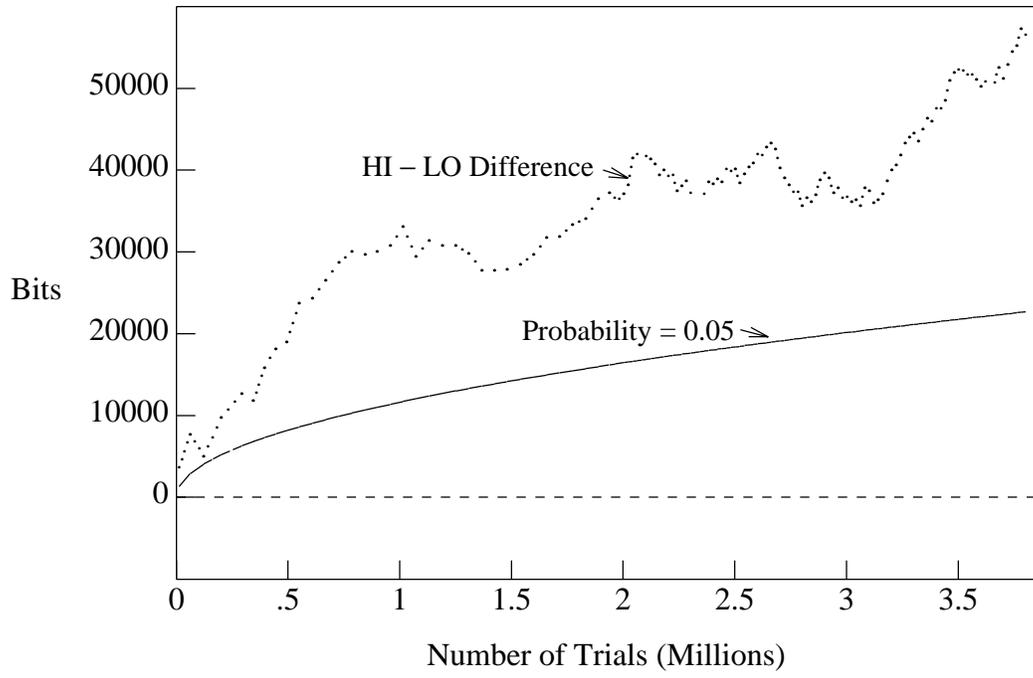


Fig. I.2.2

