Human Interconnectedness:

Research Indications

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Introduction

This paper deals with connections—connections between different parts of the mind, between mind and body, between people, between people and animals, between people and all of Nature. When I suggest that we are all connected, not only with each other but with all of Nature, I do not mean this in the more trivial sense that we are composed of the same physical materials, the same elements and chemicals—materials which ultimately began as "star stuff" created with the formation of stars in nurseries such as the Great Nebula in Orion. Nor do I mean this in another trivial sense: that we walk upon the same soil and breathe the same air. Statisticians tell us that the odds are extremely high that within the last minute we actually have inhaled and exhaled some of the very same air molecules that Julius Caesar breathed over two millennia ago. This is remarkable. However, the connections discussed in this article are, I think, more remarkable and more profound.

Our senses, our everyday observations, and the reports we find in our daily newspapers and in radio and television broadcasts do not hint of our connectedness. Rather, they suggest that we are isolated, self-contained individuals, inhabiting and struggling within circumscribed niches while satisfying individual needs. There is a striking painting by George Tooker, *Landscape With Figures II*, that perfectly portrays this view. Men and women sit in their separate compartments, cut off from one another by tall barrier walls, with looks of estranged oppression on their faces. We often feel the truth of this view. We are no strangers to feelings of isolation, loneliness, separation, disharmony.

At other times we feel differently. We are overwhelmed by feelings of commonality, sharing, harmony, union, and communion. It is as though while looking at the many apparently separate mountain peaks of a Chinese landscape, the mists suddenly melt away, revealing the mountains' previously obscured lower interconnections and continuities.

Which of these views is the valid one? Are we fundamentally separate individuals, isolated and unique? Or are we intimately interconnected and united? I think we are both of these things. These views and ways of being are complementary rather than opposed, paradoxical rather than contradictory. Each is true. Each is incomplete without the other. And like the paradoxical nature of light, which is both particle and wave, substance and energy field, the true nature of humanity depends upon how it is observed; different methods reveal different aspects.

Methods and Conditions of Observation

When physicists observe light by passing a beam through a large single slit in a sheet of metal, or when they set up experiments to demonstrate the "photoelectric effect", light behaves as though it were composed of individual packets or particles. When the same light is allowed to pass through two adjacent slits, it produces patterns revealing that it is composed of interfering fields of waves. Similarly, it is possible to learn different things about ourselves, our natures, and our capabilities by using different techniques or conditions of observation. Since human beings are more than physical, chemical, and biological systems (i.e., since they are psychological and social systems as well), our most interesting methods and conditions of observation are psychological rather than physical ones.

When either an observer or the person observed strives to accomplish goals in an effortful and egocentric manner, when he or she utilizes psychological methods rich in verbal and analytical detail, and when either individual can be characterized as being physiologically aroused (especially when driven by strong negative emotions), mentally distracted, and outwardly-directed, certain conclusions can be reached concerning their nature and capabilities. In our culture, we are quite familiar with those conclusions. They portray the commonly accepted view of human nature and can be found in any introductory psychology textbook.

But these methods and conditions obscure another side of our nature. If we make observations of people when they are using the complementary methods and conditions of imagery, nonverbal information and nonanalytical functioning, under conditions of relatively low physiological activation or arousal, when their attention is directed inwardly and is well-focused and relatively free from distraction, when they are functioning more effortlessly using a different form of intentionality and are filled with less egocentric motives and with strong positive emotions, a startlingly different picture emerges. Everyman and everywoman become less like their familiar, psychology textbook caricatures and more like the special beings who inhabit the writings of quantum physicists, mystics, and psychical researchers.

The remainder of this article will be devoted to this new picture of humanity that emerges when people are encouraged to use five simple yet powerful mental techniques: relaxation and quietude, focused attention, imagery and visualization, confident yet effortless intentionality, and self-evoked positive emotions. We shall see that these simple techniques serve as pathways to connectedness and that they allow us to remember and to gain access to important and useful interconnections that otherwise are ignored. In discussing these techniques and their effects, I shall draw primarily upon my own researches and experiences, supplementing them, when appropriate, with those of former and present colleagues.

Relaxation and Quietude

In virtually all of our experiments, we begin "setting the stage" by asking the participant to relax. Often, we use formal induction procedures to help bring about relaxation of the

muscles (using variations of Jacobson's progressive relaxation exercises[1]), quieting of the autonomic nervous system and of the emotions (using the psychophysiological phrases of autogenic training[2]), and stilling of the mind (using proto-meditational techniques[3]). Like the other four mental techniques discussed below, relaxation is a skill that can be developed and improved through practice. Entering a state of relaxation and quietude helps reduce bodily and other distractions that ordinarily prevent the efficient deployment of attention. Relaxation helps bring about a hypometabolic condition characterized by reduced activation of the sympathetic branch of the autonomic nervous system. As Edmund Jacobson[1], Herbert Benson[4] and many others have shown, this condition of lowered arousal is one that is beneficial to physical health and to psychological well-being. It is also effective in disrupting pernicious trains of thought or activities that otherwise produce needless anxiety and needless expenditure of energy. A straightforward understanding of the role of relaxation may be gained from this simple analogy. If we go outdoors during the daylight hours and look into the sky, we cannot see a single star. The stars, of course, are there, but their feeble light is overwhelmed or masked by the much more intense light of the sun. At night, when the bright, masking sunlight has been reduced, millions of stars now become visible. Entering a state of relaxation and quietude reduces the shouting voices of distractions so that more subtle whispers become audible. Freed from distractions, we are better able to direct attention inwardly to detect thoughts, feelings, and images that otherwise would be ignored. In the words of Achaan Chaa:

> "Try to be mindful and let things take their natural course. Then your mind will become quieter and quieter in any surroundings. It will become still like a clear forest pool. Then all kinds of wonderful and rare animals will come to drink at the pool. You will see clearly the nature of all things in the world."

And in those of Alan McGlashan:

> "Delight is the secret. And the secret is this: to grow quiet and listen; to stop thinking, stop moving, almost to stop breathing; to create an inner stillness in which, like mice in a deserted house, capacities and awarenesses too wayward and too fugitive for everyday use may delicately emerge."

Attention Training

Focusing attention upon any object (whether inside the body or outside) establishes a two-way communication channel with that object—a channel that can be used to gain knowledge about the object or to influence it. Like relaxation, the efficient deployment of attention is a skill that may be improved through practice. The practicing methods are variations of the two major forms of meditative discipline: learning to focus or concentrate attention (through the use of various centering devices to which one gently returns attention once the mind strays) and learning to open up attention, to be fully aware and attentive to everything that happens with a "beginner's mind."[5] Attention training is work that one does in one's mind. One practices, succeeds, and thereby acquires a mental skill of control

and coping that generalizes to other aspects of one's life with attendant increases in confidence, self-esteem, and the more efficient deployment of one's resources. Attention training further increases the ability to ignore distractions and to more efficiently access signals of all types.

Imagery and Visualization

Once attention has opened a communication pathway or channel, images provide the vehicles for carrying information back and forth through that channel. To use imagery is to exercise the faculty of imagination. Jeanne Achterberg has defined imagery in a very simple way: It is simply thinking without words.[6] Patricia Norris suggests using "imagery" to refer to wordless thoughts that arise spontaneously in one's mind, and using "visualization" to refer to deliberately constructed wordless thoughts directed toward some desired goal.[7] Images and visualizations are nonverbal languages that represent knowledge and actions in a sensory-like fashion. Being primarily visual beings, we tend to emphasize the visual modality, but images and visualizations can involve auditory, gustatory, olfactory, tactile, and kinesthetic modes as well. In fact, it is generally believed that the more complete an image (i.e., the greater the number of senses participating), the more valid or effective that image will be. Imagery appears to be a preferred language for mind/body intercommunication and can be used *to learn about or diagnose* otherwise unknown aspects of our minds and bodies. Images also can be used for *influencing* our minds and bodies and, as we shall see below, for influencing other minds, other bodies, and external reality as well. In communicating with nonverbal systems within one's body or elsewhere, it makes sense to use a nonverbal language. Like relaxation and attention, the ability to think in images is a latent skill possessed by all of us in varying degrees and one that can be developed through practice.

Intentionality

In this culture, we have overlearned a particular form of intentionality. This is an effortful, striving form, the nature of which is captured well in the phrase "will power." If we wish to move something, we push it; if it doesn't move as much or as quickly as we would like, we push harder. This strategy serves us well in many situations. In other situations, however, another form of intentionality is more appropriate. This is a form of passive volition or effortless, strivingless intention that is more like a gentle wish than a strong and active will. It is epitomized by the Taoist concept of *wei wu wei*, "doing without doing." Effortful striving (trying hard to *make* things happen) interferes in areas such as musical performances, skilled athletic performances, biofeedback and physiological self-regulation, meditation, imagery and creativity. In these and similar domains, a less effortful intentionality is more successful. One fills oneself with a strong, confident belief and expectation that the desired outcome has already occurred, then removes one's ego-involvement with making things happen and lets the process take care of itself. The efficacy of this form of intentionality reveals a truly effective teleological, goal-directed process in Nature that complements the more familiar process-oriented, causal principles. In the experiments to be discussed in this article, we encourage our participants to be less striving and more effortless, yet focused, in approaching the goals they are seeking to

accomplish through mental means.

Strong Positive Emotions

Recent investigations within behavioral medicine and health psychology are revealing the health benefits of positive emotions such as joy, humor, love, belongingness, peacefulness, and serenity.[8] Strong positive emotions can inhibit momentarily weaker negative emotions, and they can serve to break up pernicious patterns of habit, action, and thought. Perhaps most importantly, strong positive emotions can provide high levels of motivation, meaning, need, importance, and salience to a wide variety of tasks and serve as driving forces behind their initiation, maintenance, and completion. In our experiments, participants use memory skills to recall and then vividly relive periods in their lives in which they experienced strong positive feelings. They then use their imagination to leave behind the context of the original experience but bring the emotion itself into the present, amplifying it and maintaining it for as long as possible. They can then flavor their assigned tasks with this emotion to give it added relevance and heightened intensity.

On the Origins of These Techniques

These mental methods and observations of their putative effects did not emerge from modern Western psychological, medical, or scientific traditions. Rather, they were discovered and utilized by early practitioners of mesmerism and hypnosis, and by students within various esoteric, magical, mystical, meditative, and therapeutic systems. Centuries ago, techniques of attention and imagery control were being developed, perfected, and used for various purposes by persons within these traditions. Decades before they began to be explored and validated in research laboratories, these techniques of imagination and positive thinking were being systematized and put to practical use by persons such as the New England mesmerist and "mental healer" Phineas P. Quimby[9] whose work in the mid-1800's set the stage for the founding of Christian Science by his most famous patient, Mary Baker Patterson Eddy, and by originators of mental self-development programs such as Émile Coué,[10] who originated mental healing techniques of autosuggestion in Nancy, France during the first two decades of this century, and José Silva,[11] who began developing his "mind control" system of mental development in this country about 25 years later. Contemporary investigators of biofeedback, physiological self-regulation, behavioral medicine, and psychoneuroimmunology are rediscovering, extending, validating, and making "respectable" various effective mental techniques that have long been with us.

Connections Within One's Individual Mind

The five mental methods discussed above can be used to become aware of and to integrate aspects of one's own mental functioning that otherwise are ignored or isolated. For example, previously "unconscious" materials may come into awareness via imagery, especially under conditions of lowered somatic arousal induced by relaxation procedures. Imagery, attention, and intentionality may allow the identification and integration of previously "dissociated" aspects of one's personality (the extreme form of which is the "multiple personality disorder"). Previously isolated patterns of knowledge may come

together in a creative fashion to yield new insights and more balanced and more complete functioning. In our own research, relaxation, imagery, and positive emotion exercises have yielded indications of improved psychological integration and well-being.[12,13] We also have found that originality and creativity may be facilitated by the use of an experimental technique that has rich components of relaxation, effortless intention, and heightened imagery—the *ganzfeld* technique.[14]

The Ganzfeld Procedure

Ganzfeld is a German word meaning "whole or entire field". It refers to an experimental procedure of mild sensory restriction in which a person is exposed to unpatterned visual and auditory stimulation. A favorite modern method for inducing a ganzfeld experience is to have a person recline comfortably and gaze into a uniform source of red light through translucent eye covers while listening to moderately loud, monotonous white noise. The experience is one of floating in or being bathed in a sea of homogeneous red light and homogeneous sound. The technique was used originally in studies of sensory and perceptual psychology.[15] Later, it was adapted for clinical use as a means of producing an experimental hypnagogic state similar to an artificial dream and was employed in attempts to study dreamlike transformations of materials.[16] The experimental procedure induces drowsiness and vivid imagery.[17] The participant experiences something akin to a waking dream while remaining aware of its content. The spontaneously unfolding imagery can be described as it happens and the content tape recorded. The loud white noise interferes somewhat with the normal hearing of one's own voice and results in a lessening of censorship of what one says. The experiencer spends the initial moments of ganzfeld exposure attending to and discussing the sensory properties of the light and sound. As stimulation continues, attention drifts from the formal characteristics of the stimulation to memories associated with the light and sound. As stimulation continues further, memories and associations become more remote. Finally, mentation becomes quite free and "random". Parapsychologists have made use of this phenomenon because some of the thoughts, feelings, and images that occur during later phases of ganzfeld stimulation have been found to accurately reflect distant target events to which the participant's attention and intention had previously been directed. Indeed, we have found enhanced "paranormal" functioning in persons undergoing ganzfeld stimulation, compared to a nonstimulated control condition (see below).[18] As mentioned above, we have also found ganzfeld stimulation to facilitate creativity.

Recently, Marilyn Schlitz and Charles Honorton have put these three components—ganzfeld stimulation, paranormal functioning, and creativity—together in a single experiment with exceptional results. Highly creative students of The Juilliard School participated in a ganzfeld/paranormal functioning study in which they attempted to become aware of the content of pictorial targets (either dynamic videotapes or static video stills) that were being viewed by another person (an "agent") who was stationed in a separate, sound- and electrically-shielded room. The ganzfeld imagery content of these creative participants matched the target content (as assessed by an automated, blind judging procedure) to a striking degree, producing highly significant results that were twice the value that would have been expected by chance alone and higher than those of any other

group of participants previously tested under these conditions.[19]

Jeanne Achterberg[6,20] has reminded us that most, if not all, natural healing systems, from Asclepian dream therapy to modern hypnotherapy and psychoimmunology, make use of *images* presented to patients who are in a *state near sleep*. In this context, the ganzfeld procedure would appear to hold great promise as a self-healing tool, since it possesses exactly those two characteristics and is quite easy to use.

Connections Between Mind and Body

There now exists an enormous body of research reports that reveal the profound connections of body and mind. Indeed, these connections are so intimate and pervasive that they have prompted several contemporary researchers to no longer distinguish the two, but to speak instead of a single entity—the body mind.[21] Countless findings from the areas of hypnosis, sleep and dream research, biofeedback and self-regulation, meditation, psychosomatic medicine, psychotherapy, mental rehearsal, sports psychology, and the burgeoning new field of psychoneuroimmunology indicate that mental processes such as thoughts, images, and feelings can have dramatic influences upon the body and that somatic conditions can have important impacts upon mental states and functioning. Some of these influences are healthful, others harmful. The negative effects were the first to be recognized by psychotherapists and physicians. It is only much more recently that the complementary positive effects have come to be investigated. Even today, the possibility that mental processes can have positive influences upon health and well-being remains highly controversial and is vigorously opposed in some quarters.[22]

In our own research, we have found that practicing the five mental techniques described above can have dramatic effects upon a variety of bodily systems. The practice of mental exercises for relaxation and quietude was associated with significant reductions of bodily tension and general improvements in home and classroom behavior and improvements in academic performance in children with attention deficits and hyperactivity.[12] Quieting one's body and mind and simply focusing attention upon one's breathing without attempting to control it in any way for periods as brief as four minutes can have a significant influence upon heart rate and blood pressure. Practice of these same methods for longer periods of time (once a day for a period of two weeks), along with the use of positive imagery and self-evoked positive emotions, significantly increases the degree to which one can voluntarily control one's blood pressure. These findings hold for persons with normal blood pressure as well as for those with high blood pressure; for the latter, the effects occur for persons taking blood pressure medications and for those who are unmedicated.[23] In other experiments, we have found that the twice-daily practice of relaxation, imagery, and positive emotion mental exercises for periods as brief as seven days was associated with changes in immune system components that carry out "search and destroy" missions against upper respiratory infection agents and against precancerous and cancerous cells in the body. Significant changes were observed in numbers of neutrophils (11 percent increase) and natural killer cells (17 percent increase) in normal, healthy women.[13] Earlier pilot studies had indicated similar natural killer cell changes in women with Stage 1 breast cancer.[24] A formal comparison of effects among women in good health,

women with Stage 1 breast cancer, and women with benign breast disease is currently in progress and is expected to be completed soon. Similar studies are now being conducted with adult patients with asthma, with and without allergic components, and we plan to extend this work to include persons with chronic fatigue and immune dysfunction syndrome. In addition to these formal studies, we have often used combinations of these five techniques, with success, in informal clinical trials with persons suffering from excessive anxiety, stress-related complaints, phobias, sleep disorders, concentration and attention difficulties, and various forms of pain.

We are now curious about the relative contributions of the five mental processes and about the degree of specificity of imagery-induced changes. How specifically and effectively can mental processes be focused upon particular organs, tissues, or cells, to the exclusion of others? If the body-mind is as interconnected as we now believe it to be, we would expect to find that specific thoughts or images can have quite specific somatic effects. Perhaps the most exciting evidence for such specificity comes from a study recently reported by Mark Rider and Jeanne Achterberg in which it was found that imaging neutrophils was associated with significant changes in neutrophils but not in lymphocytes, whereas imaging lymphocytes was associated with significant changes in lymphocytes but not in neutrophils.[25] These findings are important to our thinking about mind/body connections because they indicate that different densities of attention within the mind are mirrored by different densities of components or functions within the body.

Connections With Other People

The types of mind/body interactions mentioned above are usually understood and explained in terms of the networks of anatomical, hormonal, biochemical, and electromagnetic connections that link the cerebral cortex, the limbic system, the autonomic nervous system, the endocrine system, and the immune system. The central dogma of modern neuroscience is that mental processes such as thoughts, images, and feelings are simply specific spatiotemporal patterns of neural activity. It should not be surprising that the brain patterns associated with certain types of cognitive activity could influence other neural systems, which in turn could influence specific neurohormones, secretions, and groupings of cells anywhere in the body. There are many interconnections, but since they involve only known mechanical, chemical, and electromagnetic forces, their actions should be limited to the body itself or to nearby objects that remain accessible to these short-range forces.

Such a view, however, cannot adequately account for the vast number of *nonlocal interpersonal interactions* that have been documented in careful field studies and in well-controlled laboratory investigations. These are cases in which the experiences, thoughts, images, and feelings of one person appear to directly influence the mental or bodily processes of another person, even when the two persons are at a great distance from one another, beyond the reach of the conventional senses, and shielded from all conventional energetic and informational influences.

These phenomena were encountered frequently by early practitioners of mesmerism and

hypnosis.[26] There were reports of special rapport between hypnotist and subject which allowed a hypnotized person to have direct subjective experiences of tastes, odors, pinpricks to the skin, and other sensory stimulation delivered to the hypnotist, even when the two parties were located in separate rooms and precautions were taken to rule out subtle cues. This phenomenon was called "community of sensation" and it was so common that it and other similar occurrences had a special name, "the higher phenomena of hypnosis." The higher phenomena also included effective mental suggestion of specific actions at a distance (often over kilometer distances), induction of hypnosis itself at a distance (without the subject being aware of the prespecified time of the remote hypnotic induction attempt), and "traveling clairvoyance" in which the hypnotized subject had the subjective experience of traveling to a distant location and could provide a veridical report of the furnishings, people, and actions at that distant target location (even though the subject had never visited the site previously). Through time, as practitioners of hypnosis increasingly sanitized the phenomenon, in order to increase its respectability and acceptance by medical and other established figures, we find fewer and fewer descriptions of the higher phenomena. There was also a change in the hypnotic induction procedure itself. Prolonged and intensive patterns of mesmeric passes, in which the mesmerist made hand movements over the full length of the subject's body (continued, in some cases, for several hours and said to result in a profound "plenary trance"[27]) eventually were replaced by the relatively brief, mild, and cursory verbal inductions of contemporary hypnosis researchers. Perhaps we find little reference to the higher phenomena today because hypnosis as practiced by the majority of current researchers and therapists is such a pale imitation of its original form that the necessary preconditions for the higher phenomena are no longer being met.

There were, and continue to be, many other forms of nonlocal interpersonal interactions. There are cases of "crisis telepathy" in which someone (typically a loved one or close acquaintance) becomes immediately and directly aware of a dangerous or life-threatening experience of another person who is many (perhaps thousands of) miles away.[28] There are "telesomatic" experiences in which one person feels or exhibits the pains or injuries of another distant person who is far beyond the reach of the senses.[29] There are the countless "curious coincidences" in which one thinks about someone for the first time in years, only to receive an unexpected phone call or letter from that person within a short period of time.[30]

These and other similar phenomena suggest profound connections between even distantly separated people—connections that allow the remote, interpersonal sharing of thoughts, feelings, imagery, and even physical reactions. For those for whom such reports are too "anecdotal", we can offer findings of similar phenomena that occur in well designed laboratory studies that follow careful experimental protocols.

Studies of Direct Knowing

We have conducted many studies of *direct knowing* in which one person indicates her or his connections with another, distant, person by accurately describing the mentation of that person. As in the mind/body studies described earlier, we make use of the five mental

processes in order to help set the stage for these nonlocal interactions and to increase the likelihood of their occurrence, detection, and accurate reporting. Possible sensory cues and conventional energetic and informational interactions are eliminated by means of sensory isolation, shielding, and physical separation of the two parties. During the experimental session, the two parties occupy different rooms. In most experiments, the two rooms are approximately 20 meters apart. However, spatial separations as great as 1400 miles and 6500 miles have been used with no important diminution of results. Artifactual correspondences and similar reactions to common external stimuli or internal cues or rhythms are ruled out through the use of truly random selection of the target materials to which the *agent* is exposed. Random target selection also eliminates descriptions of probable target content based upon rational inference. Coincidental or chance correspondences are ruled out through the use of conventional statistical analysis of results. Accuracy is determined objectively through blind judging procedures.

In a typical experiment, a target is selected randomly (using an electronic random generator, a computer's pseudorandom generator, or a table of random numbers) from a large pool of items. The target items may be photographs, art reproductions, slides, or other pictorial materials. The agent views the target picture for a brief period of time, typically 5 or 10 minutes, devoting full attention to the picture. The agent also maintains an intention for the distant *percipient* to become accurately aware of that target picture. The agent may also use goal-directed imagery or visualization of a successful outcome—i.e., a close match between the agent's mentation and the percipient's mentation.

Meanwhile, at a distant location, the percipient has been prepared through the use of quieting exercises. Progressive relaxation, autogenic training, meditation, and hypnosis procedures have been used for this purpose in various experiments. The percipient's attention is directed away from external and internal distractions and is directed toward the particular agent for that session; the percipient's intention is to become accurately aware of what that agent is experiencing (the agent's experience is determined by the target picture that he or she is observing). The percipient's attention is also directed inwardly to thoughts, feelings, and images that may serve as "vehicles" that carry target-relevant information into consciousness. The percipient is instructed to avoid effortful striving as much as possible, but to simply observe his or her spontaneously occurring mentation, to remember it, and to report it later in the form of drawings and brief descriptions. Images and feelings are emphasized, whereas words, analysis, and interpretations are discouraged. The percipient is asked to confidently expect a successful outcome. In some experiments, ganzfeld stimulation (described above) is used in order to help the percipient free attention from distractions, direct attention inwardly, and generate very rich visual imagery that can serve to carry target-relevant information.

When the experiment is over, blind judges evaluate the degree of correspondence between the percipient's protocol (drawings and comments) and each of several pictures, one of which was the actual target and others of which are "decoys" that were not viewed by the agent (typically, there is one correct target and three or five alternate pictures or decoys). Rating scales, rankings, and appropriate statistical analyses are used to determine whether the percipient's impressions matched the actual target to a significantly greater degree than

they matched the decoys. The experiment is repeated many times with different persons playing the roles of agent and percipient, in order to generate a sufficiently large number of results for statistical analysis. Generally, these experiments have yielded strong evidence for nonlocal interpersonal interactions. Not only are the results quantitatively significant, but the quality of the correspondences is often quite impressive.[31] For example, a randomly selected target picture to which the agent is attending depicts Santa Claus with his familiar red suit and boots, both with grey fur trim, his right foot elevated with his knee bent, and his sack of goodies close at hand (the session did *not* take place during the Christmas season). The percipient's complete, unedited impressions protocol reads: "I saw a vodka bottle; a woman, Czech or Slovak, in a red winter outfit, boots, grey fur trim, grey hat, foot elevated with knee bent." In another session, the agent's randomly selected target was a magazine ad showing two crossed, frosty bottles of Coca-Cola. In this session, the percipient reported: "Two crossed lines...a frosted glass filled with Coca-Cola...." When art reproductions are used as targets, it is not unusual for the percipient to correctly name the artist, and sometimes even name the painting itself. For example, when a color reproduction of Vincent van Gogh's *Boats at les Saintes-Maries* was randomly selected as a target, the percipient reported: "Impressions of...a boat, like in van Gogh's boat picture...seagull in flight, flying over rocks...wood...water...." In another session, an agent 6500 miles from the percipient is looking at the randomly selected reproduction of Pierre-Auguste Renoir's *Dance at Bougival* which depicts a theme of jollity at a tavern on the banks of the Seine: In the foreground, a man dressed in black with a hat and a woman with a bonnet dance, his outstretched hand clasping her outstretched hand; in the background are people seated at tables in lively conversation; a glass beer mug and a glass beer pitcher, both half filled with beer, are visible on a table. The percipient reports: "...A woman with a hat or bonnet...a man with a cap...several figures, like a French Impressionist painting by Monet or Renoir...a glass beer mug filled with beer, or a ceramic beer stein...pub atmosphere...jollity, lively, people with round rosy cheeks...a hand holding another hand...clasped hands...nostrils, eyes, at an angle...black, soft shape at the lower left, boomerang shaped...."

These results are not atypical. Many similarly successful experiments have been reported by many investigators. One of the largest and most carefully scrutinized series of experiments of this type has been the subject of a thorough meta-analysis of its overall results.[32] Its overall outcome was found to be associated with an extremely high significance level (9×10^{-14}) and a respectably large mean effect size (.28). We have found that the likelihood and accuracy of these direct knowing effects increase under conditions of sensory restriction, hypnosis, muscular relaxation, mental quietude, and reduced sympathetic nervous system arousal.[18,33]

Studies of Direct Mental Influence

The direct knowing experiments indicate that it is possible for one person's mental processes to influence those of another person, directly and at a distance. We have also conducted experiments that indicate that one person's mental processes are able to influence, directly and at a distance, the physiological activities of another person. In these studies of *direct mental influence of living systems*, two participants are stationed in

separate rooms. During randomly determined periods, one of the participants uses some combination of the five mental methods described earlier in order to influence the bodily reactions of the other participant in a prespecified manner. Reactions during those influence periods are contrasted statistically with reactions during noninfluence control or baseline periods. The person whose activity is being monitored is blind regarding the nature, timing, and scheduling of the influence and noninfluence periods. Under the conditions of the experiment, ordinary communication between the two participants is not possible. As in the direct knowing experiments, precautions are taken to exclude artifacts or confounds due to sensory cues, alternative conventional communication channels, responses to common external cues or internal rhythms, and coincidence. Automated recording of physiological reactions assures objective measurements free from observer bias or recording errors. Multiple sessions with many participants provide sufficiently large databases for statistical analysis and for generalization of results.

The person (the "subject") whose physiological reactions are being monitored automatically by a computer system simply sits in a comfortable room for about 20 minutes while being receptive and open to possible remote mental influences from the other person (the "influencer") whom he or she met prior to the session. The subject maintains an intention that appropriate bodily reactions will occur during the influence periods. The subject is instructed not to attempt to make deliberate, conscious guesses about when the influence attempts might be occurring, but rather, to let the mind and body be as freely variable, unconstrained, and unstructured as possible throughout the session.

The influencer uses mental processes of intention, focused attention, and goal-directed imagery in order to bring about increased calmness or increased activation or arousal in the distant subject during the randomly scheduled influence periods; during the noninfluence (control or baseline) periods, the influencer attempts not to think about the subject or the experiment. During periods in which the aim is to calm the distant person, the influencer calms himself or herself using techniques for self-induced relaxation and quietude, and vividly imagines and visualizes the subject in situations that would be calming if they were actually encountered by the subject. During activation-aim sessions, the influencer substitutes complementary strategies of increased self-activation and uses images and visualizations of the subject in activating rather than calming situations.

In some experiments, the influencer receives immediate feedback (in the form of polygraph pen tracings of the remote subject's ongoing physiological activity); in other experiments, such feedback is not provided. It appears that this feedback may be useful to some influencers in that it helps focus attention upon the desired reactions, allows trial and error testing of various influence strategies with immediate knowledge of results, and may have motivational effects. However, feedback may be distracting during certain phases of the experiment for some influencers. We have found that feedback is not essential to the occurrence of the effect.

Analysis of a large number of experiments indicates that persons are indeed able to influence the ongoing physiological reactions of distant persons in prespecified directions using mental methods.[34] We have conducted 323 sessions in which persons attempted

direct mental influences upon distant persons' autonomic nervous system activity (as measured by changes in ongoing, spontaneous electrodermal activity), 41 sessions in which the aim was to influence the distant persons' blood pressure, 40 sessions in which the aim was to influence slight, unconscious muscular movements, and 19 sessions in which the aim was to influence the amount of muscular tremor exhibited by the distant subject. A complete meta-analysis of the results of these and other (see below) direct mental influence experiments yielded strong evidence for positive overall results with a very high significance level (2.6×10^{-14}) and a respectably large mean effect size (.33).

Remote Staring Detected Physiologically

We have used a variation of the direct mental influence procedure in order to explore intention and attention in a purer form. Rather than attempt to influence a distant person's physiology in a particular direction, persons were asked to simply direct attention toward a distant physiologically-monitored person. They did this by gazing intently at the monitored person's image on a closed-circuit television monitor. The monitored person did not know when he or she was being watched remotely. Brief staring periods were randomly interspersed among nonstaring (control) periods. Thus, we were able to produce an experimental arrangement that allowed us to explore the commonly reported experience of awareness that one is being stared at by someone out of one's field of vision. The television arrangement ruled out the possibility of subtle sensory cues. In four separate experiments, involving a total of 78 sessions, we found that persons' electrodermal activity levels were significantly different for staring *versus* nonstaring periods; i.e., remote attention had a measurable influence upon a distant person's autonomic nervous system activity. In "sham control" sessions in which the procedural and analysis details were exactly the same, but true staring did not occur, these electrodermal differences did not occur. Thus, the experiments demonstrated that attention can have significant nonlocal effects.[35]

Connections Between People and Animals

Many of us do not need reminders of the special bonds that exist between people and animals. We were able to provide empirical support for the existence of special human-animal connections in experiments in which animals served as the "target organisms" for another series of direct mental influence attempts. In 40 experimental sessions, human participants were able to influence the spatial orientation of small knife fish that were isolated in a distant room (and whose orientation was assessed through automated equipment), and in another 40 experimental sessions, human participants were able to influence the rate of locomotor activity of small mammals (gerbils) that were isolated in a distant room and automatically monitored.[36] The participants used goal-directed imagery, focused attention, and goal-oriented intentionality strategies in order to bring about these behavioral changes in distant animals.

Connections Between People and Objects

But what about inanimate targets? Do special connections exist between humans and

inanimate objects that might allow the humans to access information about those objects even when they are removed from the reach of the senses or to influence objects when ordinary means of influence are precluded? The empirical answer to both of these questions is *yes*. A substantial body of evidence indicates that people are able to accurately describe randomly selected target objects that are shielded from vision (and other sensory access) and often placed at great distances from the participants.[37]

The terms "clairvoyance" and "remote viewing" are often used to describe these experiments. We prefer to simply call them "direct knowing" experiments in which the targets happen to be inanimate objects. In our own studies of object direct knowing, a small object is randomly selected from a large pool of objects. The object is placed in an attractively wrapped white box in a distant room. The participant is asked to relax, then to direct attention to the contents of the distant box and describe and draw the images that come to mind. Persons are able to describe small physical objects and pictures sealed in envelopes in distant rooms with accuracy beyond what would be expected on the basis of chance or mere coincidence. I have space for only one example. A skeptical physiologist agreed to take part in such an experiment. The full, unedited transcript of the participant's imagery is as follows. "A doll, blond hair, pink dress, with a little apron. Nothing else, except a dark glass (brownish-bluish) free-form ashtray. Doll image most persistent, no movement, very static image." The randomly selected target object concealed in a box in a closed and locked room 20 meters away was a small ceramic doll with blond hair, a bonnet, and a pink and blue dress.

Not only are persons able to learn about "inaccessible" objects, but they are able to influence them as well. Direct mental influence experiments succeed not only with freely varying animate systems as targets, but also with inanimate randomly behaving mechanical and electronic systems. Through "wishing" intentions and goal-directed imagery, persons are able to influence bouncing dice and sensitive electronic random event generators that operate on the basis of quantum fluctuations (radioactive decay or thermal noise in certain semiconductor electronic components). These random event generators were originally designed and developed by physicist Helmut Schmidt who has used them to conduct many remarkable experiments. Recent meta-analyses of 148 dice experiments[38] and over 800 random generator experiments[39] provide strong evidence for the reality of these effects in which human consciousness appears to interact directly with the physical world. We have found that persons' ability to mentally influence an electronic random generator improved following prolonged practice of visualization exercises (intensive daily practice for six weeks).[40] There are also indications that meditation experience or martial arts training may enhance these direct mental influence abilities.[41] We have found in other experiments that persons are able to influence the flickering flame of a candle that is located in a shielded enclosure in another room; the flickering was measured photometrically.[42] This indicates that direct mental connections between persons and objects may extend to the macroscopic level.

Connections With Cells

Still other experiments indicate that persons are able to influence distant *in vitro* cellular

preparations. In 74 experimental sessions, we found that persons were able to exert direct mental influences upon the rate of hemolysis of human red blood cells.[43] There was a slight, nonsignificant tendency for the effect to be stronger if the cells were one's own; however, influence of the cells of another person was also possible. The cells were osmotically stressed by placing them in test tubes containing hypotonic saline. Since the cell-saline solution becomes increasingly transparent to a certain wavelength of light as cell-destruction (hemolysis) proceeds (i.e., as the cell membranes rupture and their hemoglobin content leaks into the surrounding medium), the time course of hemolysis can be objectively plotted through the use of a spectrophotometer interfaced with a microcomputer. In a distant room, the participants directed their attention to the cells and generated goal-directed imagery of the red blood cells remaining intact and resisting the osmotic stress; i.e., they sought to mentally "protect" the distant cells.

These experiments reveal connections between an individual's thoughts and images and the activities of distant cells. Their results have obvious implications for the reality of remote healing effects of the types described by proponents of mental healing, faith healing, spiritual healing, or absent healing. They also suggest that these same mind-cell interactions may be occurring within one's body at all times, or at least upon certain occasions. These direct mental connections may complement the more familiar anatomical, biochemical, and electromagnetic somatic interconnections that are currently being explored in psychoneuroimmunology, and may be implicated importantly in some of the precise and rapid bodily changes observed in hypnotic, biofeedback, psychosomatic, and placebo contexts. Ordinarily, we cannot measure and study possible direct mind-body interactions within the body because they cannot be distinguished from those mediated by the more familiar mechanisms mentioned above. But this does not mean that they are not present and serving adaptive and regulating functions. Under special conditions (such as those of the remote hemolysis influence experiments), the more conventional influence mechanisms may be eliminated to reveal what direct mental influence can accomplish in isolation.[44] Similar direct mind-cell interactions may even be occurring in the electrodermal and autonomic staring detection sessions mentioned earlier, but in those cases, the influences are upon the similar cells of another person, rather than one's own.

In addition to the limited studies described in this section, there exist many published reports of experiments in which persons were able to influence a wide variety of remote cellular and other biological systems through direct mental means. The target systems for these investigations have included bacteria, yeast, fungi, mobile algae, plants, protozoa, larvae, insects, chicks, mice, rats, gerbils, cats, and dogs, as well as cellular preparations (blood cells, neurons, cancer cells) and enzyme activities. In human "target persons", eye movements, muscular movements, electrodermal activity, plethysmographic activity, respiration, and brain rhythms have been affected through direct mental influence. Many of these experiments are reviewed in papers by Jerry Solfvin and Daniel Benor.[45] Technical details of our own experiments are available elsewhere.[34]

Explanatory Models

How are we to understand these findings that indicate that persons are able to know about

and influence distant persons, animals, and things that are beyond the range of their conventional senses and motor systems? Two general types of theoretical explanations have been proposed. The first set of explanations propose that we are able to do these things by means of something analogous to "mental radio". According to this view, human brains (or, conceivably, some other organ within the body) may be able to generate, transmit, receive, and interpret some form of force or radiation which can travel from place to place and carry information and the potential for influence. The force or medium for such effects would be similar to familiar electromagnetic radiations. It is not widely known that a major tool of modern neuroscience, the electroencephalograph (EEG) originally was developed for the very purpose of measuring this proposed radiation by the German neurologist/ psychiatrist Hans Berger, who had a strong interest in telepathy.[46] Berger did indeed succeed in recording the first human EEG tracings (the so-called "alpha" rhythms or "Berger rhythms") in 1924, but soon found that the electromagnetic brain radiations were of feeble magnitude and were barely strong enough to penetrate the skull and reach his scalp electrodes. These were not likely candidates for physical carriers that would have to travel great distances and have exquisite discriminating capabilities in order to account for telepathic findings. Further, telepathy and other forms of paranormal functioning (such as the direct knowing and direct mental influence phenomena described in this article) have not been found to interact with spatial distance, the physical makeup of the "targets", or physical barriers in a manner consistent with what is known about the behavior of physical forces and radiations. Early work in the Institute for Brain Research at the University of Leningrad in the 1920's and 30's by Leonid Vasiliev and his co-workers[47] indicated that anomalous distant influence and mental suggestion effects could not be blocked by careful electromagnetic shielding procedures. (It is also not widely known that one of the fathers of Russian reflexology, Vladimir Bekhterev, was actively involved in this kind of research and that even Ivan Pavlov himself addressed some of these issues.) More modern studies suggest that accurate direct knowing effects can occur across vast distances (on and even off of this planet[48]) and through one of the most effective shielding substances known—170 meters of sea water.[49] Perhaps the sole surviving candidate for a plausible physical carrier for at least some types of direct mental effects is extremely low frequency (ELF) electromagnetic radiation,[50] since ELF radiation can travel great distances and its magnetic component has great barrier-penetrating capabilities. Even this hypothesis has problems, however. We know of no plausible mechanism through which the brain could interact with a posited ELF carrier in order to encode (modulate) or decode (demodulate) the necessary information. It is difficult to understand how slowly changing, low bandwidth radiation such as ELF fields could carry sufficient information sufficiently quickly to account for some of the detailed and immediate remote perceptions that have been reported. Finally, the ELF hypothesis has difficulties accounting for the many time-displaced instances of direct knowing that have been observed (i.e., veridical "precognitive" experiences). It would be unwise, however, to abandon the ELF and similar physical hypotheses completely, especially in light of recent findings of reliable relationships between direct knowing effects and geomagnetic field (GMF) fluctuations[51]; the GMF has ELF components and can interact with ELF and other physical fields.

The second set of hypotheses suggest that in these remote interactions, nothing really "travels" from one place to another. Information or physical effects may emerge in the

human brain or at an influence target site through reorganization of the "noise", disorder, randomness, or chaos already present in the brain or target system. Quantum theorists Richard Mattuck and Evan Harris Walker have proposed models for these effects.[52] Alternatively, the information and change potentials may only appear to be localized but are actually already present everywhere in some holographic or implicit form. Like retrieving a memory, the problem then becomes one of *accessing* rather than creating or transmitting information. If this is so, processes of *observation* and *attention* would have prominent places in such models. Many of the relevant issues have been addressed in writings by David Bohm, Karl Pribram, William Roll, Larry Dossey, and Sperry Andrews.[53]

Some Final Comments

The research findings described above suggest that the mind can do what the brain itself as a physical organ cannot do—participate actively in nonlocal interactions. This in turn suggests that mind itself may be nonlocal. If this is so, is it reasonable to continue to speak of individual minds? Perhaps there is but one mind that extends throughout space and time. Could what we experience as our personal minds, or as individuality itself, simply be quirks of limited attention or observation, artifacts of familiarity? According to such a view, we would expect to find many connections of the type described in this article; they become natural, normal, and not any more unusual than a part of me deciding and then succeeding in wiggling another part of me that happens to be my left index finger.

When we look into the night sky, we see what appear to be randomly placed, unconnected points of light. If we change our perspective and view these stars from a greater distance, they reveal themselves as closely interrelated parts of a single, highly organized and highly patterned galaxy.

When we look into a forest, we see what appear to be randomly placed, individual, unconnected trees. If we change our perspective and look beneath the earth's surface, we see that the trees are not isolated at all but are interconnected by an elaborate network of roots that reach out from each tree to touch those of others.

Chris Aanstoos and William Roll[54] tell us of the Native American metaphor of the "long body"—a larger self that includes significant other people, places, and objects. The findings described in this article suggest that this concept may be more than a metaphor. The described phenomena should not be possible in the absence of profound, extensive, and real interconnections between people and between people and all of Nature. The findings invite us to change our perspective and gain a larger and more accurate view of human nature and human capabilities.

NOTE

Professionally recorded audio tapes of mental exercises of the types used in this research are commercially available; contact William Braud at the following e-mail address for further details: william@integral-inquiry.com.

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