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Of Time and the Mind

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Both present profound paradoxes, and their consideration leads to speculation about a holographic model for the structure of consciousness.

To think about thinking, to wonder about wondering, to feel strongly about feeling strongly: these are perhaps uniquely human forms of awareness. This capacity to reflect upon itself-i.e., reflection upon reflection-appears fundamental to the nature of human consciousness. This thinking about thinking about thinking ..., Arthur Koestler has called "the paradox of the ego spiral."[1] It is at once our triumph and our tragedy, for in this very human process reside equal potentials for ecstasy and anguish. The moment one thinks a thought, the thinker (subject) and the thought (object) may be experienced as one in the unitary process of thinking. When this occurs, it is as if two mirrors have been opposed and each reflects the other into an infinite regression of reflective depth-past the speed of light, out of time altogether. It is an immediate, direct experience of the infinite within one's own consciousness. On the other hand (the right?), just as we possess the capacity for experiencing the ecstatic heights of union and wholeness in that reflective depth, so do we have an equal capacity for fragmentation and the schizoid splitting of ourselves into thinker and thought, body and mind, feeling and action. This split-up condition of the human psyche is what is commonly known as "normalcy." And as R. D. Laing has so poignantly put it, "What we most need is to be cured of our blasted normalcy:"[2]

The mind is perhaps the deepest mystery, the most profound paradox, of all existence. It may truly be that "Darker than any Mystery," to use the words of Lao-Tzu [a] There is, however, yet another paradox that must be confronted prior to our attempt to formulate a theoretical model of the mind. This preliminary problem concerns the nature of time.

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Given our apparently linear, sequential experiencing of past, present and future, we quite naturally interpret time as a constant instead of in terms of a construct, despite Einstein's gentle proddings to the contrary.

Contrary to common conviction, we may all rest assured that nothing has ever happened in the past and that nothing will ever happen in the future. Everything that happens happens at the moment of being, right now, or not at all. We have memory traces that we conveniently refer to as "the past," and we have anticipations that we confidently regard as "the future," but *being* itself is of the present, and ever was, is and shall be. Now is none other than that inconceivably subtle (non-existent?) interface between "past" and "future." Paradoxically enough, our present is indeed a generous gift-of absolutely everything and nothing.

Perhaps we'd best pause at this point for a somewhat more concrete treatment of these confusing abstractions. Ready? Five seconds ago we think of as residing in the past, right? At approximately that time you were perhaps reading the word "Perhaps" at the beginning of this paragraph. But at the time you were first reading it, of course, it had to be happening in the present. Five seconds from now will be in the future, right? All right, beginning now please check your watch and together we'll find out what it's like to arrive in the future. One, two, three, four, five; here we are in the future, right? Well, hardly. To repeat this elementary consideration, nothing has ever happened in the past and nothing will ever happen in the future. All that happens happens in the present or not at all.

The paradox of the present

Now we must address ourselves to the problem of the present. If it is true that five seconds ago may be considered the past, and five seconds from now will be in the future, then it must be equally true that a thousandth of a second ago must also be viewed as the past, for it is no more. And a thousandth of a second on the other side of this exceedingly fine line we call the present must be thought of as the future, for it is not yet. Between the "no more" and the "not yet," occupying infinitely less than a billionth of a second, lies that eternally present, yet absolutely absent, time-

less time zone within which everything that has happened has happened. But it's beginning to seem as if there is no time left in which anything could possibly be happening. There would appear to be no time at the interface. As Paul Tillich expressed it in his brilliant and moving little book, *The Eternal Now,* "The riddle of the present is the deepest of all riddles of time.""

The profound paradox of the present is that it both is and is not, all at once, just as the infinite exists only because it doesn't, and it doesn't only because it does ... (etc., ad *infinitum,* appropriately enough).

To extend the paradox one step further: if all awareness occurs within this infinitely fast moment of being known as the present, then, as Zeno long ago insisted, motion is impossible. A photograph of a racehorse in action snapped at a thousandth of a second yields an image of the horse frozen in a fixed position within that single still frame. Yet we may liken the instant of awareness in the present (for, remember, there is nowhere else for awareness to occur) to a camera that is set infinitely faster than a billionth of a second. If we pan the racehorse and snap the shutter at that speed, we shall have captured stillness indeed, a picture of perfect motionlessness.

Our whole notion of time grows out of what we sense and interpret as motion. Apart from the experience of what *appear* to be sequential, still frames of awareness, giving rise to the illusion of motion, there can be no concept of time.

This principle is readily apparent in regard to motion pictures, but is generally unapparent when it comes to our "ordinary" awareness. (What we think of here as ordinary being most extraordinary indeed!) Sitting in a darkened theater viewing a scene on the screen, we perceive continuous motion, just as is observed outside on the sidewalk. Yet in the case of the former, we are aware that what we experience is merely the illusion of motion created by a sequence of separate still pictures flashing on the screen at the rate of approximately 24 frames per second. At that rate-within the range of our own waking, beta brainwave rhythm, incidentally-we are unable to perceive the separate stills, as the brain insists on interpreting the unfolding scene in terms of smooth, flowing motion.

By way of setting up an analogy that will be useful in a moment, imagine if you will that the projectionist has slowed the projector so that the frames are passing between the light and lens at only half the normal rate. Obviously, the viewer would then observe the scene on the screen unfolding in slow motion, half as fast as before. At 16 frames per second, he begins to be aware of a flicker effect, and at 8 frames per second observes choppy, pixilation movement as in old-time movies. For future reference, please keep in mind that 8 frames per second would correspond roughly to the lower threshold of the alpha rhythm of the brain. Suppose the projector were then switched to a rate of 5 frames per second, corresponding to the middle range of our theta rhythm. The viewer could then begin to distinguish the separate still photographs out of which the illusion of motion is created. Further slowed to 2 frames per second, one's awareness of the paradoxical moving stillness would become even more pronounced. This would, of course, correspond to the delta rhythm which our brains ordinarily produce only during deep, dreamless sleep. Then if the film were to suddenly stop rolling, one would see a single still picture projected on the screen.

Needless to say, it would be quite a revelation for someone having no knowledge of the cinematographic process were he exposed to the above sequence of events. At somewhere around $4^1/2$ frames per second, we would probably hear him exclaim, "Ah ha, now I see how the tricky devils do it!" And the moment the sequence came to a stop on one still frame, the entire process would be revealed in perfect clarity. ¯-Still, our friend most likely fails to understand that essentially the same process will continue to function in his own consciousness as he leaves the theater and strolls down the street. It will be no more apparent to him than was the other when he was viewing 24 frames per second, for his brain will be processing the "pictures" that comprise his awareness at a continuous rate approximating 24 frames per second, assuming he is in the normal, waking, beta state.

Let us suppose, however, that our friend approaches an intersection and stumbles onto a teacher of sorts who takes him aside and instructs him in one of the various disciplines that point one toward achievement of "the quiet mind," as they say. Let us further suppose that day in and day out he conscientiously devotes himself to the monumental task of simply sitting quietly and doing nothing. Having struggled

to so sit through several years of seemingly self-defeating effort, suppose now our friend is sitting cross-legged in a dimly-lighted room, with his spine straight, his ears in line with his shoulders and his nose in line with his navel. With this picture clearly in mind, imagine that his eyes happen to fall inadvertently upon the illuminated face of a nearby clock.

Having just begun his meditation practice for the evening, he is probably firing beta (approximately 1430 bursts of neural energy per second) as his predominant brainwave rhythm. In that state of normal awareness, he observes the clock's second hand sweeping around the dial at what appears to be its usual speed. As he continues quietly sitting, thoughts and words, concepts and images slowly begin dropping away from his consciousness. Evidently, his rate of brainwave flashing is gradually decreasing. After a few more moments of this disciplined letting-go, as it might be described, an electroencephalograph would reveal that he is consistently firing alpha (within the range of approximately 8-13 flashes per second). At a constant 10 flashes per second, he experiences not only a blissful, serene state of consciousness, but notices also that the second hand on the clock appears to have slowed to approximately half its former speed. "A very interesting subjective effect," he thinks, in a temporarily jarring burst of beta. And he notices without thinking that a barely perceptible on-off flickering of light has begun to punctuate his awareness, as if he is opening and closing his eyelids at a rapid clip.

Another three minutes of this sitting in tense relaxation brings him yet closer to the stillness within, and he drops down into theta rhythm (approximately 3-7 flashes per second). In this altered state of brain functioning, he experiences a number of highly interesting effects. First he is aware, without verbalizing it internally, that the blissful serenity of alpha has increased so markedly in intensity that it could only be called a state of ecstasy. He finds his mind flooded with creative insights, as if it has established direct contact with every mind that has ever been or ever will be. It could almost be described as a dimension of awareness beyond space and time. His consciousness is expanding and he feels himself at the threshold of what has been called Cosmic Consciousness. And the flickering light pulsations observed earlier have now become much more pronounced. It is as if a strobe light set at around 5 flashes per second, the basal rate at which his brainwaves are firing, is flashing in the darkened room. He notices the choppy, pixilation movement of the second hand on

the clock and observes that it corresponds precisely to the stroboscopic rate of flashing. The flickering light he recognizes unmistakably as the flashing of his own brainwaves. It now seems to take the second hand from 15 to 20 seconds to cover a 5second span on the face of the clock.

When times stands still

Next his brainwave activity drops down to the middle of the delta range, in the area of 1.5 flashes per second. The clock's second hand now "moves," if one could call it that, in imperceptibly shifting still frames, and the ecstasy of waking delta becomes virtually unbearable. Then the strobe-like flashing slows, slows, and stops, and in that timeless instant the second hand on the clock stops dead still. He is astonished to discover that with the stopping of his own brainwaves, all motion in what passes for the physical universe has stopped dead. Prior to this "moment of the slack jaw," he had always thought of his perceptual apparatus as a sort of sound-camera, a recorder of events, but now he has glimpsed for the first time that he is also the projector. He has seen that when one's brainwaves stop flashing, birds freeze in flight, people cannot move and the entire universe stands still. The "out there" of external reality has suddenly been seen in a whole new "inner" light. Distinctions such as "inner" and "outer" all vanished in a lightning flash, and he realizes what Lao-Tzu must have meant when he suggested, "It is due to making distinctions that its Suchness is lost sight of."[3] Even the perfectly nonsensical Hindu hint, "Tat Twam Asi" ("You Are That") has suddenly made sense beyond sense, and he knows he will never be the same again (he may even rightly wonder if he will ever be "sane" again). With the intrusion of that disquieting thought, the brainwaves again begin flashing, slowly at first, then picking up speed, and the observed "movement" of the second hand on the clock corresponds precisely to the rate of flashing.

Back to beta and the flicker-fusion of smoothly moving images once again, our friend reflects on the implications of the madness he has just experienced. He sees, first of all, that what we think of as time is merely a function of one's basal brainwave rate, a convenient and fascinating fabrication of the conscious mind. Looking even more deeply, he thinks he may see a clue to the nature of what we are pleased to call "death." Clinically considered, he knows that death occurs upon the cessation of brainwave activity, and that the cessation is usually preceded by a slowing-down

process. Assuming his experience may be taken as a fleeting glimpse into the nature of things, he anticipates that his own "death" will be preceded by observations of activity perceived in increasingly slowing motion as the moment approaches-people moving about, voices, all sights and sounds inexorably slowing, slowing, and finally stopping-stopping "dead still" (an apropos expression if ever there was one). And he strongly suspects that in that inevitable moment one cannot but catch the biggest joke of all, the one Wei Wu Wei has so cleverly called "the joke that made Lazarus laugh."

When brainwaves are still, time stands still, and when time stands still the illusion of motion becomes impossible, and with the impossibility of that illusion, the fundamental illusion of separate selfhood is in double jeopardy.

Having seen that time (and/or motion) goes slower the slower the brainwave rhythm, it would not be at all surprising to discover that those with superior skills - great athletes, for example-may merely be blessed with basal brainwave firing significantly slower than that of the general population. This may prove to be the critical difference between the "star" and the "superstar." The baseball player firing alpha, for instance, might perceive the ball at no more than half the speed perceived by his teammate firing beta. One firing theta could carefully observe the approach and spin of the ball, examine the stitches, read the label, and have up to four times as much "time" to regulate the swing of the bat and make his moves. The player with the slower brainwave rate could more nearly come close to observing the individual units of motion just short of pixilation. Stopping just short, he would be unaware that his perception differed radically from that of others on the field, but he would clearly have a definite advantage over his fellows. John Brodie of the San Francisco 49ers football team has described precisely this effect and indicated that he and others occasionally experience it during critical plays of crucial games. It might well be that anyone who could produce delta waves at will could pick up a ping-pong paddle for the first time and promptly become the greatest ping-pong player in the world. With the ball perceived as moving at less than one-tenth its usual speed, one would have more than ten times as long to observe and plan and act. You are invited to fantasize freely, Walter Mitty style, and dream up additional applications of this intriguing principle.

While the hypothetical experiences of our friend may be written off by many as pure fantasy, increasing numbers of people know from personal experience that time is an entirely flexible function of their own minds. In various altered states of consciousness, time may be slowed down, speeded up, leap-frogged, or even run backward. One who insists such things are impossible is presuming a great deal about the nature of reality. The limits of reason, we may reasonably surmise, hardly define the limits of reality. Nature is not bound by the limits we impose upon ourselves. Presumably, whatever obligations She cares to assume are assumed strictly for the sake of Her own amusement.

An experiment with time

To help solder the connections between time, motion, brainwaves and the material that follows, you will need to secure the equivalent of about a dozen 3" x 5" notecards. The only other equipment required for this demonstration are a floor, in lieu of the actual ground, and a willing spirit. Assuming you were conscientious enough to secure the cards, let us proceed.

Please imagine that each card represents what we shall hereafter refer to as an "on phase," a flash, of brainwave activity. This we might view as the level of operation of the conscious mind. Imagine also, if you will, that the floor, or ground (for those of you who are really serious about this), extends infinitely in every direction and represents the dark, deep unconscious, the "Ground" of the conscious mind, out of which come the spheroid bursts of light represented by the notecards. It is roughly the equivalent of Jung's "Collective Unconscious," or "Objective Consciousness," as he later came to prefer calling it."

Now, with cards in one hand and this journal in the other, please line your cards up end-to-end across the floor. That done, you are asked to consider that, as with your abutting cards, the flashes of our conscious awareness ordinarily appear as a continuous stream of experiencing with no spaces between flashes and, thus, no perception of separate flashes. We are simply unaware of the dark gaps between flashes; that is to say, we are unconscious of the unconscious (but, after all, that is what makes it the unconscious). Just as an alternating current appears to produce a continuous stream of light in a turned-on bulb, so it is with our conscious

awareness. But in both cases it is nothing more than an apparent sequence of stroboscopic on/off pulsations of electrical energy that are simply flashing too rapidly to permit the perception of separate flashes in our field of ordinary awareness. Cards separated by no more than a millimeter would correspond to our normal, waking, beta rhythm.

Reducing the rate of flashing, as in meditation, sensory isolation, psychedelic experience, and other forms of brainwave alteration, we begin to be subliminally conscious of separate flashes. This is preliminary to our conscious awareness of the spaces between flashes. In the language of the street, we are talking literally about getting "spaced out."

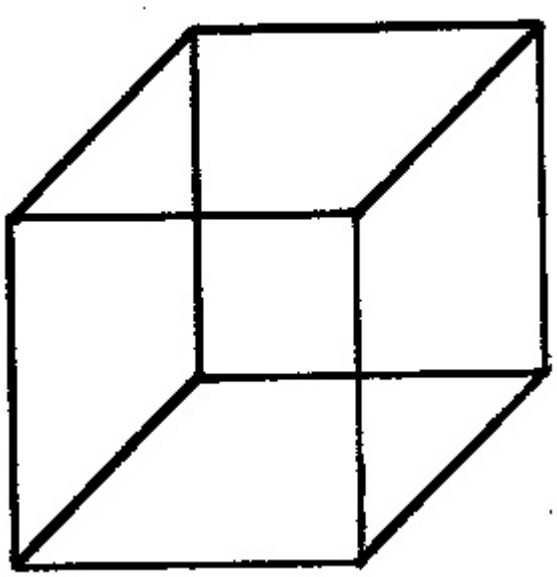
Returning once again to your continuous stream of cards laid out across the floor, it would be helpful if you would now separate each card from its neighbor by a distance of about one inch. What you are invited to see in this modified arrangement is suggestive of what one experiences while tuning in the alpha rhythm, as happens in the early stages of most forms of meditation. One begins to become aware of the dark gaps (off phases) between flashes (on phases). With this awareness, one cannot but feel a deep sense of peace and serenity, although one may be completely unaware of why it is happening. Let me suggest that it is because one is on the verge of seeing through the dark gaps into the infinite depths of the unconscious, the ground of one's being. And this inexpressible merging of the conscious mind and the unconscious has all the earmarks of union and communion with the "Ground of Being."

Spreading the cards further apart, say, 5 inches apart, you may now notice that one has equal amounts of "time" in which to be aware of the on phase and the off. This might be seen as corresponding to the upper threshold of one's theta rhythm. It is in this state, you'll recall, that creativity abounds, as one's consciousness is experienced as One with a limitless ocean of Consciousness. As a single process, the conscious mind plunges into the infinite depths of the unconscious and/or the unconscious breaks through from the depth to envelop the conscious mind. Further slowing the rate of firing (as represented with cards perhaps 12 inches apart) one now has "all the time in the world," as they say, in which to be absorbed and assimilated into

that fathomless depth. Then the flashing stops dead still (quickly, pick up your cards!). In that instant, all motion ceases, one is out of time, beyond the relative world altogether. Nothing stands between oneself and the Ground. The conscious mind and the deep unconscious are One, as was always so, but was simply unrealized. And up until the moment the flashing resumes, one is perfectly content, as Camus expressed his highest aim, "to remain lucid in ecstasy."

The Illusion of motion

We must now address ourselves to the problem raised by the necessity for qualifying "sequence" as nothing more than an "apparent sequence." As was suggested earlier, past and future are purely subjective operations and have no objective existence in reality. (The question remains, of course, whether anything exists "objectively" in reality.) Reality knows only the single still frame of the moment of being. Subjective memory and expectation make possible our interpretations of "before" and "after," and give rise to a sense of motion derived from the appearance of a sequence of still frames. It is this apparent sequence that makes possible the illusion of motion. If past and future do not, in fact, exist, there can be no motion. And if motion does not exist, there can be no time. And if time does not exist, space and matter become very tenuous propositions indeed.
To illustrate what appears to occur in the processes of perceived motion, let me begin by presenting below my favorite demonstrator of perceptual shift, the classic Necker cube.



If you will gaze at the above configuration of connected lines for a few seconds, you will suddenly observe that the figure-ground relationships have shifted and you are viewing what appears to be a quite different box. First it may have seemed to be resting on a flat plane, and then it was perhaps seen as hanging out in space. Something apparently changed, but what moved to make that change possible? Obviously, in this case, only your mind "moved."

As you continue gazing at the illustration, you might attempt to discern the point of shift, the interface, between distinctly interpreted perspectives. No doubt you have already noticed that there is apparently no perceptible movement to be seen anywhere in the process. Where there is change, we infer movement, but please keep in mind that it is no more- than an inference. In this case, that much is clear; in other cases it may appear less clear, but it is no less the case. The "motion" of the box shifting cannot be observed, and its "speed" cannot be measured, because what happened happened out of time-infinitely beyond the speed of light. The figure-ground shift occurred in the timeless interval between on phases (flashing) of your conscious mind. During one interpreted flash, which comprised the totality of your awareness in that instant, you observed a single, stable configuration of the cube. Then came an off phase (the dark gap between flashes), and the next on phase revealed the box in a new perspective. (Remember that the idea of an actual sequence of flashes is nothing more than a conceptual convenience and should not be taken literally.) The off phase is of the unconscious, that timeless, limitless dimension, while the on phase is a manifestation of the conscious mind, the surface level at which we carry on our multifarious (if not nefarious) business of the relative world.

All that we perceive as motion (which is also all that we experience as time-and space, for that matter) is exclusively a function of consciousness shifting figure-ground relationship to create the "next" picture in the perceived "sequence." That "motion" is the no-motion at the point of shift (that infinitely subtle nuance), which- only seems to be made up of one still frame after another. Our everyday perception of sequential motion is precisely analogous to the shift in perspective of the Necker cube. As we observe the shifted perspectives, we might be inclined to believe the shift simply happened too quickly to perceive, yet it is actually of a dimension beneath the level of conscious awareness. Neurologically speaking, we

have an "on flash" of brainwave activity (conscious mind) in which we perceive one perspective, then comes the off phase in which the figure-ground pattern is shifted to appear as the next picture in the perceived sequence, etc., ad *infinitum.* With every perceived shift in figure-ground relationships we have a new ambiguous pattern presented for interpretation at the conscious level. So the conscious mind and the unconscious, again, shift like the Necker cube, the off phase being the phasing itself between distinctly interpreted perspectives which give every appearance of unfolding sequentially in time.

Another interesting property of this fascinating process is that any number of figure-ground shifts may be perceived in any given amount of "time," since time is not actually a factor. What we might think of as a billion shifts in the perceived motion-picture sequence may seem to happen in what we would call a billionth of a second, or one shift may take a billion years. This might help account for the experience of countless individuals near death who have reported seeing their whole lives in a flash, as if unrolled on a scroll. When the flashes of neural energy slow and stop, all the still frames are there to see simultaneously and instantaneously for there is no more time out of which the illusion of sequence can be fabricated. We are not looking at frames rolling by with the past being taken up on a reel to the right and the future unreeling from the left-we are viewing at a tangent to the linear plane, peering into the infinitely reflective depth of a single still frame. All frames are of the one frame.

In what we observe to be the on-off flashing of brainwave activity, apparently the flash itself is only the moment of awareness of a shifted perspective of the figure-ground relationships in an ambiguous pattern comprising the screen of conscious awareness. Both the point of shift and the flash (the dark and the light, the figure and the ground) evidently occur in no-time, but Consciousness conspires to create the appearance of separate, sequential flashes or frames of awareness. Since there is no time between flashes (the shift requiring none, as was seen with the Necker cube) there is nothing to separate flash from flash, or flash from no flash. The one flash of dark/light is merely the light/dark of Consciousness playing like the illusion of time/motion is for real and forgetting it is playing a trick on itself just for fun.

What before we perceived in terms of a dualistic on/off, light/dark sequence of brainwave activity, we may now wish to view instead as a unitary dark/light pattern of a single frame within which all awareness manifests itself, and out of which any form may be created. The shifting of figure-ground relationships alone creates distinctions such as on and off in our field of consciousness. This should come as no great surprise as our Buddhist neighbors have for centuries been trying to tell us that Nirvana (the Infinite Unconscious) and Samsara (the day-to-day activity of the conscious mind) are one and the same. The unconscious is as readily apparent in every off phase as the conscious mind is in every phase of the cycle, but we fail to see the former because of our lock-step habit of paying attention only to the latter. When brainwaves are slowed to the range of perceptible flicker, we begin perceiving with equal clarity the off phase and the on phase (Nirvana and Samsara) and we realize the essential oneness of the cycle, i.e., that there is no on without an off and no off without an on-each creates the other and is the other. Every wave has a crest and a trough; every brainwave has an on and an off.

To repeat once more, the unconscious is manifested in every off phase of the on-off cycle. It is as if one shoots down (or opens up) at a tangent through the dark gap between on phases, and that tangent extends infinitely in every direction into the deep unconsciousness. But it must be remembered that there is no time or space, and so, no directionality in the unconscious.

In our "ordinary" consciousness we fix our awareness only on the on phase of the cycle. In our "high" moments, we see through the surface screen and see that which cannot be seen. This is like God playing hide-and-seek with Himself, as in the Hindu Vedanta scheme of things. There can be no on phase without an off, but there can be an off without an on. Before the beginning (of "time") there was an off (Void) that wasn't even that, for it wasn't an off relative to an on or to anything at all. "And God said, 'Let there be light"' (an on flash), and the cycle was established. At "death" the on phase ceases along with the relative off, but not the Absolute Off, the Ground of All Being. Once one has awakened to even a partial realization of the deeper Nature of his Being, (i.e., catches a glimpse into his Self-Nature, as they say in Zen), then the idea of death has forever lost its sting.

It is as if all that we see as comprising our separate selfhood is drawn on an infinite sheet of paper (infinite in every direction, unimaginably enough), and we learn to think of ourselves as contained within the outline of the drawing. We neglect to notice that the outline appearing to circumscribe our entire being is the same line as the inline of everything else. And that inline delineates and defines our apparent individuality as precisely as does the outline. They are, in fact, the same line; it's just a question of shifting perspective. We naturally fail to see that all that surrounds us and gives us our sense of selfhood is everything that is -and that includes ourself. At the moment of what we term "death," it is as if the line, the most superficial aspect of our case of mistaken identity, is merely erased. There is as much "self" as ever left within the former boundary line, but now we see the whole idea of a separate self was no more than the illusory feeling of separation itself. To illustrate it somewhat more poetically, we are rather like a plastic bag of seawater sinking into the fathomless depths of some infinite ocean. At the moment of "death" and/or "ego death," the plastic bag, by which we maintained all sense of our separate seawaterness, suddenly disintegrates and disappears leaving no trace. The water we had identified as our "self" may appear forever lost, or the whole of the warm and boundless Sea of Being may be seen as gained. Again, it's all a question of shifting perspective. Clinging to the unreal sense of separate selfhood past that ultimate point would quite literally be one hell of a fix, figuratively fraught with no little weeping, wailing and gnashing of teeth. Conversely, letting go to flow freely beyond that infinite point could be nothing less than a perpetual state of ecstasy.

This way of looking at our Self-Nature might go some distance toward explaining various forms of psi phenomena which otherwise may seem to defy both "natural law" and rational explanation. If the deep unconscious is continuous with everything that is (or Is what everything Is!), then what we think of as our consciousness is one with all the consciousness that is, has been or shall be, to put it in temporal terminology. From this perspective, it would be expected that ESP is not limited by the speed of light, for Consciousness has nowhere to go-it's already there! It should not seem surprising when a mother dreams her son's plane crashes on the other side of the world at the precise instant of the actual event. After all, is it not the same Consciousness in which they live and move and have their Being? Being in the here and now knows no separation, no split, in time and/or space. Precognition

and retrocognition would be seen as natural phenomena, and not at all astounding, once one recognizes the absence of even the concept of time in the deep unconscious. Distance and duration are exclusive properties of the relative space-time frame of reference. It is encouraging to note that the idea of the Oneness and Allness of one and all, once thought the drink of wildeyed mystics, is fast becoming the meat of clear-eyed modern physicists.

A holographic model of consciousness

In Consciousness, the one frame is every frame, storing an infinitude of images in an infinitely creative pattern of pure and perfect ambiguity. As in the enormously exciting process of three-dimensional lensless photography known as holography, a vast amount of optical information-many pictures-may be stored within, and retrieved from, a single holographic plate, depending on shifts in angles in the exposure and reconstruction of images. To extend the parallel one step further, it is interesting to note that any single fragment of the hologram is seen to contain the entire image stored within the complete holographic plate. Each part is at once the whole, and the whole is every part. It does appear modern science and ancient mysticism are about to meet at the crossroads. Perhaps neither will be too surprised to discover each is but a mirror image of the other.

If we are to succeed at this point in developing a holographic model of the structure of consciousness, it will be necessary to assume for the time being the philosophical posture of commonsense realism. In other words, we must proceed as if we accept at face value the objective existence of external reality in general, and of the physical brain in particular. The built-in limitations of our dualistic language structure will also no doubt continue to bedevil us.

All that we experience as external reality is apparently nothing more than patterns of neuronal energy firing off inside our heads, yet these patterns have the capability of representing (or reflecting?) a broad spectrum of sensory, nonsensory and extrasensory experiences. A free (and freeing) translation from an ancient Sanskrit manuscript has provided the rules for the game: "Gracious one, play your head is an

empty shell wherein your mind frolics infinitely."

Increasing numbers of neuropsychologists and neurophysiologists are coming to regard higher brain functions in terms of an optical system processing a form of bioluminescence (light in the midst of the darkness of the skull). To briefly summarize my own tangent in this general line of speculation, let me suggest that brain functions such as perception, memory, imaging, etc., are beginning to appear most clearly explainable on the basis of a holographic modelg a. The "screen" of awareness may turn out to be an organic form of a holographic plate which processes three-dimensional perceptions and reconstructed images with equal facility. Although laboratory evidence is just beginning to accumulate, and introspection remains suspect, it may not be premature to hypothesize that the area of the midbrain immediately posterior to the optic chiasma will be found to be the locus of a neural holographic plate. The pituitary gland, hypothalamus, thalamus and pineal body in particular appear to be intimately associated in the theater of conscious awareness. The discovery that the pineal body, long thought by many a vestigial sensory organ, is partially composed of light-sensitive tissue similar to that found in the retina of the eye, seemed to lend support to the speculation that it might serve as the "grid" of patterned ambiguity on which perceptions are constructed and memories are reconstructed. This seemed too much to hope for, of course, inasmuch as this pea-sized organ has for so long been regarded in the East as the "third eye," and considering that Descartes and others had so long ago designated it "the seat of the soul."

In attempting to work through the interrelationships of the organs of the midbrain, all that seemed clear at first was that the thalamus apparently radiates neural energy to the opposing cerebral hemispheres and possibly organizes incoming impulses into more coherent wave forms. In this process, it was also suspected that the thalamus may serve as the source of the alpha rhythm, as a regulator of brainwave frequency and intensity, and may play an important role in the scanning and retrieval mechanism(s) of the brain. It appeared, however, that if the pineal body did play a primary role in perception and memory, its excision would be seen to produce profound, if not total, disruption of these functions. Such, of course, has not been shown to be the case. The removal of the pineal body in rats disrupts the circadian rhythm, the biological clock of the organism, and similar effects have been

observed in humans. Further reflections on the process suggested that the "screen," the holographic plate which I had so long been attempting to identify with an organ, may actually be a function of an area instead of an organ. It began to appear that the pineal body occupies the midpoint at the center of a neural energy field, at which point occurs the burst of light that is experienced as the screen of consciousness on which shifting figure-ground relationships represent external reality. This would be the same point at which the sense of time and/or motion manifests itself, and so it should not be surprising to discover that the removal of the pineal body strips the gears of the biological clock. This would simply mean that the monitoring mechanism of the sequential bursts of light goes when the pineal body goes. The flashes persist in the same area, at the same point, even though the organ at which they had occurred has been removed.

It now seems highly plausible that the "seat of consciousness" will never be found by a neurosurgeon because it appears to involve not so much an organ, or organs, but the interaction of energy fields within the brain. These patterns of energy would be disrupted by surgical intervention, and have long since disappeared in cadavers. Neurophysiologists will not likely find what they are looking for outside their own consciousness, for that which they are looking for is that which is looking.

In terms of the model under consideration, this mysterious area of the midbrain would evidently function as a transducer in the processing, or impedance matching, of "external" (physical) and "internal" (neural) wave energy. Patterns of brainwaves would be activated in the contralateral cerebral hemispheres (each being a mirror image of the other) based on the holographic image perceived. Memory would involve enervation of the originally-fired neuronal circuits, a reactivation of the brainwave patterns that were interpreted as the original experience, a convergence of interference waves reflected from the contralateral hemispheres, and a reconstruction of the original hologram. What we term "memory" would be seen as the conscious-level interpretation of the otherwise ambiguous figure-ground pattern appearing on, or within, the holographic plate, the locus of conscious awareness. Co-herent wave energy may also be found essential to the process, just as coherent light produced by the laser is necessary in holography. Perhaps the neural energy must be polarized and made coherent for the system to function efficiently. As is true of

the holographic process, the more coherent the light, the clearer the reproduction of the holographic image. The degree of coherence of the wave forms might well determine the relative degrees of efficiency in both the storage and retrieval processes.

In all fairness, it should be remembered that the foregoing summary of personal speculations is based on the perhaps groundless assumption of the brain in a general scheme of commonsense realism. Still, it will surely do us no harm to recognize and acknowledge our assumptions as assumptions. We might even go so far as to seriously consider that, contrary to what everyone knows is so, it may not be the brain that produces consciousness, but rather that it is Consciousness that creates the appearance of the brain, matter, space, time and everything else that we are pleased to interpret as the physical universe. All we can possibly know for sure is that something very interesting is going on. Exactly how, why or what it's all about, God only knows! And the biggest paradox of all may well turn out to be that there's not a paradigm's worth of difference, so to speak, between Him and you.

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