

# MEASURING the IMMEASURABLE

THE  
SCIENTIFIC  
CASE *for*  
SPIRITUALITY



SOUNDS TRUE  
BOULDER, COLORADO

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How do our bodies manufacture emotion? How are our emotions connected to our thoughts? How is our brain connected to our mind, our body, and ultimately, our consciousness? These are some of the questions that Dr. Candace B. Pert, author of *Everything You Need to Know to Feel Go(a)d*, tackles in the following excerpt from her book and a lecture she gave in Tucson, Arizona. Building on her acclaimed research about the "the molecules of emotion," she explains how thoughts and feelings can influence the physiology of pain, and how the mind and emotions can influence experience. She also points us toward an understanding of why we are capable of creating reality.

## The Science of Emotions and Consciousness

CANDACE PERT, PH.D., WITH NANCY MARRIOTT

*I looked out at my audience, said a silent prayer, introduced myself, and then brought up my first slide. On the screen was a gorgeous, sexy woman, dressed in black and reclining in ecstatic abandonment. A hush fell over the audience as they took it in—a magazine ad for the perfume Opium—and I continued speaking, launching into the information they'd come to hear. . . . This essay is the substance of my lecture.*

### THE LECTURE AT TUCSON

Bliss! That's what I know a lot about; that's what I studied as a graduate student at the Johns Hopkins School of Medicine

in 1973. It was there, along with my mentor, Dr. Sol Snyder, that I discovered the opiate receptor, the key to the body's mechanism for pleasure. The breakthrough caused a revolution in brain science and sent reverberations throughout all of the biological disciplines.

For years, scientists had theorized that drugs acted in the body by attaching to receptors to exert their effects. But no one had ever done simple experiments that demonstrated how this worked. No one had proved that receptors even existed at all until I developed a test-tube method in our lab at Hopkins to measure the opiate receptor and earned my PhD. As an Associated Press news release flew around the world, I found myself at the center of the scientific community's attention. This was the first receptor to be measured by a method that would later be used to measure many more newly discovered receptors.

But the burning question that everyone wanted answered was: Why was there a natural mechanism, the opiate receptor, that allowed drugs like morphine and heroin to act in the body? What followed was a mad dash on both sides of the Atlantic for the discovery of the body's own morphine. A British laboratory won the prize, identifying a tiny protein chain of amino acids called endorphin as the opiate receptor's key. Endorphin, a peptide bound to the opiate receptor, produces a natural high that drug companies everywhere hoped to capitalize on as a natural, nonaddictive analgesic, but it wasn't to be.

In retrospect, the opiate receptor discovery was important not because it led to identifying the body's own morphine, but because it opened a new avenue of exploration for the invention of drug therapies for disease. The fact that we could now demonstrate that there are receptors on the cells where the body's own chemicals attach—and even measure them—meant that we could make new external chemicals in the lab, commonly known as drugs, to access the cell in the same way. This

avenue eventually led to Peptide T, the AIDS therapeutic that I'm currently developing with my husband, Michael.

#### A BODYWIDE, PSYCHOSOMATIC NETWORK

Over the decade following the discovery of these newly identified substances, my lab and others around the world rushed to map them, finding endorphin and opiate receptors in parts of the brain known to be associated with the emotions. The amygdala and hypothalamus, two structures within the limbic (or old emotional) brain, were found to be loaded with what I came to call the molecules of emotion. But we were surprised to also find insulin receptors in the brain, along with ones for virtually every other peptide in the body. Insulin is a large peptide secreted by the pancreas to regulate the level of sugar in the blood. What was it doing in the brain? For years, neuroscientists had claimed the brain as the seat of emotions, pointing to the fact that when brain structures in or near the limbic system were stimulated during neurosurgery, intense emotional expression of early memories occurred. But we found that these molecules of emotion aren't just in the limbic system, but throughout the body, linked to form a comprehensive system of communication including the endocrine, digestive, and reproductive systems—literally, every system in the organism.

We eventually were able to show a network of intercellular communication humming along under the coordinated efforts of these informational molecules of emotion, which we called the "psychosomatic network." The brain, we proposed, is just one nodal point of entry into this psychosomatic network that has many nodal points, including the spinal cord and the sensory organs. The system could be accessed from different places, depending on a person's focus of attention. For example, if you know any teenage boys, you know that their gonads

will tend to override any other information entering this system and drive the organism in a predictable behavior.

The old paradigm held that the brain is the seat of consciousness, and the mind is the brain's by-product. But we can no longer say that brain is to mind as kidney is to urine; the mind is not the product of any organ, not even the brain. Awareness is the property of the whole organism; and in the psychosomatic network, we see the conscious and the unconscious mind infusing every aspect of the physical body. This is why I can say: The body is the subconscious mind.

#### CURRENTS OF EMOTION

Besides receiving and processing information to unify a single bodymind, the peptides and receptors are clumped to form ion channels to pump ions in and out of the cell. This rhythmic, pulsating movement creates an electrical current that meanders through the body, influencing the state of excitability or relaxation of the entire organism.

One of the most studied receptors is the GABA receptor, which is where the drugs Valium and alcohol bind. (GABA is the name for the corresponding endogenous, or internal, substance.) When those two drugs bind simultaneously at the GABA receptor, because someone has just popped a Valium and then poured a drink, the chloride ion leaks into the cell through the receptor-modulated ion channel. The effect of this flow is to create deep relaxation, as the threshold for neuronal firing gets very high. This is why the combination of alcohol and Valium can kill, which we now understand is what happened back in the sixties when famed columnist Dorothy Kilgallen unintentionally overdosed and died.

The set points of brain-cell excitability vary from place to place and from individual to individual, depending on which receptors are occupied by which neurotransmitters, other



informational substances, or drugs. The differences in these thresholds can be the cause of much mischief, especially for marital relationships. The high-strung, excitable, talkative wife and the near-comatose husband with his nose in the newspaper are in an electrochemically incompatible mode that, if not modulated, could easily lead to trouble!

#### THE MATTER OF CONSCIOUSNESS

I propose that the matter of consciousness—the measurable, material substance—is the vibrating, moving, breathing, pumping molecular complexes of receptors and their ligands, as they bind to every cell of your body. The activity of these molecules creates an electrical charge and continually generates a current throughout your bodymind to keep you awake, alert, and conscious.

This is why I can say that the molecules of emotion are those of consciousness. Emotions span the material and the immaterial realm; they're the bridge linking the two. Just like the simultaneous particle and wave properties of light, the molecules of emotion go both ways. They're physical substances that you can see and weigh on a gel in the laboratory, ones that vibrate with an electrical charge in the living animal; and at the same time they're a kind of wave between people that conveys information. They're both physical and psychological, linking brain to body in one vast network of communication, to coordinate the entire bodymind.

Dual nature: particle-wave  
Wave action...

In the Eastern view, consciousness comes first, and molecules are simply a metaphor, an afterthought, to explain consciousness. I'm amazed by how, over the years, I've come to understand and finally embrace this concept. Even more astonishing is that the science I've done supports the closure of the East/West gap, whether we focus on molecules or consciousness, matter or spirit. The two seeming opposites are simply flip sides of the



same coin, or end points in a wide spectrum that's completely traversed by emotion.

#### NEW MIND, NEW THOUGHTS

Some very astounding data has come out of the National Institutes of Health laboratory of Dr. Eva Mezey that makes all of this easier to understand. Dr. Mezey recently proved irrefutably that mind and body are one by showing that stem cells migrate from the bone marrow into the brain and become neurons. Equally astounding is that her paradigm-jolting work was allowed to surface, given that the initial reaction to her data resulted in her lab nearly being closed.

Stem cells—cells that are undifferentiated and have yet to become organ cells—are made in the bone marrow, which we already knew. We also knew that stem cells move through the blood to other systems and organs. But the news that they move out of the bone marrow, eventually becoming neurons in the nervous system, was shocking.

Dr. Mezey found this migration happening not only in response to illness, as when stem cells grew into immune cells, but as a matter of course. And even more shocking was that these stem cells weren't just showing up in the spinal cord (which I consider an extension of the brain), but also in the highest part of the brain, a structure known as the "frontal cortex."

The first experiments were done by injecting bone marrow from a male mouse into a female mouse, but were repeated in a clever way with humans. Dr. Mezey used female subjects—some were children, some were older women—who had leukemia and had been treated with bone marrow transplanted from males. None lived more than a few years, and of the eighteen cases she was able to study, every one of the females upon autopsy had plenty of neurons with the male Y chromosomes in them. In other words, male stem cells were in the females' brains,

irrefutable evidence that brain cells travel from the bone marrow into the brain.

The bones are giving rise to the brain! Ancient Chinese medicine says that *chi*, loosely translated as “the life force,” originates in the bone. Now we are showing in our Western model that cells start as baby stem cells born in the bone marrow, become immune-like cells as they pass through the body, and then arrive in the brain as brain cells. This migration, our lab had shown in the eighties, was directed by the molecules of emotion in a process known as chemotaxis. We used to think that by the age of five, you had all the brain cells you were going to get. Then neuroscientists discovered that your brain keeps growing when you’re a teen, and your frontal cortex doesn’t stop developing until you’re twenty-five. But the new research shows that the growth of brain cells never stops—this replenishment, the influx of new brain cells, is going on throughout your entire life! Neurogenesis, the birth of new cells appearing, moving, and becoming neurons in the brain, used to be controversial; it now is one of the hottest areas of research in biomedical science today. So what does this all mean? Well, it means that you can learn and change and grow, because you’re literally making a new brain every day. Since you sat down in your seat here tonight, you’ve made thousands of new neurons! You’re literally being given the opportunity to think new thoughts, to change your mind, to create the reality you experience from moment to moment. It’s no longer just a truism that thinking positively is a good idea—thank you, Dr. Norman Vincent Peale! If you have uplifting thoughts, you’re building a very different brain than if you have negative ones.

#### EMOTION AND MEMORY

Classically, the hippocampus is the structure in the brain associated with memory, because when you remove it surgically, a

person will have deficits in memory. But contrary to what many neuroscientists believe, this doesn't necessarily prove that the hippocampus is the seat of memory.

In fact, recent findings support the theory that recall is stored throughout the body, not in the brain alone. Dr. Eric R. Kandel, a neurobiologist at Columbia University College of Physicians and Surgeons, received a Nobel Prize for Medicine in 2000 for showing that memory resides at the level of the receptor. The activity of cellular binding throughout the body can impact neuronal circuitry, influencing memory and thinking.

When a receptor is flooded with a peptide or other ligand, the cell membrane is changed in such a way that the probability of an electrical impulse traveling across the membrane is affected. Remember, wherever there's a receptor, there's also a vibrating electrode or diode where circuits can change. This, in turn, affects the choice of neuronal circuitry that will be used, impacting brain activity. These recent discoveries are important for appreciating how memories are stored not only in the brain but in the body as well, where a psychosomatic network extends throughout all systems of the organism. A major storage area is in the receptors distributed near the spinal cord, between nerve and ganglia, and all the way out to the internal organs and the surface of the skin. This means that your memories are in your spinal cord, as well as all throughout your bodymind.

Whether your memories are conscious or not is mediated by the molecules of emotion. They decide what becomes a thought rising to the surface, and what remains buried deeply in your body. What this means is that much of memory is emotion driven, not conscious, although it can sometimes be made conscious by intention. The emotions that you're able to experience can bring a recollection to the surface; if your feelings are suppressed, however, they can bury that same memory far



Awareness is a necessary pre-requisite for choice. ... so the question becomes, "of what am I aware?"

below your awareness, where it can affect your perceptions, decisions, behavior, and even health, all unconsciously.

Buried, painful emotions from the past make up what some psychologists and healers call a person's "core emotional trauma." The point of therapy—including bodywork, some kinds of chiropractic, and energy medicine—is to gently bring that wound to gradual awareness so it can be reexperienced and understood. Only then is choice—a faculty of your frontal cortex—possible, allowing you to reintegrate any disowned parts of yourself, let go of old traumatic patterns, and become healed, or whole.

Very clear studies done by Dr. Donald Overton show that there are *dissociated* (not connected) *states* of learning and memory. His data demonstrates that what you learn in one drug-induced state, you can't retrieve from your memory at a later time unless you're in the same condition. If you're smoking cigarettes and drinking coffee to prepare for an exam, you won't be able to remember enough information to pass unless you're doing those things when you take the test. This is because various substances (such as alcohol, nicotine, and caffeine) create altered states of consciousness with different emotions and memories, and therefore, different modes in which to learn.

In other words, you acquire knowledge with your entire bodymind, not just with your brain. **Also, learning is an emotional event, impacted by how you're feeling. There are tons of data showing that you can't grasp new information in a state of fear. I've lectured to educators about how punishment and threats actually inhibit the learning process.**

#### DRUGS AND THE BODYMIND

Emotions are like drugs, all of which—Valium, alcohol, methamphetamine, the opiates, and marijuana—work because they

We make choices all day long whether we are "aware" or not. Dogs, cats, birds etc. make choices. Of what are we aware? What factors do we bring to bear? What priorities are arising?

use the same receptors as the internal ligands. Drugs, just like the peptides in the body, find their way to the exact keyhole on a cell's surface in order to bind. For marijuana, the chemical cannabinoid fits into the marijuana receptor. And our own internal version, endocannabinoid, is the only substance made in the body that can fit that receptor, too.

External drugs and internal juices: both of these hum in one giant, emotionally vibratory field as they bind to receptors and make things happen. Your emotions follow the same pathways as your peptides and their receptors, and the same routes as the drugs that you're prescribed or take illegally. All three—drugs, natural ligands such as peptides, and emotions—operate through the same mechanism, which is binding at the site of the receptor.

This is important, because how you think and feel—your emotional state at any given moment—can actually impact the movement, the division, and every other activity of your cells in much the same way as your internal juices and pharmaceutical drugs do. This is a central idea of my theory of emotions—that there's a physical substrate for your feelings, just as there is for the action of drugs and their effects in your body.

Scientists have identified many types of receptors on our cells that fit internal juices that have known equivalent external drugs, but not all of the scores of known receptors have known external matches. For example, if a plant growing in a rain forest in Brazil made people angry when they ingested it, no one would try to smuggle it into the country and sell it for recreational use. The plants that get cultivated are the ones that make us feel good.

#### BODYMIND IDENTITY

Just as drugs do, emotions trigger altered states of consciousness, each with different memories, behaviors, postures, and

even physical processes. We can learn a lot from looking at so-called multiple personality disorder (MPD), a condition that exists when a person exhibits many personalities, each with its own identity and often physiology.

MPD is usually considered a pathological condition, but I believe that normal people like you and me have many subpersonalities, with one more dominant than the others depending on which stimuli are influencing us. A CEO is a very different person in the boardroom than she is when she's at home playing with her toddler. But is it just the behavior that's different? It may appear so, but in the new paradigm of physiology, we see that much more is actually going on.

Psychologists and authors Drs. Hal and Sidra Stone have utilized this concept in their approach to consciousness and transformation, which they call Voice Dialogue, used to access hidden or deep parts of the personality and integrate all of them into the whole. If you've ever had the experience of speaking to your spouse or child one morning and the next day feeling as if you're dealing with someone who seems to be a completely different person, then you know what I'm talking about.

But my point is that the accessing of different personalities is a natural expression of how the molecules of emotion are constantly coordinating our memories at the level of our physiology. To expect everyone to be the same all the time is to buy in to the myth that emotions don't matter and don't play a powerful role in who we are, affecting our very identity from moment to moment.

One way to understand how we're all multiple personalities (and that this is normal) is to think of "white" light, which is the sum of all of its visible frequencies. Light may appear white or colorless, but if you filter it through a prism, you see a rainbow of different colors. People are like that, too: we may appear to be a solid, single identity, but we're actually made



up of many different states and personalities, each one coordinated by our molecules of emotion. These chemicals in our body are continually orchestrating the movement within us of different states of consciousness, moods, and memories—and even physical conditions and alterations.

#### PAIN AND AROUSAL

Q We've seen how our molecules of emotion impact memory, learning, and identity. Now let's look at how they impact our perception of pain and the state of arousal or alertness we experience. There's a structure in your brain that sets your threshold of pain—that is, how much you can tolerate a harmful stimulus—called the peri-aqueductal gray (PAG). This is loaded with endorphins, opiate receptors, and many other informational substances that are emotion modulated. Your perception of whether something hurts a lot or a little passes through this gateway and is strongly informed by your emotions.

The PAG isn't near your frontal cortex, but there are neurons in your frontal cortex that project down into the PAG, making it possible to have conscious control over the degree of pain or alertness that you experience. This means that you can choose how to interpret the stimuli around you. You're doing this unconsciously all the time, but you can train yourself to interpret stimuli consciously at the threshold that you choose. One way to do so is with repeated affirmations that can help you reframe certain sensations in your body and promote healing.

For example, if I worry about a little buzzing sensation in my knee, and I think, *Oh no, there's that bum knee again. It's going to give out on me someday!*, then I'm projecting a negative belief on that experience. I become emotionally involved in a story about my knee, which then influences my molecules to follow my message.

On the other hand, I can respond with interest rather than fear, choosing to feel the buzzing in my knee as a sign that something is obviously moving around in there—opening, closing, and changing—and my knee wants me to stay tuned! That will send an entirely different message to my physiology through the many emotional informational substances that are communicating with my knee and connected to pain centers in my brain.

Remember, the bodymind is a vast network of communicating molecules, involving every cell, organ, and system of the organism. Pain in the knee is determined by emotions impacting molecules in your brain. In fact, any pain is really felt in the brain, which is the final common pathway.

This is useful, because if you know that your thoughts and feelings can influence your physiology for pain, you realize it is possible to decrease chronic-pain conditions, such as fibromyalgia, without drugs, by using various methods that access your conscious and subconscious input. Similarly, natural-childbirth training, which can be mastered by just about any woman, transforms pain and fear into pride of accomplishment and satisfaction.

Once again, not only do different emotional states have varied capacities for learning and memory, but they also have different set points of pain and arousal, whether triggered by drugs or by our internal informational substances. The ways that you can change your pain threshold resemble the memory or learning variations that I described earlier, in that your state of mind can affect your experience of reality. Your state of healing and well-being (that is, living pain free), as well as the ability to stay asleep or be alert, will change depending on your emotional state. "Change your mind and change your pain" would be a more helpful aphorism to have in the vernacular than "No pain, no gain."

All of this demonstrates again how emotions are the key to consciousness, determining from minute to minute what you experience, what you feel, and even who you are.

#### YOU CREATE YOUR OWN REALITY

Back in the seventies and eighties, whenever our laboratory at the NIMH mapped endorphin receptors, we always found them rich in areas that process incoming sensory information, such as sight, sound, smell, taste, or touch. We saw this clearly in the so-called dorsal horn on the back of the spinal cord, where "touchy-feely" kinds of information enter the nervous system from the body. Receptors for endorphins and other neuropeptides (such as bombesin, VIP, insulin, and others) are all confined to a stunning narrow stripe on visualization.

These neuropeptide receptors are never found in the ventral horn, which is the motor part of the spinal cord that directs movement. This is the same in other sensory pathways to the brain, not just for the sense of touch carried in the cord. Wherever the nerves first enter the brain, carrying sensory information about sight, sound, and the like, there are sites that are always heavily encrusted with the receptor molecules of emotion.

Different senses have pathways with varying degrees of filtering of information. Vision is very highly refined; it travels six synapses from the time light first strikes your retina, travels to the occipital lobe at back of your brain, and then hits four more way stations before reaching consciousness in the frontal cortex. In contrast, smell only takes one synapse before it hits deep within your amygdala, and then is relayed to your higher brain.

Remember, those molecules along the sensory stopping points are storage sites for memory—but of what? Well, they're recollections of every perception that you've ever had, from

your earliest consciousness of bliss at your mother's breast to the emotional upset you had after a fight with your boss the other day. They're all stored at the site of the receptors, which are most densely populated where information is coming in, not going out.

In other words, your experience of so-called reality is filtered through your memories, giving your experience a spin, adding meaning, and even making part of each situation go or stay unconscious if the event is too painful to remember, as in the case of a core emotional trauma.

We're constantly resonating with what we already know to be true. Everything that you feel is filtered along a gradient of past experience and memory that's stored in your receptors—there isn't any absolute or external reality! What you experience as reality is your story of what happened.

This has huge implications for healing traumas from the past. Even if you had a perfect childhood, I'm pretty sure that if you went to junior high school, you endured emotional pain. We tend to underestimate and even deny that we're all damaged in some way, just as we refuse to acknowledge that we all have multiple personalities. But experiences in childhood and even adolescence leave scars that affect every aspect of our lives. It's interesting that the word trauma refers to both psychic and physical damage. When this anguish is fully processed, constant bliss is a possibility.

#### FRONTAL CORTEX AND BLISS

Your frontal cortex is the part of your brain that's key in understanding how reality is created. This structure is behind the forehead, and it's what makes us distinct from the apes. Our DNA is 99.4 percent the same as that of chimpanzees, our closest relatives, but chimps barely have a frontal cortex. That 0.6 percent difference must have a lot to do with



frontal-cortex development, and it's this part of the brain that makes us human.

What does the frontal cortex do? Think of it as the "executive level" of consciousness, where you plan for the future and also where you can choose to direct your attention. Just how important these two capacities are is shown by the results of hundreds of neuropsychology experiments conducted on brain-damaged subjects who were asked to sort cards. A normal person can easily change the criteria by which they sort, due to a capacity for *selective attention*, an ability to consciously shift focus to something else at any given moment. But if you have damage in your frontal cortex, you can't pay attention selectively, and you can't truly choose.

I want to revisit those sensory way stations for a moment and show you another aspect of the frontal cortex: how incoming sensory information is filtered along synapses loaded with opiate receptors. In 1981, I published a paper in *Science* with Mort Mishkin and Agu Pert (my husband at the time) entitled "Opiate Receptor Gradients in Monkey Cerebral Cortex: Correspondence with Sensory Processing Hierarchies." In this paper, we reported how more opiate receptors are found in the frontal cortex than in any other part of the brain or body, and how we found an increasing gradient along the sensory way stations in the cerebral cortex of monkeys. The experiments were done in monkeys who'd already been well studied to determine the information-processing going on at each synapse. In the animals, we were able to carefully map the opiate-receptor density.

Our data showed that as you travel up from the back of the brain (where the occipital cortex first receives sight) to the frontal cortex, you find, as you progress forward and upward, that there are more and more opiate receptors—exponentially more as you move up to the frontal cortex. As I've mentioned, the

frontal cortex is the place in the brain where we make choices and plan for the future, and what we saw in the lab was that those pathways are increasingly mediated by the molecules of bliss—the endorphins and their opiate receptors.

This increasing gradient of pleasure and bliss was apparent whether we were looking at hearing or vision. Both sensory pathways increased in opiate receptors as information moved toward the front of the brain. I interpret this finding to mean that pleasure and bliss increasingly influence our criteria of choice as incoming information climbs higher and higher up the sensory way stations. In other words, we make moment-to-moment choices about what to pay attention to and what to plan for in the future based on the pleasure that we get from our choices. No pleasure? Well, then we aren't very likely to choose it. Without a frontal cortex, we'd be like simpler animals, who have no capacity to choose other than to react to or avoid potential pain and death.

But because we have a frontal cortex—that very important 0.6 percent of DNA difference from the chimps—and it's loaded with opiate receptors and endorphins, we can experience the higher-consciousness states of bliss and love, what the mystics call “union with the divine.” Our biology actually makes this possible!

Unity: this is our spiritual/biological heritage as humans. Animals don't have a seventh chakra, no mystical third eye or crown connecting them to something beyond—at least my chocolate Labrador retriever, Tory, hasn't indicated that to me yet! Humans do, and the potential for higher consciousness is built right into our anatomy. Beyond just feeling good, we can feel God, and from that state of bliss and union, we have the capacity to create a future for ourselves . . . and for our planet.

#### MANIFESTATION OF YOUR DESIRES

Attention is important for creating reality, especially when combined with intention. In fact, manifestation, the skill of



imagining what you want and making your dreams come true, can be learned. I've understood from mystics and the teachings of Eastern sages that such things are possible, and in fact, I've learned to meditate with the intention of removing obstacles to the further manifestation of Peptide T in the world. By focusing attention on a mantra or on breathing, a state of quiet and calm alertness can be achieved. Interestingly, the frontal cortex receives input from neuronal fibers sprouting from a tiny cluster of cells at the base of the brain that make norepinephrine, the brain's own amphetamine. I've theorized for some time that the frontal cortex strengthens and even enlarges from frequent meditation, just as a muscle in the body gets pumped up from weight training. This has been proven to be true in experiments showing a resulting thickened layer of cells in this part of the brain, performed by Dr. Richard Davidson, director of the Laboratory for Affective Neuroscience at the University of Wisconsin, in collaboration with the Dalai Lama!

#### THE FUTURE

If we're so powerful, I also wonder, what do we want to create for this human existence, this planet of six billion people hurtling through space? It really is the next question to ponder, so I want to conclude my remarks with some speculation about what the future holds, especially the future of medicine. I think that there will be more and more emphasis on wellness rather than disease. The health that I'm predicting we'll see more of is psychosomatic well-being, involving not just the physical body, but the mental, emotional, and spiritual self as expressed in the corporeal. We can't afford to keep leaving out these aspects of the human experience in treating illness. Energy medicine and psychology, along with forms of chiropractic that treat emotional as well as physical release and alignment, will become more and more popular as the science explaining the

mechanisms of these approaches comes to light. I'm confident that the medicine of the future will include the whole picture: body, mind, and spirit, with a special emphasis on alleviating stress, which is often the result of emotional overload.

## Effects of a Fourteen-Day Healthy Longevity Lifestyle Program on Cognition and Brain Function

By Dr. David S. S. ...

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