

**Special
Gigantic
Double Issue!**



MEGABRAIN

R E P O R T

THE JOURNAL OF MIND TECHNOLOGY

Volume I, Number 3

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A Message to Subscribers

Dear Megabrain Report Subscriber,

I'm proud of this special double-issue MEGABRAIN REPORT, and I believe you'll find it a unique and rich source of brain-stretching and thought kindling information, ideas, theories and opinions.

As most of you are aware, this double-issue has been a long time coming—well over a year since the publication of MBR #2. I want to thank all of you who wrote, wondering where your next issue was, expressing concern, impatience and sometimes even exasperation at the hiatus, explaining how important MBR was to you. It's good to feel wanted. It's *not* good to feel like a cause of irritation. So I want to give you a personal explanation for the delay.

First, this has been a painful and extended lesson to me in the dangers of putting too much on your plate at once. When I began publishing MBR, I was also immersed in writing a book, conducting Megabrain workshops around the world, and setting up a non-profit institute that would conduct research in brain technology. And, by the time MBR #2 was out, I was also involved in helping to create a mind-enhancement audiocassette series, writing scripts for another tape series, working with a producer to develop a TV mini-series based on one of my books, making a tour and other public appearances to promote a recently published book, and involved in several other writing projects.

And, most time-consuming of all, I found myself president of an organization that had rapidly grown from an easygoing part-time one-man operation that produced Megabrain Workshops to a high-pressure mail-order retail corporation with numerous employees. Somehow I found myself, a writer who had spent much of his life intentionally avoiding the 9 to 5 business grind, devoting huge amounts of time and energy to running a *business*. And somehow, despite the fact that my main interest in brain technology was in *using* and enjoying it personally, I found myself overseeing (of all things) a *sales* company.

Fortunately all of that has changed. In the fall of 1991 I completely terminated all sales operations of Megabrain, Inc. I have agreed to write a "Hutchison's Guide" section in the *Tools for Exploration* catalog, but in that capacity I am not a salesman and not involved in making sales or fulfilling orders. The publisher of that catalog, Terry Patten, has given me full freedom to write about whatever mind tools I choose in what is in essence a "Consumers Guide to Brain Technology." I am now free to devote my time to what I love best, exploring and writing about human technology evolution, and I've begun to refer those who have come to me seeking to obtain these technologies to Tools for Exploration. Terry Patten is a personal friend and a contributing editor to MEGABRAIN REPORT, but we are not business partners. And both he and I agree on the importance of *not* letting business considerations influence the objective journalism to which MEGABRAIN REPORT is devoted and committed.

A second reason for the long delay after MBR #2 was that I personally was going through a period of upheaval. In September, 1989, I had become the father of a baby boy, Galen Hutchison, and his extraordinary presence transformed my life totally (to include such things as 4 a.m. diaperings and feedings and 6 a.m. wakings). It required a total reordering of my priorities, and made me yearn to spend as much time with him as possible. At the same time my marriage to Kelly Hutchison was crumbling and moving inexorably toward divorce. Adding to the stress (and in large part as a result of it), for well over a year I was struggling with a debilitating case of Chronic Fatigue

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EDITORIAL: ON OUR WAY TO MEET THE TERMINATOR

Here we are again. At last! For a personal explanation for the long hiatus, see my letter on the inside of the front cover.

Meanwhile, technology for enhancing human performance—and popular interest in that technology—continues to develop and gather momentum at a breathtaking rate. The future path of this development is becoming ever more clear: the evolution of mind technology will continue to accelerate, touching and ultimately transforming virtually every aspect of modern culture. I think this has now become inevitable, because mind-technology embodies the central evolutionary force and historical event of the coming decade: the growing interaction and interdependence between humans and technology.

This human-machine linkage is taking many forms, some of them chilling. George Bush's appalling war in the Persian Gulf, for example, revealed to the hundreds of millions who watched it on TV (one of our culture's most influential techno-human bonds) that war was no longer fought by humans armed with weapons, but by weapons armed with humans—by a human-technology fusion based on information transfer and information exchange. Humans, their brain-power enormously expanded by the information provided by technology, their capacities accelerated by the superhuman information processing speed of technology, "operated" high-tech weapons systems that were in turn "operating" their human components through a continuous feedback of information, corrections, instructions and orders.

But in its clear demonstration of the stunning powers of the techno-human fusion, that war also inadvertently provided a message of hope for humanity: powers that can be used for ill can, in the right hands, be used for good. Powers that can be used to destroy a land so rapidly can also be used to turn a wasteland into a garden, to alter climates, to restore the environment, to explore space. Such wonders of human-machine information processing used to gather intelligence, direct weapons and control armies, can as easily be used to disseminate intelligence freely, promote communication, accelerate the unrestricted flow of information, provide education and medical care for billions, link us together in a global community, and promote the kind of open, cooperative scientific inquiry that can transform our lives and our universe.

As with warfare, techno-human fusion has already transformed the corporate world, as entire global organizations are linked to, dependent upon, and "operated by" their technological components, including immense information exchanges, databases and processing systems. (The power of technology to "operate" these huge networks independently of the humans supposedly in charge was demonstrated by the chain-reaction, out-of-control eruption of selling on the Stock Exchange in October, 1987, which was generated by computerized "program trading" systems, and created a vicious cycle downward spiral that many believe was a major cause of the great stock market crash.) And while robots turn out the hardware/product, the flesh and blood human corporate "components" are linked together as individuals and common-interest groups in intimate and/or faceless

and instantaneous computerized informational-social networks. But again, as with the powers that fought the war in the Gulf, the enormous powers of this global human-machine system, at present guided mainly by vicious self-interest, can be used for good or ill.

Other examples of the increasing proliferation of human-technology include sophisticated tools for medical diagnosis and monitoring, by now indispensable for most medical professionals; accelerated learning systems that respond to the learning rate and abilities of the student using them; computerized automobile and airline guidance and control systems (ranging from autopilot and automatic landing systems to anti-lock braking systems, and computers that monitor and talk to you about your door locks, speed, gas and oil levels); high-tech exercise machines that continuously monitor blood pressure, heart rate, weight, age, level of fitness and much more to provide the user with optimal exercise; and the growing sophistication of virtual reality systems (which within a few years will, among other things, enable users to have 'virtual sex,' which would include the interesting possibility of having sex not only with other humans widely separated by distance and time, but also with intelligent machines).

There seems little doubt that if we can avoid a global cataclysm our lives will become increasingly not just dependent upon but actually fused with and inseparable from technology. For good or ill, the evolving symbiosis between humans and technology is creating our future, and bringing into existence an unprecedented sort of hybrid creature, a new meta-human being who inhabits a new info-sphere reality. We are on our way to meet the Terminator—both the anti-human of the first film and the guardian angel of Part II—and by the time we get there we may be surprised to find that he is us.

MIND TECHNOLOGY. The area of techno-human interplay with which MBR readers are most familiar—mind machines for enhanced brain performance—has been evolving with mind-boggling speed in recent months. The evolution has been happening on several levels. First, existing devices have been modified by incorporating the latest developments in microcircuitry, design and research, the result being devices that are miniaturized, far less expensive, much more user-friendly, and much more powerful and sophisticated. For example, light and sound systems that used to be bulky and expensive (some of them costing many thousands of dollars) have been transformed into tiny hand-held systems with incredible versatility costing under \$200 (see our review of "A New Generation of Light and Sound Machines" in this issue).

EXPANDING PUBLIC AWARENESS. The effect of this transformation has been that these machines have begun to enter the main-

stream mass-consumer marketplace under the innocuous description of "stress reduction" or "relaxation" tools. These devices, which only a short time ago were unknown to most people, or carried an eerie tinge of science fiction "mind control," are now selling by the thousands in mainstream catalogues like Sharper Image, Hammacher Schlemmer and DAK.

Along with the increasing acceptance and skyrocketing sales, has come increasing interest by the mainstream media and cultural intelligentsia. As one example from among many, *Forbes* magazine has just published a very positive and substantial article on mind-tech in *Forbes FYI*, a quarterly supplement that goes out to its over 750,000 subscribers, virtually all of them upscale business people. The article describes Wall Street traders, business executives, corporate personnel managers and medical professionals using and praising the mind machines, and carries the message that, in the words of one M.D. quoted in the article, "I don't think we have to wait. The machines do work."

INNOVATION AND EVOLUTION.

The current process of seemingly constant innovation and evolution shows no signs of slowing down: all of the major manufacturers now have in development new projects that constitute a major leap forward. The field shows every sign of settling into a state of continuing innovation, as has happened with computers. Not content to add refine-

ments to current devices, manufacturers and other innovators are scrambling over each other to develop and bring to market entirely new systems and new syntheses of existing technology. Examples include acoustic field systems, bioacoustic field effects biofeedback (systems that monitor whole body field-effects and use that information to alter the bioacoustic whole-body stimulation), and the emerging magneto-EEG biofeedback using bioacoustics (discussed by Dr. George Fritz in the "Megabrain Forum" in this issue and Terry Patten's introduction to "Acoustic Field Generators: The Ultimate Consciousness Machines?" in MBR #4). Another imaginative product of synthesis-thinking is the new Stress Shield (reviewed in MBR #4), which is the first truly effective ganzfeld system on the market, but combines the ganzfeld effect with selectable color fields, to make it also a useful phototherapy device.

INCREASING RESEARCH. Another pivotal sign of the expanding interest in mind-technology is the increasing amount of significant new research being performed in the field. Some of the most exciting work, in part because of its potential for rapidly transforming and improving millions of human lives, has been that of Dr. Eugene Peniston and Dr. Paul Kulkosky, (described in "At the Crossover Point" in this issue) demonstrating that by learning to alter their brainwave activity, individuals suffering from alcoholism and drug

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The Persian Gulf conflict revealed that war is no longer fought by humans armed with weapons, but by weapons armed with humans . . . by a human-technology fusion based on information exchange.

RESEARCH UPDATE: HAPPY BRAIN, SAD BRAIN: BRAINWAVES, HEMISPHERES AND EMOTIONS

by Michael Hutchison

Let a Smile (Right Side) Be Your Umbrella

Stop now and note your emotional state: are you happy, sad, upbeat, depressed, eager? All right, now, keeping the left half of your face motionless, vigorously contract the right side of your face several times—smile energetically and forcefully, each time contracting not only the muscles in your cheeks that draw the lip corners up but also the muscles around your right eye. Stop now and pay attention to yourself. Has your emotional state changed?

You have just been practicing one of the most recently discovered examples of *neuro-technology* (i.e. the systematic application of a body of knowledge to your brain). If you are like most people, contracting the right side of your face probably triggered positive emotions, joy, rockiness, a lifting of the spirits. If you had contracted the left side of your face you might have felt an inexplicable sadness and depression.

The link between left side of the face activity and sadness and right side of the face activity and happiness has been discovered, and verified in a series of studies, by Canadian researchers (in the journal *Neuropsychologia*, 27: 923-925). In two of the studies the researchers, Bernard Schiff and Mary Lamon, simply asked the subjects to vigorously contract either the right or left sides of their

face. They found strong evidence (in over 90% of the subjects) that contorting one side of the face produces emotions, with the left side of the face producing sadness and negative emotions, right side producing positive emotions.

In another study subjects were asked to describe an emotionally ambiguous picture after performing the contractions. Subjects tended to describe it negatively after contracting the left side of the face, positively after the right.

The research emerged from Schiff's experiences as a therapist, when he noticed that clients often began therapy with great facial asymmetries which disappeared as their distress diminished. In another study, Schiff reversed the studies described above and worked from actual feelings toward facial expressions, and found that stress itself could cause subjects to exhibit such facial asymmetries.

Most of us have probably played the game of placing a pocket mirror down the center of photographic head-shots (such as those in school yearbooks) to see the enormous differences between faces made up of two left sides (i.e. the "right" side actually a mirror image of the left side) and two right sides. Schiff and Lamon's studies add a new dimension to this, and to the simple act of consciously observing peoples' faces, since it's clear that peoples' facial expressions, and their patterns of facial symmetry and activity, reveal much about their emotional state and their personality.

Since Schiff and Lamon's subjects reported that their emotional responses were independent of conscious thought, these studies challenge the long-dominant view that emotion is invariably secondary to some form of thought or consciousness and add to the growing neuroscientific evidence that emotions can precede and often determine conscious processes. The researchers concluded that, "Unilateral facial contractions appear to induce emotional experiences without cognitive mediation."

"One implication," they observed, "is that asymmetries in facial expression, whether spontaneous or deliberate, may actually influence the emotional experience." Which suggests that we can deliberately influence and alter our emotional state by means of facial expression. Let a smile be your umbrella, indeed, provided the smile is on the right side of your face.

Sun Brain, Moon Brain

Interestingly, several other groups of scientists working independently of Schiff and Lamon have recently published a flurry of studies that cast light on the actual neurophysiology underlying the link between facial asymmetry and emotions. Using EEG testing, these scientists have discovered that the difference between a happy disposition or a melancholy one (and between left-face and right face activation) may lie in a specific pattern of brainwave activity. Specifically, these scientists have found that "EEG asymmetry in anterior regions of the brain" can predict and diagnose emotional states and emotional styles.

What is this EEG asymmetry? Stated simply, people with more activity in the left frontal cortex than in the right tend to have a more cheerful and positive temperament—they are self-confident, outgoing,

interested in people and external events, resilient, optimistic and happy. On the other hand, people whose EEG shows more activity in the right frontal cortex than in the left tend to be more sad and negative in their outlook—they see the world as more stressful and threatening, are more suspicious of people, and feel far more fear, disgust, anxiety, self-blame and hopelessness than the left-activated group.

Looking at this in terms of evolutionary biology, we might say the high-activity left-frontal people show more "approach" behavior, while the right-frontal actives show more "withdrawal" behavior. Clearly the survival and evolution of the human race required both types of behavior, but the new evidence suggests that ordinarily the left frontal region of the brain exerts some control over the right frontal cortex, "turning off" the negative or withdrawal behavior when it no longer serves a purpose. However, it now appears that in some individuals, high levels of right frontal activity may have overpowered or short-circuited the normal ability of the left frontal cortex to turn off or exert control over negative feelings.

These discoveries have been reported in a recent outburst of articles in scientific journals (mainly in the *Journal of Personality and Social Psychology* and the *Journal of Abnormal Psychology*), but are the result of over a decade of research by a number of scientists, led by Dr. Richard Davidson, of the University of Wisconsin.

"Unilateral facial contractions appear to induce emotional experiences without cognitive mediation."

MEGABRAIN® REPORT

The Journal of Mind Technology

Volume 1, Number 3

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Layout And Formatting: Dennis Schick, Professional Computer Arts, and Michael Maffeo, Butterfly Graphics Services

MEGABRAIN REPORT is published four times a year by Michael Hutchison, P.O. Box 2659, Sausalito, CA 94966. Editorial and circulation address is: MEGABRAIN REPORT, P.O. Box 2744, Sausalito, CA 94966. U.S. subscriptions are \$48/year, Canadian and Mexican subscriptions are \$54/yr, other foreign subscriptions are \$62/yr, and single issues and back issues are \$16 each, payable to MEGABRAIN REPORT. Subscription inquiries: send new or renewal notices or change of address (send both new and old addresses) to MEGABRAIN REPORT, P.O. Box 2744, Sausalito, CA 94966.

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sin, Madison, and his colleagues (including Dr. Jeffrey Henriques, also of UW, Madison, and Dr. Andrew Tomarken, a psychologist at Vanderbilt). Let me summarize some of their fascinating findings.

In one recent study, Davidson and Tomarken gave a group of 99 women a personality test that classified them on a scale from positive outlook to negative. They also studied their patterns of brainwave activity using an EEG. The results were clear: those with the most right-frontal activity were also those whose personality tests showed the most pronounced negative outlook, while those with the most left-frontal activity had the highest scores for positive outlook.

This emotional difference between right and left was also evident when the scientists worked in the other direction, working backward from facial expressions to brainwave patterns: they measured observable facial behavior during experiences of happiness and disgust, while simultaneously measuring brainwave activity to observe patterns of hemispheric activation during the experience of happiness and disgust. They found that disgust was clearly associated with right-sided activation in the frontal and anterior temporal regions, while happiness was accompanied by left-sided activation.

New Insights into the Brains of Film Critics

In one study, Dr. Tomarken found that these brainwave patterns could predict "affective responses to emotion elicitors," i.e. how the subjects would react to film clips that were preselected to elicit positive or negative emotions (the positive film clips were of a puppy at play, or an amusing gorilla taking a bath; the negative clips showed gory surgery scenes). Those with more right-frontal activity showed far more powerful negative emotions, such as fear and disgust, when viewing the surgical scenes than did those with more left-frontal activity. On the other hand, those with more left-frontal activity derived far more pleasure and delight from the positive films than did the gloomy right-frontal subjects. Significantly, these effects were independent of the subjects' mood ratings at the time at which their base line EEG was measured, just before viewing the films.

In other words, things that might produce delight and euphoria in some people will leave others cold, unmoved, or even suspicious; and things that some folks find only mildly unpleasant will fill others with enormous revulsion, disgust and horror. And these responses can be predicted, simply by observing their brainwave

patterns. Now imagine these different types of people trying to communicate to each other their feelings about something more emotionally complex than a frolicking puppy or open-heart surgery—something like life, and the experiences of day to day existence. Imagine an activated left-frontal husband with an activated right-frontal wife. . . .

Depression in the Brain

There is also evidence that these brainwave asymmetries may be linked to depression. Henriques and Davidson tested the EEGs of a group of normal subjects who had never been treated for depression, and a group of subjects who had been previously depressed and later successfully treated for depression. They found that the previously depressed subjects had far less left-frontal activity, and far more right-frontal activity, than those who had never been depressed.

In a later study Davidson found that patients who had just been diagnosed with depression and were about to begin treatment had less left-frontal activity than non-depressed subjects. "You find similar brain patterns in people who are depressed, or who have recovered from depression, and in normal people who are prone to bad moods," said Davidson. "We suspect that people with this brain activity pattern are at high risk for depression."

The Cry-Baby Biomarker

There is evidence that these brainwave patterns and emotional "styles" may be hereditary or genetically-influenced. Davidson has studied the behavior and the EEG patterns of 10-month old infants during a brief period (one minute) of separation from their mothers, and found that "those infants who cried in response to maternal separation showed greater right-frontal activation during the preceding base line period compared with infants who did not cry." Observed Davidson, "Every single infant who cried had more right frontal activation. Every one who did not had more activity on the left." He concluded that "Frontal activation asymmetry may be a state-independent marker for individual differences in threshold of reactivity to stressful events and vulnerability to particular emotions."

These clear links between frontal activation asymmetry have led many researchers to believe that these brain patterns can be useful for diagno-

sis, particularly for diagnosing people at risk for depression. Says Davidson, "We believe that in the face of life stress like losing a job or a divorce," those with right-frontal activation "are likely to be particularly susceptible to depression."

These recent experimental findings support earlier work, such as that of Pierre Flor-Henry of the University of Alberta, who found that when he gave barbiturates to the right brain only, anesthetizing it and leaving only the left hemisphere active, subjects reported euphoria, and when he anesthetized the left, subjects became depressed. A neurosurgeon reported recently that after he had removed part of the right frontal lobe during surgery the patient's personality was transformed, becoming much more positive and affectionate. A 1984 study in the journal *Brain* of

patients who had suffered strokes reported that those with lesions in their right frontal cortex were "unduly cheerful." And recent PET scan studies at U.C.L.A. and in France have revealed that severely depressed pa-

tients show a dramatic decrease of activity in the prefrontal lobes on the left compared with non-depressed subjects.

Turning Up the Juice in the Jolly Lobe

The next step, of course, is to move from simply observing the existing brainwave patterns and using them for diagnosis to actively developing strategies and techniques for altering the patterns. As Dr. Davidson pointed out, "If you learn to regulate your negative feelings better, it may turn out that you have also learned to turn up the activity in your left frontal lobe."

Well, here we are where we started out: It should now be clear that our original exercise in neurotechnology, in which we contorted the right side of our face to produce positive emotions or good feelings, is one technique for "turning up the activity in your left frontal lobe." We know that the brain is cross-wired with the body, so that the left hemisphere is linked to the right side of the body. Thus, by activating forcefully the right side of the face, it seems we are also activating the left side of the brain, the side associated with positive feelings. Another method for doing this, an ancient yogi *pranayama* technique, is breathing through the right nostril to activate the left hemisphere. The yogis called this the "sun breath,"

"Every single infant who cried had more right frontal activation. Every one who did not had more activity on the left."

in comparison with the "moon breath" of the left nostril/right hemisphere.

Mind Tech, Brain Coherence and Emotional Self-Regulation

But of course this raises some interesting questions for those of us who are familiar with modern brain-technology. One of the clear effects of some of these tools has been to alter brainwave activity, both in frequency and in amplitude. One of the claims by some makers of light and sound devices, for example, has long been that these devices can "harmonize," "balance" or "synchronize" the activity of the brain's hemispheres. Similar claims have been made about motion systems (such as the Graham and SAMS Potentializer and the Integrated Motion System), ganzfeld devices, flotation tanks, cranial electrostimulators, and binaural beat frequency tapes (as suggested, for example, by the name "Hemi-Sync™"). Not only have these claims been made, but there is some compelling evidence (such as EEG brain maps) that some sort of shift in inter-hemispheric brainwave patterns is produced by these devices.

If in fact these mind-tech tools can reliably alter brainwave hemispheric asymmetry and produce more symmetrical brainwave patterns, or if we can learn to use them to target and selectively activate one region of the brain (such as the left-frontal cortex), it makes sense to believe that they might have a profound impact, not only on the treatment of depression, but in helping non-depressed individuals learn to reject tendencies toward negative emotions such as fear, sadness, suspicion, self-blame, retreat and disgust, and replace them with authentic feelings of joy, self-confidence, delight and an optimistic engagement with the world.

Certainly, much research needs to be done in this area, particularly research that uses modern brain-monitoring equipment such as topographic brain-mapping EEGs to observe the effects of mind machines, and can then link these machine-induced changes in brain activity with changes in emotional states (I suspect even more interesting links between brain activity, brain machines and emotions would emerge from the use of PET scans, though unfortunately this technology is still too costly for the budgets of most mind-machine research projects). But if, as Dr. Davidson says, positive emotions and healthy emotional states may come from simply "learning to turn up the activity in your left frontal lobe," we may find that mind-machines can be effective tools of personality transformation, emotional self-mastery and continuing delight.



COMING IN MEGABRAIN REPORT:

MORE LIGHT: MEGABRAIN EXPLORES LIGHT TECHNOLOGY

➤ In which we offer a Consumers Guide to Light Technology, including full-spectrum lighting systems, colored light therapy systems (such as the Lumatron); discussions of recent research into the use of light systems for the treatment of learning disorders, phobias, anxiety and more; the work of Dinshah Ghadiali, whose Spectro-Chrome™ color light system is still banned by the FDA (with information about how readers can create their own color projection systems easily and inexpensively); and much much more.

SOUND THERAPY: HIGH FREQUENCIES FOR PEAK PERFORMANCE?

➤ A look at the use of high frequency sound to stimulate the brain for enhanced brain-body functioning, from the work of French researcher Alfred Tomatis. Including discussions and reviews of new audio cassette sets now on the market using the Tomatis technique.

COGNITION-ENHANCING DRUGS, PART TWO

➤ Another information-packed feature on nootropics, introducing a variety of brain-boosting substances not described in Part One. Nutritional educator Oz Garcia reports on his clinical experience with many cognition-enhancing substances. Reports about nootropics, including brain-machine/brain-drug interactions, from MBR readers.

PULSED ELECTROMAGNETIC FIELD GENERATORS

➤ Authorities Bob Beck, Glen Rein, Eldon Byrd, Peter Lindemann and Elizabeth Rauscher and Bill Van Bise take a critical look at a variety of PEMF devices now on the market.

DO SUBLIMINALS WORK?

➤ Subliminal tapes are sold by the millions, but do they really work? MBR looks at the scientific evidence, and talks with researchers who have investigated subliminals, including Dr. Eldon Taylor, Dr. Thomas Budzynski, the National Research Council and others, and uncovers some mysterious forces and scientific conflicts. Including a comprehensive and straight-talking "Consumers' Guide to Subliminal Tapes."

EEGS FOR YOU AND ME: NEW BRAIN MAPPERS & MIND MIRRORS

➤ A survey of the wave of new, relatively inexpensive, consumer oriented EEG systems, ranging from the sophisticated topographic brain mapping NeuroSearch 24 and the CAP Scan, to an inexpensive build-it yourself Mind Mirror-style full-spectrum EEG that can be integrated with your PC, to new EEG-driven sound and light systems. How do they work? Which are the best? How effective are they in helping produce desired brain states?

SACRED MIRRORS: THE VISIONARY ART OF ALEX GREY

➤ An interview with Alex Grey, creator of "consciousness technology" art: paintings that are tools for inducing heightened states of consciousness, and that serve as maps for brain states produced by other brain-tools; along with an essay/review by Michael Hutchison of a newly published book of Alex Grey paintings.

THE AWAKENED MIND

➤ Foremost authority on the use of the Mind Mirror and other EEGs, and leading teacher of processes for altering brainwave activity to attain high-performance brain states, Anna Wise provides powerful techniques for brainwave training that you can do on your own and in combination with mind machines.

MEGABRAIN REPORT

AT THE CROSSOVER POINT

NEW BREAKTHROUGHS IN THE TWILIGHT ZONE

by Michael Hutchison

Interesting how things fall together. The book *Megabrain* included discussions of some of the intriguing effects of theta brain-wave activity (i.e. brainwaves in the range of 4 to 8 Hz). Much research had established that the *theta state* (characterized by dominant or high amplitude theta brainwaves) was associated with vivid hypnagogic imagery, sudden bursts of insight, and intense memories of childhood. Most of us experience it briefly as we drift off to sleep. Unfortunately, as scientists and meditators have found, it is not easy to enter or remain in the theta state at will: the natural tendency is to slip fleetingly through theta and down into sleep.

Theta Explorers

In the 1970s researchers Elmer and Alyce Green at the Menninger Foundation began experimenting with biofeedback to train subjects to enter and remain in the theta state. The results were surprising and extraordinary: subjects who learned to enter theta showed enhanced immune functioning, heightened creativity, and underwent profound “integrative experiences” in which the subjects felt that their lives were transformed.

During that time biofeedback researcher and clinician Dr. Thomas Budzynski also began to explore theta, which he dubbed the “twilight state,” and found that the theta state was characterized by hyper-suggestibility and hyperreceptivity. It was, he discovered, an ideal state for accelerated or superlearning, and a state in which suggestions for behavioral change had dramatic and longlasting effects. He created a biofeedback device—the Twilight Learning System—that helped users get into theta and then automatically activated a tape player that fed them information or suggestions as long as they remained in theta.

Megabrain also cited research by Dr. Gary Lynch, Dr. James McGaugh and others suggesting that theta was a key to memory and learning, that it was the natural rhythm of the hippocampus—the brain’s gateway to memory and learning.

I speculated that one of the reasons the theta state produced such vivid memories of childhood was that the natural dominant brain-wave activity of children is in the theta range. As adults, however, our dominant waking brainwave activity is in the beta range, and we rarely experience more than fleeting moments in the theta range. Memories laid down in childhood, it seemed, were *state-dependent* or *state-bound*: to gain access to them, you had to be in the state in which they were created, i.e. theta. It made sense that as biofeedback techniques helped subjects enter the theta state they would suddenly

gain access to those state-bound memories. This would explain Budzynski’s findings that theta was the ideal state for “rescripting” or “reimprinting” the brain, eliminating destructive behaviors or attitudes that were a result of “scripts” laid down in childhood (during times when the child is in a theta state) and replacing them with positive scripts.

I also speculated that somehow by entering the slower, more coherent, brainwave range of theta, the brain was enabled or stimulated to go through a sudden, dramatic and profound reordering process much like that described by Ilya Prigogine as “escape to a higher order” (and perhaps the source of the frequent “integrative experiences” in theta noted by the Greens). The evidence was compelling that if people could enter this beneficial brain state using biofeedback training, then the new brain machines could speed up this process enormously.

Theta and Personality Transformations

Recently a wealth of new information about the benefits and characteristics of the theta state has emerged. In MBR #1 we described the exciting findings of Dr. Eugene Peniston and Dr. Paul J. Kulkosky, who discovered that alpha-theta biofeedback training had unprecedented effects in the treatment of alcoholism: subjects not only had unprecedented success in overcoming their alcoholism (a success rate approximately 600 percent higher than those subjects going through standard medical treatment for alcoholism), but also underwent dramatic personality transformations.

Among the extraordinary changes noted in their subjects, Peniston and Kulkosky found that those who had the alpha-theta training showed significant increases in warmth, abstract-thinking, stability, conscientiousness, boldness, imaginativeness and self-control, and significant decreases in behaviors labelled schizoid, avoidant, passive-aggressive, borderline, paranoid, anxiety, somatoform, dysthymia, psychotic thinking, psychotic depression and psychotic delusion, among others. Control groups using standard medical treatment did not show these changes.

In MBR #1 we suggested that mind machines could represent an important shortcut, providing a much more rapid way of producing the beneficial slow brainwave states: “if some of the mind machines are in fact effective in quickly putting users into slow brainwave states, and, in the ‘bicycle training wheels effect,’ can teach users how to enter those states themselves, then they can be invaluable in speeding up the healing and personal transformation process not only for alcoholics and drug addicts but for all of us who seek integrative experiences and increased creativity, health and well-

Subjects who learned to enter theta showed enhanced immune functioning, heightened creativity, and underwent profound “integrative experiences.”

being.” We have recently learned that Dr. Peniston has had similar remarkable success in using theta to treat Post-Traumatic Stress Syndrome among Vietnam War vets: while in theta much of the painful material is able to emerge, be fully experienced and dealt with, yet without the horror and agony and pain usually associated with the emergence of such material.

In another important study linking theta with beneficial life changes, this one at the Center for Alcohol Rehabilitation and Educational Services in Medford, Oregon, researcher Rita Sullivan used a Twilight Learning System to give alcoholic subjects EEG theta brainwave biofeedback training coupled with suggestions delivered while in the theta state. She found the subjects not only were far more successful in reducing alcohol consumption, but also showed a marked improvement in quality-of-life, as measured by the Oregon Quality of Life Questionnaire.

Mapping the Crossover Point

Recently, a number of researchers have begun using multi-channel EEGs, such as the CAP Scan and the NeuroSearch 24, to explore in more detail what happens in the brain when it goes through these apparently transformational moments. What they have found is that when a subject becomes deeply relaxed, alpha brainwave activity increases through the whole brain. As relaxation increases, the subject begins to produce more and more theta activity. As theta amplitude increases, alpha seems to recede or diminish, until the subject reaches a point, easily ascertained by the EEG, at which theta supersedes alpha. Exactly at that point, what the researchers are calling the “crossover point” or the “critical point,” the subjects experience important, emotionally loaded, even life transforming moments. These frequently consist of creative insights, vivid memories from childhood (so vivid that the subject would experience it with a feeling of “being there”), or, as in the case of the Vietnam vets, the emergence of suppressed or repressed experiences. Subjects consistently report these moments as profound, moving, life transforming, even spiritual moments.

Interestingly, when the researchers replay the moment-by-moment topographic maps of brainwave activity, each subject can identify the “Aha experience” or the moment of insight or childhood memory as occurring just at the crossover point, the time when theta activity superseded alpha.

The question arises: if being at the crossover point can have such profound benefits, what would happen if you could learn not just to “cross over” that point briefly, but stay there for long periods?

A number of researchers have asked that question and begun to find out the answers. Since the EEGs can be linked to biofeedback

signals, such as tones, they have now begun letting subjects monitor their own brainwave activity and learn how to reach the critical crossover point and to stay there for extended periods. For example, the user might hear one tone indicating alpha activity, another indicating theta, with the tones rising or falling in amplitude with increases or decreases in alpha or theta. The user simply uses relaxation techniques (or one of the brain machines) and listens to the biofeedback until he or she reaches the crossover point, at which time another tone is heard. The user then learns to stay at that point.

In Search of the Crossover Machine

This is an extraordinary breakthrough. The EEG equipment being used by these researchers is moderately expensive. However, it would be a relatively simple electrical engineering project to put together a device specifically designed to provide biofeedback in the form of different tones for alpha and theta and a third signal indicating the crossover point. Such a device could be used alone, or in combination with any of the currently available brain machines, and could assist the user in learning to enter that extremely beneficial, transformational state rapidly and reliably.

In light of suggestions and evidence that brain machines can help speed up the process of attaining alpha-theta brain states for many individuals (see the discussions in the MEGABRAIN FORUM elsewhere in this issue), it seems a logical next step to produce an instrument that uses brain machine stimulation, in the form of sound,

light, CES, etc., to alter brainwave activity and move it toward the desired goal, the crossover point. Such a device could combine the active stimulation with biofeedback technology that would alert the user when he or she is at the critical point and teach him or her to maintain that critical point, so that using the “training wheels” effect, the user can learn to enter that extraordinary state at will.

The technology to produce such a device already exists. The work of Peniston, Budzynski, Sullivan and others suggests that such a device could have profound effects when used in a therapeutic setting. Equally exciting, it could enable all of us to gain rapid access to long lost childhood memories, integrative experiences, and greater self awareness.

Mind-machine manufacturers take note. Perhaps some mind-machine hacker is already out there putting together this “Crossover Point Trainer” in his garage workshop. I hope so. I can’t wait to try it out. One of the researchers who has been investigating this crossover point is William Beckwith. We asked him to write about his experiences and his ideas for MEGABRAIN REPORT and he has provided us with the eloquent, wide-ranging, brain-stretching essay that follows.

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MOVING BEYOND METAPHORS OF THE MIND

ADDICTION, TRANSFORMATION AND BRAIN WAVE PATTERNS

by William J. Beckwith

Alcohol and chemical dependency treatment in the U.S. at present follows assumptions growing out of the Twelve Step Model of AA. This model, as put forth by John Bradshaw, Anne Wilson Schaefer, Charles Whitfield and others, assumes the importance of early childhood experiences on the later development of what has come to be called "codependency." In this model, there is no cure for codependency, only perpetual "recovery."

Recent research and clinical studies, however, have provided data that suggest a more inclusive model of addiction than that of codependency theory. Dr. Eugene Peniston, in his work with Dr. Paul Kulkosky at the VA Medical Center in Fort Lyon, Colorado, has demonstrated convincingly that alpha-theta brainwave training has a statistically-significant effect on recovery and sustained prevention of relapse in alcoholics.¹ Specifically, a thirteen-month follow up study showed that their biofeedback protocol has only a 10% failure rate as compared to relapse rates of 60% or more in conventional detoxification and counseling programs. Further follow-up 36 months later shows this percentage to be stable. Peniston's work demonstrates that a substantial improvement in the treatment of major addictions is not only possible, but available.

There remains a question as to how alpha-theta brainwave training achieves these results. Peniston's published work has concentrated on methodology and the statistical significance of his follow-up studies rather than proposing a mechanism for how the Peniston-Kulkosky effect works. Others have attempted to explain the effect as well as make use of it.

Two very different models have been proposed by Dr. Lester Fehmi and Dr. Carl Sonder to explain this phenomenon. Fehmi's model is based on his Open Focus training program, which assumes that addicts have narrowly focussed attention and compulsively dwell on real and imagined problems. He uses brainwave training and guided imagery to break the "closed focus" habit that excludes access to other thoughts and feelings.² This model emphasizes controlled alpha production as a substitute for the alpha increase that occurs after ingestion of alcohol.

Sonder,³ in contrast, has based his work on the Hobson-McCarley analytical model of memory encoded by theta waves originating in the "primitive" limbic structures of the brain. Neurological studies have shown that signals originating in the brainstem activate theta

rhythms in the hippocampus which proceed through the cortex to the neocortex during periods of REM sleep. Hobson's original theory reported in 1977 assumed that dreaming resulted from attempts by the neocortex to "make sense" out of relatively random memory fragments passed through almost accidentally while the work of memory encoding proceeded in the limbic system. This is inconsistent with the latest research on dreaming, especially studies of lucid dreaming. Hobson has recently revised his theory to acknowledge the psychological significance of dreams and reduced the role of the brainstem to that of a "switch" controlling the onset of new dream episodes.⁴

Tapping Into the "Total Information" Field

A third option is available. Another theory of memory encoding was outlined by Stanford neurosurgeon Dr. Karl Pribram in his book *Languages of the Brain*, based on holography.⁵ It drew on the work of English physicist David Bohm who proposed that the physical universe is a gigantic hologram, connected in undivided wholeness by an "implicate order." The holographic model of memory storage fits the reality of a quantum universe.

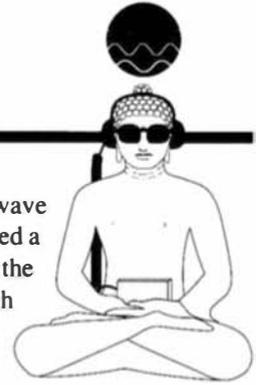
Dr. Jon Cowan has proposed that the membranes of the axons connect-

ing the neurons of the thalamus to the cerebral cortex are a potential source of coherent energy.⁶ Since these axons form parallel columns perpendicular to the cortical surface, synchronous excitation of these neurons could result in the formation of standing waves of various frequencies, similar to a tunable laser or maser. Experimental confirmation of this theory exists. Emission of coherent microwave radiation (i.e., maser emission) from the surface of stimulated axons in blue crab neurons was established by Allen Frey in 1968 and confirmed in later studies.⁷

This is paralleled by the work of Dr. Glen Rein, a neurochemist conducting research on scalar fields at Stanford University. His theory of "crystalline transduction" proposes that electromagnetic fields can be converted into scalar fields in the liquid crystals of neuronal cell membranes. Scalar fields present fascinating possibilities. Dr. Eldon Byrd, in the first issue of MEGABRAIN REPORT⁸ described scalar fields in the following way:

"I look at scalars strictly as information. . . Could it be that we live in a sea of information? Not in the form of electromagnetic energy, not acoustic energy, but a whole other form of energy which we currently have no instruments to measure. It's a sea of informa-

Dr. Jon Cowan has proposed that the membranes of the axons are a potential source of coherent energy. Synchronous excitation of these neurons could result in the formation of standing waves of various frequencies, similar to a tunable laser or maser.



tion. It's just there. It doesn't take any time for it to propagate from one point in time and space to another because it has nothing to do with time and space. Scalars are just information, and they are not bound by the same laws that govern matter or energy."

A hologram results from the destructive and constructive interference of two superimposed coherent electromagnetic energy wave patterns. As a field of interference, a hologram is independent of direction and velocity. It is pure information. A hologram is also independent of space and time: illuminate a small portion of the hologram, and spherically distributed information of the whole is available in the part.⁹ A hologram is a scalar field.

The production of synchronized, coherent electromagnetic energy by the human brain at a given frequency leads to a "laser-like" condition increasing the amplitude and strength of the brainwaves. It also generates a scalar field containing the total "information" of that individual. Additive increase of alpha and theta brainwave amplitudes does appear clinically as brainwave training sessions progress, requiring constantly higher EEG thresholds to be set in order to provide an optimal amount of client feedback.

Miraculous Resolutions

Several researchers working with the Peniston protocol have noted that as clients learn to increase their alpha amplitude and produce theta waves without losing consciousness, a critical point is reached when theta amplitude begins to exceed alpha amplitude. Cross-lateral brainwave synchronization also increases, creating a more coherent system. At this point, there are profound alterations in client mood and behavior. This is consistent with the research of Peniston and Kulkosky, and was an important factor suggesting that the holographic model be applied to the data.¹⁰

The critical point referred to above is commonly accompanied by spontaneous surfacing of previously inaccessible memories, often from early childhood. Other clinical indications are the seemingly miraculous resolution of complex psychological problems—often not directly related to the presenting condition of substance abuse. There is a sudden re-ordering of the entire personality in ways that cannot readily be explained by other models. More information is available to the individual. Two examples referred by Dr. Nancy White of the Texas Meta Center in Houston illustrate this.¹¹

The first client was referred for brainwave training by a psychiatrist who had prescribed a regimen including Prozac and Activan.¹² At the beginning of the program, pre-testing with standard psychometric instruments indicated a probable schizophrenic disorder, or an anxiety disorder in a paranoid personality.

Hypochondriacal features were also disclosed. Presenting symptoms included severe anxiety attacks, depression, sleeplessness, low energy levels, and cognitive impairment. After the brainwave training program, post-testing revealed the client to be within normal limits: there was no clinical diagnosis. Academic performance had returned to normal, depression and anxiety symptoms had vanished, chronic fatigue syndrome symptoms were in remission and there was a marked positive change in interactions with family and friends. Perhaps most telling, the attending psychiatrist discontinued all medication.

The second client came into therapy with a family history of alcoholism stretching at least three generations. Pre-testing revealed a possible schizophrenic disorder, a severe clinical depression syndrome, an obsessive-compulsive disorder and a borderline personality disorder.¹³ Previous cognitive therapies and AA attendance had not resolved the presenting emotional problems or eliminated the craving for alcohol.

In the first week of treatment, after autogenics instruction and temperature biofeedback training, persistent migraine headaches ceased. In the third week of brainwave training, the long-standing depression lifted and did not return. Craving for alcohol vanished as well, as did the previous anxiety attacks. Imagery arose spontaneously during later sessions concerning childhood sexual abuse, and was recognized by the client as a major source of current dysfunctional behavior. An untargeted side-effect of the program was the apparent moderation of an eating disorder; the craving for binges on junk food diminished and eating habits normalized. There was a significant shift toward "normal" ranges in clinical post tests.

Healing the "Inner Child"

"Traditional" psychotherapy cannot explain these kinds of sudden cures. Even the concept of brief psychotherapy does not apply,

Synchronized energy in the human brain leads to a "laser-like" condition increasing the amplitude and strength of the brainwaves. It also generates a scalar field containing the total "information" of that individual.

The critical point is commonly accompanied by spontaneous surfacing of previously inaccessible memories, often from early childhood . . . and the seemingly miraculous resolution of complex psychological problems.

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since outcomes were achieved that were not anticipated nor sought. The "Inner Child" was not only healed, but healed by a protocol involving only relaxation training, positive imagery and entry into an alpha-theta state at least four times a week. Three other facts are notable.

First, the dominant waking brain wave frequency of children under the age of six is in the four to eight hertz range associated with theta in adults.¹⁴ The pattern of these waves, however, more closely resembles that of adult alpha waves. These lower frequency theta waves in adults are usually associated with reverie, dreaming, fugue states and hypnagogic imagery. They usually occur only in the transition from wakefulness to sleep.¹⁵ As Dr. Thomas Budzynski and others have shown in recent years, however, theta brainwave production in adults is a vital component of learning and memory encoding.

Clinical results at several centers have indicated that EEG brainwave training can provide reliable access to the alpha-theta consciousness state of early childhood, with results extending beyond the treatment of substance abuse. Clients with other addictive behaviors, eating disorders, post-traumatic stress disorders and chronic pain all experience measurable shifts toward "normality" as shown in pre- and post-test psychological evaluations.

This suggests a physical basis for the "inner child" metaphor of codependency. The surfacing of memories from early childhood during theta training also fits Charles Tart's observations of "state-dependent memory," i.e., that information learned while in an altered state of consciousness is more difficult to access when in another state of consciousness. The natural shift in dominant brainwave frequencies during maturation could result in dysfunctional childhood learnings being preserved in the unconscious.¹⁶

Second, the greatest shifts in client mood and behavior occur when brainwave frequencies occur near the interface of adult alpha and theta rhythms. Specifically, this means brainwave activity in the seven to eight hertz range. Insufficient data is currently available due to equipment limitations, but I suspect that the crucial "window frequency" will turn out to be 7.8 hertz. This is the so-called "Schumann frequency": the

natural resonant frequency of the earth's electromagnetic field.

Third, the observed brainwave amplitude fluctuations and reversals result in precisely the condition that can produce a "Prigoginian reordering" of the "chaos" of an "abnormal" client personality into a "healthier" personality pattern.¹⁷ A possible mechanism for this reordering is the interaction of the individual scalar fields of the client with the electromagnetic and scalar fields of the earth generated by Schumann frequency resonance. This interaction could result in a holographic transfer of information from the larger scalar field, or other scalars in resonance with it, to the client.¹⁸ It could also explain the rapid shifts in client mood and behavior mentioned above. (This type of field transfer phenomenon also provides a psychophysical model for Carl Jung's metaphor of the "collective unconscious.")

A possible mechanism for this reordering is the interaction of the individual scalar fields of the client with the electromagnetic and scalar fields of the earth generated by Schumann frequency resonance.

In utilizing the Peniston treatment protocol, there is a profound alteration in the state of consciousness of the client. We are training adults to produce a brainwave pattern that they have "outgrown." We are facilitating access to the consciousness state of early childhood, where rapid learning was easy—and possibly increasing access to the unitive consciousness state described by mystics of all religions. Alpha-theta brainwave training is not the only way to accomplish this shift in consciousness, but it is certainly one of the most reliable and demonstrable.

If there is indeed a psychophysical reality to this "Inner Child" whose traumas and obsolete behaviors are said to produce dysfunctional behavior in up to 90% of all people, then better methods need to be used to "heal" it than those current in the field of psychology. We have the clinical evidence. We have the technology. Perhaps it is time for a "New Psychology" based on transpersonal reality and the models of the "New Physics."

William J. Beckwith is an ordained minister, counselor, and consultant in Houston, Texas. He holds Master's degrees in divinity and religious psychology, has undergraduate degrees in biology and chemistry, did doctoral research in neurophysiology, and is currently conducting

research toward a Ph.D. in clinical psychology. He was formerly a consultant to the Texas Meta Corporation, and is currently completing a book on spirituality and Jungian psychology. He can be contacted at 6210 Paisley, Houston, Texas 77096.

FOOTNOTES:

1. Described in MEGABRAIN REPORT, Volume 1, Number 1, pp. 27-28. For complete information on the study, see Peniston, Eugene G. and Paul J. Kulkosky. "Alpha-Theta Brainwave Training and Beta-Endorphin Levels in Alcoholics," *Alcoholism: Clinical and Experimental Research*, 1989, Vol. 13, No. 2, pp. 271-79.

2. Fehmi, director of the Princeton Biofeedback Research Institute, is associated with Dr. Jon Cowan in a commercial venture utilizing the Peniston-Kulkosky effect with Fehmi's Brainwave Biofeedback Synchronizer for alcohol and drug abuse treatment. Dr. Cowan trained with Dr. Peniston in the methodology, and was also a research collaborator with Dr. Joe Kamiya at U.C.S.F. in his early work with biofeedback.

3. Sonder, who has worked with Dr. Jay Segal of Temple University and Tom Kenyon of ABR in testing Acoustic Brain Research tapes in clinical use, was formerly associated with Adam Crane in another commercial venture using the Peniston protocol for treatment of alcoholic and chemical abuse patients.

4. Sonder, in his clinical work, has continued to focus on the neurophysiology of the limbic system.

5. Karl Pribram, *Languages of the Brain*. (Englewood Cliffs, NJ: Prentice-Hall, 1971).

6. Jonathan D. Cowan, Ph.D., "Mind as the Projection and Reception of Electroholographic Fields by the Brain: A Proposed Mechanism," First International Conference on the Study of Consciousness Within Science, February, 1990.

7. See A. Fraser and A.H. Frey, "Electromagnetic Emission at Micron Wavelengths from Active Nerves," *Biophysical Journal*, 8, 1968, pp. 731-34. Also, A. Frey, "Evolution and Results of Biological Research with Low-Intensity Nonionizing Radiation." In A.A. Marino (Ed.), *Modern Bioelectricity*. (New York: Marcel Dekker, 1988, pp. 785-837. I am indebted to Jon Cowan for making me aware of this research.

8. Michael Hutchison, "High Voltage: The Bioelectric Interviews," MEGABRAIN REPORT, Vol. 1, No. 1, p. 29.

9. For an excellent discussion of quantum physics holograms, and the holographic brain, see Fred Alan Wolf's book *Star Wave: Mind, Consciousness and Quantum Physics*. (New York: MacMillan Publishing Co., 1984), pp. 154-65.

10. In fact, Fehmi's model and methodology is also consistent with the holographic paradigm. Open Focus is based on his long familiarity with Zen meditation methods and a worldview similar to that of quantum physics.

11. Dr. White is president and clinical director of the Texas Meta Corporation, a neurobiofeedback facility using the Peniston protocol.

12. This client was also taking the antibiotic Bactrim for symptoms of Chronic Fatigue Syndrome.

13. A "borderline" personality as a clinical diagnosis does not simply indicate someone who is on the border between "normal" and "abnormal." Borderline personalities are extremely resistant to conventional therapies, and generally fall into the category of the "perpetual patient."

14. Adult alpha waves are, by common consensus, in the eight to thirteen hertz range.

15. An excellent discussion of brainwaves, biofeedback and the development of higher states of consciousness can be found in Cade, C. Maxwell and Nona Coxhead, *The Awakened Mind* (Great Britain: Wildwood House Limited, 1979, republished by Element Books, Ltd. in 1987).

16. In Jungian terms, this "bundle of outdated learnings" would be a complex dissociated from the ego. Individuation, or growth toward wholeness, would require that information in the inner child complex be recovered and reintegrated into adult consciousness.

17. Ilya Prigogine, author with Isabelle Stengers of *Order out of Chaos: Man's New Dialogue With Nature*. (New York: Bantam, 1984), won the Nobel prize for his theoretical work with what he termed "dissipative structures" that transform chaotic conditions into order in ways that seemingly violate the Second Law of Thermodynamics. Although originally devised in terms of chemical reactions, the theory has been suggested as one explanation of altered states of human consciousness and seems particularly applicable here.

18. The holographic model is also compatible with Rupert Sheldrake's "morphogenetic field" theory.



PRODUCT REVIEWS: A NEW GENERATION OF SOUND AND LIGHT MACHINES



MIND GEAR, THE SHAMAN, THE MASTERMIND, THE INNERQUEST IQ-TUTOR, AND THE ALPHA PACER III PLUS

Virtually all of us who have purchased PCs in the last decade have faced the quandary: do I buy Model X now, or wait six months until a whole new generation of PCs emerges that is more powerful, faster, smaller, and probably cheaper?

Would-be purchasers of sound and light machines have faced the same quandary, as the devices have evolved from suitcase-sized brutes costing thousands of dollars, to computerized and highly versatile dictionary-sized units with prices ranging from about \$500 to \$900, to sophisticated miniaturized units in the \$300-\$500 range.

Now, seemingly all at once, a new generation is upon us, several of them with innovative and unique features, most with prices that range from under \$100 to about \$350. The following machines are, in our opinion, the best of the new generation.

Mind Gear

Leaping into the fray to be the most “state-of-the-art” sound and light machines are these two new systems, the Mind Gear PR-1 and PR-2. The only significant difference between the two is that the PR-1 is non-programmable. Both have 25 built-in preprogrammed sessions, but the PR-2 permits you to create and store up to 10 personalized custom programs. These devices are cleverly designed and extremely user-friendly. Unlike some of the other sound and light machines that permit the user to create and store programs, the Mind Gear’s programming controls are not daunting or hard to learn, but operate in a very intuitive way that allows you to create your own programs very simply. Among the numerous features, the ones we find most valuable (and many of them unique among machines in this price range), are:

BINAURAL BEATS SYNCHRONIZED WITH LIGHTS. Both systems have sophisticated sound generators that can produce binaural beats synchronized with the visual flash frequency.

CHOICE OF WHITE OR RED LIGHTS. Some prefer incandescent white lights, others like red LEDs. With the Mind Gear systems you can take your choice. Or order both, to explore the differing effects.

PULSE WIDTH CONTROL. These are the only systems in this price range that permit the user to vary the pulse width, i.e. the ratio of time the lights are on vs. time the lights are off. This can produce profound visual effects, and indications are it can influence entrainment effects.

VARIABLE FREQUENCY OF RIGHT AND LEFT SIDE. Again, these are the only devices in this price range to feature independent right-eye and left-eye frequency selection, so you can com-

bine (for example) a theta frequency in one eye with a beta frequency in the other, thus permitting a number of preprogrammed or manually-controlled sessions producing “mind-awake body-asleep” and other states. This also permits you to generate a third frequency rate: the beat frequency produced by the two separate eye frequencies (e.g. 18 Hz in one eye combined with 10 Hz in the other eye sets up a third 8 Hz composite or beat frequency “seen” by the brain). This feature also produces a variety of astonishing visual effects that users often describe as “psychedelic.”

Other things we like: 25 excellent preset programs, ranging from energizing beta to sleep programs; digital display—all system parameters are displayed in three digits, permitting precise control; manual mode—you can ignore the presets and experiment with the built-in features yourself, exploring various combinations and frequencies; frequency control from 1.0 to 30.0 Hz; an internal rechargeable battery (on the PR-2); high quality stereo headphones (unlike some of the cheapies that come with other inexpensive units), a couples option to accommodate two users simultaneously, a “Gentle Off” feature, a pause function to pause the program at a place you like for as long as you want, and a whole lot more.

We think these systems are well-built, imaginatively designed, very user friendly, and with an enormous array of features, some of them unique for devices costing under \$695. The PR-2 retails for about \$350. The PR-1 goes for about \$299.

The Shaman

This gem is a product of Bill Lee, the innovative designer of the DreamWave™. The word on The Shaman from some competitors is that it’s

“bad for the industry.” Creator Lee (who set a new standard for binaural beat sound quality with the DreamWave) has jammed too many features and too much quality into a \$195.00 unit, they say: “He’ll give people an unrealistic set of expectations!” He has crammed many (though not all) of the features of the DreamWave into this excellent device, added some new ones, and has done so at an almost unbelievable price. Some of the features are:

LIGHTS SYNCHED WITH BINAURAL BEATS. Like the DreamWave, the flashing lights are synchronized with the binaural beat frequencies. The binaural beats and lights are tunable from 1 to 20 Hz.

HARMONIC LOCK. The pitch of the acoustic binaural beats is harmonically locked to the beat frequency (i.e. the tone frequency is exactly 32 times the frequency of the binaural beats and flashing lights), so the tone gets lower as the beat frequency and light frequency gets slower. It’s not exactly clear why this fixed relationship between pitch and frequency should be so pleasing and effective, but it does produce a unique effect. This harmonic lock feature also presents exciting and novel possibilities for “biofeedback/biofeedforward” when the Shaman is used together with the optional EEG biofeedback system (described below).

AUTOMATIC PULSE WIDTH VARIATION. Another innovation: The pulse width (the percentage of time the lights are on during each flash) of the lights alters with the frequency: at higher frequencies you get sharper imagery from narrow pulse widths, while at slower frequencies you get greater entrainment effect from wide pulse widths.

ACOUSTIC CIRCLE SOUND MODULATION. The user can have the beat tones and/or the sound of an external audio input modulate from right to left at the beat frequency, while it all seems to rotate slowly around the listener’s head in a circle of sound. This unique effect can be combined with:

LIGHT CIRCLE MODULATION. This feature permits you to link the pattern of the light flashes with the acoustic sound circle, so that the lights as well as the sounds seem to slowly rotate, producing a delightful swirling effect that can gently separate your awareness from external distractions or concerns and produce a profoundly internalized state.

MEGABRAIN REPORT

MEGABRAIN REPORT NEW PRODUCT REVIEWS CONTINUED

Like the DreamWave, the Shaman has great sound quality and it also permits only one simple programming option: you set the starting frequency, the "target" frequency, and let the machine do the rest. Or, you can control it manually, to "fine tune" it to those window frequencies you find most effective.

EEG Biofeedback Option

This represents a great leap forward in sound and light brainwave entrainment: a positive feedback loop between brain and machine. The Shaman (like the DreamWave) can be equipped with an EEG system that monitors your own brainwave activity and responds to it by adjusting the Shaman's light and beat frequency to a rhythm slightly slower, powerfully entraining your dominant brainwave frequency downward at your own natural pace until it reaches your preselected target frequency. This option does away with the need for preset programs, as it insures that you move downward into slow brainwave states at your own natural speed. With the harmonic lock effect, the pitch of the tone you hear is directly linked to your own dominant brainwave frequency. This means you immediately hear, through the rising or falling of the pitch, the changes in your brainwave activity, and thus permits the use of various self-regulation or biofeedback techniques to allow you to learn to alter your brainwave frequency. This EEG entrainment option can come with the Shaman or if you choose to add it in the future can be added with no extra installation charge. The cost of this optional system is \$525.

Red and Green LEDs

Another notable optional feature for the Shaman (and DreamWave) is a unique set of goggles that combine both red and green LEDs in an ingenious way. Some people find red LEDs have a more stimulating or arousing effect, while green LEDs are more relaxing and calming. These goggles combine red and green in such a way that the potential arousing/calming effects of the lights are linked with appropriate frequencies. The green lights gradually turn on and off during each flash in smooth sine-like waves, while the red lights flick on for a brief burst at the peak of each flash. At low frequencies, this produces a mostly green effect, and at high frequencies a mostly red effect. Many users will find this feature adds an entire new dimension to the light/sound experience.

CES OPTION. The Shaman (and the DreamWave) offer CES, biphasic microcurrent stimulation, in phase with the light/sound stimuli delivered through earclips. This option is available for \$300. For information about the effects of

combining CES with light/sound, see the review of the Alpha Pacer III Plus on the next page.

The MasterMind

This is the latest production from Robert Austin, designer of the MindsEye Plus and Courier models. The MasterMind includes an extraordinary array of features at a low price (suggested retail \$199.95).

The unit is small—about the size of a deck of cards. Its flat surface contains no external buttons, knobs or dials, but rather is imprinted with fourteen square blocks, each one containing either numbers (for selecting specific preset sessions) or symbols (controlling light intensity, sound volume, selection of sounds or binaural beats, pitch, frequency of the binaural beats, and a ColorPulse mode, that causes an external sound source to modulate the brightness of the lights, so that the lights flash with the beat or rhythm of the music). This flat hard surface is actually a membrane covering sensors, so that a light touch of one or more of the square blocks activates or adjusts the system.

The MasterMind is programmed with 12 preset sessions, designed to induce states ranging from sleep to deep relaxation to extreme alertness. The sessions vary from very "active" programs with multiple changes of frequencies and light patterns, to more simple programs that gently ramp down toward a target frequency and then after a preset time ramp back up into higher frequencies.

The user can vary the 12 presets by selecting from an assortment of tones, chords and beat frequencies, by choosing a variety of light and sound patterns and intensities, and can even adjust the binaural beats (or HemiTones) to a desired frequency. As with the other MindsEye products, the sound quality of the various tones and beat frequencies is very good and quite varied. The ColorPulse feature is entertaining, adding vivid visual effects to any music you choose, from Beethoven to rock, so that you seem to be seeing the dynamics of the music as well as hearing it.

The glasses (known as LiteFrames), are similar to those that come with the Courier—folding frames of heavy black plastic that look something like Slim Jim dark glasses (like Roger McGuinn of the Byrds used to wear back in the 60's), with two high intensity red LEDs over each eye. In terms of potential brightness the MasterMind is more intense than the Courier. Designer Austin tells us he has "pumped the circuitry up" to con-

serve power and send it to the LEDs. The results are visually stunning.

One interesting new feature is something Austin calls "soft on." This means that the lights will ramp up over about 15 seconds to the selected brightness level—that is, the brightness "comes on" gradually. This is a valuable feature for those who are highly sensitive to light, and eliminates the sudden blast of light when the LEDs come on full-intensity at the moment you switch the program on.

You can power the unit either from an internal 9 volt battery (8-12 hours usage from a standard 9 volt alkaline cell) or from an external power supply. The device also includes a handy battery-saving feature that shuts it off 30 seconds after a session or if the keypad has not been used for 30 seconds. It comes with inexpensive headphones that conveniently fold up and fit into a box about the size of an audiocassette box.

As we go to press the MasterMind has been upgraded. First, the number of programs has been increased from 12 to 24 by the addition of "half-time" sessions—with one key-stroke, each of the 12 sessions, including ramp times, can be cut in half. Also, a new complex session has been added that has about 80 ramps and jumps and nearly as many changes in brightness, sounds and light patterns—an exciting and entertaining program. The price of the unit remains \$199.95.

The InnerQuest IQ-Tutor

As sound and light machines have become mass-market consumer "relaxation" items, with sales moving into the hundreds of thousands of units, and devices being marketed through mass outlets like the Sharper Image, Hammacher Schlemmer and DAK catalogues, the demand has grown for inexpensive and simple "starter" units. The IQ-Tutor is the most sophisticated of these devices to break the \$100 barrier (suggested retail is \$99.95). The Tutor is also remarkably tiny, with a console about the size of a deck of cards—2.5" x 4" x 0.8". It's powered by 3 "AA" batteries.

It features four programs, chosen to represent the most commonly used and popular of the present IQ programs: motivation/stimulation; relaxation/learning; creativity; and relax into sleep. The programs range from 25 to 30 minutes.

Accessories include the standard InnerQuest EyeStim glasses, a pair of "basic" stereo headphones, and the stereo patch cord. This is not an item for someone who wants sophisticated programming options or a large variety of preset sessions, but for those who want utter simplicity and portability, it offers good value.



Alpha Pacer III Plus

The power of light and sound devices to alter brain-states derives in part (how large a part is yet to be scientifically determined) from their capacity to *entrain* brainwave activity, i.e. to cause dominant brainwave activity to fall into the same rhythm as the light/sound stimuli. The new ALPHA PACER III PLUS claims to produce far more powerful entrainment than other devices on the market by combining *four* different types of entrainment stimuli, adding cranial electrostimulation (CES) and a pulsed magnetic field to the traditional light and sound configuration. All four types of stimulation are delivered at the same frequency, which varies as the device moves through its programmed session.

The CES stimulation consists of what designer/manufacture Keith Simons calls a "biphasic pulsed pink noise," which means a pulsed biphasic sine wave signal that contains or bundles a pink noise signal (when you look at it on an oscilloscope the basic sine wave looks fuzzy, containing many bundles or spindles within it). He claims this signal "appears capable of producing entrainment at much lower current levels than the other wave forms." (For differing opinions on the question of the safety and efficacy of sine waves see "High Voltage: The Bioelectric Interviews" in MBR #1.) The CES stimulation is adjustable from 0 to 400 microamps, so even at its highest setting the stimulation will be imperceptible to most users.

The pulsed magnetic field is a biphasic spike that Simons claims radiates out about 6 feet, producing a field of about 1 milligauss at two to three feet.

Simons claims that the addition of CES and magnetic stimulation has a synergistic and potentiating effect that makes brainwave entrainment "deeper and stronger." At this point I'm aware of one preliminary study that has indicated that the addition of CES does increase entrainment effects, but for the most part the claims of increased entrainment are, as Simons says, "intuitive and subjective." Simons does cite preliminary findings from a study using neuromapping EEG equipment that indicate, in his words, "that the CES is a stronger component in the induction of brainwave changes than the lights or sound."

Thus far there is little evidence that a pulsed electromagnetic field can entrain brainwave activity by itself. Simons claims that while the magnet itself seems to have little perceptible effect, it has a synergistic effect when combined with the other three elements, and that most users feel an enhancement of the effectiveness of the machine when the magnet is turned on.

The Alpha Pacer III Plus is a dramatically revamped and improved version of the Alpha Pacer II Plus (reviewed in MBR #2). The new system includes four different light/sound stimulation modes (synchronous, front/back, side/side, and criss-cross) as opposed to the two modes on the II Plus. It provides eleven preprogrammed sessions (there were none on the II Plus), including relaxation sessions, cat-nap, creativity stimulation, energize, theta meditation, alpha meditation, binaural beat relax, binaural beat energize, and "body energy centers balance"; and three user-programmable sessions (there were none on the II Plus), plus a manual mode, in which the user controls the frequency during the session.

In the user-programmable sessions and manual mode, the user selects frequency (1-30 Hz), light/sound mode, CES levels (0 to 400 microamps), magnet on or off, length of session and type of sound (a high tone, a low tone, a pink noise and a binaural beat frequency).

The goggles are very comfortable, and made from a modified ski-mask. The mask is totally opaque, cutting out all external light, and thus the light intensity seems much greater and the visual effects are, in my opinion, stronger than those produced by units that use eyeglass-type frames, which permit lots of peripheral external light unless you're in a totally dark room (i.e. the total blackout goggles have a better signal-to-noise ratio; compare the effects of watching a movie in half-light or total darkness).

You can select several LED options and configurations: the standard goggles come with either red or amber LEDs, and these are arranged with 4 LEDs over each eye; or for a \$10 surcharge, you can opt for high intensity LEDs, with two LEDs over each eye (producing a higher intensity of light than the standard 4 LED configuration).

The control unit is the size of a thick hardcover book (about 8 1/2" x 8 1/2" with a sloping face that goes from about 3" to 1 1/2"), made of thick plastic, and much more professional in appearance than the old II Plus model. The controls are clearly labeled and easy to operate. One complaint: the frequency control buttons are right next to the on/off button, so that when you're in the manual mode it's possible to reach out your hand to alter the frequency and accidentally shut the machine off.

Because of the CES mode, the device only operates on battery power (it's illegal to run any unit with electrodes attached to the body directly from AC due to the potential of a power spike from an electrical storm or other disturbance). Four AA batteries will operate the machine for 8 to 10 hours, so battery costs can mount up. At an addi-

tional cost (\$100) you can purchase a rechargeable 6 volt battery and charger. That makes this device more expensive to operate than other light/sound units.

The binaural beat can be selected with all the user-programmed sessions, but cannot be used in the manual mode. Note that the binaural beat can be set to various frequencies but can only "step" down from frequency to frequency and does not "ramp" (which would require a more sophisticated processor).

The unit comes with one set of goggles and CES ear-clip electrodes (very easy to use), but it has a two-user capacity, and extra goggles and electrodes may be purchased (\$50 for goggles, \$45 for earclips). The price of the unit is \$625, and it comes with a six month warranty.

Compared to some of the slick and sophisticated multi-function light/sound devices available for hundreds of dollars less, the light/sound component of the AP III+ is fairly crude and inflexible. As manufacturer Simons points out, "There are light and sound units out there with better tones or sound controls, more pre-programs or user-programmable positions. But I believe effectiveness to be the bottom line rather than all the bells and whistles. . . . And I believe that in a comparative test with a number of machines we would find the AP III+ more effective in inducing deeper and longer lasting brainwave changes. This is primarily because of the added CES and electromagnetic features of our unit."

It remains to be seen whether actual EEG and other research will support Simons' assertions; they are, however, backed by writer and explorer of consciousness Ken Wilber, who has extensive experience with brain machines, and asserts that "in my opinion the Alpha Pacer is the single best and most complete machine now available at a reasonable price."

I also found the AP III+ to be quite "effective." I am intrigued by the possible synergistic effects. However, the machine is not inexpensive. At \$625 it seems like the addition of the CES and magnetic components is adding over \$400 to the cost of a very basic light/sound system (by adding the CES option to the Shaman, for example, you get an excellent system, albeit without the electromagnetic component, and without preset programs or true user programmability, for \$495).

— M.H.



MEGABRAIN REPORT

SUPERCHARGING THE BRAIN: THE BIOELECTRIC INTERVIEW

MEGABRAIN REPORT INTERVIEWS RAY SMITH

For almost 20 years Ray Smith, Ph.D., has been a groundbreaking researcher in cranial electrostimulation (CES). After receiving a Ph.D. in physiological psychology from the University of Texas in 1967, and work as a research scientist at the State University of New York and the University of Maryland, he took a position with the District of Columbia government as Chief of Research and Clinical Training at the District of Columbia government 600 bed alcoholism hospital. It was there that he first encountered CES.

There he made the extraordinary discovery that CES could not only dramatically ease withdrawal from alcohol, but could also eliminate what was then called the “permanent brain damage” that often accompanied long-term alcoholism. He has since discovered that CES can have similar revolutionary benefits in the treatment of other drug addictions, including heroin, methadone, and cocaine. But while he has published his findings in a variety of scientific journals, including the American Journal of Psychiatry, Biological Psychiatry, the International Journal of the Addictions, the Journal of Clinical Psychology, and the Journal of Nervous and Mental Disease, his has often seemed to be a still small voice crying in the wilderness. His remarkable findings about the benefits for CES for drug and alcohol treatment are still largely ignored by the vast addiction treatment establishment.

In recent years Ray’s research has expanded to include investigations of the effects of CES on neurochemistry, phobias, memory, personality, and recovery from traumatic brain damage and stroke.

A native Texan, Ray is an engaging story teller with a wry sense of humor that kept MEGABRAIN REPORT interviewers Mike Hutchison and Terry Patten laughing. We began by asking him to describe how he became interested in CES.

Reversing “Irreversible” Brain Damage

RS: At the time I was chief of research and clinical training at the District of Columbia government 600 bed alcoholism hospital. As a physical psychologist, my interest was more in animal research. But back in 1972, the psychiatrist in charge of the hospital called me and said, “Come up to my office, we’ve got two men from Dallas with this machine that they say makes people relax. I want you to look at it.”

I went up and looked, and it was this thing that weighed about 50 pounds. I kind of groaned inside; and I thought, “Hey, we got rid of the Orgone box back in 1920, you know?”

And I really hated giving up my MO’s and having to study patients. But I was told it worked to cure alcoholics. So I worked

with 36 alcoholics, average age of about 42, that were public inebriate. They were all males, 80% black, and there’s not a whole lot in treatment programs that make a dent in these people. But I put them on a single blind program where the nurse would hook them all up to the CES device. Half of them, she’d turn it all up to where they could feel it, and then turn it back down. The other half of them she’d turn it all the way off. So half of them were treated, and half of them weren’t. They all *thought* they were treated.

Meanwhile, I was in fact doing psychological tests every day for depression, anxiety, and things like that. And chronic alcoholism had produced a type of mental confusion in these subjects, which was then called brain damage, “*permanent brain damage.*” So for three weeks we stimulated them 40 minutes a day. And after the three weeks, I looked at the results, I was just stunned at the changes!

Dramatic reductions in anxiety and depression and so on. And I couldn’t believe the difference between those that had actually gotten treatment and the sham control group. I thought I had done something wrong!

So I went over the statistics and results with a fine tooth comb, and I couldn’t figure out where I went wrong.

So I got another 36 patients and did it again, and got the same results. So with a group of 72 patients, half of which were treated and half of which were sham, we published. That started my interest.

I had graduate students up there from the University of Virginia, and I was supervising their research. We studied the tremor response in alcoholics who had just finished withdrawal. They come out of withdrawal and they are still trembling. So we got an old psychology school tremor meter; it’s the metal device that has the holes in it of various sizes, and you stick a metal rod down in it. If the metal rod touches the side of the hole when you are trembling the clock is triggered and measures the amount of tremor. We studied the effects of one hour of CES.

We had measured these men on a Minnesota Multiphasic Personality Inventory (MMPI), that showed the amount of tenseness or stress of the subjects. Interestingly, those who measured very tense, or very stressed, started out by not trembling rods. But after an hour, yes, they started trembling. On the other hand, those who measured very relaxed or more relaxed on the MMPI started out trembling and after an hour they stopped trembling. Surprising.

What turned out is that those who were very high on the MMPI were so stressed they have a kind of atonic seizure—that is, they are too stressed—too tense, too rigid—to tremor, if you will. And CES actually relaxes them enough to begin to start their trembling.

So I thought that if we could have this dramatic effect on depression and anxiety, we might do something for the brain damage, the so-called permanent brain damage. I have to say, I thought the prospects were kind of slim, but I got some measures of

“I found to my surprise that so-called permanent brain damage in alcoholics was curable in three weeks with CES!”

(PART TWO)

visual retention tests, for example. I used scales from the Army beta—30% of our patients in D.C. were illiterates, so we had to use non-verbal tests on them. So I used the old Army betas that they used in recruiting centers, and still do. Two of those show the existence of organic brain dysfunction. And I found to my surprise that “permanent brain damage” was curable in three weeks with CES!

And I couldn't believe that, and so I got another 100 patients, and did it again. In a single blind study again—we had no blinding boxes available at the time, but we had single blind—and I cured what, in 1972, they said was incurable brain damage in the alcoholic, with CES, in three weeks!

CES Encounters Resistance

I called the company in Dallas and said “Get ready, I'm going to publish this stuff. And when the world finds out that we've finally found a cure—number one that it's curable, and number two this is the cure—they're going to beat a path to your door. And you won't be able to beat them off with a stick.” It turns out nobody ever cared, to my amazement.

And that study came out in the mid-seventies, and nobody still cares that we have a treatment. Not only for alcoholics, but drug addicts also. There are thousands of hospital beds in America filled with drug addicts. And there probably aren't more than five hospitals treating brain damage, if you will—cognitive dysfunction we now have to call it. We can't call it damage any more, because it's recoverable. But there's not any interest! And I can't imagine why—it's in the literature. And if you go as a staff-support person to the hospital and tell them that the cure is this, this, this, they say, “That's good.” But they just dismiss that part immediately. No one really cares.

MBR: Why do you think that might be?

RS: I tell you, I think it might be because we started our alcoholic treatment programs in America back in the 1930's using the AA model. We were teaching at the time that it was all permanent brain damage—whatever they'd lost was lost, and that's it. And so we were never set up to measure and certainly not able to treat it.

Later on—I might have been one of the first to come up with it, but certainly a lot of studies are coming up with it now—we've found that it is reversible. In fact, in two years of total abstinence, an alcoholic will get his memory back to where he pretty much ought to be able to be back to his original IQ, but it takes two years! Again, with CES we do it in three weeks.

One of the reasons it's not caught on is that, again, we're committed to the AA system. We're not used to measuring it, we're not used to caring about it, and nobody who has been taught to treat alcoholics thinks about brain loss or memory loss or ... one of the things plugged into it.

Now when the drug people start coming in, the cocaine people who are more than 50% of some of some hospitals now—they're still back on the AA system, even with drug people! And, again, they don't know a lot about treating brain dysfunction—they know it's there, but they don't know how much it is and they don't know what they can do about it and they don't really care. That's not what they're there treating. They are trying to get them off the drugs, and hopefully to stay off. That's their major concern. But, I don't know. . . .

MBR: Do you see anything a little more sinister, such as some sort of medical establishment actively resisting a new modality?

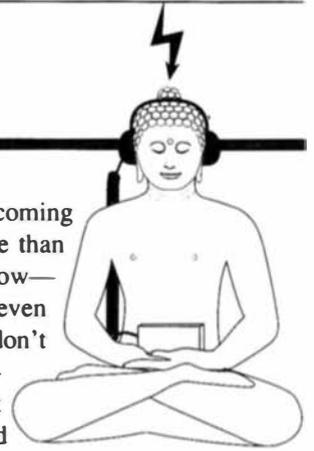
RS: No, I don't see that so much. Most chemical dependency hospitals seem to be presided over by psychiatrists. And most of those that are, are run by psychiatrists or physicians who are in fact addicted or recovering themselves from some addiction. And, believe me, I think those people are grasping at anything that might keep their problem down, in psychiatry itself and among the non-addicted psychiatrists. I think they would really like to say something that would make them more presentable and more acceptable

as therapists, as opposed to just trying to talk them to death—or talk them into health, sorry about that slip [laugh]. They are really looking for an accepted treatment. . . . I just don't know what the problem is.

MBR: Perhaps it hasn't become widely enough known to be accepted.

RS: That's possible. Well, I tell you, back in the seventies I taught the physicians about it—well, not taught the physicians about it, but I'd actually send articles into medical journals, and the reviewers would just send them right back, saying this amount of current couldn't even get into the head! Now, thanks to the works of people like the Robert O. Beckers, we know that minute currents can do a lot of things. We don't have to use electroshock to get into the head any more.

When I was with NeuroSystems in 1980 to 1985, we were the only game in town in terms of we'd been “grandfathered” by FDA, we had legal rights to sell as many [CES devices] as we wanted to providing that we only used medical claims that the devices were effective for treating depression, anxiety and insomnia. But we also had a patent, and that patent didn't go out until February of last year. And now it turns out that there are five or six companies making CES devices. So I think it'll be heard of. Of course, Michael, when they start reading your thing, *Megabrain*, and connecting the Alpha Stim with CES, that's going to help a whole lot.



“One of the reasons CES has not caught on is that we're committed to the AA system.”

MEGABRAIN REPORT

SUPERCHARGING THE BRAIN: THE BIOELECTRIC INTERVIEWS (PART TWO) CONTINUED

MBR: Perhaps you could go back, then, to when you went back to the CES manufacturer after your initial studies and said that you had found this cure for brain damage, and they had better watch out, that people were going to beat a path to their door and nothing happened.

RS: In NeuroSystems, when I went with them, I looked around to see what the problem was. Number one, they were selling this great big 50 pound job. I'm telling you, it really wasn't 50 pounds, but it just felt like it to me. It's a big office model. But they'd sell them for \$720, and once they sold them—that's all the money they got, that's all they ever heard from it.

I discovered that in Texas, for example, they had sold them to over 40 VA hospitals. Then I went to the VA hospital in Waco and they had three on a shelf somewhere, but they couldn't even find them when I got there to ask what they were doing with them. And I thought, well, the only way to sell that stuff and keep it sold is to measure something—it put that scientist in me to work. But if you show them a measure, that something has been measured, that you got a difference you couldn't get before, then of course you've sold it—they would believe it now, you know.

CES can be subtle. In fact, it is subtle. It's not like Valium, where you swallow it and 20 minutes later you go say, ah, it's there. I just looked over data—in fact I'm writing up some data now from this most recent study; 144 patients, and it took seven days for a significant movement on some of the psychological scores. And that's not unusual with CES. Again, this was in an addiction sample, and they can be hard to move.

But it turns out also with CES that when you go into a hospital, for example, and try to set up something to measure, unless you're going to control it, there's no point in measuring it. And when you control it, by then you've got a scientific study and you're absolutely going to send the staff into total distraction. Staff in no hospital, psychiatric hospital, or chemical dependency hospital, is set up to control or even provide a single or double blind study of any kind! So when you go in and try to sell equipment with scientific studies, forget it.

What we did do, however, and deliberately, was we went into CompCare, which was the largest chain then of all chemical dependence treatment programs, may still be. We went into their program in Fort Worth and I set up and designed two studies for them, which they then did and published. At that point, the president of NeuroSystems and I and a psychiatrist who had

been involved in the study, went to the president of CompCare in California. He gladly wrote a letter to all of his administrators saying these people here have something very interesting to talk about. Please see them when they come, which meant we were going to have to see them one at a time, and again we had no sales force, no sales team at all. We had no salesmen. So the company owner would sit in his office in Dallas and make appointments for me in Seattle and Tampa and St. Louis—and I'm not a salesman, I can tell you. But I went out and talked to physicians about it and so finally I was able to get into maybe five hospitals.

We'd lose one, then we'd get two more, then we'd lose three. And again, it was because we were expecting hospital staff to do the therapy. Everyone in a hospital is there for a specific thing.

"Back in the 70s I'd send articles into medical journals and they'd send them right back, saying, 'This amount of current couldn't even get into the head!'"

Nurses are there to do specific things that nurses do; psychologists do what psychologists do; social workers do what social workers do; and nobody is there to do CES therapy. So somebody had to take time out of their other work to do CES. And when that person learned to do it, and got good at it, they would leave and go to another hospital across the nation somewhere for three months. For three months they would have no CES in the hospital. We knew, because they were ordering them every month...

At some point, then, NeuroSystems kind of got a bead on that and put their own therapists in the hospital and paid half their salary. The hospital would pay half and NeuroSystems would pay half, and that worked out much better. Then, in that case, I would go around and convince the physicians to try it. I would hire and train a therapist, to make sure they had it down pat. And then I'd leave town.

NeuroSystems was eternally underfinanced. They started out before electronic medicine was used in America back in 1970-1975. Electronic medicine wasn't in when NeuroSystems started, so they started to put all this cash into a business that wasn't ready to go yet in America. There's a world of difference in 1991 in terms of what happens when I walk into an office of a physician than what happened to me when I walked into a similar office in 1981. They are much more impressed, or much more impressionable now about electronic medicine. It's a much easier sell.

CES and Fear, Cocaine, Hypnosis and Prozac

MBR: Over the years you have continued to do research?

RS: In July, 1990, I gathered data in Huntington Beach, CA using the Alpha Stim to study phobia patients. We began the study with 31 subjects who had an average of 14 years of phobia, 60-80% of whom were on medication, and we treated them with CES and then asked them to rate their fear again. We used a 1-7 scale of fear. Three of the subjects rated their fear level as "0" which wasn't on the scale, so I had to throw out their results, and one subject didn't come back to be tested, so we only got usable results from 27 of them. Nonetheless, we got results which were so improbable that my statistics program rounded the probability down to zero! I had to have some statistic for probability, so I used .001 (one in ten thousand) which was the smallest figure that it seemed reasonable to round up to.

What we found, essentially, was that the CES blocked the subjects' ability to feel fear altogether!

This study suggests that the old brain, the "rhinencephalon" including the hypothalamus and amygdala, governing memories and emotional expression, is the area affected by the electrostimulation.

In another study, for which the data was gathered in January of 1989, cocaine-addicted subjects were separated and studied specifically. This was the first study I know of which focused exclusively on cocaine-addicted subjects.

It was conducted at the care unit in Coral Springs, Florida. 105 or 107 patients were tested

"What we found was that CES blocked the subjects' ability to feel fear altogether!"

for mood states; we had patient norms on these tests going in to serve as our controls. The patients were given CES treatments on a regular basis and then retested over a 3 to 4 week period. There

was no significant difference in the first week, but then the results were stunning.

The original plan was to test half the patients for three weeks and then to reverse the pattern and to give the treatment to the other half of the patient population, but we couldn't get the machines back from the patients in time to conduct the second half of the experiment! The patients knew they'd been helped, and they didn't want to give up the equipment!

By far the most important study involving CES that's going on right now is a meta-analysis of CES research which is being done at Harvard for the Fetzer Foundation. They're compiling



what is known and not known about CES. This will enable Fetzer to evaluate what has been shown and what needs further research, so they don't get into funding redundant studies.

I have hopes that this will be considered as a meaningful report by the FDA, which has amended its device classification for CES. I am hoping that we will see Class 2 labels for the proven applications. But the FDA is perfectly capable of eliminating applications they don't feel have been fully proven, and there are some areas where people have been getting major help, but for which the data may not be conclusive yet, like insomnia, for instance, where the FDA may reclassify, putting it out of people's reach.

I don't do therapy myself anymore, but I remember one anecdotal situation with a very badly traumatized Vietnam Vet who was a patient of mine, who couldn't talk about what he was feeling at all until after I had given him CES, which enabled him to begin therapy.

In the 70's people were doing "Neuro-Psychotherapy" using the Neurotone (the RelaxPack) to hypnotize patients to neutralize fear. Of the

30% of the population who couldn't be hypnotized by conventional methods, 90% went into deep states with CES.

I have used CES to withdraw patients from Prozac, which is now becoming a big issue. A lot of people are up in arms over the over-prescription of Prozac, and somehow somebody got hold of my work using CES to get them off Prozac, and this afternoon our local Channel 2 is coming over to interview me about it.

"We couldn't get the machines back from the patients. . . . They knew they'd been helped, and didn't want to give up the equipment!"

"Mixing Blood and Psych"

Also I'm in the middle of one big outpatient study right now,

and we expect to have probably at least 60 patients. What we are doing is . . . a lot of studies that have been done, some of which I have been part of, that have done psychological testing. And the physicians look at those and say, "Well, that's just paper and pencil stuff, don't you have something medical?" And so Saul Rosenthal, back in the late 60's and early 70's, did some medical things, like thyroxine and hydrocortical steroids in the urine, for example, and things like that. But they only used five or ten patients at a

time, and they only stimulated them for about five days, and they got significant results.

But then out there they say "So what?" Because he didn't *compare* it with anything, didn't define it with anything psychological. And so finally what we're doing now is in a private family practice here in the Salt Lake City area. We're doing blood studies *and* psychological studies *and* EEG relationships.

I was just counting up today—I have put 760 patients to date through depression, anxiety or brain damage studies using hundred cycle CES devices, i.e. pulsing 100 times a second on 20% duty cycle. I have never researched Alpha Stim, but now Saul Liss in New Jersey has a device that he thinks is superior to all the rest, and FDA has approved it. It pulses at 15, 500 and 15,000 Hz, they are all nested inside of each other on a square wave pulse. It's totally different from anything I've ever seen. Now he does have blood studies on his device, but no psych studies. And no studies in the field of chemical dependency, and we're primarily aimed at chemical dependency in psychiatry right now.

CES Increases Beta-Endorphins, Serotonin, Norepinephrine

MBR: Do you know what Saul Liss's blood studies show?

RS: Yes, in fact he does strange things. He got away with it because some patients were hospitalized, so he was able to do cerebral spinal fluid as well as blood from the arm. He showed his CES device produces increases in endorphins, more in the cerebral spinal fluid, of course, than in the arm, because it breaks down very fast. He got serotonin increases, he got norepinephrine increases, he got acetylcholine increases—cholinesterase is what they were actually measuring. But he got significant increases. That was work done by Dr. Norman Shealy.

I presented CES at the International Conference for Medical Physicists in San Antonio a couple of years ago, and Dr. Shealy was right in front of me. I never met him, but he got up and put CES slides on, and he was giving blood studies and things like that. I got up with my set of slides, and I had psych studies. And again, it came home to me that while we are both working very hard in our areas, nobody's cross mixing between blood and psych. But we are doing that now.

Last summer when we were doing the EEG studies we had Bob Beck's device, the BT6, and also the Alpha Stim, and now this week I'm doing a protocol for a group here in town who do electro-convulsive shock. The only problems they have getting patients is that patients lose their

The Meta Center—Mind Tech in Texas

The Meta Center in Houston, Texas is a unique blend of psychotherapy, consciousness technology and research. Headed by Dr. Nancy White, a clinical psychologist, it is staffed by an eclectic mix of counselors, physicists and biologists. Their clients include individuals, corporations and state and local government.

The Meta Center is equipped with two Alpha Chambers, futuristic-looking, egg-shaped devices consisting of a padded, scientifically-contoured chair and strategically-placed speaker systems.

Also used at the center is the Somatron Table. Similar in function to the Alpha Chamber, it allows clients to feel as well as hear music. The Meta Center also uses Dr. John Downing's Lumatron and has had remarkable results with the device over a wide range of disorders ranging from depression, chronic fatigue syndrome, short-term memory loss and anxiety disorders.

The Center is also at the forefront of addiction and codependency treatment using the Peniston-Kulkosky protocol. Currently, brainwave training is being conducted in accordance with this protocol using CAPSCAN units which help individuals to modify the proportion of alpha and theta waves they produce. This form of treatment has resulted in a success rate much higher than traditional treatment methods at half the cost. Both corporate and government officials are interested in this approach and The Meta Center is actively pursuing expansion of this aspect of their treatment program.

Ongoing research at The Meta Center includes the application of biofeedback and brainwave training to marriage and relationship counseling, eating disorders,

treatment of chronic pain, and behavioral disorders in children and adolescents, and education.

Dr. White invites inquiries regarding work being conducted at The Meta Center and would be interested in networking with others involved in similar therapeutic and research ventures. The Meta Center is located at 4600 Post Oak Place, Suite 301, Houston, Texas 77027.

The Meta Center is one of a rapidly increasing number of places where consciousness technology and brain machines are being used by medical professionals, therapists, researchers, educators, counselors, athletic trainers, explorers of consciousness, entrepreneurs and others. We at Megabrain Report are sure we're not the only ones who would like to have a resource book that listed all the places where brain technology is being used—a book that not only listed but gave a brief description of each place, including information about what machines were being used, where they are available for use on a commercial basis, and the price of sessions.

If you have any information about individuals, clinics, centers, brain-mind gyms, and other places where brain technology is being used—whether it's one person who rents sessions on a sound-and-light machine in his or her living room, or a hospital-based pain and stress clinic, or a full service brain-fitness center—please send us as much information as possible. Write to:

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MEGABRAIN REPORT

SUPERCHARGING THE BRAIN: THE BIOELECTRIC INTERVIEWS (PART TWO) CONTINUED

short term memory for six months and they hate that. So the protocol I'm going to write up is to go in with a 100 cycle device and also a Liss device, and I'm going to see which one will get their short term memory back quickest. This is sort of a pilot. Then once I find out which one of these will do it, I'm going to run a real study, even double blind if I have I have to. But we are going to change psychiatry in America with that study, because I have enough ECT patients here to do that with.

MBR: I am very interested in seeing the blood work.

RS: The blood work we're doing now in this study—it started last week—we're doing again serotonin, we are repeating the Liss study, basically, but we are using just blood tests, not cerebrospinal fluid, which is very difficult to come by these days in terms of volunteers. But we are looking for serotonin, norepinephrine, cholinesterase again and beta-endorphins.

And then in the psychological tests we are using the IPAT depression scale from California, we're using the state/trait anxiety inventory for both state and trait anxiety, and we're using the WISC for brain dysfunction; we're going to look at the organic brain scales.

MBR: Do you have an preliminary results yet?

RS: I don't have any results at all. We've done no "pre" and "post" yet. What we have, actually, the patients are being randomly given CES devices. The situation is that we've a therapist in education there who's going to be working with them three times a week during the three week process. Just hold on to them, and do some psychiatric stuff, but also make sure they are using their devices. She has been getting exceptional results here in the public schools and even with some medical school students with CES. But she's been using the 100 cycle devices, and I'm afraid that she's got a bias, so I don't want her to be the one who assigns patients' devices. I have a secret code with patients who are going to be assigned the devices before any of the treatment staff get a hold of the patient at all.

Comparing Devices

MBR: Perhaps for our readers it would help if you could just briefly explain the 100 cycle device, the type of wave form and so on, and differentiate that from some of the other devices.

RS: Well, the big devices that NeuroSystems had in the old days used a sinusoidal current. What they were doing, they delivered up into kilohertz, and they sampled off of that 100 times a second. In other words, it was using frequencies in the kilohertz range, but a 100 Hz pulse repetition rate. [Ed. note: For a full discussion of the distinction between frequency and pulse repetition rate, see the "Bioelectric Interviews, Part One" in MBR #1.] But what they sampled off of that was 2-4 cycles, if you will. So while the pulse was pulsing at 100 times, they were getting 2 cycles at a pulse off that kilohertz, so they were getting 200 little

kilohertz things at the rate of 100 pulses of those. All the studies I've done that I'd done with their device—and I'm not using theirs now—all the studies we've done, I've used current in the microamperage range. Patients had to be stimulated below sensation threshold to blind it. So we were ending up with between 100 and 200 microamps in most all the studies.

MBR: At what voltage?

RS: It was running off 10 volt batteries, and they were knocking up between 47 to 57 volts.

MBR: You say that used a sinusoidal wave. But now most of the CES devices use a square wave, right?

RS: Yes, either because it's easier to do, or because some of the claims that Bob

Beck was making about square waves—the embedded frequencies.

Patients in fact want more current—that is *some* of the patients. The alcoholics want more, most cocaine patients turn it all the way up real quick, and some of the crack patients. But heroin addicts don't like the feeling at all, so they don't usually turn it up.

MBR: You've mentioned the BT6. We've worked with the BT5, and discussed it with Bob Beck [see MBR #1, "The Bioelectric Interviews, Part One"]. But the BT6 hasn't been released for commercial use yet.

Maybe you could just talk briefly about what your experience...

RS: OK. I worked with the BT6 on the EEG last summer. I was with Dr. Eric Braverman for three months. We ran 150 patients through computerized EEG. I had set up a

design where we would have three of the staff—me and two others—using either the RelaxPak, the Alpha Stim, or Bob Beck's unit, sort of randomly.

But to my chagrin we found—well, many people believe that everybody's EEG pattern is very specific, just like a thumb print—once you get it, you got it. That turns out not to be true at all. I think we have to go back into chaos theory to understand EEGs.

It turns out that if you find everything on repeat testing on the EEG that you've found before, that's a pathology problem. The brain never stays the same twice. And what I found to my chagrin was that any time any of the three of us put on any CES device, the brain changed—in some cases more than others. But on the other hand, by the time we got into the following week, put the next one on, our brain hadn't come back to normal. It was still significantly different than it was before we put on the first device!

So I could never control the brain of the three of us long enough to get similar start points for the three devices. See what I mean? What I found out was that I could not in any meaningful sort of way compare the three devices with just three heads.

So what we did was go into a different paradigm where we would take different patients, lots of differ-

ent patients. Meanwhile, Braverman was trying to make kind of a name for himself. He became very enthusiastic about CES. He was sure it was going to be the therapy of the future. He'd read scientific literature saying that the children of alcoholics have a "genetic marker," which is essentially reduced alpha wave activity in the right forebrain of the subject. So he said, "If that's the case then if I can change that marker by increasing the alpha waves in the right forebrain, I may

have a—if you will—a cure or preventative for that group." And it's a great theory, had it worked.

So what he did is put one electrode on the wrist of the left arm and the other electrode in the center of the forehead, and this was to run the current back and

forth from the arm up through the right part of the brain. You simply run it through that right lobe up there, where he was trying to stimulate the alpha. He was first using a Health Pack 100 cycle device, but then he did a group of patients with the Alpha Stim.

Meanwhile, I was trying to get him to run patients "normally," because we know what CES does with chemical dependent patients, or alcoholics certainly, used across the head—behind the ears usually is where we used it. He wouldn't do that. I wanted to run a group of patients that way.

What I finally got was a group of ten patients using the Health Packs, the 100 cycle device behind the ears on 10 patients—and he's got that data and I'm still trying to get it from him. We've also got 11 patients with the Alpha Stim CS on the ear clips. What I've found finally, and what I'll publish if I can ever get the data from him, is that on the head/wrist thing he only got one change. The spectral analysis we were looking at showed delta waves, beta, alpha, low beta, middle beta, fast beta, that kind of thing—and you can either get a reduction of one of those or you get more of it. And I was measuring each of those for more or less. And on the head/wrist position I only got one change in one of them on the spectral thing. On the other hand, on the Health Pack on the back of the ears, 100 cycle, I only got 2 changes. On the Alpha Stim, I think got probably six or seven. I got more spectral changes with the Alpha Stim than with any other device we used.

MBR: And on spectrum changes, what increases in alpha activity?

RS: I've got a list of those. I was going to write that up for the *Electromedical Journal* this week, but it's occurred to me that I could write up a much better one if I could get some of the other data from the 100 cycle devices I'm comparing it against. But what I've gotten is more alpha, more delta, more beta. I've gotten a lot more *across the spectrum*. We looked at the P300 wave, which is an auditory evoked potential response. It can be a sign of improvement in alcoholics or drug addicts, that kind of thing. And depressives, some depressives, and some other things like schizophrenics.

In fact, in the Alpha Stim, we didn't get P300 data. We couldn't get them. I think it's because we got so many spectral changes we drowned out the P300

"I think CES probably puts the brain back to normal homeostasis—the way it was born to be."

"After using the BT6 he said, 'I feel really up,' and he got top score of anybody who had played that game!"



response. You'll get that, you'll see it going across the head in a EEG, starting clear at the back, peak toward the top of the head toward the back. But in fact in Alpha Stim, in using Alpha Stim, we got all the spectral changes, but we could not get P300. I think it's because we had so much spectral things going on up there, it simply couldn't work its way back. I don't know if that's good or bad, but just there it is.

MBR: Did you have an association with Electromedical Products, the manufacturer of the Alpha Stim?

RS: No.

CES and Brain Enhancement

MBR: Did you get data on the BT5 or 6?

RS: OK. The BT5 was in the original study on the two controls, the three controls. And I got good stuff on that, but I didn't get anything I didn't get with anything else. But what I did do, strangely, when Beck came up with the BT6, which was hush-hush, was with a 67 year old man who was working with the children of alcoholics. And what he does in his side office when he has children waiting for their parents or getting tested or whatever—he'll have them play computer games. Some mouse chasing something else trying to eat it up, or whatever. And it shows the top ten scores up there, the high scores.

And this 67 year old man worked and worked, and he realized he was old and he realized these kids were young, but he wasn't going to let them beat him. But he could never get more than four or five up there on that scale. There were at least five little kids or teenagers, ahead of him. So he put on Bob Beck's device—I did an EEG first on him, then put on the BT6—the 7.8

cycle for 40 minutes—and then did another EEG. I didn't pick up changes on the EEG—that is, nothing dramatic. But of course, he had used Alpha Stims, the RelaxPak, and he'd had the Health Packs on. So by that time it'd have been a miracle had I got a significant EEG change from anything. On the other hand, after using the BT6, he said "I feel really up, I feel really up!" And I didn't know what he meant by that, but he went to play that machine and he got top score of anybody who had played that game!

So before I left, about a month later, we said, "Well, shall we try it again, and make it science this time?" He said sure. So we said, "Play three games and then we'll take the average score—then we'll put you on Bob Beck's device and you can play three

more, and then we'll take another average." He was all for that. He played his three games, but lo and behold, he was still up above any of the patients! He didn't come back down!

And so his initial scores going in finally, after working on the BT6 again, 7.8 cycle—he did 50 overall points better. But in fact the variance going in and coming out sort of overrode that a bit. Fact is, he didn't come back down after that first initial shot. He never did get beat back after that.

Which is typical of CES, once you get treated—I'm not saying a one-time stimulation—but the patients I've treated in the past. I've followed over 100 patients for six weeks or more, half of which have gotten CES and half of which hadn't. I've tested their depression and anxiety every Friday. And for six weeks the people who'd gotten the sham or placebo

treatment got a little better, little worse, little better, little worse, about the same. But the people who had been treated with CES got better every Friday, every Friday's testing! And I found the same thing in brain dysfunctions; they improved!

MBR: Even after the treatment is terminated?

RS: It catalyzes some sort of an improvement process. . . . I just don't know what it is. But they continue to maintain after treatment. And I found that it can really be devastating if you try to do a lot of studies in three months on the three different devices. That's the problem I had with Beck's device. The 67 year old man never got beat again by an adolescent!

MBR: Did you speculate on what you think the process might be in the brain that continues or is set in motion by CES?

RS: Well, I guess I'd like to spend a year just reading up on chaos theory, which is new to me. But . . . Well, look. In our society, we drive up and down the interstate highways, which is just not natural to primates. I was visiting somebody in an office building last year and he was showing me the view out his window. I looked out the window 40 stories up and there's this 1/8 inch pane of glass between me and eternity straight below. That kind of thing just isn't natural for the brain. We were evolved, probably, to live on a 25 acre farm with maybe 3 chickens, a goat and a cow, at best [laughs].

We certainly were not evolved to do what we're doing, working the places we work, with the numbers of people we work with. So we have this stress reaction. We shift out of normal homeostasis into stress response. And that is an unhealthy shift, but it's permanent or semi-permanent. Then we start paying—the symptoms of the ulcers, the heart conditions,

THE MEGABRAIN FORUM

More Cognition-Enhancing Nutrients and Peak-Performance Pills

In an upcoming issue of *Megabrain Report* we will focus once again on nootropic drugs, brain-boosting nutrients and their potential interactions with mind technology, including information about a variety of mind-extending substances not described in our smart-drugs feature in MBR #1.

To add depth to our investigation of mind foods, we want to devote our MEGABRAIN FORUM in the same issue to an exploration of your experiences with and thoughts about these controversial substances.

The goal of *Megabrain Report* is to increase the flow of information regarding mind technology. In THE MEGABRAIN FORUM we try to facilitate this process by inviting readers to share their knowledge or information about a specific question that seems to us to be of particular importance. We then print selections from the responses we receive, together with discussions of the question by prominent researchers or authorities in the field.

We invite your ideas and information about a constellation of issues having to do with cognition-enhancing drugs:

- **What have been your own personal experiences with these substances, both taken by themselves and in combination with other types of mind-technology, such as mind machines?**
- **Have these nutrients proven to be valuable and *authentic* mind-enhancement tools? (That is, through your use of such brain-nutrients have you produced/learned/created/understood things, or grown/matured/transformed in ways, that you would not have done otherwise, or more rapidly and easily than you would have without the use of these substances?)**
- **Will these substances become widely used, and if so what will be the impact on our society of widespread use of brain-drugs?**

Please send your responses to:

THE MEGABRAIN FORUM
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MEGABRAIN REPORT

SUPERCHARGING THE BRAIN: THE BIOELECTRIC INTERVIEWS (PART TWO) CONTINUED

whatever. I think CES probably puts the brain back to normal homeostasis—the way it was born to be.

MBR: Why would that be? Why would a minute electrical stimulus alter the brain in that way?

Recharging the Brain's Batteries

RS: Well, I kind of think of it like a battery with 6 cells in it and one of them's dry, if you will. If you put water in it and then let it sit it can take forever for it to come back up to charge, if it ever does come all the way back up. On the other hand, put water and a trickle charge in there, and you simply get it functioning up to its normal level again. It's just as good as any of the others, even though it was totally dead or nearly so when you began.

I think of the brain in terms of work that Dr. Simon Markovich did in Summit, New Jersey. He did a double blind study to test this theory of his. And his theory was that the addictive drug—alcohol, methadone, heroin—simply mimics endorphins in the brain that are manufactured by the hypothalamus, and once you put enough of the drug in there, then the hypothalamus will stop manufacturing it. For alcoholics, methadone, or heroin people, once they take the drug away, the hypothalamus is not producing endorphins any more.

Now the endorphins ordinarily go across and restrict the production of norepinephrine, which is another word for adrenaline. When they're missing and the drug or alcohol breakdown products aren't there to control it, then the norepinephrine pours out uncontrolled—an uncontrolled flood of adrenaline. So of course you get withdrawal symptoms.

He was theorizing that because norepinephrine flows into the locus coeruleus of the brain unhampered, you could try to block the effects of the norepinephrine on the locus coeruleus. What he did was develop clonidine, as a natural blocker—an "alpha blocker"—that keeps the locus coeruleus from responding to the incoming norepinephrine. And that stops the symptoms. So now clonidine is used all over America in withdrawal patients.

On the other hand, he turned to CES, based on some dog studies done back in the late 60's, early 70's at the University of Tennessee, that showed CES could stimulate hormones. He said, 'Well, if CES can actually stimulate the production of hormones, then what it should do is stimulate the hypothalamus to manufacture endorphins, and in the three day withdrawal process, they should then begin to control the norepinephrine the patient produces that causes withdrawal signs or symptoms.' He did a double blind study and gave half the patients an alpha blocker and the other half nothing except CES. The physician did not know who was receiving the alpha blockers or receiving CES during the three week withdrawal process. After withdrawal, it turns out, the alpha block patients always go through severe depression as part of that treatment—it's a requirement almost. But the CES patients did not! And they could spot them 100% of the time! The CES patients did not have depression,

and they came out alert, in better mental health if you will, and more ready for their treatment program, if they decided for that.

MBR: You mentioned a couple of explanations here that may be the same. One of which is restoring the brain homeostasis and the other being what seems to be a kind of a shotgun stimulation of beneficial neurotransmitters and neurohormones.

RS: But when I think like that, I think about my battery. In a trickle charge the battery's got five good cells, the trickle charge does nothing for those.

MBR: In essence you're saying that the parts of the brain that are functioning well, it doesn't affect them, and it seems to influence cells that are suboptimal, or sub ...

RS: Right. And again because parts of the brain typically control each other in that homeostatic relationship, when one part of the brain is not functioning well, another part can become too strong and the whole thing's out of balance. My thought is that CES goes in to the weaker part, picks it back up and makes it as healthy and strong as the one that had the upper hand before.

"We are going to change psychiatry in America."

MBR: We've talked about this with people like Robert O. Becker, Dan Kirsch at Alpha Stim, and they say that they've noted that people who use CES over a period of time seem to go through some sort of transformation experience, and that even after they've stopped using CES, they feel that they've changed. In fact, Becker quoted one of Meg Patterson's patients as saying, 'I feel like I'm no longer an addict. I no longer have an addictive personality.' And you have alluded to these lasting effects too.

RS: Yes. I can give you lots of clinical things, the kinds of things that are a little hard for science to grab on to. For example, they often ask us, 'Will CES stop my craving?' And it's awfully hard to measure craving as a scientist. But on the other hand, I was out at the hospital just last week, and one of the therapists on staff said they had used a CES device on a woman who is a prescription drug addict. She said when she left there, 'This thing has saved my life. I can tell you now, if it hadn't been for this, I would have been right back there.' And that's fairly common.

Another example. I was setting up a hospital in Tampa two years ago in January of 1989 and one of the patients came up after the first hour of stimulation on this 100 cycle device and he had this leg brace in his hand. I asked what that was all about, and he said "Look!" And he started doing knee bends, and said he couldn't even bend this knee an hour ago. I said, "Wait, stop, hold it, hold it." That's one thing you warn therapists about, don't let them get into things like that! And he went out and played basketball, and then was in bed for the next three days. He probably couldn't feel the pain at that time. Probably because of the endorphins.

Another patient came up in another hospital and starting bending at the waist, saying he was arthritic and hadn't been able to bend his back in so many months, or whatever. I said, "Hey don't do that!" So

the therapists now have been trained to warn them—if you're a pain patient or if you've got something broken, don't start using it just because you don't feel that pain right now. Go on through your therapy before you get cute with that. But we have to warn them of that.

MBR: In one of your papers you did a comparative study of available CES research, and I recall one chart comparing how long the various studies had gone on. It indicated that there was greater success when it was done regularly for a period of at least a week, and usually two or three weeks.

RS: Well, in the journal report I'm typing up now, it's clear that in less than one week this group didn't get anything—changes in measured depression, anxiety or anything. I found out that in America, one of the things we had to do is to say, "How long does it take to get this effect." And it's easy to fool us in clinical work because some patients are very sensitive and respond very quickly to CES stimulation. And they know it. They will tell you about it. But there are people out there, and probably maybe half or the majority of them, who if you don't hit them in the head with a ballpeen hammer, they don't feel anything. They don't notice any changes.

So in science we learn to measure early on, because if we're measuring something external to them, even if it's just paper and pencil on a reliable test, then we can know, we can see if there's a change or not. But we don't have to ask the patient if there's any change. Now, some patients will be the first one to tell you "Hey, this is some great stuff." And I can't tell you the number of patients in CD work—chemical dependency work—I've heard who've said, "This thing has changed my life." And you can't take it away from them. But on the other hand, those are the receptive people, and not everybody is receptive.

MBR: In general, you could say that people should not expect an immediate hit from CES. It's often more of a long-term?

RS: Well, I'll tell you what ... give me a crack patient and give me one I can turn all the way up on a 100 cycles device, and he's going to tell me right there "I feel like I'm having a crack episode." Give me a teenager in a hospital on marijuana, and let me give him a device, 100 cycles again—there might be others better and faster, but I'm just now getting to research them. But on the 100 cycles, I've had 15 teenagers take them off simultaneously—marijuana—patients, and it's, "Man, I came to this hospital to get over this, not make it worse. I feel like I'm smoking!" It'll do that within 10 minutes. On the other hand, that's the receptive ones again.

MBR: This brings up another point. We keep coming back to the 100 cycle devices compared to others such as maybe the Alpha Stim CS, and the BT5 and the BT6, and the Liss device, which are not apparently 100 cycle ...

RS: I think the BT5 had—the last time I looked—about 110, 111 pulses per second square wave. Bob deliberately did that to get 250 or some odd frequencies nested in the square wave, as he states his theory. I don't understand his theory.

On the other hand, I think that Dan [Kirsch, of Alpha Stim] has gone to .5 Hz on the "piano theory."



If you hit a low key on the piano you vibrate all the harmonic or related strings clear up to the top of the piano. So I think that he's probably going to .5 because that gives you a greater range of related frequencies that can be stimulated. My question is . . . we know on the piano that the ones closer, the octave for example, vibrates much harder than the 13th or the 18th up the scale, which vibrates even less and less. My question is, I wonder how much vibration it takes up there to get effective use of all the others.

But that's not what I'm researching. I'm actually doing blood and EEGs; fact testing research. I'll be able to tell you in probably another three months.

MBR: So far, does your research indicate an advantage to any one particular available device over other forms?

RS: No, I'm not qualified to discuss, to comment on that. I would hope in all this—look at Liss, look at Alpha Stim, look at 100 cycle devices—I would hope that number one, someone else doesn't come out with something strikingly different, because I just don't need any more work right now! [Laughter] On the other hand, I would hope that I will know soon which device is best at getting at endorphins or getting at serotonin, which is best at stopping depression fastest, that kind of thing.

MBR: You are actually testing the Liss device, the Alpha Stim, the Brain Tuner . . .

RS: Not the Brain Tuner.

MBR: Oh. But a 100 cycle device?

RS: Yes. And I'll probably be using the three hopefully on the protocol I'm typing up day after tomorrow. I hope to use all three devices, because I want to see what they'll do on recovering short-term memory in each situation. I have no real love for the 100 cycle device, it's just that I've run that past 616 patients to date, and I haven't run the Alpha Stim or the Liss device on anything in a controlled way yet.

On “Window” Frequencies

MBR: What are your thoughts on some of the ideas of Dr. Meg Patterson who claims that there are actually very specific window frequencies that stimulate certain neurotransmitters: certain window frequencies that are specific to cocaine as opposed to heroin, and so on. She has reported dramatic clinical successes in her treatment of heroin, cocaine, alcohol and other serious addictions. As I understand it, she uses CES (which she calls NET “Neuro-Electric Therapy”) constantly over a period of several weeks, changing the frequency of the electrical current at four-hour intervals. Dr. Patterson claims powerful and unique frequency-specific effects, but it is my understanding that she has never revealed the exact sequences of frequencies she uses, so no independent researchers have been able to test her methods, and double-blind studies validating her claims have never been published. What is your opinion of Dr. Patterson's claims of frequency-specific CES effects?

RS: From reading her books and her article for the World Health Organization, my understanding is that she has used 72 straight hours of stimulation, beginning always with the same pulse rate. Dr. Patterson

asserts that a good clinician knows when and how much to change the pulse rate, but she doesn't provide details. So her science ends there, and from there on, her methodology is essentially clinically-based. In the United States you have to publish directions for use if you are selling medical equipment, and evidently she doesn't have that information. She says a clinician can know or be trained to know. But from reading what she has written, I have the impression that if I were to use her approach I would have to be trained by her to replicate her successes.

MBR: Isn't there any research on frequency-specific effects?

RS: I've seen the Russian study last year that showed different effects at 70, 80 and 90 Hz. Their table didn't give me enough information, such as mean shifts, for example, to enable me to evaluate the study. The Russians didn't use Meg's frequencies anyway. I've talked to Fred Lerner and Bob Beck about this subject and none of us can think of anything in neural theory or neurotransmitter theory that could account for her claims. None of us had talked to anyone who could account for her claims in terms of generally-accepted theory here.

For example: you aren't *entraining* brainwaves at 2000 cycles per second on a cocaine patient. On the other hand, I've heard a physician attest to miracles—miracles you wouldn't expect from 100 cycle CES—at 2000Hz. I have to defer to Fred Lerner, who I think of as something of a gift to this field—he said one time he sort of threw up his hands about five years ago and said it looks like no matter what kind of electricity you put in people's heads they respond to it. They improve.

MBR: So you think it might just the electrical stimulation itself?

RS: I think electricity. I think, with that trickle charge you're putting in there, the brain is going to use what it will. So when you talk about the different effects of different frequencies, the real factor may be that at higher frequencies there is simply more current getting absorbed by the brain. I've seen miraculous things at 0.5Hz with the Alpha Stim, which doesn't have the 80% rest cycle like the original Neurotone device. Saul Liss uses 15,000 Hz embedded in 500 Hz embedded in 15 cycles per second. He accounts for the effects of CES in terms of biomedical engineering, saying that the brain is acting as a capacitor and is storing the energy (our cells can act as capacitors). He says that no specific rate is reflected in the brain at all, but that the neuron is just storing up energy until it gets what it needs in the axon and fires.

When Meg Patterson treats for alcohol, I think she starts out the treatment at 370Hz and then moves it to another point, and later to another. Unfortunately, it would take about 2000 studies to get her onto the market with her claims substantiated. I'm very open-minded about her claims. I would never say that she's wrong about her claims. What I have encouraged her to do is to put her frequencies as research parameters on to a device that has approved frequencies on it also.

It could have the FDA approved 100 cycles and six or so of Meg's—10 for nicotine, 30 for marijuana, 2000 for cocaine, etc. Of course, I think it's more than a technicality to include 100Hz. I have heard that people withdrawing from cocaine using 2000Hz have problems with depression, which I know from my own research you don't have with 100Hz. I think it's great to try various specific frequencies, but I think you should go back periodically to 100Hz.

MBR: Is the Alpha Stim producing an effect that you regard as equivalent to what you have researched at 100 cycles?

RS: I have tried to do a controlled comparison between the two, but I haven't succeeded yet. However, I will say that the Alpha Stim has accomplished what I had expected from the 100 cycle devices in terms of therapeutic impact. I don't have any way to compare them objectively, but Liss' theory of brain energy would certainly account for the Alpha Stim producing an equivalent therapeutic effect. And, logically speaking, .5 cycles at nearly a 100% duty cycle should do more than 100 cycles at 20%.

CES, Singing, Salt and Sauerkraut

MBR: Could you speculate for a moment on the use of CES not as a therapeutic tool, but as a way of stimulating peak performance or optimal brain states?

RS: As a scientist listening to that question, I have to ask what optimal performance is. For example, when I was in Dallas working with NeuroSystems, I sang with the Dallas Symphony Orchestra Chorale. I was a baritone singing in the bass section, and if I had a stressful day what I used to do is put those CES electrodes on my larynx right before I went to rehearsal and that gave me four more bass notes down. That was optimal performance on that! [Laughter] But I guess I need to know what we are measuring, what continuum we're looking at.

MBR: Well, for example, there are studies correlating CES with improvements in short-term memory and concentration. Maybe that extends in other ways that you could speculate about.

RS: My thought is, I'd hope that what we finally find out is that what CES does is, if worn properly for three or four weeks, I would hope that it resets the brain, if you will, resets the odometer down to zero and turns it into a new car again. Then the person can come out using all the ability he had, all the neurological ability he was born with.

MBR: You mentioned that you had modified the MMPI to put together a 44 item . . .

RS: Actually the MMPI has five hundred and fifty two items, I believe. It's long. I developed a great little 44 item test that will tell any MD in the country which of his patients are going to respond to CES and which will not. Based on that, I've run that across several other

“Is CES safe? . . . It's impossible to design a research project to prove that something is safe.”

MEGABRAIN REPORT

SUPERCHARGING THE BRAIN: THE BIOELECTRIC INTERVIEWS (PART TWO) CONTINUED



studies that have cross validated my 44 item MMPI. It's just amazing. It's a very simple thing. The subject just true/false that thing. You score it, and if the subject gets a score of 22 or above, that's a prime patient for CES. They're really going to respond.

MBR: That means respond really quickly?

RS: Yes. That means if measured on an MMPI they are going to have high stress scores. If we measure them on depression and anxiety scales, they are going to be in the pathology range on most of them. On almost every psychological test I've checked them on they are in the pathology range, above 50 percentile certainly.

MBR: I know a lot of our readers are owners of or users of CES devices or are interested in exploring their effects. I wonder if you could describe briefly what might be the wise way of using them? For example, how many minutes, whether daily, or what.

RS: OK. What I tell patients is that if you wear it for at least 30 minutes every day for three weeks, your brain will know when to use it. It's like salt. You know sometimes the brain tells you more salt today. And there are times, if your blood acid level drops, your brain will even send you out to get sauerkraut. The brain just sort of has a knack for knowing what it needs, salt and sauerkraut just being a case in point. On the other hand, I've looked at 110 patients from a Santa Barbara study I did who had devices for up to 18 months. And they told me, "There's periods I forget where I have the thing. But at some point, my brain tells me exactly where I left it, and tells me to go get it, that I need it." And they'll wear it maybe 30 minutes, maybe 7 hours.

I'm a case in point. I rarely use CES, but sometimes my brain calls and I'll put that thing on. I don't wear it 30 minutes, I'll wear it for 5 hours. I'll take it off when I feel irritated by it.

CES Safety and The "Retired Expert Syndrome"

MBR: Are you aware of any potential dangers or damage associated with use like that? For example, long-term use or use for 5 hours at a time?

RS: No. When I use it I'll turn it up all the way. When I first put it on alcoholics, the patients I dealt with in DC, and saw what it was doing, I wouldn't touch it. I never put that thing on my head! It took two years to get that thing on my head, because it was so dramatic and I've never even had a Valium in my body. I'll take aspirin, but I don't ordinarily put chemicals in my body. So I never wore it. But I come from a family full of migraine sufferers, and I was one of them. I can be knocked out for 3 days with a good migraine. One day when I was about to leave the hospital, I felt one of my migraines coming on, so I grabbed the unit and put it on and carted it home with me, and I didn't take it off until about midnight or something. The thing is, I never got the headache. And I was afraid to take it off. The fact is, I have not had a migraine since. That was the last one. And I'd had them all my life.

MBR: Wow. Robert O. Becker is one who has expressed to us some reservations about the experi-

mental personal use of CES. He told us there is not enough known, he warns about the possibility of brain tumors and so on. I wonder if you have any comments about that.

RS: Yes. Well, I noticed that in MEGABRAIN REPORT. I'm sort of a fan of his, because everyone wants to be the next Robert O. Becker. But I know that it's impossible to design a research project to prove that something is safe. That is not something science can do. Now, while you are running other projects, you can run into something, and say 'My God, tumors.' That kind of thing. But you can't design something to show that something is safe. You can design something to show it's NOT safe. If we do this I either get cancer or I don't, but you can't show it's safe.

So my first reaction to Becker's statements in MEGABRAIN REPORT was like my reaction to Margaret Mead when she became famous for her studies in the South Pacific. She then became an expert on everything. She was on the radio talk shows, and TV talk shows and the President had her in to talk. . . . You just put up a subject and she would wax philosophical about it. She just went well beyond her data.

And what we have in our society, one of the things we all have to watch out for, is what I call the "Retired Expert Syndrome." Once we get very good at something, people think we are clever and I guess most people are. Robert O. Becker certainly is. But we tend to go beyond our data and start waxing knowledgeable about things we don't have any data on.

On the other hand, the possibility also exists. I can tell you there are over 12,000 NeuroSystems pocket model devices out there on people, and they started out there in 1981. I have only studied and followed for six months over 100 patients. I followed for 18 months 110 in Santa Barbara, and for 14 months on 60 patients out of Fort Worth. That still doesn't tell you what happens if you use it for five years, that kind of thing. But I can say that the FDA requires NeuroSystems and all other manufacturers to keep a file on any reports of anything negative. For example, at the VA hospital in Fort Worth, they've been using it for over 10 years now, and they have never had a negative report come back. The patients go home.

MBR: As Bob Beck has pointed out to us, Becker himself does not have any data. He hasn't done any actual research into this area. According to Beck, Becker's fears mainly had to do with a different type of stimulation, which was electromagnetic.

RS: Right. I know he's doing electromagnetics pretty much as a source of electrical stimulation. But one of the problems we've had with CES in America is the FDA with their reluctance and resistance. They are quick to grab at an expert comment that it could be dangerous. So I kind of had a bad feeling in my gut when I saw that statement in MEGABRAIN REPORT, because I thought that surely the FDA would grab that and do horrible things with it.

In fact, back in 1976 when the device amendment came out, giving the FDA power over things like that, they submitted the studies to the National Research Council asking what was safe and was it effective. And 90% of the literature they were given to read was behavioral psych literature, and they didn't have any behavioral psychologists or behavioral types there to read it. So they came back and said they couldn't read it. They said, "We don't know if it's effective or not, but we can tell you one thing, it's absolutely safe at this current level." And so the FDA at that point classified it as a nonsignificant risk device and published that fact for all to see. And they still maintain that it's a nonsignificant risk device.

MBR: Do you think this could be effective for treatment of Parkinsonism? There are studies of CES showing it increases dopamine levels in the blood.

RS: I had Parkinsonism myself. I can't give medical recommendations, you understand. I'd get put in prison for 5 years. But the thing is, I would treat it with precursors to dopamine in the diet, and CES. I sure would. In almost every tremor condition we've seen in hospitals, CES always reduces it somewhat. There is no way I'd go into Parkinsonism without first using CES. I'd try to halt it if I could with precursors to dopamine and CES.

MBR: What precursors do you mean?

RS: The amino acid precursors for dopamine—tyrosine, phenylalanine. . . . I'll tell you something else. If you want to have fun, Michael—and you're a head type, as I read you in the past—take an amino acid supplement that has the 19 major amino acids in it, about 30 to 40 minutes before you put your CES device on, and sit back and wait for the serotonin. You're going to love it! [Laugh]

MBR: Would that same effect happen if somebody took specific serotonin precursors, such as tryptophan or hydroxytryptamine . . .

RS: Well, you can't get tryptophan any more, but they've got some substitutes, I think, since the FDA closed that off. I haven't tried it with tryptophan, but if you do tryptophan, keep in mind that you have to take it with no other protein in your . . .

MBR: But just the mixed amino acids would do.

RS: Mixed amino acids—you'll love what happens. I got that effect with the RelaxPak, actually, in the BEAM lab and my EEG went out of sight. In fact I got so excited that they rested me every 30 minutes for about an hour and a half on that EEG. It did go back to normal . . . finally [laughter].





REGENERATING THE HUMAN BODY?

ROBERT O. BECKER'S ELECTRICAL REGENERATION INSTRUMENT

One of our heroes is Robert O. Becker, M.D., whom we first spoke with for our Bioelectric Interviews (featured in MBR issue #1). Readers are aware that this crusading healer and researcher has spent decades investigating bioelectricity, including groundbreaking work in the use of electrical stimulation to speed healing, and his investigations of the "body electric," the electrical counterpart to the human nervous system.

Now Dr. Becker has presented MEGABRAIN REPORT with evidence of an extraordinary technique that he claims uses electrical stimulation not only to heal, but actually to regenerate new tissue. According to Dr. Becker, a prototype of the new electrical healing device is now in clinical use.

The technique involves using a silver electrode, made electrically positive with a small voltage (less than 0.9 V), which Becker found to emit large numbers of free silver ions that penetrated tissues to a depth greater than one centimeter. The healing/regenerative effect seems to be produced by the de-differentiation of cells. "As you can see," Becker reports, "the technique is capable of de-differentiating large numbers of human cells." De-differentiation, Becker points out, "is the process of de-repressing the entire set of genetic instructions making these cells able to form any type of tissue required to heal the wound. In essence the cells are returned to their embryonic state and a process akin to embryonic growth then takes place at the site of the missing structure." De-differentiation, that is, seems to be a key to regeneration.

As Becker laconically notes in a paper he sent MBR, "There are no reports of any technique, electrical or otherwise, producing a de-differentiation of any other mature cell type of human cells. The observations reported herein are therefore of considerable interest both from a clinical and a basic biological view."

As Becker points out, "The essential element in true regenerative growth is the production of a blastema derived from the de-differentiation of mature cells at the site of tissue loss."

Before Becker's latest findings, the only cell type in the mammal competent to de-differentiate, when given an appropriate electrical signal, was bone marrow.

"It is evident, therefore," observes Becker, "that unless another mechanism is found that is capable of producing de-differentiation of a more common cell type, no measure of adequate regenerative growth can be restored to the human. *The observation that the electrically generated silver ion is capable of producing de-differentiation of normal human fibroblasts is therefore of much more than academic interest. In view of the ubiquitous distribution of this cell type in the body it would appear that appropriate use of this technique either locally, or using the in vitro techniques described, may well result in an adequate blastemal mass to support major regenerative growth.*" [Italics added.]

From Regeneration to Rejuvenation?

Of much more than academic interest indeed. What we're dealing with, after all, is the possibility of regenerating damaged hearts, regrowing amputated legs, and even regenerating the supposedly "unregeneratable" nerve cells—think of the possibilities of being able to regenerate parts of the brain!

Sufferers from Parkinsonism, for example, could be able to regenerate dopamine-related cells. Alzheimer's victims could "replace" damaged neurons with regenerated cells. For those with an interest in longevity and anti-aging

techniques, think of being able to "heal" the body from the degenerative effects of aging with electrically generated silver ions.

Writes Dr. Becker, with typical understatement, "From a basic point of view the phenomena described appear worthy of additional investigations. The stimulation of de-differentiation is a major example of alteration in gene expression. It should be noted that all present techniques for genetic manipulation involve the replacement and substitution of other genes. There is no technique other than the electrically generated silver ion that influences gene expression. Many of the unknowns in biology involve the mechanism of gene expression. For example, the growth of a complete, multi-tissue, organized adult from a single fertilized egg is accomplished by control over the expression of the total genetic material in each cell. The mechanism involved in this process is totally unknown. The ability of the electrically generated silver ion to produce de-

differentiation of human cells at will is therefore of potentially great importance in determining the normal mechanisms used by organisms in such activities."

Becker points out that his new technique, by stimulating de-differentiation of normal human fibroblast cells, has been shown in clinical practice "to be associated with major enhancement of both the rate and competency of the subsequent healing process. It is possible that further investigation of this technique may result in the ability to stimulate true regenerative growth in the human patient."

The healing device is now being used. As Becker informs MEGABRAIN REPORT, "A former student, Dr. Arthur B. Flick, has now used this on over 150 patients with acute injuries involving tissue loss and has attained true regeneration."

"The technique is inexpensive and easy to apply," according to Becker, "with most patients able to completely care for their own wounds." Becker has paid careful attention to potential cancer-causing side effects, and notes that "it produced de-differentiation and cessation of growth of several types of cancer cells. It now appears promising as a therapeutic agent for certain cancers, a prospect we hope to follow up on."

But don't look for this device in your local drugstore. Becker's groundbreaking work has consistently been either ignored or rejected by the medical establishment. A theme of *Megabrain* has been the difficulty for scientists exploring new fields, fields on the cutting edge, like bioelectricity, to obtain recognition (and funding) by the scientific establishment. In Becker's words, bioelectricity "is the most important area of medical research today," presenting the possibility of "a quantum jump in medical technology." However, he points out, "we have the electrical . . . technology and we have the evidence. But we don't have the funding. . . . The establishment is too busy cutting and burning and charging huge fees to do it, while thousands continue to suffer."

In this case, Becker informs us, "Despite all the evidence of the ability of the technique and its clinical utility—not one medical equipment or pharmaceutical company believes it. Primarily because it flies in the face of present dogma."

— Michael Hutchison



"This technique may result in the ability to stimulate true regenerative growth in the human patient."

—Robert O. Becker, M.D.

MEGABRAIN REPORT

THREE PATHS TO PEAK PERFORMANCE: THE MEGABRAIN FORUM

MEDITATION, BIOFEEDBACK AND BRAIN MACHINES

In MBR #1 we inaugurated what we hope will become a regular MBR feature, the Megabrain Forum. In the Forum, we hope to facilitate the flow of information about consciousness technology by inviting readers to share their knowledge or information with us about a specific question that seems to us to be of particular importance. The question raised in issue 1: "Various 'tools and techniques' can be used to attain optimal or peak performance brain states. Some machines . . . show evidence that they can directly induce such states. Biofeedback devices have proven effective as a technological assist to the autoregulation of such states. Various forms of meditation represent traditional methods of self-generating these same optimal states. Or are they the same?"

"Is there a difference between the optimal brain-states achieved through (a) meditation, (b) biofeedback, and (c) other 'brain machines'?"

We received responses that were thought provoking, intriguing, imaginative, humorous and informative. Due to space limitations, we can only offer you a few of the responses we found most valuable.

Thomas H. Budzynski, Ph.D.

Thomas Budzynski, Ph.D., has extensive clinical and research experience in biofeedback, meditation and the use of brain stimulation technology. He conducted pioneering research in biofeedback while at the University of Colorado, most notably his explorations of the theta brainwave state, which led to the development of his Twilight Learning Device. His practice at St. Luke's Medical Center in Bellevue, WA, includes both brain technology and psychotherapy.

For me the major differences occur in the first fifteen minutes into these procedures. Meditation and CES are similar because I usually use a mind quieting technique when I use CES and one of those techniques is meditation. It seems to take anywhere from 5 to 12 minutes to clear my mind of fast tracking thoughts when I use meditation or CES. Of course, if I don't employ a mind quieting technique with the CES my thoughts may keep spinning all through the CES session even though I may feel a gradual relaxation. On the other hand, the light/sound device produces an immediate positive, exciting experience which then (for me) changes to a relaxing and interesting kaleidoscope of light images. After a time, perhaps within ten minutes, emergent imagery begins to form, some of which, I believe, is related to the frequency of stimulation. For example, light/sound at theta frequencies seems to facilitate early childhood memories for me. Perhaps there is some state-dependent effect coded in the dominant EEG frequency of that past time.

By biofeedback I am assuming that the type is EEG feedback as opposed to EMG, finger temperature, or EDR. Alpha feedback requires that I clear my mind of active thought process particularly of a visual sort. Paradoxically it demands that I not strive too hard or the alpha will not come through. This technique teaches one to inhibit a good deal of conscious thought process, but it is a harsh task master, with the tone cutting in and out with the alpha bursts. If find that this technique is excellent for training the brain to let go of consciously focused thought but it is not as relaxing for me as is CES or meditation, nor as exciting as light/sound. I also feel however, that the biofeedback training gives a wonderful sense of mastery which the CES and light/sound do not. As one acquires skill at meditation it also gives a sense of mastery but not so quickly or as saliently as biofeedback.

The end result of the four techniques appears to be somewhat different as well in that meditation leaves me feeling peaceful and better able to establish priorities while CES is wonderfully calming if I started the session quite tense, fearful or angry. Some research has shown neurotransmitter changes in the brain as a result of CES. I often get interesting imagery with light/sound sessions and I may feel as though I had slipped in and out of sleep. Biofeedback leaves me with that sense of approximation to mastery or at least the feeling of some greater degree of control over the EEG rhythms. All of the techniques give me something useful, and when several are combined the effect can be synergistic.

George Fritz, Ed.D.

George Fritz, Ed.D. is a psychologist and well-known biofeedback researcher and clinician. He is co-author (with Les Fehmi, Ph.D.) of the Open Focus Handbook. His research interests include dynamic brainmapping using computer-assisted EEG, and exploration of acoustic field effects. His current clinical work includes development of a magneto-EEG biofeedback system. He is currently in private practice in Bethlehem, PA.

The question posed by the MEGABRAIN FORUM is one I have considered for years as I sought to make sense of both my personal experiences with meditation, biofeedback and "brain machines" and of my clinical observations during several thousand hours in the application of brain technologies.

As to whether the brain states achieved by these brain technologies are the same, it seems to me that, as brain states "per se" they are, or potentially can be the same. Nevertheless, I also believe that a very important distinction needs to be made between brain states and states of consciousness. Therefore, although the brain states achieved may be the same, the phenomenology of consciousness associated with the use of each of these brain technologies can be qualitatively distinct.

Before anything else can be asserted, therefore, we first need to reach a consensus regarding what is meant by a "brain state." The question, as it was posed in the MEGABRAIN FORUM, equates the notion of "brain state" with "peak experience." This equation makes a qualitative leap of reference from a condition of energy (brain state) to a condition of consciousness (peak experience).

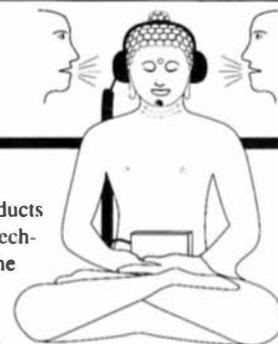
This touches on a major philosophical issue: What is the relationship between energy and consciousness? One view is that energy determines consciousness. Although it is obvious that energy, under certain conditions, whether chemical or electric, does in fact determine consciousness, these are in my view the exceptions to the general rule. I view consciousness as the senior principle in relation to energy. This point is extremely significant.

Consider the biopsychiatric model of the brain with its reliance on neuropharmacological interventions. Here the observation that biochemical "energy" can determine consciousness becomes a belief system in which energy is the senior principle over consciousness. If this belief system were extended to brain machines, then their use could be seen as neuro-electric analogs to the neurochemical interventions of biopsychiatry. Would MEGABRAIN REPORT readers be comfortable with this model? I, for one, would not.

This distinction between energy and consciousness, as well as the issue regarding the senior principle between energy and consciousness, clarifies what

"A systematic analysis of my data would show that essentially 'the same' energetic brain states do indeed occur during the application of each of the brain technologies."

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I mean by a "brain state" as might be achieved by the various brain technologies. It is both a condition of energy and a condition of consciousness. Moreover, the specifications of energy for any brain state do not altogether determine the content of consciousness associated with it.

Yet, look at how we evaluate "brain states." We use energy measures like the EEG. Now I've had experience with dynamic brain mapping of topographic EEG. In fact, I've evaluated all of these brain technologies with brain mapping equipment. I believe that a systematic analysis of my data would show that essentially "the same" energetic brain states do indeed occur during the application of each of the brain technologies.

However, the data include notes on the concurrent subjective state of the monitored individuals. The experiential content of an individual (i.e., the sensations, perceptions, emotions and judgments made by the subject about what's happening during each condition of brain technology intervention) can be so variable as to render the achieved equivalence of energy distribution (i.e.: successful entrainment at a common EEG frequency) relatively insignificant.

How can this be so? It is so because the relationship between measurable brain energy and states of consciousness is not causal, but merely associational. Indeed, there are energetic functions that may be described as hierarchically below the brain-mind (that is, gross physical, emotional-sexual, and heart energies), as well as those that transcend mind at the brain level (the self-sense and consciousness itself). These energetic functions provide the full context of the energetic functions of the whole body. It is a presumptuous abstraction out of this context to focus on brain energy exclusively. These other energies function with varying degrees of emphasis and integration within an individual, regardless of what might otherwise be the equivalent activity between and among individuals at the level of the brain.

There is a lot more going on energetically in and around the field of the whole body of an individual than what is described by the "brain state." That's why I conclude that, whereas the brain states achieved with brain technology interventions may be the same, still, what's going on altogether as the consciousness of that individual is likely to be quite different.

Just as I believe consciousness to be the senior principle in relation to energy, it seems to me also that meditation is the senior brain technology in relation to biofeedback and brain machines. Biofeedback and brain machines are targeted interventions which use specific neuroelectric measurements as their "language." We speak of "alpha" or "theta" biofeedback and entrainment. Medita-

tion, on the other hand, is best described using the "language" of consciousness itself. Although meditation strategies can also be categorized as "alpha," "theta," or "delta" techniques, I do not think this is always the most useful way to describe them. Brain electrical activity is an abstraction out of a larger energetic field of activity in and around the body. Some meditation strategies may be purposed to concentrate attention in the brain. Others may not. I have always been attracted to the "openness" techniques instead of the concentrative ones. A meditation strategy oriented toward openness and integration in relation to the whole bioenergetic field is better described, it seems to me, by its field effects than by the relatively local and narrow range description provided by neural activity.

My current work with individuals typically includes meditation training conceived as whole body feeling, rather than mental concentration. The two great influences on my approach have been Les Fehmi's notions of narrow and open focus and my own practice of meditation. It seems to me that narrow focus expresses itself in most of us as an exclusive concentration of attention in the thinking brain, whereas open focus attention for me specifically includes the feeling presence of the whole body. With the whole body as the feeling reference, consciousness can be felt to radiate throughout a broad field of space.

Despite this emphasis on meditation or attention training in my clinical work, I greatly value brain machines and biofeedback. In fact, in the actual protocol of my work with patients, I almost always start with brain machines.

I like the transcranial microcurrent stimulation devices, especially the Alpha-Stim and the Pain-Suppressor (the former to facilitate EEG training and the latter especially when migraine headaches or clinical depression are the presenting complaints).

Meanwhile, I believe that I've at least sampled by personal experience most, if not all the light and sound machines presently on the market. I have also utilized all the prominent audio-signal technologies. (Incidentally, my personal favorite audio intervention is Kelly Hutchison's "High Coherence" tape. I especially like the tape because there's no distraction by verbal instruction. My preferred private ritual for taking "time out," in fact, is to lie down with Kelly's tape and a set of biocircuits. I almost always feel profoundly refreshed afterwards, and, most typically, fall into a brief but profoundly deep sleep.)

As I said above, I've looked at the computer EEG (CEEG) brain maps of all these interventions. Different patients respond to different technologies

and different products within classes of technology. When the right match between patient and intervention is made, there is an associated (presumably therapeutic) shift in the CEEG. What counts most, however, is the self-report of the individual. Did the person feel relaxed (regardless of CEEG changes)? Did their perceived pain levels decrease or dissolve completely? Did they find that the induced brain state facilitated the achievement of a targeted state of consciousness? sleep? creative visualization? hypnosis? optimal performance imaging? prayer? self-transcendence?

Biofeedback is used by me as a second level in an hierarchy of interventions, where brain machines constitute the foundation level.

With biofeedback, as with brain machines, I believe that the orientation of consciousness determines how any shift in brain energy will be integrated and used. Thomas Budzynski's work both with "twilight" and subliminal learning, Fehmi's work with Open Focus meditation, and mine with whole body feeling, are all examples of "consciousness as context" for brain energy interventions. It

seems to me that all of these approaches have in common a belief that therapeutic change occurs primarily as a function of consciousness change. The energetic brain states associated with each approach (e.g.: EEG synchrony training, etc.) are conceived as

creating the permissive conditions for a shift in consciousness.

What I am trying to say here is that consciousness is the sine qua non for personal transformation. When a person trains with me I am hoping to help them become aware of, integrate and then transcend energy functions that are more associated with feeling than is the verbal brain. This provides a larger context for self-identity than the narrow self-definition associated merely with the thinking brain. Despite a continuous stream of thinking and our habitual tendency to identify ourselves with the thinking mind, the being does not in fact live exclusively in the brain. I find Da Free John's description of the meditative process particularly illuminating in regard to these essential distinctions. My own meditation strategies guide a person to resonate as the perceptual (rather than conceptual) mind, to be the whole body, and feel as the whole body. As the self-identification with the thinking mind begins to strictly mechanical—controlled by an integrated cir-

"Bioacoustic field effects feedback is the most potent and practical new technology. . . . In field effects feedback lies the future of biofeedback interventions."

MEGABRAIN REPORT

THREE PATHS TO PEAK PERFORMANCE: THE MEGABRAIN FORUM CONTINUED

loosen, then a stream of therapeutic changes can flow.

My use of brain machines is conceived primarily to afford an individual the opportunity to experience him- or herself in an interruption of and expansion beyond the otherwise chronic concentration of consciousness on a continuous stream of thoughts. This can be done not only using the brain machine technologies, through sensory bombardment, but also by using the REST (Restricted Environmental Stimulation Therapy) technologies, such as flotation tanks, which work through sensory restriction. My preferences among these tools are for technologies with demonstrated effectiveness in undermining the force of the contraction of consciousness into "mere thinking" as its exclusive domain. Thus, I am especially fond of flotation.

My use of biofeedback, with any individual, builds on prior achievements of thought interruption and consciousness expansion with brain machines (or REST). My in-house research data demonstrate that introductory sessions of transcranial stimulation facilitate the subsequent learning of EEG auto-regulation skills. It only makes sense: if you're first taken for a ride to an unfamiliar destination, you'll better know how to get there on your own when it comes time to drive yourself.

Because of my convictions, as described above, regarding the field of energetic reality that constitutes the whole body of an individual, biofeedback of brain states is not now, in fact, my preferred mode of biofeedback intervention. I much prefer to work with feedback of whole body field-effects. There is a presently emerging class of such feedback systems. In my experience thus far, bioacoustic field effects feedback is the most potent and practical of these new technologies. (These systems have been marketed, among others, as GENESIS and BETAR—see *Omni* magazine, December 1989, p 123.)

I have over 2000 hours of clinical experience with Genesis and recently purchased my first two Betar systems. My brain mapping data shows strict correlations between brainwave changes, attentional strategy shifts, and energetic field-effects during bioacoustic feedback. With Betar the field of biofeedback can move into magneto-EEG biofeedback using bioacoustics—very powerful stuff.

There doesn't seem much interest yet in field effects among my fellow professionals in the biofeedback community. EEG biofeedback is already daunting to most clinicians, so feedback of energy field changes may still be too far out. However, I believe at some point it will be widely recognized that in field effects feedback lies the future of biofeedback interventions.

Similarly, I feel that field effects entrainment devices (as distinct from feedback devices) offer enormous potential, beyond those of "brain machines." As we eventually solve the problem of how to monitor field effects with consensually validated technology, then the currently "esoteric" notion (that we exist within an energetic dance of interacting fields) will become conventional wisdom. Then too, those subtle energy interventions that align the whole body within its field, such as acupuncture and biocircuits, will be evaluated directly, according to their energetic influences, rather than (as now) according to their secondary "spillover" effects on gross physiology and symptomatology.

I have used biocircuits extensively for years as an adjunctive intervention to catalyze desirable "shifts." I don't know of any other practitioner who has more extensive clinical experience with them.

In fact, biocircuits are probably the single tool I use most often. [Ed. note: we take an in-depth look at biocircuits and new developments in biocircuit research elsewhere in this issue—see MBR #4, pages 31-34] More recently, I have also begun using acupuncture and biocircuits in conjunction with biofeedback, to catalyze or heighten therapeutic "shifts" into desirable states. (See my article "Convergent Acupuncture Biofeedback" in *Somatics* Autumn-Winter 1990-1991)

All the brain technologies, as well as the whole-biofield technologies, will eventually be enlisted in the service of consciousness. As I have argued here and elsewhere, consciousness is active as the entire field of the whole body. This includes brain states, chemical states, energy states, measurable and subtle, as well as subjective experience. Brain machines, biofeedback, and meditation can and should be used creatively, even synergistically, each and all, for therapeutic purposes, and even to stimulate "supernormal" function or transpersonal realization.

Bruce Harrah-Conforth, Ph.D.

Dear Friends:

Thank you for a stunning first issue of MEGABRAIN REPORT. I was extremely heartened by your thoroughness, scholarly approach, and topics. I have been conducting research into the field of brain entrainment for over two years now and am just completing a book-length manuscript based on my findings. I am also doing research for Synetic Systems with their Mind's Eye Plus, as well as for Acoustic Brain Research, Inc. I have devised my own device, the NeuroTech, which enables

different frequencies and patterns to be delivered to each ear/eye piece. I have little doubt that brain entrainment technology is a highly effective means of inducing changes in consciousness. For this reason I was particularly interested in your Forum question concerning meditation/biofeedback/brain entrainment.

I firmly believe that there is no need to invest long periods of time and effort to achieve a glimpse of the ephemeral God-head promised by meditation. As has been said many times before by Michael Hutchison, what once took months or years really can now be accomplished in days or hours. Every culture uses the technology that is at its disposal. There is no reason to fear or critique this new technology because it seems so much easier than meditation, safer than psychedelics, or missing some

religious doctrine. This new technology is merely a more efficient means by which we may search within ourselves.

Still, there are many who use a kind of "Protestant mind ethic" to proclaim that nothing of value

can be achieved that easily. John Clark, president of the Himalayan Institute, has criticized brain entrainment technology as a danger to our minds. He says:

"...we run a great risk when we use (brain entrainment) to instantaneously induce (the effects produced by traditional meditation). It's only one step away from hallucinogens... It's another example of turning over your life to the experts."

Clark is wrong when he says that there is a risk to instant induction. Stimulation of this type has been scientifically researched for over sixty years. In all that time the only negative side-effects ever reported are that some hypersensitive people may find photic stimulation disturbing, and persons prone to epilepsy or heart conditions should not use photic stimulation since flashing lights can possibly set off seizures. Even this latter hypothesis may prove incorrect, however, as research is currently under way that is exploring the possibility that photic stimulation can actually prevent epileptic seizures.

Though Clark is right when he says brain entrainment is a step away from hallucinogens, this assessment is not what Clark infers. Yogic meditation, chanting, ritual dancing, and all the other traditional technologies can also be considered one step away from hallucinogens. All technologies that induce alternate states, from the most traditional to the most contemporary, share certain brain-manipulation characteristics with hallucinogens. Brain

"What once took months or years can now be accomplished in days or hours. Every culture uses the technology that is at its disposal."



technology, whether it be yoga or electronic entrainment, acts to stimulate certain areas and chemicals within the brain. This is precisely why they are effective, and precisely why Clark's argument is specious at best.

Finally, Clark calls entrainment "another example of turning your life over to the experts." On the contrary, brain entrainment is a quicker way of getting away from the experts and in control of your own life. Followers of yogic meditation may spend years, even decades of their lives, devoted to a particular teacher. There is no guarantee that this devotion will be accompanied by success in controlling one's inner states. Users of brain entrainment technology can eschew this type of dogmatic influence in favor of the adventure of self discovery. Stress reduction, increased mental functioning, improved immunology, as well as a host of transpersonal experiences, are all at the almost instantaneous disposal of brain entrainment users.

Swami Chetanananda, founder of the Nityananda Institute and teacher of kundalini yoga, has voiced oppositions to brain entrainment. He calls this technology "...hogwash. It's impossible to shortcut any of the steps that need to be taken and still arrive at the highest state. Shortcuts... insure failure."

Chetanananda's criticism, like Clark's, may reflect the voice of vested interests. If brain entrainment actually does what it claims, as my research indicates, there would be little reason for anyone to spend the extreme amounts of time necessary for success at schools like those run by both Clark and Chetanananda. Short cuts to the "highest state" are not only possible, they may actually insure success, the exact opposite of Chetanananda's claim.

What neither Clark nor Chetanananda mention is that their time-honored techniques of meditation can actually fool the brain. Because of the increasing levels of relaxation that one encounters during a meditative session, it is quite common for meditators hooked up to EEG machines to have their brain "shut down" before reaching the desired state. The brain, in effect is saying to the body, "You feel extremely relaxed, and so there's no need to go any further." These EEG tests have demonstrated that a majority of practiced meditators may never reach the lower levels of alpha that some yogic master do, even though they believe they are succeeding in their pursuit. Brain entrainment, on the other hand, has been shown to be a virtually fool-proof method of achieving these desired results.

The brain DOES follow the type of stimulus provided by brain entrainment technology. A photic flash rate of between 8 to 12 Hz will produce alpha waves. Because of this effective method of wave alteration, the opposition to brain entrainment technology expressed by meditation-boosters is prob-

ably inflicting a greater disservice to their own cause than to entrainment technology. In what seems to be an ideal marriage of Eastern metaphysics and Western technology, meditators who refuse to accept the potential of entrainment may be missing a means of securing the positive results of their own efforts. It has been demonstrated time and time again throughout recent testing that those brain entrainment subjects who are already experienced in meditation experience more vivid and deeper states of trance during entrainment sessions than they had ever achieved on their own. Frequent use of this technology seems to be able to entrain the brain to replicate these states at will.

With regards to the differences between biofeedback and brain entrainment, there are several issues of concern with the former. Biofeedback only allows the user to control that portion of that brain that is linked to an electrode. It is, for this reason, far from being a whole brain technique. Further, tests have shown that biofeedback users quickly forget how to enter optimal states only a short time after stopping biofeedback use. Brain entrainment, at least within my research, has shown itself to be virtually fool-proof and does indeed facilitate whole brain experiences.

Gordon Broussard

You question whether or not there is any difference between "optimal brain states" achieved through meditation, biofeedback and other brain machines. I have a number of observations to make.

First of all, it may be simplistic to lump all forms of meditation together (unless, perhaps, one is looking at those meditators who are quite advanced) inasmuch as research done with meditators who do one-pointedness techniques vs. mindfulness techniques (see Daniel Goleman; *The Meditative Mind*) indicates that they have different reactions (or lack thereof) to external stimuli.

Secondly insofar as the similarities of CES (I have played with some forms of biofeedback in the past and have not been impressed) and meditation are concerned; I have found a difference. I have been meditating for over 25 years and utilize a form of mediation which focuses on a "current" (sometimes known as the "I" or "I Am" current but which goes by a variety of other names). There are similarities to CES current but that is all that can be said—in my case (at this time) both involve an energy.

At one point in my meditation, meditating consisted in part (at one level) of "grabbing" attention/consciousness and/or the energy of which it consists and drawing it to a center (none of the 7 major chakras) which is a focus of my meditation. Currently I need only "think"—generally without particular effort—of focusing (while working, driving, etc., even sometimes between sleep and waking) and energy flows automatically to that center. I got a Brain Tuner one week ago and after one week's experimentation found that I "grab" elements of the energy generated by the BT5 and draw it to my center of focus. Other elements of the energy begin in the brain and eventually involve the entire body (a "psychic" friend saw a transparent wave flowing up and down the auric field. Additionally, several people have

noted pain decrease in parts of the body after only brief use of the CES device). As an aside, I now find that when meditating without it, the contact points behind my ears vibrate.

A third observation is that although I have

begun teaching a few people how to meditate in a manner similar to that which I use, if I were to use the BT5 with such people, it would be for the purpose of showing them what they can feel when meditating. However, from my own observations and experience, feeling that energy without—initially—directing it would not be sufficient.

Another observation is that as I see meditation, one initially arouses the "I Am" current with effort. Later, as I indicated above, this effort is not necessarily needed. As time passes, one is "made" to meditate as the current begins to act, consciously (Superconsciously?) directing him as he initially directed it, and to take more and more control of a person's consciousness as he surrenders to it. He then begins to become a part of the current rather than a person experiencing it (presumably, if mystical writings are correct—and so far major aspects of them have been—a time arrives when there is no separation.)

A further observation based on my own and others' experience is that part of this on going process of surrender leads to personality transformation (among other forms of transformation). I therefore feel that although the energy from the BT5 and other CES devices has effects similar to the meditative current, the meditative current seemingly has a consciousness of its own. It is therefore not

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MEGABRAIN REPORT

IT'S CONTROVERSIAL AND SUPPRESSED: HERE'S HOW TO

HOW TO MODIFY FUNCTION GENERATORS TO WORK AS "FREQUENCY THERAPY" INSTRUMENTS

By Bob Beck

Bob Beck, B.E., D.Sc., is widely known for his instrumentation of altered states, his development of medical electrostimulators such as the Brain Tuner series (BT-5, BT-6), and his investigations of Tesla electromagnetics. To sample his distinctive and original thinking on a wide range of subjects from CES to scalar technologies read MBR #1, "High Voltage: The Bioelectric Interviews."

Due to the proliferation of AIDS, mononucleosis, herpes B, Epstein-Barr, cancer and diseases unmanageable with antibiotics or conventional therapies, interest is being redirected to unorthodox alternatives like electromedicine. History proves that since corporate profits are far greater with pharmaceuticals, many proven cures are deliberately suppressed.

One amazing and well-documented "cure-all" which has never received a fair or impartial evaluation by our orthodox medical establishment is the classic "Rife" type device long in public domain. This article and the schematic diagram that follows contain all the information necessary for the do-it-yourself construction of an improved hybrid "Frequency" Instrument in modern form, plus easy modifications to off-the-shelf generators.

Thirty years ago this was known as "Frequency Instrument Therapy." It was originally tested south of the border where proven cures of innumerable diseases including cancer were documented. FITs were forcibly retired when several competitive local clinics and pharmacies secretly complained to authorities that its operators' successful cure rates were damaging their incomes and therefore the under-the-table payoffs to Mexican "Federales." FITs can be user-assembled for under \$75.00 if the builder is moderately skilled in electronics, or under \$125.00 if parts are purchased retail instead of surplus, or for a low of \$300.00 to a high of \$850.00 if construction is delegated to a professional technician. But an excellent instrument can be easily made by modifying a readily obtainable BK 3011 Function Generator as described in this report.

Background: The original construction plans detailing the "FG-3" vacuum tube device are wholly credited to a researcher in Idaho who prefers to remain anonymous. He took data from an exact working replica of an FIT built by Rife. The replica, constructed many years ago by a qualified engineer-physicist, was analyzed with modern test equipment for the precise frequencies, waveforms, outputs, impedances, and all other known parameters thought to be biologically significant. The original, owned by an associate of the re-creator, was engineered to reflect the exact thinking of Rife and eliminates many unfortunate distortions perpetuated by his imitators and "spokesman." How does it work? Controversy may surround this question for another fifty years, since results with Rife instruments built recently clearly prove that many diseases, infections, viruses, microbes, parasites and fungi appear to blow away very rapidly.

Rife's original theory was that each pathogen has a unique size that can be physically resonated and "blasted" with its exclusive tuning like a wine glass that shatters with a specific tone. This thesis has innumerable

drawbacks including the fact that Rife and his modern-day followers confuse pulse-repetition rates with "frequency" [Ed. note: for an in-depth discussion by Bob Beck and others about the distinction between frequency and pulse repetition rate, see "The Bioelectric Interviews" in MBR #1]. FIT wave pulses are electrical, not acoustical, and therefore won't "vibrate" cells even at critical dipole resonance except for minute piezoelectric effects found only in bone and some cell (not viral) membranes; also FIT wavelengths are many orders of magnitude longer than 1/4 wave resonances of viruses. But most significantly, all Rife-type instruments are square-wave generators. By textbook definition, square waves always contain an infinite number of odd harmonics extending beyond many Megahertz in transformerless designs. So to confuse square-wave repetition rates with a coherent, discrete cell "frequency" is clearly absurd and continues to handicap thinking in the field of electromedicine even today. Each and every pulse regardless of its rate produces hundreds of actual, discrete, individually measurable frequencies in the form of harmonics as displayed with frequency-domain spectrum analyzers. Oscilloscopes cannot show these embedded harmonics since scopes show only time-domain displays. The nano-Hz and pico-Hz signals active at viral dimensions cannot possibly penetrate the body because of "skin effect" (Eddy-current) repulsion, even if they were present, which they are not. Embedded harmonic "frequencies" unrecognized by Rife's theory are what make a flute, piano, or trumpet although playing the same note (Hz) sound entirely different.

The body's endogenous immune system is activated by the alien electro-magnetic signals, and a broad spectrum of antibodies is rapidly stimulated into production.

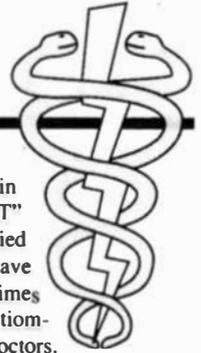
A better hypothesis may be that the body's endogenous immune system is activated by the alien electro-magnetic signals, and a broad spectrum of neuropeptides, hormones, leukotrienes plus other antibodies are rapidly stimulated into production. This is proven by chromatography which shows that neurotransmitters are produced when TENS (Transcutaneous Electrical Neuro Stimulation), C.E.S., or other electrical treatments are used for pain or stress.

There are over 2000 peptides identifiable at present. Some are produced by human skin. Cytokines like Interleukin and Interferon are thought to be immunization factors for a broad-spectrum of diseases ranging from the common cold to cancer. Neurotransmitters like beta endorphin alleviate pain. Our body's complex healing interactions appear limitless and can be safely stimulated and mobilized electromagnetically with no known adverse side effects.

CAUTION: After completion and before attempting to use this instrument, frequencies MUST be set individually with a digital frequency counter to within plus or minus 0.5 Hz of the correct numbers. The 3011 contains a built-in counter. Also, applying metallic electrodes directly to subject's skin WILL cause burns if output amplitude is set too high.

TREATMENT PROTOCOL: Currently preferred procedure is to place terry-cloth pads (inexpensive wash-cloths moistened in water) or several layers of soaked paper towels between the bottom of subject's feet and the two stainless steel applicators. Reynold's heavy duty aluminum

BUILD IT YOURSELF



kitchen foil can be used for temporary or expendable footplates. The metal should NEVER be placed directly on bare skin. Three square-wave rates (666, 690 and 728 Hz designated as A, B, C) are then run in this sequence for five to ten minutes each at highest comfortable intensity for a total of 15 to 30 minutes to complete each treatment. Intensity is slowly advanced to maximum (-35V rms) as subjects adapt to the tingling sensations. Times may be extended to a maximum of 15 minutes per setting with very rigid, aged, or entrenched subjects.

Practitioners recommend repeating treatments daily for two consecutive days, then no treatments for the next three days to allow the body to rebalance and handle toxins, then twice a week for three weeks. There appear to be no negative side effects if the body is given sufficient time to dispose of released toxins, parasite or yeast kill-off (*Candida Albicans*). With heavy fungal infections, cures may be accelerated with ingestion of dilute hydrogen peroxide H_2O_2 . Subjects should drink as much pure water as possible to flush system of dead fungi and toxins.

Applicators should be placed ONLY on soles of feet or palms, never on other areas of the body. For tumors, electrodes were once placed straddling the area, however this appears unnecessary since results apparently are effected by the production of antibodies mobilized at sites remote from the tumors and subsequently delivered to diseased areas by the body's circulatory systems. Using two plastic buckets containing water made more conductive with Epsom salt or sodium chloride (table or sea salt) in which the electrodes and feet are separately submerged also works very well. Any frequencies applied to feet are demonstrated to permeate all parts of the body, and appear to trigger the immune-system's enhancement sites wherever those may be located. Do not use immersion if there are cuts, rash, sores, or abrasions on feet. If used with different subjects, solutions should be discarded and replaced after each use. Twice-daily treatments may be endurable.

Why use separate frequency-generating 4011's and then a phase-locked loop and X-10 frequency multiplier instead of a single switchable generator for the desired repetition rates? The designer rightfully contends that this approach, while more expensive and complex, provides greater stability and insures accurate, repeatable settings although degrading rise-times. Designs using a single 4011 chip and switch "R" may be better if carefully done.

(NOTE: The above paragraphs refer to the original clone using 666, 690, 740, 1840 and 1998

Hz. Recent data changed the correct settings to 666, 690 and 728 Hz only, and eliminated the upper two frequencies altogether.)

DISCLAIMER: These data are thought to be accurate but must be shared "For information and research purposes only" as protected by the First Amendment. Although California health practice laws have been relaxed recently in the AIDS emergency, FITs cannot be used legally for the treatment of disease or to save lives except by a licensed physician, and then only with FDA permission under suppressive Class III experimental restrictions. Even with malpractice insurance, few seem willing to take risks with "unapproved" approaches. Keep in mind that no doctor can yet guarantee a positive cure for many modern ailments with currently known treatments, but what is guaranteed is that all of them continue to take the victim's money. Doctors realize far greater profits from treating than from curing, since cure patients don't keep coming back.

The writer, a credentialed scientist lecturing at major universities, is active in the field of alternative new-age medicine and for twenty-five years has diligently researched electromedicine both here and abroad. He believes that FIT type devices may be the most promising of hundreds of suggested holistic treatments ranging from Acupuncture to Zone Therapy. Electronic approaches may prolong life dramatically and overcome disease by enhancing the immune system and antibody production.

This information is freely shared with qualified persons to prevent FITs from being monopolized, buried, or exploited for profit by vested interests or by entrepreneurs falsely claiming exclusivity or proprietary "secrets." It is interesting to note that

before and after Rife's death in 1971 a number of "Rife FIT" instruments, basically modified HeathKit or Global square-wave or function generators, sometimes with added calibration potentiometers, were sold to new-age doctors. Several of these came to the writer's lab for analysis over the years and not one of them provided outputs even approximating correct values. The device described here is far less expensive and demonstrates excellent performance.

Individual researchers assume all responsibility for construction and use and are reminded that unlicensed "curing" of

human subjects is forbidden by all Health Cartel, FDA and HEW regulations. Also, to avoid confiscation, devices must be clearly labeled "For Experimental Use Only" and no medical claims whatsoever should be made or implied. Constructors are cautioned to limit experimental use to themselves, family members and trusted friends, and to avoid any publicity.

Please do not attempt (or permit anyone else to attempt) to contact the writer personally or by telephone or mail. This project is strictly non-profit and humanitarian. Anyone can build his own instrument with minimal effort or investment. All necessary information is included in these pages. FITs are purely experimental and no other claims are made. The writer does not build or sell these. His research results are shared freely and without charge to interested experimenters.

An excellent source of additional information is a \$9.95 paperback: *The Cancer Cure that Worked!—Fifty Years of Suppression* by Barry Lynes with John Crane, 1987; Marcus Books, 75 Tidefall Drive, Toronto Canada, M1W 1J1 (416) 494-6771 or 492-2431. It is available at many bookstores.



Individual researchers assume all responsibility . . . and are reminded that unlicensed "curing" of human subjects is forbidden by all Health Cartel, FDA and HEW regulations.

A Call for Research and Contributions

MEGABRAIN REPORT intends to be a nexus of new information in the field of consciousness technology. We plan to publish papers, essays, summaries and other discussions of ongoing research and investigation by scientists, inventors, researchers and explorers. Please send queries or contributions to:

Megabrain Report
P.O. Box 2744
Sausalito, CA 94966

MEGABRAIN REPORT

ROLL YOUR OWN: SCHEMATIC FOR A RIFE-TYPE "FREQUENCY THERAPY" INSTRUMENT

MODIFYING FUNCTION GENERATORS TO WORK AS "FREQUENCY THERAPY" INSTRUMENT

by Bob Beck

Since the recent resurgence of interest in electro-medicine, a number of solid-state and vacuum tube "clones" and replicas have emerged. Schematic diagrams, plans, instructions, and classes have attempted to provide instruments for interested persons. Most attempts have fallen short of expectations because of costs, complexity, human failings, and lack of expertise. This MEGABRAIN REPORT special paper describes a simple, inexpensive, fail-safe alternative that will positively provide an excellent "Universal" Frequency Instrument costing under \$270. It will have advantages over and be superior to many devices selling for over \$1,800.

Surprisingly, using a transformer and eliminating vacuum tubes does NOT appear to degrade performance.

ADVANTAGES: This "UNIVERSAL" instrument will provide much higher output power, plus better square waves and harmonics than most available devices, and it incorporates a

built-in frequency counter. It can be instantly tuned to ANY desired settings, requires no "warm up" time, and is not locked in to factory pre-sets or crystal controlled rates which will undoubtedly change as additional research and expert opinion evolve better frequencies. It is light-weight (5.5 lb), compact (only 3.3 inches high) and fits in a small attache case. All modifications can be added internally if the user wishes, making it completely self-contained. It can provide sine and triangular in addition to square waves.

MODIFICATIONS: Since frequencies are very difficult to set to plus or minus 1 Hz on unmodified generators, a 10-turn 5000 ohms "Helipot" is substituted for the original single-turn frequency adjusting potentiometer. A 50 ohms linear potentiometer can be added for "superfine" vernier tuning from the front panel. (This is an additional convenience only and is not essential.)

WHAT WILL IT COST? BK Precision's model 3011 - 0.2 Hz to 2 MHz generator sell user-net for \$220 at Action Electronics, 1300 E.

Edinger, Santa Ana, CA 92705, Phone (714) 547-5169. It is also available at many other stores. Action generally has them in stock. The ten-turn helipot sells for \$14.90. The "Turns Counting" knob for the Helipot (a convenience only) costs \$14.90. All available at Action. The 50 ohms linear pot is at Marvac Electronics, 2001 Harbor, Costa Mesa, CA (714) 650-2001 or a most electronic supply houses for about \$3.00. The transformer, switch, jack, and dial knob for 50 ohms 1/4" shaft are available at almost any Radio Shack. Ask for "P.A. Transformer, 70-Volt Line Use" #32-1031, \$5.95. It raises the generator's 11 Volt output to 30+ volts for rapid and effective treatments.

A miniature SPST switch #275-327 \$1.95 and a 3.5 mm female phone jack #274-251 \$1.59 can be installed on the 3011's panel for even greater convenience. The switch and separate jack for electrodes enables the 3011 to be switched from a "standard" function generator to a "treatment" instrument without mutual interference. The impedance matching transformer can then be installed internally for a completely self

Up-Graded "Frequency Therapy" Instrument

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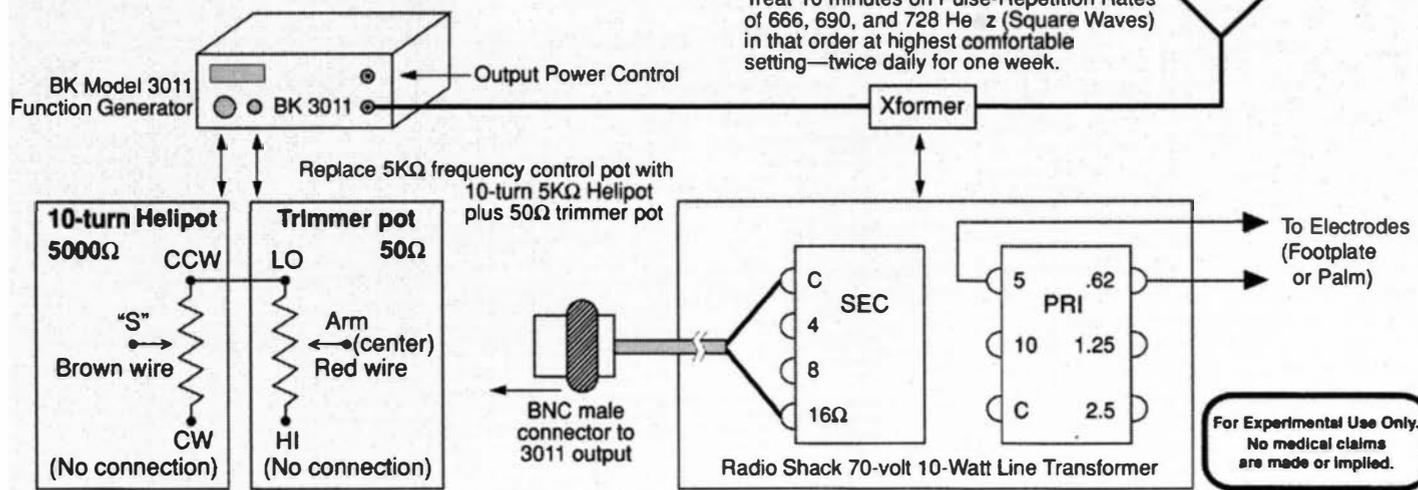
Parts List

BK Model 3011 Function Generator; 0.2 to 2 MHz range with built in counter	\$220.00
Beckman 5K Ohm 10-turn "Helipot" part #P7276R5K (Caltronics)	14.90
Beckman 10-turn locking TURNS COUNTING DIAL 1/4" shaft #P2626 (optional)	14.90
<i>(all above parts from Action Electronics, 1300 E. Edinger, Santa Ana, CA 92705 (714) 547-5169)</i>	
Radio Shack 70 Volt 10 Watt P.A. Line Transformer cat.#32-1031	5.95
Dial knob 1/4" shaft for 50Ω trimmer pot, cat.#274-433 (2 for)99
50Ω linear of (generic) Marvac Elec., 2001 Harbor, Costa Mesa (714) 650-2001	3.00
	\$259.74

Stainless Steel Electrodes
Always cover with moist towels!
(Never place bare metal on skin)



Treat 10 minutes on Pulse-Repetition Rates of 666, 690, and 728 Hz (Square Waves) in that order at highest comfortable setting—twice daily for one week.



GENERATOR"

contained modification. This totals under \$270 plus tax.

HOW TO CONNECT: The simplest and fastest way to connect a BNC male with two leads to the "C" and "16 Ohms" on the "Sec." side of the line transformer. The BNC plugs into the "output" jack on the 3011. Then two wires to the 3.5 mm phone jack connect to the "5W" and "0.62 w" lugs on the "Pri" side. This provides the best impedance match. A 1/8" male phone plug, 6' leads and alligator clips for plates work well. Obviously, the transformer is being connected "backwards" to raise the output voltage. Foot or palm electrodes then plug into the jack. Transformer can be separate and left outside. The 10-turn Helipot is substituted for the original 1-turn frequency pot inside the 3011. The hole for shaft must be slightly enlarged with a reamer or drill, being very careful not to crack the plastic panel. An additional (convenience only) 50 ohms pot is wired in series with either side (not arm) of the Helipot for ultra-fine settings. See attached schematic drawing for clarification.

I installed the switch, jack, and 50 ohms vernier pot on the 3011's panel. Transformer can be mounted inside the 3011 on the left side of rear steel bracket with washers. Two components

must be de-soldered and bent down parallel with the chassis to clear transformer. The "hot" or center terminal of the 3011's output jack is connected through switch to the "16 ohms" lug, and the transformer's "C" connects to BNC's ground or shell.

USE: Metallic (preferably stainless steel) plates or screen mesh or kitchen aluminum foil foot-sized electrodes are clipped onto leads marked "electrodes." Several layers of paper towel are folded, moistened and placed over the electrodes, and subject's bare feet are placed on pads. Exposure of from five to fifteen minutes for each of three frequency settings are applied (Total time fifteen to forty-five minutes per treatment). Only THREE (not five) pulse-repetition "rates" are currently preferred. These are 666 Hz, 690 Hz and 728 Hz. "Amplitude" dial is set to maximum comfortable tolerance. Do not apply electrodes to any part of body except feet or palms. Never place bare metal against skin, always use moist towels over metal.

SETTING THE 3011: On top row of buttons, push "1K." On "function" row push square wave (left-hand one of the three brown buttons). "Duty" knob (left) is rotated all the way counter-clockwise. "Offset" knob is pushed IN and set

straight up (center or 12 O'clock). Ignore the TTI knob. Push "Amplitude" knob IN and rotate to left. Then set "Frequency" knob to read exact desired rate on digital display. After subject's feet are on wet pads over footplates, let him slowly advance "Amplitude" knob to highest tolerable level. This is gradually increased during treatment as subject adapts to the stimulus. A signaling timer is set to remind subject to change frequencies. Subject should drink large quantities of pure water to flush toxins from system so kidneys will not be overloaded with expelled microbes, bacteria and yeasts such as Candida. (No medical claims are made or implied. This device is for experimental use only.)

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UPDATE: Bob Beck has recently advised MEGABRAIN REPORT that: "The addition of the two potentiators described in this article is no longer necessary. The current BK3011 A or B include these as standard off the shelf model updates. Only the transformer is necessary to have a superior frequency therapy instrument."



■ FORUM *continued from p.25*

strictly mechanical—controlled by an integrated circuit as with the BT5 (However metaphysical that may sound.)

Another aspect of the meditative current is the following—it has long been reported anecdotally (also see Maxwell Cade; *The Awakened Mind*) that some teachers of meditation can induce episodes of higher consciousness in their students through touch or just by focusing on the students. I currently give credence to the hypothesis that these teachers have an effect similar to that of a CES device and thus "help" their students briefly reach that state they are seeking to reach through meditation. Working in this manner with a teacher for a time enables some students to hasten their ability to "achieve" the meditative state on their own. The mechanism by which the teachers "help" their students is not electrical (from a 9 volt battery) and not even bioelectrical (if done at a distance or when not even present) so it may not be like the effects of CES after all. When "mind" is understood (is it part of brain, or is it a field of energy accessed through the brain, which acts only as an interface?), the similarities and differences may be understood.

Some scientists may wish to deny mystical/meta-physical elements of reality but many do not. When all aspects of reality are understood a theory may be developed to explain the interrelationship of all forms of energy (CES, meditative, brain/mind, matter, heat, light, vibration etc.) Until then, one can only speculate and should not simplistically call CES a modern equivalent of shamanism,

Michael Kennedy

I have been meditating (sitting still and listening as conscious witness) to "theta" and "delta" entrainment "Hi-tech meditation tapes."

My theory being—that I can accelerate my progress using the tapes. (Instead of doing ZaZen 20-30 years to achieve a "theta" state I can pop in the tape and listen for an hour, not to mention save my knees!)

Anyway, I had been using even more "High powered" Delta tapes when I went for Satsang (entrainment by the physical presence) of an enlightened master. When I entered the room for the meditation service, I felt a very similar stillness—but deeper.

As I entered the room for the meditation service, the master was sitting there and his secretary came up to me to give instructions to this "newcomer" (sit on a cushion or chair, etc.). The first words out of her mouth were "you've experienced this before!" I said "What?" or something else profound to that effect. I said, "Yes, in meditation" (my thoughts were coming too slowly and it was too bothersome to explain that I used "Hi-tech tapes" for the same experience). I was drinking in the deep peace and stillness.

I sat in a chair for the 2 1/2 hour service. I sat silent, still, content and wordless—it was an effort to force a flow of thought, but fully functional and aware.

After the service I went to urinate and was still very still—but I remember while standing at the urinal thinking "wow—this is like being very drunk or very stoned and just thoughtless!"

Then, in the lobby/bookstore area I was very still but inside and outside were mingled in a sea of consciousness, and other people were shells, islands, in a sea of consciousness.

The next morning after Satsang, I woke up still, and meditated headphoneless and listened to a plane's sound—but with no mental labeling or flow of thought. There was just the sound (I can maintain and duplicate this mental stillness for some time after listening to a delta tape!) For example, the first time after using the Delta tapes 2-3 times for an hour I was sharing a mental stillness—it popped into my mind—"Hey, I know what was different! I wasn't thinking about anything!" The day, making plans, etc. I was just present, still, sharing (Zen—"when sharing just share").

These two experiences are similar to what Ken Wilber describes in *No Boundary*, p. 50:

"As one Zen Master exclaimed upon his enlightenment, 'when I heard the temple bell ring, suddenly there was no bell and no I, just the ringing.' (i.e. no mental clutter) I am hearing the bell just the sound of the bell in still consciousness!"

To sum it up, yes—the "Hi-tech" meditation tapes can stimulate a variety of optimal brain states, and can provide the same effect as entrainment in the physical presence of a master!

Keep up the "cutting edge" work! Great stuff!



LIGHT: THE NEW BRAIN MEDICINE?



LIGHT: MEDICINE OF THE FUTURE

by Jacob Liberman

Bear & Company
Hardbound 253 pp \$22.95

Reviewed by Terry Patten

In 1974, a young optometrist decided to try something new: Instead of using traditional methods to treat his patient (a 7 year old girl with 20/20 uncorrected vision in her good eye and 20/200 best corrected vision in her poorer eye) he flashed colored light into her good eye, allowing it to travel through the neurological connections in the brain to stimulate the opposite eye. In thirty minutes her "bad" eye measured 20/25. After five sessions, her vision in both eyes was 20/20. It has remained unimpaired for fifteen years.

The optometrist's name was Jacob Liberman. In the weeks and years that followed, he employed similar methods with other patients, ultimately thousands of people. Liberman has used light to improve vision, to boost the academic performance of children with learning disabilities, and to provoke physical and emotional healings from a complex range of psycho-physiological disabilities. He also received a Ph.D. in vision science for his pioneering work in phototherapy. Today he is the president of the College of Syntonic Optometry. (Syntonic Optometry involves therapeutic use of colored light such as described above.) A small but growing community of syntonic or behavioral optometrists and related practitioners describe clinical methods and dramatic results very much like Liberman's.

His new book, *Light: Medicine of the Future*, is the first popular book to describe the power of light to affect brain function and total health. Thus, it is an important book, and deserves serious attention.

(Readers of MEGABRAIN REPORT may be familiar with some of these ideas through Dr. John Downing, an innovator and longtime member of the College of Syntonic Optometry, whose Lumatron machine has been used to achieve many dramatic benefits such as those described by Dr. Liberman's book.)

Liberman begins his book by offering a scientific background for his discussion of light. The optic nerve leads not only to the visual cortex of the brain, but also to many other brain centers including the hypothalamus, which registers not just the presence and absence of light, but which is affected differently by different wavelengths of light. Thus, the light we take into our eyes affects the whole body because the hypothalamus is the brain's master-controller of the autonomic nervous system. The hypothalamus also regulates the pituitary gland, and through it the thyroid and the entire endocrine system and thereby the condition of our body's immune response.

The present book devotes an entire chapter to a discussion of the pineal gland which also works in conjunction the hypothalamus, and which is generally known to be regulated by our exposure to environmental light. The pineal gland is very sensitive (responding to as little as 200 lux) registering the amount and quality of the light to which we are exposed, and depending on the lengths and intensity of light to which it is exposed, it secretes varying amounts of melatonin into the bloodstream, which regulates cycles of rest and activity, including our physical, chemical and emotional cycles, circadian (daily), ultradian (short cycles, less than a day) and infradian (longer cycles, with lengths which may be several days in length, monthly, seasonal, or annual).

Liberman's discussion recapitulates the history of light and color therapy, grouping together a diverse range of research and therapy into a single discussion. His history begins over a century ago, and extends into the color therapy work of Dinshah P. Ghadhiali as well as the foundational work of Spitzer, the founder of Syntonic Optometry—then it extends into new sophisticated techniques for performing surgery with light called "photo-dynamic therapy," in which cancer cells are accurately identified via photoluminescence and selectively destroyed within the body by light.

Liberman offers us an engaging discussion of the landmark work of Dr. John Ott, the pioneering light researcher whose experiments have demonstrated that light is an important nutrient not only to plants, but also to animals and humans. He discusses a number of important implications of Ott's work, including a clear challenge to the widely-accepted notion that all UV rays are bad for our skin and eyes! Liberman also discusses Seasonal Affective Disorder (SAD), the "winter blues" resulting from insufficient exposure of light, as well as how it is treated successfully with exposure to light.

After reading the book I found myself newly sensitive to how powerfully I am affected by light and color every day. I had learned about the pioneering work of Wohlforth and Schauss, the researchers whose work with color and behavior have given us "pink rooms" in prisons and asylums as well as strong correlations of color upon the performance of Canadian schoolchildren. I also learned about successful light treatments ameliorating PMS symptoms and the Irlen Clinic's dramatic results with improving learning disabilities using tinted glasses.

More importantly, I had met Jacob Liberman. The author presents himself and his material very candidly and vulnerably. He tells his own story—that of a child with language and learning difficulties who overcame them to become a well-known and

successful optometrist learning, mastering, and then making his own original contributions to syntonic and behavioral optometry. Liberman comes across as a compassionate, magnetic, intelligent, and creative man, and I found it a pleasure to make his acquaintance through the pages of his book. In the process of writing this review, I interviewed Liberman directly, and attended one of his public speeches. Do so yourself, if you have the opportunity. In person, I was even more powerfully impressed. He is confident of the importance of his message, relishes his own role as a communicator and is grounded in his mastery of the scientific and technical information about which he speaks. But what is most striking about Liberman is that he is primarily rooted in his own humanity, disarmingly open and vulnerable, and powerfully able to make contact with his audience on an emotional and spiritual level—a very dynamic speaker.

A couple of people have expressed disappointment to me that this (long-awaited) volume does not simply marshal hard evidence to establish mainstream scientific credibility for the therapeutic applications of color and light. [The evidence exists, and it's growing, but work with light and color is still regarded with skepticism by most conventionally-trained doctors and scientists.] Although Liberman provides an excellent review of the history of these therapies, describes the physiological mechanisms through which they may affect us, recounts many persuasive experiments on the effects of color on human affect and performance, describes a range of clinical evidence and retells a couple of

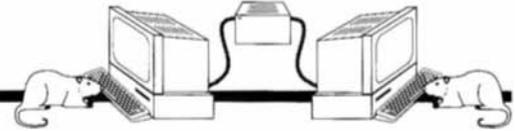
dynamic case histories, he writes personally and informally. His book kicks off its shoes instead of donning a labcoat or a tie. For instance, he doesn't hesitate to express his personal opinions, even some (such as his passionate opposition to experimentation based on cruel treatment of laboratory animals) that will sound a bit "soft" in the context of the mainstream scientific dialogue.

What results is delightful and important, and in no way disappointing—a dynamic author whose book delivers an accessible review of the fascinating and persuasive evidence that light and color can transform our emotions and physical health. He has been excited intellectually, affected emotionally and changed fundamentally by the powerful healing information he describes in this book. By sharing this candidly, Liberman connects powerfully and personally. He and his book are destined to exercise a major influence on holistic medicine for decades to come. And even in the coming months, before his larger influence is fully felt, Liberman's book will excite and influence thousands of people.

*The light we take into our eyes
affects the whole body through the
hypothalamus, the brain's
master controller. . . .*



THE MIND-BODY DATABASE PROJECT



In *Megabrain Report #1* I described my hopes for a "cooperative information-gathering project" focused on consciousness technology. I described my own personal reasons for seeking such a brain-mind-body database. In gathering information about techniques for enhancing mind-body performance for *The Book of Floating and Megabrain I* had been astonished, first, by the sheer volume of information there was—thousands and thousands of studies and publications—and second, by how hard it was to get my hands on much of that information. "Much of what turned out to be the most fascinating and significant information," I wrote, "was hidden away in obscure journals that were not available in most libraries; or was in papers that had not been published at all but rather copied and circulated among various special interest groups."

The third astonishing thing was how many of the scientists, researchers and others interested in the field were unaware of the vast body of knowledge that already existed, and how much information there was available with just a bit of digging. In part this is true because this "body of knowledge," which has to do with interrelationships between physical, emotional and awareness states, consists of seemingly unrelated fragments hidden away in the scholarly and scientific journals of a variety of seemingly disparate disciplines, including neuroanatomy, mythology, electroencephalography, religion, biophysics, anthropology, music theory, biochemistry, art and so on.

In our era of increasing specialization, it's

little wonder that so many investigators were unaware of highly important work done in disciplines they weren't familiar with. There's an interesting sort of paradox here. We're experiencing a historically unprecedented surge of interest in the nature of human "being" and our species' capacities and potentials. This includes an increasing understanding of interrelationships between physical, emotional, and awareness states. And as this understanding grows, and our fascination increases, so does the quantity of information produced by the various scientists, scholars, investigators and explorers. Unfortunately, this flood of information comes in the form of numerous seemingly diverse floods in many different disciplines and areas of specialization. Throughout most of the cultural "knowledge" mainstream there is a notable lack of cross-disciplinary thinking and integration of the real knowledge available.

Much of the most fascinating and significant information is hidden away in obscure journals or unpublished papers.

What is needed is some way of linking together the information from all these varied and eclectic information streams and making the information available as a research, resource and knowledge

tool to all who have interest. Thus the "cooperative information-gathering project" proposed in *MBR #1*. That proposal for a mind-body database generated a strong response from readers, and a lot of discussion and suggestions. There's widespread agreement that the project could have an enormous impact. The idea is exciting and lots of people have many interesting ideas. It is fun to toss these ideas around. We can toss ideas around for years. But while we toss around ideas for this exciting project, it remains only an idea.

One of those with whom we have discussed the project at great length is Alex Kochkin, senior partner at ASK* Marketing and Research Group, who has much experience in the gathering and organizing of information. Alex is the sort of person who says, "Yes, this is an exciting idea. Let's not just talk about it, let's do it." Out of four discussions with Alex have emerged plans for a self-sustainable effort offering the widest access to the largest mass of mind-body information ever assembled. It will require the cooperative efforts and contributions of a lot of people. Already, we have commitments for exclusive access to collections and electronic databases from a number of major primary sources involved in mind-body research and practice. Plans include blending materials from original sources, existing databases, publishers, book abstracts, newsletters, and whatever else looks good that we can get our hands on. Alex has written the following brief description of the project and its main activities.

—Michael Hutchison

A BRIEF OVERVIEW

by Alex Kochkin

In brief, what is proposed is the establishment of the first international computer database with information and consulting services concerning the mind and body, with special attention to extraordinary aspects of human consciousness and healing. It would embrace all disciplines including physical, medical, life, psychological, social sciences, and other appropriate spheres of activity.

The computer database is the foundation for this effort. We plan to build an information base of from one quarter to one half million records from several thousand publications and other primary sources. Initially two databases are anticipated: one consisting primarily of detailed abstracts and citations, with limited full-text, would be updated monthly; the other, devoted to full-text of original articles and books, would be developed based on commercial contracts and grants.

A team of talented individuals has been assembled with expertise in library science, computer database development, artificial intelligence, business, marketing, and research services. Preliminary commitments have been obtained from internationally-recognized research organizations, libraries, and individuals to provide paper and computer readable material, most of which has never been available to the public.

Attuned to many of the concepts and much of the work associated with consciousness and healing, this team can develop the informational relationships

which will facilitate interaction between areas of specialization. The Mind-Body Database will be much more than a consolidation of information from existing sources, as planned enhancements will add greatly to its value.

Based on investigation, it is expected that, assuming the quality and accessibility is present, demand will be fairly high for this unique resource. Thus, there is every reason to expect that once launched and expertly managed, it will quickly become a self-sufficient operation with adequate revenues to support improvement and expansion.

One information product is based on CD-ROM technology and would feature an expert system to aid in the search process and in analyzing complex interactions between the different disciplines. (One example is a prototype psycho-neuro-immunology language tree.) Future developments could include expert software, diagnostic and research tools. Examples of some products and services related to this project are described below.

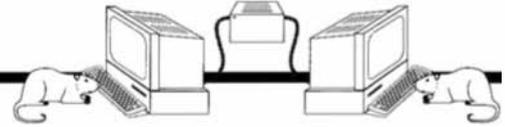
Extensive consideration has been given to the requirements of a successful information services venture such as this—a number of recognized experts from a variety of fields have provided input to this undertaking.

The markets exist and are growing rapidly. Efficient technology is in place to organize, disseminate, and access an enormous body of computerized information anywhere in the world. There is a strong and growing information industry based on the collection and distribution of information on any conceivable subject.

It is our hope to raise sufficient capital to establish this as a successful enterprise and key resource in aiding the development of the fullest potential of the human species.

MEGABRAIN REPORT

THE MIND-BODY DATABASE PROJECT CONTINUED



There is so much more which can be said about this proposed undertaking; hopefully, these comments can provide an adequate initial overview.

BASIC STATEMENT OF INTENT:

The term "Mind-Body" is meant to embrace all concepts addressing physical being and consciousness. It is our intention to collect and make available the greatest amount of information concerning mind-body research, related technologies, healing, and other practices as is feasible and to facilitate the exchange of such information across many disciplines, worldwide.

Major Goals and Activities

Examples of major activities which we would be engaged in include:

- Developing and managing commercial online databases
- Developing custom applications using commercial and proprietary software
- Producing print bulletins (current awareness profiles, etc.)
- Article retrieval services—performing database searches
- Producing special research reports
- Custom research and consulting (technical, marketing, etc.)
- Online/media conversion services.

Of these, emphasis is on developing the commercial database and on custom applications which will further aid commercial database development and usage.

Customers will include academic institutions, libraries, corporations, and individuals. Users of the database and various services envisioned will include a broad cross-section of all persons with an interest in mind-body-healing work.

Features and Distribution

The source content of the Mind-Body Database would include (but not be limited to):

- Scientific research papers
- Conference proceedings
- Governmental-sponsored research
- Patent summaries selected for likely relevancy
- Business, trade and newsmagazine articles
- Magazines not usually covered by existing online systems
- Professional and research journals
- Private sources from research organizations
- Survey of current research being conducted in various settings
- Summary of funding sources for research or development work

- Directory of resources—products, services, and the like
- Calendar of events
- Paid classified announcements
- Book reviews
- Audio and video tapes catalogs.

Initially, a mix of material in the following formats is anticipated:

- a. Citations (100% of records)
- b. Abstracts of 25 to 100 words (25% to 50% of records)
- c. Full-text (10% to 25%—will be increased as demand requires)

As the project thrives, it is anticipated making available material from non-English language sources (both translated and native language) and develop new sources of revenue including CD-ROM products and customized services.

A user guide to the database will be available listing all concept codes and key words in the main index. A selection of formats will be prepared to assist in the downloading and review of information. The database will be available initially through very large, commercial online distribution systems and on optical disk (CD ROM) to licensed users.

Periodic bulletins of new titles and features will sent out to all subscribers. Customized bulletins (print and online) of titles and citations according to subscriber needs (current awareness profiles) will be available for a set fee.

Funding and Revenue Potential

Thoughtful design will reward us with the flexibility needed down the road. This is important as it is expected to plan for future applications such as various information products and services.

Sources of start-up funds for this project could include some mixture of the following:

- Pre-paid subscriptions
- Underwriting by major users
- Grants—private investment capital
- Sweat, eye-strain, and keyboard-tendonitis.

Revenues, contributed directly and indirectly, would include some mixture from the following sources:

- Online royalties
- Print bulletins (current awareness profiles, etc.)
- New publications
- Licensing of database (optical and magnetic disk)

- Article retrieval fees (includes online ordering)
- Custom searches of the database
- Special research reports
- Custom research and consulting (technical, marketing, etc.)
- Online conversion services
- Fee-based directories
- List development and rentals.

A very generous return on initial funding is projected and we expect the operating margins to grow rapidly after the first full operating year. Some of our potential clients are tax-deductible foundations who are also seeking grants and private donors to computerize their in-house information and make it available to widest possible number of users.

The online text information industry in the U.S. is around \$4 billion—and this does not include online financial transaction systems or other highly specialized systems such as for airline reservations. Concepts pertaining to health, biology, medicine, and psychology represent the largest customer interest group.

The Bottom Line

*Throughout the cultural
"knowledge" mainstream there's
a notable lack of cross-
disciplinary thinking and
integration of the
real knowledge available*

It is quite likely that within 2 to 3 years from start-up, this information system could generate somewhere around \$2.5 to \$5 million per year. Such an income level, coupled with a fairly high net return, would permit a basis to cover languages

other than English and to support new informational products using delivery mechanisms such as CD-ROM employing the latest in expert system technology.

This very important endeavor requires approximately \$1,000,000 for a full-scale launch. Initial commitments of \$500,000 are required before we can proceed. Already, we have identified at least \$200,000 of funding available through non-profit research foundations who are potential clients of this project.

If You Are Interested in Assisting This Project

We need to be in contact with potential funders—either as private investment or large grant sources. We would like to be informed of private or institutional libraries and files which might be included in this project.

Contact Michael Hutchison at MEGABRAIN REPORT, or Alex Kochkin, Project Coordinator, at P.O. Box 100752 Anchorage, AK 99510-0752 or

EDITORIAL: ON OUR WAY TO MEET THE TERMINATOR CONTINUED FROM INSIDE FRONT COVER

addictions, post-traumatic stress, depression and other problems, can quickly recover and transform their lives in the process. Now a number of other researchers are using the Peniston-Kulkosky studies as a springboard to new explorations. One of those is William Beckwith, whose article, "Moving Beyond Metaphors of the Mind" (MBR #3) is a lucid examination of what seems to be happening when brainwaves reach the crucial "crossover point."

Another series of studies that have enormous implications for mind-technology is the work done by Davison, Henriques, Tomarken, Ekman and others (described in "Happy Brain, Sad Brain" in MBR #3) demonstrating a direct preconscious link between emotions and brainwave patterns. For if brain machines alter brainwaves, and brainwaves are linked to emotional states without cognitive mediation, then mind machines may be effective tools not only for short-circuiting depression and other negative emotions, but also for rapidly inducing positive and beneficial brain states.

There is also exciting new evidence that cranial electrostimulation (CES) can have powerful effects on emotional as well as physiological states. In the second installment of our "Bioelectric Interviews" (MBR #3), Dr. Ray Smith, perhaps the leading scientific investigator of CES, makes some startling revelations about CES, including evidence that it can reverse "irreversible" brain damage, increase IQ, memory and other cognitive functions, dramatically boost recovery from drug addiction, totally block the ability to feel fear and eliminate phobias, and help return the brain to an optimal state. In this astonishing interview, Dr. Smith summarizes the scientific findings of his 20 years of controlled, double-blind studies, and then moves beyond with a powerful expression of his personal views of the potentially revolutionary powers of CES.

In addition to CES, there is also exciting new evidence that stimulation of the brain with colored light and with light/sound machines, can have dramatic effects in treating both children and adults with learning disorders. We examine several of these recently

DATABASE *continued*

call (907) 562-1275, telefax (907) 562-3835; Alaska-Pacific time.

Alex Kochkin, of ASK Marketing and Research Group, contributes both technical and marketing expertise to this effort, as well as a solid understanding of the many perspectives that are involved in the areas concerning mind-body-healing work. Members of his staff also have special expertise in database development, marketing and attitudinal research, and strategic planning.*

So far, he has secured the cooperation of a number of organizations and individuals whose work represents some of the leading contributions in mind-consciousness research and practice over the past four decades. Among these groups are some personal and corporate collections which have never been available to researchers and practitioners. Also, he has developed a preliminary operational plan for the establishment of the Mind-Body Database and information services.

ASK has offices in Alaska, Idaho, and New York.*



released studies, in "Brain Tech Breakthroughs in Treating Learning Disorders" (MBR #4).

SUBTLE ENERGIES AND THE NEW PARADIGM. The existence of "subtle energies" (such as *chi* and *prana*) has been a key feature of many medical and scientific traditions and systems, and many devices and techniques have been developed over the centuries to manipulate those energies. Mainstream science has remained skeptical, however, claiming there is no hard evidence of these energies. But now, for the first time, some of the necessary evidence has emerged. Recently, what is to our knowledge the first fully controlled double blind study of a subtle energy instrument was performed by Dr. Julian Isaacs. And now the dramatic findings of this breakthrough study are published for the first time, in MBR #4.

One reason evidence for subtle energies has been resisted with such determination by mainstream science is that such energies cannot be explained by the prevailing paradigm. One of the most momentous developments of our time is the emergence of a new scientific paradigm, one that moves beyond time and space, matter and energy, to a vision of a universal wholeness. Col. Tom Bearden is the creator of perhaps the most compelling of the new "unified field theories," which involves the action of "scalar" energies (also known as "non-Hertzian" or "vacuum" fields, "zero point energy," or "quantum potential"). In "Stalking the Wild Scalar" (MBR #4), our Megabrain Report interview with Col. Bearden, he places his theory in a scientific/historical context and then reveals its explosive, mind-boggling implications. We found his speculations and assertions on such matters as teleportation, time travel, action-at-a-distance, mind control, telepathy, free energy machines, vacuum engines, engineering the nucleus, and the universe as holograph, to be astonishing, exciting and thought provoking. So astonishing and thought provoking, in fact, that we called on other authorities to comment upon, criticize and elucidate Bearden's theories. Our interviews with physicist Elizabeth Rauscher and electromagnetic researcher Bill Van Bise, and with neurochemist Glen Rein—leading researchers into the biological effects of some of the mysterious forces Bearden discusses—combine to create an unprecedented four-way exploration of "scalar" energies that breaks new ground and will stimulate future scientific research in this area.

NEW PROGRAMS AND APPLICATIONS.

As the breakthroughs and revelations mentioned above lead to the creation of ever more effective brain-tech "hardware," many users have felt the need for the development of an assortment of brain-tech "software," the programs and techniques that will allow users to harness the powers of the machines, and to apply their sophisticated circuitry and advanced potentials to specific tasks and applications, such as accelerated learning, sports training, peak performance training, weight loss, problem solving and so on. In response to that need I have taken an initial step toward the development of an assortment of mind machine "programs" by describing a variety of techniques for using mind machines as powerful tools to attain desired goals in "Beyond Entertainment: How To Use..." in MBR #4.

I feel that this development of systematic and practical applications for mind technology is a tremendously important issue. So important, in fact, that my

next book, *Mega Brain Power: How to Use Mind Technology for Peak Performance and Mental Excellence* (to be published by Hyperion Books in 1993) will focus entirely on this subject, providing step-by-step "programs" for using mind machines as powerful tools for attaining specific goals, including athletic training, accelerated learning, increased intelligence, changing attitudes and behavior, enhancing healing, boosting immune function, alleviating pain, anxiety and depression, and much more. While my article, "Beyond Entertainment," can be seen as an introduction to this subject, I have written it to stand alone as a practical guide for anyone who seeks to use his or her mind machine for more than just entertainment and simple relaxation. I hope this essay will serve as a stimulus to your own explorations of the long-term beneficial applications of brain technology.

What I am describing above is a dynamic process, a process of evolution through information-movement, in which a broad complex of forces is interacting and evolving as a sort of whole. Popular interest in mind-technology grows, spurring increased sales through mass-market outlets and the development of more and more advanced equipment, which leads to greater effectiveness which in turn leads to greater popular interest, and so on. At the same time, increasing amounts of brain research provide increasing information about how brain-machines can have beneficial effects, and pave the way for increasing amounts of research into the effects of brain-machines themselves, which leads to the development of more and more sophisticated and advanced machines, which leads to the development of increasing numbers of increasingly effective programs and applications, which leads us to ever greater popular interest, and on and on, in an expanding, evolving network based on multi-directional informational feedback loops.

It occurs to me that this dynamic process of mind-machine evolution is a limited version—or a sort of fractal loop—of the larger process of human-technology fusion. It's a process that emerges from the synergistic properties of complex systems. Synergy was defined by Buckminster Fuller as "behavior of whole systems unpredicted by the separately observed behaviors of any of the system's separate parts or any subassembly of the system's parts."

A key point that emerges from Fuller's concept of synergy is that the evolutionary or synergetic behavior of these systems is *unpredictable*. As we've noted before (see my editorial in MBR #1), information is inversely related to predictability, which is why those opposed to change always oppose and attempt to suppress unpredictable events as well as the free flow of information: thus George Bush's famous assertion that "The enemy is unpredictability."

This synergetic interplay between information, unpredictability, and the growing fusion between humans and technology has immense even metaphysical implications for each of us as individuals, and for the process of human evolution. I will explore some of those "cosmic" implications in my editorial for MBR #4, "Active Information and the Human Ballet at Childhood's End."

—Michael Hutchison



MEGABRAIN WORKSHOPS GO ON THE ROAD

A Special Invitation to Subscribers

In 1992-93 a new series of Megabrain Workshops will be held throughout the US and around the world. In these workshops Michael Hutchison will introduce you to the latest developments in mind technology and you will experience first-hand the effects of a vast array of the most innovative and powerful tools to alter consciousness, enhance brain functioning, and increase intelligence.

As Megabrain Report subscribers you receive a 10% discount to these workshops. And we invite you to consider two additional ways you can participate:

1) *Enrollers.* Reduce the cost of your participation and receive discounts on equipment by assisting us with enrollment and promotion.

2) *Organizers.* Gain special access to tools and training, receive the highest discount on equipment and promote your own business or practice by helping us organize and promote a seminar in your area.

If you would like to work with us as a Organizer or Enroller in your area please call or write our office for details.

The Next Step: *MEGABRAIN Intensive*

Medical professionals, therapists, educators and those interested in commercial applications of consciousness technology—ranging from retail sales to brain fitness centers to clinics—are invited to attend the Megabrain Intensive. Limited to 10 people, this highly personalized training takes place in Sausalito over three full days, and includes private consultations and training sessions with Michael Hutchison as well as with leading scientists involved in consciousness technology research, creators of mind-expansion tools, and some of the most talented practitioners and explorers in the field.

Participants explore a wide array of mind-enhancement tools firsthand, are trained to operate specific devices they may wish

to incorporate into their practice, and may receive detailed information dealing with all aspects of professional applications of consciousness technology, including selection and purchase of equipment, layout and design of facilities and systems, installation of equipment, training of staff and much more.

If you are interested in finding out more about the Megabrain Intensive please call or write to:

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R E P O R T

THE JOURNAL OF MIND TECHNOLOGY

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ACTIVE INFORMATION AND THE HUMAN BALLET AT CHILDHOOD'S END: EDITORIAL

IMPLICATE ORDER, ACTIVE INFORMATION AND SCALARS. My editorial for MBR #3 explored the idea that the evolution of mind technology and the growing link between humans and machines is *synergistic*—not only unpredictable, but also in its unpredictability and dynamism something very much akin to information, “an expanding, evolving network based on multi-directional informational feedback loops.” As I thought about this I was reminded of physicist David Bohm’s concept of “enfolded” or “implicate order,” the key feature of which is, in his words, “that the whole universe is in some way enfolded into everything and that each thing is enfolded in the whole.”

Recently Bohm has proposed that this implicate order is a manifestation of what he calls *active information*. This active information underlies and gives form to the universe; Bohm uses the analogy of a ship on automatic pilot guided by radar waves—“The ship is not pushed and pulled mechanically by these waves; rather, the form of the waves is sensed and a certain form of motion is given to the ship under its own power.” Another analogy Bohm uses for the way a common pool of active information organizes the seemingly independent parts of the whole through “non-local connection” is the ballet, “in which all the dancers move together in a similarly organized way in response to the music,” even though the dancers are “individuals,” and may seem to be moving independently.

Bohm’s notion of active information recalls Dr. Eldon Byrd’s description of scalar fields in MBR #1, cited in MBR #3 by William Beckwith in his “Moving Beyond Metaphors of the Mind” (“I look at scalars strictly as information . . . a sea of information. . . . It doesn’t take any time for it to propagate from one point in time and space to another because it has nothing to do with time and space”). And scalar theorist Tom Bearden in his *Megabrain Report* interview speaks movingly of a scalar force that connects everything independently of time and space, in terms very similar to those of Bohm: “The spirit of the living system is—in the virtual state—everywhere in the universe—and *everywhen* as well. It’s all a giant hologram, not only in space, but in space-time. The entire universe is everywhere alive, with everything. . . . All life is eternal. Nothing is ever lost.”

Bohm concludes that mind and matter, the mental and the physical, are “essentially the same process” and that active information is “a link or bridge between the two sides of reality as a whole.” He emphasizes that “Through enfoldment each relatively autonomous thing partakes of the whole. Through this, it partakes of all the others in gathering its information, and through the activity of this information it similarly takes part in the whole and in every part.”

MIND, MATTER, INFORMATION, EVOLUTION AND CHILDHOOD’S END. I am intrigued and wonder if perhaps this might offer us insight-by-analogy into the relationship between humans and technology, which, like the link between mind and matter, the mental and the physical, is a product of and guided by the operation of information. And which, according to Bohm, may be “essentially the same process.”

Perhaps what we are experiencing with the intensifying information exchanges, and growing fusion, between humans and machines I’ve mentioned in my MBR #3 editorial is an object lesson in our personal enfoldment (along with that of technology) in the wholeness. As Bohm points out, “This wholeness is general and means that each element in the universe participates in all the others to such an extent that it is not possible to attribute what happens unambiguously to any one alone: i.e., there is a universal participation.”

Perhaps, of course, this is all mumbo jumbo. Perhaps Bohm and Bearden are engaging in that well-known snake-oil salesman’s trick of using scientific rhetoric to disguise platitudes and bromides. Maybe the important implications of technology reside simply in its straightforward benefits to humanity. Maybe an attempt to give philosophical and spiritual significance to the human-technology fusion is merely an example of the age-old human tendency to impute meaning to the objects that surround us. Sometimes, as Freud observed, a cigar is just a cigar.

On the other hand, the idea of human-ma-

chine participation in wholeness suggests a rather startling vision. It suggests that as our human *matter* becomes linked with technological *mind* (which we still smugly call “artificial intelligence”), and our human *mind* conjoins with the hard *material* reality of machines, our sense of a separation between mental and physical “reality” may alter. That as we learn to see that both mind and matter are essentially the same process, partaking of the implicate order, guided by “active information,” our vision of our selves as relatively autonomous independent beings may alter. It suggests that perhaps, as this process is lived, we will begin to see ourselves as part of the process of “universal participation,” linked beyond space and time, beyond matter and energy, to every element in the universe.

Perhaps we will see that our growing fusion with technology is not a process in which “we” are “using” technology to gain more and more control over others, or over the material reality “out there,” but a process of awakening to the fact that “we” and “others” and technology, and the material reality “out there,” are one. That we are all dancers in the same ballet, each of us moving in apparent independence, but all guided and choreographed by the pool of active information called “the dance,” moved by, in Bearden’s words, “the spirit of the living system.” And how can you tell the dancer from the dance?

Of course this vision of universal wholeness, unity and participation is in no way dependent on our growing engagement with technology: it has been the central feature of the mystical experience for thousands of years. But similarly for thousands of years the major barrier standing between most humans and this experience of wholeness and participation in the “living spirit of the universe” has been our stubborn insistence on our essential separateness from and superiority to other existing things. Perhaps it is the

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MEGABRAIN® REPORT

The Journal of Mind Technology

Volume 1, Number 4

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Layout And Formatting: Michael Maffeo.
Butterfly Graphics Services

MEGABRAIN REPORT is published four times a year by Michael Hutchison, P.O. Box 2659, Sausalito, CA 94966. Editorial and circulation address is: MEGABRAIN REPORT, P.O. Box 2744, Sausalito, CA 94966. U.S. subscriptions are \$48/year, Canadian and Mexican subscriptions are \$54/yr. other foreign subscriptions are \$62/yr. and single issues and back issues are \$16 each, payable to MEGABRAIN REPORT. Subscription inquiries: send new or renewal notices or change of address (send both new and old addresses) to MEGABRAIN REPORT, P.O. Box 2744, Sausalito, CA 94966.

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DO SUBLIMINALS WORK? EXAMINING THE SCIENTIFIC CONTROVERSY

by Terry Patten

Thousands of pages have been published on the subject of subliminal communication. Some studies seem to prove that subliminally-perceived suggestions can be a powerful catalyst for changes in affect and behavior. Others seem to prove that subliminals, as currently available, are utterly ineffective, and quite possibly simply fraudulent. This introductory article poses the questions raised by the differing positions of various scientists. We will attempt to find the "truth behind the facts" in a longer in-depth article scheduled for publication in a forthcoming issue of MEGABRAIN REPORT.

Round One: The NRC Debunks Subliminals

During the Summer and Fall of 1991, subliminals were in the news. Radio and TV news mentioned a new study, and articles appeared in many daily newspapers, and national magazines. The news? "Subliminal Tapes a Hoax" Says New Government Report."

The Report referred to by the media coverage was published by the National Research Council, a panel appointed by the National Academy of Sciences. The report "surveyed the market of available subliminal tape packages" and was prepared by an NRC subcommittee. The report concluded, "there is neither theoretical foundation nor experimental evidence to support claims that subliminal self-help audiotapes enhance human performance."

Round Two: Subliminal Proponents Debunk NRC

After the publication of the NRC report, the International Society for Preconscious Learning, a subliminal learning professional organization, issued a press release denouncing and disputing the NRC report, accusing its authors of bias and bad science. The press release cited numerous references, including nine double-blind studies which appear to demonstrate the effectiveness of subliminal audio tapes. All of this was available to the NRC, said the ISPL, but strategically ignored. The NRC report was not so much a scientific document, said its detractors, as a political document.

The ISPL went further. The most important study on which the NRC based its conclusions (the "Greenwald" study) was seriously flawed, misleading, and misrepresented in the NRC report. "They weighed an apple, an orange, and an orangutang," says Eldon Taylor, President of the ISPL, "and then they proclaimed to the world the

average weight of onions!" Did the NRC report's authors have an "axe to grind"?

Round Three: The Subliminal Subtext: Money, Power & Politics

What are the real motives of the parties to this dispute? Did the NRC committee have an unannounced agenda which biased its approach? Was its science really flawed? What about the motives of the ISPL? Is it just an industry organization, offering a knee-jerk defense of its own profitable business, regardless of the scientific facts? And what are the scientific facts anyway? What is really known about the effects of subliminal messages? Some very public statements have been made on both sides of this controversy, and it is clear that somebody's not telling the whole truth.

A MEGABRAIN REPORT investigation, underway at the time of this writing, has revealed that there seems to be much more to the controversy than first meets the eye. In fact, in the controversy over subliminals, it is what we cannot consciously hear (the subliminal messages??) that may be the real story. Behind this apparently straightforward disagreement about the science of subliminal suggestion is a complex story. Possible plot elements include money, competing vested interests, secret alliances, Christian vs. atheistic conspiracy theorists, major corporate forces and scientific politics.

Round Four: But Do Subliminals Work?

Biases or no biases, the NRC report raises some interesting and important questions about the efficacy of subliminal self-help tapes. The evidence supplied by the ISPL suggests other critical questions about commercial subliminals and their popular uses. For instance:

At what volume must the messages be recorded in order to be effective? What is the common practice in the industry? Can subliminals influence behavior more complex than correctly naming a color projected on a screen? What is the hard evidence for the effectiveness of subliminals? What is the hard evidence to the contrary? Does the evidence conflict, or can it be resolved into a single accurate understanding about subliminal suggestion? How does this apply to audio subliminals? Visual subliminals? If they are in some circumstances effective, what are the circumstances? Can commercial tapes be used in a way that meets these criteria? How often do the tapes need to be used to be effective?

MEGABRAIN REPORT will survey the evidence and try to answer these challenging questions.

Round Five: A Critical Review of Subliminal Technologies

Competing commercial subliminal audio tapes include one or more of a host of very different techniques. On some the subliminal messages are recorded on multiple tracks, supposedly increasing the number of suggestions to which the listener is exposed. On others, thousands of suggestions are delivered via time compression recording techniques. Are these techniques effective? Is there any hard evidence supporting their use or disputing their effectiveness?

Other tapes include such techniques as messages recorded backwards. Can the brain really make sense of this? What about "silent subliminals" on which subliminal messages are recorded at high, supra-audible frequencies? How valid, and how important are the hypnotic techniques and the language of effective suggestion, said to be central to the effectiveness of some subliminal tapes? What about right-left separation of messages? Are these new techniques merely spurious gimmickry or are they important breakthroughs?

Round Six: A Consumers' Guide to the Subliminal Marketplace

Finally, MEGABRAIN REPORT will take a look at the marketplace, supplying a "Consumers' Guide" to commercially-available tapes. Some of the issues that will be considered: Which tapes employ each audio technique? Which manufacturers use hypnotic suggestion techniques? Which employ Right-Left separation? At what dB levels are their suggestions recorded? What research supports the effectiveness of each type of tape? Do any of them pass muster once the scientific evidence has been considered? MEGABRAIN REPORT will survey numerous currently available subliminal products, exercising its "mega-thumb" in one of two directions: "thumbs-up" or "thumbs-down"!

The Judges' Decision? Stay Tuned!

Obviously, this short preview cannot really answer these questions. It is only intended to raise them. From reading this, we hope you can see that there are many important issues, possibly valuable new technologies, many competing claims, counter claims, scientific information and disinformation. We will attempt to root out the unheard reality behind the "road noise" and bring you the otherwise hidden truth, "the subliminal message about subliminals" loud and clear!



Articles in MEGABRAIN REPORT Volume I

VOLUME I, NO. 1

High Voltage: The Bioelectric Interviews: leading authorities such as Robert O. Becker, Bob Beck, Eldon Byrd and others reveal new information about cranial electrostimulation and "scalar" fields.

Cognition-Enhancement Drugs and Peak Performance Pills: An in-depth article on a new family of legal pharmaceuticals—Nootropic (brain-enhancing) drugs—with information about where to purchase them, and reader's survey.

Brain Technology Research Update: The latest word on cutting edge research—CES improves human learning; stimulating brain growth; breakthrough in treatment of alcoholism using theta brainwaves; binaural beats alter EEG patterns. . . .

New Products: The Dreamer, the Courier, the Alpha Stim CS.

Information and the Enriched Environment: Unpredictability, information and mind technology—an essay by Michael Hutchison.

Cross Currents: The promise of electromedicine, the perils of electropollution, by Robert O. Becker, a book review.

VOLUME I, NO. 2

The Megabrain Consumers' Guide to Sound and Light: An in-depth, feature-by-feature evaluation and discussion of virtually every light and sound machine currently available.

Technological Revolutionaries, a Manufacturers' Roundtable: A revealing debate among the three leading manufacturers and designers of light and sound machines.

Time Flashes: Michael Hutchison presents a wide-ranging history of the use of light and sound to produce heightened states of consciousness.

A Long and Twisted Tale—Denis Gorges and the Synchro-Energizer: In which we uncover letters forged on FDA letterhead, signatures forged on contracts, fake FDA files and false claims, investigate secret mind machines for the Saudi Arabians and encounter the mysterious "deep brain" in a slashing expose of a man who is not what he claims to be.

Photic Driving—Red LEDs versus White Lights: Opposing views on light by two leading manufacturers and designers of light/sound machines.

Roll Your Own—Schematic for a Pulsed Scalar Field Generator: Complete instructions and diagrams for building your own scalar field generator, designed by Peter Lindemann.

Product Reviews—Dual Induction Hypnotic Tapes: A careful evaluation of Hypno-Peripheral Processing, Changeworks, and Paraliminal tape series.

Unpredictable, Dangerous Information: A book review of *The Anatomy of Sex and Power*.

VOLUME I, NO. 3

On the Way to Meet the Terminator—An exploration of the growing fusion of humans and technology.

Happy Brain, Sad Brain: Brainwaves, Hemispheres and Emotions—Startling new research showing direct unconscious links between brainwave patterns and emotional states.

At the Crossover Point—New Breakthroughs in the Twilight Zone: New discoveries of how specific brainwave states can lead to dramatic personality transformations.

Moving Beyond Metaphors of the Mind—Addiction, Transformation and Brainwave Patterns: EEG researcher William Beck with discusses his extraordinary work using EEG "crossover" training for rapid personal growth.

A New Generation of Sound and Light Machines: including the MasterMind, MindGear, IQ Tutor, Shaman, and Alpha Pacer III-Plus and more.

Supercharging the Brain: The Bioelectric Interviews, Part Two: Eminent CES researcher Ray Smith reveals his successes in using CES for reversal of so-called "permanent brain damage," treatment of alcoholism, drug addiction, anxiety and phobia, and much more.

Regenerating the Human Body?: A look at an exciting new healing device, invented by Robert O. Becker, M.D., which may be the first step in regenerating the human body and organs.

Three Paths to Peak Performance: Megabrain Forum: Meditation, Biofeedback and Mind Machines: discussions by experts Dr. Thomas Budzynski, Dr. George Fritz and others.

Roll Your Own—Schematic for a Rife-type Frequency Generator: Electromagnetic innovator Bob Beck describes how you can build the controversial "frequency therapy" instrument banned by the FDA, for under \$275.

Light—Medicine of the Future: a look at the new book by light researcher Jacob Liberman.

The Mind-Body Database Project: An overview of a "cooperative information-gathering project" and international online database focused on consciousness technology.

VOLUME I, NO. 4

Active Information & the Human Ballet at Childhood's End—The revolutionary and meta-physical implications of techno-human evolution.

Beyond Entertainment: How to Use Mind Machines for Peak Performance and Self-Transformation: A guide to using brain tools for accelerated learning, deep relaxation, rescripting, including such techniques as anchoring, mindfulness, open focus, self-hypnosis and more.

In Search of the Wild Scalar—The Bioelectric Interviews, Part Three: Foremost scalar theoretician Col. Tom Bearden reveals links between new scalar breakthroughs and teleportation, mind control, scalar weaponry; physicists Elizabeth Rauscher and Bill Van Bise challenge Bearden; neurochemist Glen Rein explains his investigations of the effects of scalar fields on biological systems.

The New Science of Brain Growth and IQ Improvement: new research and books exploring the impact of stimulation on brain growth (by leading authority Marian Diamond) and on intelligence and giftedness.

Brain Tech Breakthroughs in Treating Learning Disorders: New breakthroughs in using photic stimulation, light/sound machines, and CES for the treatment of learning disabilities.

Acoustic Field Generators: The Ultimate Consciousness-Machines?: An exploration of what Dr. George Fritz calls "the most potent and practical" of the new technologies, whole-body energy field acoustic stimulators, including the Genesis, Betar, Vibrasound and others.

Go with the Flow—Three New Motion Systems: Moving beyond the Graham Potentializer, a look at three new systems for vestibular stimulation that are having powerful effects on mind and body.

Product Review: Consciousness technology researcher and authority Dr. Julian Isaacs reviews the Stress Shield, a new color-therapy ganzfeld device.

New Evidence for "Subtle Energy": A Double Blind Study of the "Biocircuit": Dr. Julian Isaacs describes his startling evidence about the effects of Biocircuits, the first fully controlled double blind study of a subtle energy device ever performed.

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BEYOND ENTERTAINMENT: HOW TO USE MIND MACHINES FOR

TECHNIQUES FOR MAKING MIND MACHINES A POWERFUL TOOL FOR ATTAINING SPECIFIC GOALS AND IMPROVING YOUR MIND

by Michael Hutchison

There are intriguing parallels between the emergence of brain machines today and the advent of the PC a decade ago. Ten years back, computers were expensive, difficult to operate, heavy, daunting. You had to know a computer language to even operate one. Most of them were in labs or universities—who could have imagined having a computer in his or her home? Most people who weren't hard scientists or number crunchers thought computers were something exotic that could never be of any use to them.

Today, PCs have transformed virtually every aspect of our lives, and recent surveys show that nearly 25 percent of all households in the U.S. have at least one PC, that PCs are used in virtually every office in the country, and that well over 50% of the population have some familiarity with PCs. It's hard now for many of us to imagine how we *ever* lived without our computers.

What happened over the last decade that made PCs into mass market consumer-electronics items? The first thing was that the hardware went through a series of extraordinary and rapid transformations: each new generation was smaller, easier to operate, vastly more powerful and far less expensive.

The second key to the mass popularity of PCs was the development of a huge variety of *software*—programs that enabled users to apply the massive computing power of the hardware toward specific tasks, ranging from word processing to spreadsheets to design to publishing to game playing. Without such software, the hardware would have remained virtually inaccessible to most users. Think now: how often would you use your computer if there were no software, if you had to create your own programs and do all your computing through your operating system?

The parallels are obvious: brain machines, which first were unwieldy, expensive, complex, and carried the weird-scientist aura of the laboratory, have now gone through a rapid evolution and emerged as small, easy to operate, inexpensive and as sleekly designed as miniature Braun coffee grinders. As an example, the old Synchro Energizer described in the first edition of *Megabrain* was the size of a suitcase, had to be manually operated, and cost over \$8,000. Today far more sophisticated and effective devices the size of a pack of cards, containing a multitude of computerized programs that can be operated with the touch of a button, and costing less than

\$200, are sold by the thousands through mass market catalogues like Hammacher Schlemmer, Sharper Image and DAK.

Today the *hardware* of brain technology—the mind machines themselves—exists. It is inexpensive, effective, innovatively-designed, and, increasing amounts of scientific evidence indicate, when used skillfully can produce peak performance brain states, heightened mental powers and enhanced mind-body interaction.

Today the hardware of brain technology exists. . . . What is lacking, is the software that will allow the user to apply its sophisticated capacities toward specific tasks and applications.

What is lacking, in our mind-machine-PC parallel, is the mind-tech *software*—the programs, systems, techniques or operating environments that will allow the user of the mind machine to apply its sophisticated circuitry and advanced potentials and capacities toward specific tasks and applications, such as accelerated learning, sports training, weight loss,

or stress reduction; ways the machines can be *used*—not just passively experienced as novelties or instruments of pleasure and entertainment, but actively used as immensely powerful tools to attain desired goals.

Because of this lack of programs, many mind machine purchasers end up putting the devices on a shelf in the back of their closets once the novelty of the experience itself has worn off. "I really liked it," they say; "when I first got my light and sound machine I used it several times a day. It was fun, I had lots of fascinating experiences and I felt great. But then, after a few weeks, I just kind of lost interest. I mean, after a point, what are you supposed to *do* with it?"

What follows is an initial step toward the development of a compendium of mind machine "programs." In this article I present a variety of strategies/systems/applications/techniques that I have found to be extremely powerful and effective when used in combination with mind technology. The techniques have emerged from my own personal exploration, from experimentation with thousands of people in Megabrain Workshops, from the work of skilled therapists and clinicians who have made extensive use of mind machines in their practices, and from my conversations and correspondence with hundreds of explorers and experimentalists around the world.

Because this is an introduction, and due to space limitations, my descriptions of these techniques in this issue take the form of brief summaries (with information about where you can get more information about each technique in a "Resources" section at the end of the article). In future issues of *Megabrain Report* I will provide in-

PEAK PERFORMANCE AND SELF-TRANSFORMATION

depth treatments of some of these techniques, including case histories, relevant research, and detailed, step-by-step instructions for using these techniques yourself.

The techniques are effective with virtually all of the brain technology now available, including light/sound, binaural beats (i.e. "brain sync" tapes), cranial electrostimulation, movement devices, acoustic field systems (Vibrasound, Betar, Genesis, etc.), flotation tanks, ganzfelds, biocircuits; and (it should go without saying) they're also effective with various combinations of brain technology used synergistically (i.e. CES while on biocircuits while listening to binaural beat tapes; or light and sound stimulation while on a motion system). For convenience and brevity, I will throughout this article use the abbreviation MT for mind technology, and it will refer to all the varieties of MTs mentioned above.

Deep Relaxation

The first step toward making active, systematic and productive use of your MT is to learn to use it to put you into a state of profound relaxation. But wait, you say, isn't that the responsibility of the machine? After all, many of these devices claim in their literature to be "relaxation" devices, and many of them, such as the light/sound machines, offer a variety of preset "relaxation" sessions.

It's true that numerous scientific studies have shown that MTs can induce deep relaxation states in untrained subjects; some studies have found MTs even produce relaxation states in untrained subjects as deep as or deeper than the relaxation attained by subjects with extensive training and practice in relaxation techniques such as Progressive Relaxation. Speaking generally, put on your MT (such as an alpha beat frequency tape or a light/sound machine that ramps down into alpha) and within 10 to 15 minutes you should be more relaxed.

The problem is that qualifier "more." Many of us start from such a high level of stress, muscular tension and/or nervous arousal that even though we become more relaxed in relative terms, we're still, in absolute terms, not in true deep relaxation—a highly beneficial hypometabolic state in which muscular tension throughout the whole body is dramatically decreased (users describe it as feeling their body "go to sleep" or "melt away," or as simply losing all awareness of having a physical body), and in which the beta brainwave activity of active consciousness diminishes, while alpha and theta activity increases and becomes dominant.

Also, many of us have had the experience of being so tense or agitated that we know we would benefit from relaxing, we know that

using our MT would help us relax, but we're simply too wound up to put it on, or if we do put it on, we're unable to let go sufficiently for the MT to carry us into a relaxed state. In fact one of the main problems with popular relaxation and stress reduction techniques of all kinds—including biofeedback, "relaxation response" meditation techniques, and systematic relaxation procedures—is what the researchers call "lack of transference." They may be highly effective in a training seminar, during a quiet evening at home, at a doctor or therapist's office, or when you're in a mood of curious or calm self-exploration, but still remain extremely difficult to use effectively in the midst of the pressures and urgencies of the everyday world.

And finally, even though the MTs are effective in producing relaxation for most of us, in many cases it can take 30 minutes or more to let go of muscle tension and mental chatter and reach a truly relaxed state. If we have set aside a half hour or 45 minute period for our MT session, then we have little time to pursue active strategies such as those we explore in the rest of this article before our session is over and we're back into our busy schedule again.

And yet true relaxation is a key to most of the various strategies and techniques that follow, from accelerated learning to visualization to problem-solving to self-healing to attaining a state of hyperreceptivity and hypersuggestibility. Fortunately, since the

MTs themselves are helping induce deep relaxation, they speed up the learning process enormously: relaxation techniques that might take weeks of disciplined practice to master without the use of MTs can be mastered in just a few sessions on an MT. In fact, research suggests that *all* methods of relaxation or mental or physical self-regulation work more powerfully and effectively in combination with mind machines

than in any other environment.

So no matter what MT we use, and no matter what our levels of stress, tension and arousal, all of us can profit enormously, and amplify the power of our MTs, by learning and practicing a relaxation technique that we use in conjunction with our MT. I suggest that each time you put on your MT your first step is to use your relaxation technique. Soon this will become almost automatic, and the relaxation process will accelerate: a technique that at the start might allow you to reach deep relaxation in ten minutes will soon take just seconds. Over time, your relaxation technique will become linked with your MT, so that simply by putting on your MT you will find yourself returning almost instantaneously to a relaxed state.

Herbert Benson of Harvard Medical School has studied the beneficial, healing "relaxation response," as well as many of the

Many of us have had the experience of being too wound up to use our mind machine, or if we do, of being unable to let go sufficiently for it to carry us into a relaxed state.

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techniques, ranging from ancient meditative disciplines to modern systems, used to trigger this response. He found that they all worked by using certain specific techniques or elements in combination. The key elements he identified are:

- **Mental Device.** There should be some sort of constant stimulus, such as a word or phrase repeated silently or audibly, fixed attention on an object or process. Attention to this mental device or technique shifts you away from logical, externally oriented thought.
- **Passive Attitude.** Let the process happen, do not attempt to force it or control it. If distracting thoughts arise, simply observe them, let them go, and return to the process.
- **Decreased Muscle Tonus.** Get into a comfortable position so that minimal muscular tension is required.
- **Quiet Environment.** Try to use your MT where you won't be interrupted or distracted by external stimuli.

By using these elements in combination with your MT, you can quickly reach deep levels of relaxation. Following are brief summaries of some of the relaxation techniques that can be used to enhance your MT experience.

Breath Awareness

Abdominal Breathing. Relax your abdominal muscles, so that when you inhale, your belly expands, when you exhale your belly contracts. Shallow breathing (expanding and contracting the chest and rib cage) is physiologically linked to the fight-or-flight response; thus chest breathing causes the autonomic nervous system to remain in a state of arousal and inhibits relaxation.

Nose Breathing. One effective technique is simply to focus attention on the breath as it passes in and out of the nose. Feel the air, the coolness at the tip of your nose as you inhale. As you exhale, focus on the warmth at the same spot. If you wish, count your inhalations, numbering each from one to ten; when you reach ten begin with one again. Should thoughts rise into your awareness, don't resist them but allow them to pass, and then return all attention to your breathing.

Moving Around the Body. With each breath, direct your total attention to a particular spot in your body. Move systematically through your body (e.g. you may begin at the top of your head, and move breath by breath downward through your head, neck, chest, right arm and fingers, left arm and fingers, torso, right leg and foot, left leg and foot, and back up again to end at the top of your head; some find it more effective to count each spot, beginning at the top of the head with

one, and ending up back at the top of the head at a count of sixty or so). As your attention moves from place to place it creates and is accompanied by strong body sensations—feelings of melting, warmth, brightness, growing “softer.” By the time you have made a full cycle you should be deeply relaxed.

Visualization of Light. The nostril breathing practice described above can be combined with visualization: see the air entering your nostrils as pure white light. As you inhale, follow the flow of light through your nasal passages, into your abdomen; visualize it radiating to every part of your body. The as you exhale, see the light flow back out of your body. Focus on your breathing entirely.

There are many variations. For example, use visualization of light in combination with the moving around the body technique—with each count, as you focus your attention on another part of the body, see the light flow to that part, see it glowing warmly. Move the light around your body.

Mindfulness

Breath awareness is one element of a practice called *mindfulness* that can not only be an effective relaxation technique, but if practiced regularly can lead to profound transformations in your life. On the most basic level, mindfulness involves simply *being aware*, observing patiently, with detachment and without judging, what you are doing. Ultimately, with practice, mindfulness can lead to “waking up” from ordinary consciousness into a state in which each moment is a peak experience, and in which one has direct and immediate access to one's full powers.

The first step to mindfulness is breath awareness. As in the exercise above, simply focus your attention on your breathing and hold it there. Be aware of the sensations that accompany your breathing. Pay attention. Don't attempt to *do* anything; don't attempt to control your breathing; don't attempt to *think about* your breathing. Simply be aware. As thoughts arise, don't fight against them, simply be aware of them and then return your attention to your breathing. If you suddenly realize something has carried your mind off, notice what it was, and return your attention to your breathing.

You will find this practice rapidly calms the body and mind. Very quickly you become aware of your thoughts and feelings, and by observing

them and returning your attention to your breathing, you learn that you are not your thoughts and feelings, that you can detach yourself from them. In time it can lead to feelings of inner stillness, clarity, and centeredness.

Body Scan. As your mindfulness practice progresses, and you find you can maintain sustained periods of continuous attention to your breath, you may want to practice other types of mindfulness. One technique is the Body Scan. As you become relaxed, turn your attention from your breath to your body, moving in a step-by-step fashion around your body, focusing attention

Mindfulness can lead to “waking up” from ordinary consciousness into a state in which each moment is a peak experience.

on each part in turn, being aware of sensations, feelings, thoughts, whatever arises into consciousness, and then returning awareness to that part of the body. Feel each region fully, breathe to that region, *be* in that region, and then let go, *feel* all the tension and fatigue in that part of the body flowing out, and finally move on to the next region.

Mindfulness can also be directed at music: use a music tape in conjunction with your MT, and as you become relaxed, turn your attention from your breath to the music, not thinking about it or listening to it judgmentally, but simply being aware of the music, moment by moment, as pure sound, hearing each note. If thoughts arise or your attention is drawn away, simply return awareness to the music.

As your practice progresses, you may want to focus your attention on the thoughts that flow through your awareness. Be aware of their content, and the emotional charge that may accompany them, but don't judge them; simply observe them as “events,” and let them go. Notice what thoughts keep coming back to you, what feelings and moods; don't get drawn into thinking about your thoughts, simply notice them and let them go.

Mindfulness and enhanced perceptions. Mindfulness is a practice that can be carried beyond your MT session into the rest of your daily life. The evidence is that it can have profound effects, ranging from boosting your immune system to enhancing your mental functioning to heightening your awareness to intensifying the pleasure and the quality of your life. One series of studies done at Harvard Medical School tested a group of subjects who practiced mindfulness and a control group, and compared their abilities to perceive brief, millisecond flashes of light on a device called a tachistoscope. The mindfulness group's perceptions

were extraordinarily keen: while the control group was barely able to see the flashes or separate one flash from the next, the mindfulness group was able to perceive the flashes with such clarity that they could observe the instant the flash started, the moment it reached its peak, the moment the flash began to cease, the moment the flash was gone, etc.

Such studies are a clear indication that the practice of mindfulness can have dramatic effects on brain functioning and consciousness. Fortunately for users of MTs, reports from users suggest that MTs can be a powerful adjunct to mindfulness, not only helping novices learn mindfulness, but actually increasing our powers of mindfulness and attention.

Open Focus

For over 20 years Dr. Les Fehmi has been one of the leading biofeedback researchers, with a particular interest in developing techniques to induce peak performance brain states. His research led him to believe that one key to peak brain function was *whole-brain synchrony*—a phenomenon in which the dominant brainwave activity throughout the whole cortex shifts into a single, coherent, in-phase rhythm.

Fehmi designed a biofeedback device that would monitor the brainwaves for synchrony, and give the user a signal when synchrony was occurring. I have written in *Megabrain* about this device, the Biofeedback Brainwave Synchronizer. I've also used it extensively in Megabrain Workshops, and have found it's an extraordinarily effective tool for rapidly teaching users to produce heightened states of consciousness. But of course few can afford to own a \$3,000-plus biofeedback machine. Fehmi began searching around for a simple technique that would induce the same state of whole-brain synchrony as could be learned by using the Brainwave Synchronizer.

To do this he hooked subjects up to the Brainwave Synchronizer and tried various spoken inductions and procedures, searching for something that would produce synchrony. As he experimented, Fehmi drew on his own experiences as a Zen meditator. He felt that whole-brain synchrony was linked to *attention*. In modern western civilization, he observed, we value the ability to have a narrowly focused attention: the ability to concentrate on a single matter and ignore other "distractions" is highly rewarded. Unfortunately, Fehmi became convinced, this narrow focus of attention also leads directly to tension, stress, and all the stress-related ailments.

Experienced Zen meditators, on the other hand, strive to open up their field of attention to

take in everything. They have what Fehmi called *open focus*. When he analyzed the brain state it took to produce whole-brain synchrony on his Biofeedback Brainwave Synchronizer, Fehmi discovered that it too was an open focus state. He found, as he told me, that brain synchronization "is correlated experientially with a union with experience, an 'into-it-ness.' Instead of feeling separate and narrow-focused, you tend to feel more into it—that is, unified with the experience, you *are* the experience—and the scope of your awareness is widened a great deal, so that you're including many more experiences at the same time. There's a whole-brain sensory integration going on, and it's as if you become less self-conscious and you function more intuitively."

Seeking a simply way to produce this widening of attention, this open focus, Fehmi developed a spoken induction that uses "objectless imagery" to guide the listener through a progressive opening of focus. When subjects were hooked up to his Brainwave Synchronizer EEG, he found that the open focus exercise produced a state of whole-brain synchrony. As he began to experiment with the open focus exercise, he also found that it was effective in learning enhancement, stress management, pain control, improved health, psychotherapy, and peak sports performance, among others.

When you listen to the basic Open Focus exercise, what you hear is a voice asking you a series of questions that begin with the words, "Can you imagine. . . ?" You begin with an opening of awareness in your head (Can you imagine the distance between your eyes . . . between your ears . . . the volume of your tongue . . . the space inside your throat) that progresses throughout your entire body, requiring a gradual opening of awareness (Can you imagine the distance between your hands, the volume of your fingers, the space between your feet, the volume of your feet), and moves you beyond the limits of your own body to an awareness of everything within you and around you.

The tape ends by having you imagine that you can enter this open focus state any time you wish, and there's no doubt that after you've gone through the exercise enough times you can learn to enter the open focus state remembering what it feels like and by intentionally *being there*. Most importantly for the purposes of this article, the open focus state adds an extraordinary dimension to the use of any mind machine.

On the first level, you can listen to an Open Focus tape while using an MT, and I think you'll find there's a unique synergy: the MT seems to make you more "into it" (to use Fehmi's terms), more at-one with your experience, and thus more able to enter the open focus state; the guided exercise on the tape, on the other hand, seems to organize or give shape to your MT experience, giving it a direction and a dynamism that it might otherwise lack.

On the higher level, once you have learned to enter the open focus state quickly, on demand, you can begin all of your MT experiences by putting yourself into open focus and then doing whatever else it is your primary purpose, such as accelerated learning, sports performance training, self-suggestion, self-healing, etc. Being in open focus seems to make all these other techniques and practices even more effective.

Accelerated Learning

One of the most often-mentioned uses for MTs is as "superlearning" tools. Some MT manufacturers even label their products "relaxation and learning" devices. But exactly how are these tools supposed to be used for learning? There are several quite different techniques, each of which

has different results and can be used for different types of learning. I will summarize these different accelerated learning techniques in this section.

But first, it's important to point out that the manufacturers' claims (and the widespread

perception) that MTs are effective tools for accelerated learning are based on strong scientific evidence. I'll review a few of the most compelling studies linking MT use with increases in types of learning (for more detailed discussions, see the new, revised and updated 1992 edition of *Megabrain*).

At Texas A&M, a controlled study compared the learning and thinking abilities of a group that heard the lessons while relaxing in a dark room with a group that heard the same lessons while in a float tank. The groups were later tested on how much they'd learned, with the learning being evaluated on three levels of increasing difficulty: 1) simple memory or rote learning, 2) the ability to apply the learning to new situations and problems, and 3) "synthesis thinking," the ability to combine the ideas learned in new and creative ways.

When subjects were hooked up to his Brainwave Synchronizer EEG, Fehmi found that the Open Focus exercise produced a state of whole-brain synchrony.

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The results showed that the float group learned much more than the control group on every level. Most intriguingly, as the degree of difficulty and complexity of the learning tasks increased, the superiority of the float group over the control group increased sharply. The scientist who conducted the study concluded, "There's no question that the [float] group learned more, but *where* they learned is the most important point. People who floated learned at a different cognitive level. The results showed that the more difficult the concept, the bigger the difference in the performance of the two groups."

In a carefully controlled study of learning, Dr. Daniel Kirsch and Richard Madden compared the learning abilities of a group that was given a computer-learning task while being stimulated with low levels of cranial electrostimulation (CES) with a group doing the same computer-learning task without receiving CES. The CES group not only learned more than the control group, but over repeated trials, when the control group's learning levels dropped off (perhaps due to boredom or fatigue), the CES group's learning rate continued to *increase*. Other studies using CES have shown increased learning as a result of CES, and still others have demonstrated increases in IQ (for alcoholics and subjects with brain damage).

Investigating the effects of motion devices (such as the Graham Potentializer and the SAMS Potentializer), EEG researcher Marvin Sams of Dallas has found that such devices can optimize the Neuro-Efficiency Quotient—the speed with which neurons pass information—an EEG measure that is closely correlated with IQ. Ongoing studies using light/sound machines and light/color devices (such as the Lumatron) suggest that these devices can have powerful learning-enhancement effects.

Granted the evidence that MTs can serve as excellent accelerated learning tools, how can they be used most effectively for specific learning tasks?

In-Session Learning

The most obvious method of MT accelerated learning is presenting the material to be learned while in the midst of the MT experience. The research of Bulgarian psychiatrist and educator Georgi Lozanov (popularized as *Superlearning* in a book of the same name by Lynn Schroeder and Shiela Ostrander) suggests that we can tap into the brain's extraordinary powers of learning and memory by presenting the material to be learned while the learner is in an optimal learning state. The essential elements of this optimal learning state include:

- **Relaxation.** Lozanov and similar accelerated learning techniques attempt to induce relaxation in the learner by using rhythmic breathing and playing slow stately music (such as Baroque largos) intended to produce relaxation and slow brainwave activity. Interestingly, researchers studying the Lozanov technique have found that not only is deep relaxation essential to the process, but *the deeper the relaxation, the more the student is able to learn.*
- **Slower brainwave activity.** The various Superlearning techniques use music, breathing and relaxation to shift the brain from the beta brainwaves of ordinary waking consciousness to the slower alpha and theta brainwaves, characterized by a heightened receptivity to new information, and (as suggested by the Texas A&M study mentioned above) a heightened ability to synthesize ideas, think creatively and master difficult concepts.

The Lozanov and other similar Superlearning techniques have proven to be extremely effective in boosting learning abilities. However, a wealth of research into the effects of MTs suggests that they can be far more powerful learning boosters, in part because they simply are more effective in producing the essential elements of accelerated learning. As for relaxation, for example, as we have seen, MTs can assist the user in rapidly attaining states of relaxation far deeper than most people can reach without MTs, even though they may have extensive training and practice in relaxation techniques.

As for slower brainwave activity, most MTs are designed with the specific purpose of slowing brainwave activity into the alpha and theta ranges through such techniques as entrainment, restricted environmental stimulation, or rhythmic movement of the body.

Virtually all MTs can be used in combination with audiocassettes. Some, such as CES devices, binaural beat frequencies and flotation tanks, can be used with videocassettes as well. An ideal program for accelerated learning would be to begin use of the MT, use one of the quick relaxation techniques described above, and then, after five to ten minutes, begin presenting the material to be learned via audiocassette. One convenient way of doing this if you're working by yourself is to put the material to be learned on a cassette that

begins with five to ten minutes of relaxing music and then moves on to the material to be learned.

Alpha or Theta? Since many MTs, such as light/sound devices and beat frequency tapes, permit the user to select a target brainwave frequency, the question arises as to what is the best state, or the "appropriate depth," for learning: the relaxed, receptive alpha state, or the hypersuggestible, drowsy, dreamlike twilight or theta state.

Evidence suggests that alpha is ideal for learning new information, data, facts, material that the learner wants to be fully aware of and readily available in waking consciousness. On the other hand, theta is the ideal frequency range for the uncritical acceptance of external suggestions, for bypassing defense mechanisms and

resistance and presenting important self-change messages to the deeper parts of the mind. That is, to present messages having to do with attitude or behavior change to the unconscious mind, without the critical screening present in waking consciousness, it is best to get into the theta range.

As Dr. Thomas

Budzynski points out, "the material is being stored in the brain much the same as verbal information assimilated during anesthetic surgery, i.e., it cannot be recalled, but does influence behavior."

Thus a suggestion for those who have light/sound machines and other variable frequency devices and want to find the best program for peak learning: if the material to be learned is informational, a useful program might be to begin by entraining brainwaves from a waking EEG (anywhere from 14 to 18 Hz—experiment to find what "feels" right), ramp down slowly to a low alpha frequency (from 8 to 10 Hz, again find out what feels right), remain at this frequency for the duration of the learning tape, and then ramp back up to a final relaxed but alert frequency (from 10 to 14 Hz).

Those wishing to learn material having to do with attitude or behavior change would begin by entraining brainwaves in beta, ramp down slowly to theta (around 4 to 6 Hz seems most effective), remain at theta for the duration of the learning session, and then ramp back up to 10 to 14 Hz. For both types of learning the material seems to be better assimilated if the user spends several minutes after the learning material has been presented remaining in a relaxed alpha or theta state before

"People who floated learned at a different cognitive level," said the researcher. "The results showed that the more difficult the concept, the bigger the difference in the performance of the two groups."

ramping back up to beta, ending the session and returning to ordinary consciousness.

CES devices, of course, permit you to use a wider range of learning modalities, including reading, writing, typing, using a computer, etc. Evidence from several studies, and anecdotal reports by many CES users suggest that when you're using the machine your memory and concentration are at a peak. Some speculate that the electrical stimulation of the brain "turns up the volume" on the reticular activating system (the brain's alertness and attention control system) and stimulates the hippocampus (a key to the formation of memories).

Post-Session Learning

Most MT users notice a feeling of mental clarity and sensory acuity that lasts many hours after a MT session. This can be explained by the continuing elevation of certain neurochemicals associated with heightened consciousness, and with the continuing presence of slow brainwave activity.

There is evidence, from tests of blood and cerebrospinal fluid, that MTs, including light/sound and CES devices, produce elevations in such neurochemicals as beta-endorphin, norepinephrine and dopamine, all of which have been linked by neuroscientists to feelings of heightened mental clarity and to the formation of memories. In addition, research indicates that the slow brainwave activity induced by the MTs can be detected many hours, even days, after an MT session. One study of floaters, for example, found that a one hour float raised theta activity sharply. But surprisingly, when the researchers did follow-up EEG tests of both the float group and a control group, they found that they could still detect higher levels of theta activity in the brains of the floaters *three weeks* after their float session.

There's no doubt that most MT users experience an increase in mental and physical acuity for several hours after a session. That makes this post-session period an ideal time for enhanced, high-efficiency, high-quality learning: the brain is still extremely receptive to external information, and still in a free-floating state that is conducive to imaginative and creative thinking. Many have found that it's in the hours after a session that they find themselves discovering solutions to problems or being seized with new ideas, and often notice that this is a time when reading, studying, listening to music and so on are particularly rewarding and productive.

Remember also the Texas A&M study mentioned above demonstrating that users of one type of MT (the flotation tank) not only learned more

than a control group, but as the difficulty of the concepts to be learned increased, their superiority over the control group increased. And it was in the highest, most difficult type of learning—"synthesis" thinking or creativity—that the float group was most superior to the control group. Since the period after a session still partakes of many of the elements of the session itself—relaxation, mild euphoria, heightened clarity, slow brainwave activity, elevated mind-enhancing neurochemicals—it makes sense that this period is an ideal time for learning, particularly learning of the more difficult type, learning that involves opening up to new ideas and trying to understand difficult or subtle concepts. This is the time, for example, to open up that philosophy text, or to get your mind around the ideas in that book about the new physics, or to synthesize some of the concepts in that sprawling world history or comparative religions book. This is the time when the exciting Eureka! can take place.

Pre-Session Learning

There are certain types of learning, I believe, that are best accomplished when the learning takes place *before* the MT session. The best example of this is one I cited in *Megabrain*. One floater, a flower-farmer from Long Island who was trying to learn Dutch (for his flower-buying trips to Holland), told me that he had recently gone for a float immediately after his Dutch lesson. He didn't get time in the next few days to review the lesson or to study at all, but when he went in for his next lesson, he had virtually total recall of the last lesson, and his instructor remarked that he must have studied very hard! He felt that somehow the float had subconsciously solidified the information in his brain. Was that possible?

THE REMINISCENCE EFFECT. Shortly after that I was reading some reports of sensory-restriction research and read of a study in which researchers read a lengthy passage from Tolstoy's *War and Peace* to two groups of subjects. They didn't tell the subjects to remember this passage, didn't even say why they were reading the passage. Then the control group stayed in an open room while the experimental group went into a sensory-restriction chamber. After 24 hours the groups were retested. The researchers found that while there was a steep drop in retention of the Tolstoy passage for the control group, there was *none* for the experimental subjects. In fact, the

sensory-deprivation group remembered *more* after 24 hours than at first! In interviewing the subjects, the researchers found that none of them had expected a retest on that material, and only one had reported that he had even thought about the Tolstoy passage during the interim. The researchers dubbed this the "reminiscence effect." Somehow, simply being in a state of sensory restriction caused an increase in memory for something that happened *before* the sensory restriction.

How to explain this? Scientists now agree that there are at least two different types of memory, generally known as short-term memory (STM) and long-term memory (LTM). STM deals with information we need to hold in our minds temporarily, like a phone number, but which can then be quickly forgotten. On the other hand, there's another type of information that can be held in consciousness just as fleetingly as, say, a telephone number, but can become so permanent that it can be recalled with absolute clarity a lifetime later, such as the memory of some brief event observed momentarily by a child, but remembered clearly 90 years later. This is information that has passed into LTM.

Studies using drugs that inhibit protein synthesis in the brain have proved that STM consists of short-acting electrochemical changes in the brain, while protein synthesis in the brain (i.e. actual physical growth of axons or dendrites, increase in number of glia, increase in number and richness of dendritic connections) is necessary for LTM. When drugs that inhibit protein synthesis in the brain are given soon after subjects learn something, the information is forgotten—that is, it never makes it into LTM. However, when the drugs that inhibit protein synthesis are given more than an hour (in some studies two hours) after the learning, the information is *not* forgotten, which means it has already become a part of LTM. In other words, information passes into LTM—protein-synthesis takes place in the brain—during the hour or two after the information is received.

Other studies by psychologists have demonstrated a similar sort of disrupting effect on learning by interposing other events or information. That is, when subjects are given something to learn, and then, within an hour (i.e. before protein synthesis has taken place in the brain and the information has passed into LTM) something else happens—a vivid event, other types of infor-

Evidence suggests that alpha is ideal for learning new information, theta for bypassing defense mechanisms and resistance and presenting important self-change messages to the deeper parts of the mind.

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mation to be learned—the original material is not remembered as well.

To return to the “reminiscence effect,” we can surmise that this effect results from the fact that after being given the information, the sensory-restriction group was placed in an environment that cut them off from new sensory input, from things that would compete with the information for long-term memory. Thus, the original information, in this case the passage from Tolstoy, was given enough time for protein synthesis to take place, enough time for the information to “solidify” or become a part of LTM.

Clearly MT users can put this reminiscence effect to good use as a part of their MT accelerated learning program. Whatever information they want to put into their long-term memory should be studied prior to their MT session (or should be presented via video or audio tapes during the early part of the session). The session that follows—ideally at least an hour—should allow time for the necessary protein synthesis to occur in the brain to permit the information to become consolidated and committed to long-term memory.

This pre-session learning, I believe, is ideal for certain types of learning, specifically rote-learning types of information: vocabulary words and tenses, facts, data, details. The kind of material you want to feed into your own data banks. On the other hand, this is probably not the best time for complex or synthesis types of learning. That kind of subtle learning dependent on synthesizing ideas and information from many different sources probably does not get directly translated to LTM very effectively, since it's largely dependent on creating new information from information that already exists in LTM. The ideal time for this type of synthesis or creative learning, for grasping difficult concepts and combining these concepts in original and imaginative ways—to come up with new answers to problems, to create new knowledge—is, as suggested above, during the session itself or in the post-session period.

There's no doubt MTs can be a revolutionary instructional tool, with students of all fields of study using MTs as a means of rapidly absorbing large amounts of information and gaining insight into difficult concepts. But where MTs can be of greatest value, I suspect, is on the cutting edge of knowledge—in solving problems, in creating new wisdom and understanding. For it the MT's learning-enhancement effect increases as the difficulty and complexity of the material being learned

increases (as the Texas A&M float tank study suggests), then it must be the scholars, the original thinkers, the creators, the finest minds, dealing with the newest and most difficult information and concepts, who will profit most.

Beyond Relaxation: Self-hypnosis and Self-suggestion

One of the most direct and powerful ways to use the MT experience to effect changes in your attitudes and behavior is by using autosuggestion while you are in a *hypersuggestible* state. This is just another way of saying self-hypnosis.

As noted above, one of the characteristics of the theta or twilight state is hypersuggestibility (i.e. suggestions or statements enter directly into

your brain or unconscious mind, and are accepted as being true, bypassing the mental filters and critical defense mechanisms by which we usually judge such statements). In theta, as Budzynski points out, our mind has the property of

“uncritical acceptance of verbal material, or almost any material it can process.” Our subjective experience of theta, however, is one of a drowsy, largely unconscious state—as soon as we become conscious, or begin actively paying attention to something, we pop out of theta, and are no longer hypersuggestible, since our critical screening defenses are once again operating. For that reason, the best way of profiting from the hypersuggestibility of theta is by using audiotaped suggestions (or suggestions spoken by someone else). That way we can stay in theta and let the suggestions wash over us without paying any attention to the suggestions or the process.

Self-hypnosis, on the other hand, permits us to enter a hypersuggestible state and to actively offer ourselves suggestions for personal action and change even while monitoring ourselves to be certain we remain in a hypersuggestible state and while remaining in conscious control of the process. Self-hypnosis is not a difficult or arcane procedure. It is quite simple, and can be easily learned from any of the popular “how to” books available. It consists mainly of three elements: deep relaxation, focused attention, and suggestions.

We know that MTs are unprecedented tools for producing states of profound relaxation. As for focused attention, I've suggested above in the sections on Mindfulness and Open Focus that MTs, in part by effectively blocking out external

stimuli, provide an unparalleled environment for calming, clarifying and focusing the mind. Some research with MTs and hypnosis has been done, and as you might expect, it shows that people using MTs go into a deeper state of hypnosis than they do when hypnotized without MTs. In addition, there's evidence that MTs significantly increase hypnotizability—that is, people who ordinarily can't be hypnotized can go into deep hypnosis when using an MT. One study of flotation, for example, concluded that some of the subjects who initially were virtually un hypnotizable “became hypnotic virtuosos” in the tank.

The first step toward self-hypnosis is called *induction*. Without MTs, this process can be lengthy, but much of the time is spent in becoming progressively more deeply relaxed and mentally focused. However, with MTs, this process can be speeded up enormously, simply by using one of the relaxation techniques described above, and combining it with a focusing of attention on the induction procedure, using the focusing skills gained from your practice of mindfulness or Open Focus.

Relaxed and focused, you can proceed with your induction by using some sort of sequence that takes you progressively deeper into hypnosis. For example, you might count backwards from 100 to 0, combining your count with suggestions to yourself that you are becoming more suggestible, more focused and more relaxed with each count, and that by the time you reach zero, you will be in a deep, relaxed, focused, hypersuggestible trance. (There are countless ways of moving into trance; examples include visualizing yourself walking down stairs or moving down a series of escalators, each one taking you deeper into hypnosis; floating downward through clear tropical waters; somersaulting backwards through space, with each somersault taking you deeper into trance, etc.)

Once you are deeply relaxed and focused, you can offer yourself suggestions for personal change. A few general principles that will enhance the effectiveness of suggestion include:

- **Suspend judgment**—try to feel that the suggestion is true, experience it as real in your imagination;
- **Be positive**—positive suggestions seem to have more force than negative ones; instead of “I am not afraid . . .” you might say, “I am bold . . .” or “I reject fear . . .”;
- **Be concrete and specific** (brain research indicates that right hemisphere speech comprehension is simple and concrete, that that it doesn't process abstract material well, if at all);

The ideal time for creative learning and grasping difficult concepts is during the session or in the post-session period.

- **Use many senses**—don't simply use a verbal suggestion, but visualize—actually see yourself successfully performing the activity—and, where appropriate, smell and feel the activity;
- **Repeat**—repetition is perhaps the most widely used suggestion technique, used by everyone from political leaders to TV commercials; repeat your suggestion several times using various wordings and images;
- **Use rhythm**—suggestions are more effective when s
your own rhythms of breath and voice; researchers have found that voice intonation and rhythm are processed through the right hemisphere and can have greater emotional impact—compare the powerful rhythms and changing voice intonations of gospel preachers with the monotonous, unrhythmic speech patterns of a Henry Kissinger.

While in trance you should capitalize on your hypersuggestibility to implant suggestions that will help you reenter the hypnotic state quickly and easily. Many like to use a signal or cue word: e.g. you might suggest to yourself that when you are in a relaxed state and speak the word “shazam” to yourself, it is a signal for you to go directly into a deep hypnotic trance, relaxed, focused and hypersuggestible.

Ideomotor Signals.

While in a trance state one has more direct access to hidden or unconscious material. One effective way of learning information that is hidden away in your unconscious mind is the use of ideomotor finger signals: suggest to yourself that you will ask yourself questions, that you will respond to those questions truthfully, and that if the answer to a question is “yes” you will respond by moving your right forefinger; if the answer is “no,” you will move your left forefinger. This is a valuable technique for everything from uncovering past (and long suppressed) traumas to making decisions to remembering where you put the car keys.

Anchoring

One of the most remarkable features of being in a trance state is that you can plant suggestions so that they take effect at some later point, when you're no longer in trance. We're all familiar with the concept of *post-hypnotic suggestion*: the hypnotist plants the suggestion in the hypnotized subject that when the subject receives a certain signal or stimulus, a whistle, for example, the

subject will then feel compelled to tie his shoelaces. In recent years a variation of this technique has been developed and refined that permits individuals in trance to give themselves a trigger mechanism that later, when it's employed, can automatically activate specific desired behaviors or states. The device is called an anchor.

An anchor is basically a stimulus/response mechanism: Pavlov conditioned his dogs to salivate at the sound of a bell by teaching them to associate the bell with food. Anchors are created whenever we're in a heightened or intense mental state, and we receive a specific signal or stimulus at the peak of that state: at that point a neurological link between the stimulus and the state is created. Pavlov's dogs were in a heightened state (hunger) when they were given food, and at the peak of that state the bell rang; in time the bell alone was enough to cause the dogs to salivate. In a similar way hundreds of Oldies but Goodies trigger a response in me: I was in a heightened state in the back seat of a car, for example, when the Fleetwoods came on the radio playing “Mr. Blue,” and now thirty years later when I hear the song it triggers a Pavlovian response in me—the song is an *anchor* for that intense psychophysiological state.

... now thirty years later when I hear the song it triggers a Pavlovian response in me—the song is an anchor for that intense psychophysiological state.

Anchors can be created under virtually any circumstances—we do it all the time, when we unconsciously link a specific slogan with a specific product (“Just Do It”), or a signal with a feeling-state (a Christmas tree), or a signal with an action (the stop light turns red). Athletes anchor themselves constantly: the batter tugs his shirtsleeves just so, pounds the bat twice in exactly the same spot, pulls the bill of his cap once, and only then, having anchored a feeling of confidence, is he ready to swing at the pitch. However, we now know that the more intense or heightened our mental state, the more rapidly and powerfully are we going to create anchors, and the longer will those anchors last. Mind machines, as much evidence indicates, are highly effective tools for creating intense and heightened mental states. In the self-hypnotic trance we enter a heightened and intensified condition called hypersuggestibility. The combination of these two, self-hypnosis and mind machines, is one of the most extraordinarily effective and rapid ways of creating powerful anchors that has yet been discovered.

How do you create anchors? The first step is to get into the state you wish to anchor. This is

where *self-hypnosis* is so valuable. Let's say you tend to get flustered and slow-witted when in the midst of staff meetings, and want to anchor a feeling of cool-headedness and verbal ease, fluency and control. You put on your MT, enter your hypnotic trance, and when in a hypersuggestible state, you visualize yourself at a staff meeting, seeing all your associates, creating the meeting room, hearing the sounds, smelling the smells, feeling your chair, all in concrete detail; and you experience yourself as being fluent, cool-headed, witty and controlled. You experience this as intensely and powerfully as possible. Then, at the peak of this entire experience, when you are fully and intensely experiencing the exhilaration, the confidence, the sensations of mastery . . . at that point, create your anchor.

The anchor may be any distinctive stimulus. You might, for example, place your thumb against the first knuckle of your right forefinger. Evidence indicates that the best anchors are those that combine several different sensory modalities—sound, image, sensation, etc. So you might want to create an anchor that combines the thumb against right forefinger with a spoken word (something like “Speak Now”); perhaps you might even want to add an image to the anchor (perhaps a bright image of a sun shining).

Once created, the anchor serves as a sort of post-hypnotic suggestion. The next staff meeting when you feel the need to speak you will then activate your anchor. You will find yourself experiencing the feelings of verbal mastery and coolheadedness that you experienced in your trance state: these feelings are neurologically linked to the anchor.

If you create your anchor when you are in a highly focused and intense state, one time will be enough to produce a strong response when you activate it later. However, in all cases repetition serves to strengthen an anchor. By enabling you

We at MBR are interested in how you are using consciousness technology. If you have made use of any of the techniques mentioned in Michael Hutchison's article, or other programs or procedures that involve the use of mind machines, share your information and experiences with others. What you have learned may help others in their own explorations. Send us a written description of any experience or information you wish to share: we would like to include some of these anecdotes in upcoming issues of MBR. Write to MBR, PO Box 2744, Sausalito, CA 94966.

MEGABRAIN REPORT

BEYOND ENTERTAINMENT: HOW TO USE MIND MACHINES FOR PEAK PERFORMANCE AND SELF-TRANSFORMATION CONTINUED

to quickly, consistently and reliably return to your deeply relaxed, focused state, MTs are invaluable for the creation of strong and effective anchors.

Having intentionally created one anchor you can then move on toward the creation of an entire repertoire of anchors—one for relaxation, one for a sudden burst of physical energy, one for pleasure, one for intense concentration, one for creativity, one for self-healing, one for pain relief, one for confidence, etc. (In fact Robert Monroe, creator of the Hemi-Sync™ tapes, has devised a tape series that in effect helps you create a multitude of anchors. He has called the series H-Plus (Human Plus), A Program of Planned Self-Evolution. Each of the more than 50 tapes presents the listener with a new anchor [what Monroe calls an “action signal”], ranging from anchors to enhance memory to anchors for enhanced circulation to the brain. I recommend this series highly, and have found it works well when used in combination with other MTs.) In any case, your ability to create and use anchors is limited only by your imagination.

Self-Regulation and Exploration

Once you have learned a few of the simple techniques outlined above, a whole new universe of ways to use your MT opens, and your MT use becomes not simply a way to relax and passively entertain and enjoy yourself, but a versatile tool for actively transforming your life. In the sections below I will briefly touch on a few of the ways you can use your MT for self-exploration, problem-solving and personal growth.

Pain Relief

There’s abundant research showing that virtually all type of MTs—float tanks, CES, light/sound, motion systems, binaural beats at certain frequencies—are effective in alleviating pain. Evidence indicates that, among other pain-alleviating effects, many of these MTs stimulate the release of beta-endorphins, with their opiate-like pain reduction properties. However, there are ways of using MTs to increase and accelerate their pain-reduction power.

Body-Scan. Perhaps the best way to start working on your pain is to use the mindfulness body-scan technique mentioned above. Use the body-scan to focus on your pain, and to become aware of how it effects the rest of your body and your life. This mindful body-scan may provide you with information about how you can alleviate your pain, and how you might be able to change your style of living or your activities to alleviate the pain. For example, someone with chronic headaches might find on an attentive body-scan

that they have tension in their shoulders or neck, and that by loosening that tension they can eliminate their headaches. Similarly, by using your MT session to conduct a daily body-scan, you can be aware of the increases and decreases in your pain, and begin to associate levels of pain with your daily activities: you might find, for example, that your lower back pain peaks the day after you spend long hours completing a report on your computer, something you’ve never noticed before, and then take action to change your physical posture at the computer.

Breathing. Having completed a body-scan, you might want to then use one of the breathing techniques outlined above and visualize each breath as a white light that eliminates pain—as you inhale, the pain-relieving light flows directly to the source of your pain, where it creates a glowing ball of light. With each inhalation, the ball of light grows in intensity, with each exhalation, you visualize yourself exhaling pain. In a very short time you’ll find the pain diminishing and disappearing.

Self-hypnosis. Or, after completing your body-scan, you may want to do a self-hypnosis induction. Having reached a state of hypersuggestibility, you may suggest to yourself that your pain is gone—this suggestion can be strengthened by using different sensory modes, for example visualizing your pain as a tight knot and then seeing it loosen, expand and dissolve, like a Chinese paper flower in water; or, experiencing your pain as being red hot, and then replacing it with ice, and feeling it become cool. When you’re truly hypnotized, the powers of suggestion are enormous—hypnosis has been widely used to anesthetize patients undergoing serious surgery, childbirth and dental work, and afterwards the patients report experiencing no pain whatsoever.

Rescripting

Much of our behavior as well as our image of ourselves and our beliefs are the result of suggestions or programs that have lodged themselves in our psyches in moments when we were particularly receptive or suggestible. Many of these suggestions, or “scripts,” are a result of childhood experiences. Dr. Thomas Budzynski points out: “If you slap a child, or in any way get it into an altered state . . . and then say something to the child, you’re going to be laying down a *script* in the right hemisphere, which may not have access later on to consciousness in the left hemisphere,

but nevertheless will alter the behavior and attitudes of that child as an adult.” Budzynski points to such scripts as “You’re no good” and “You’ll never amount to anything” and “You’ll never learn” as particularly powerful scripts, leading to constant self-sabotage in adult life.

However, the MTs are a perfect tool for counteracting these negative scripts, or “rescripting.” Dr. Budzynski, who uses MTs for rescripting in his own practice, observes that “The technique involves, first, the uncovering of the scripts, second, the creation of counter-scripts which present a more positive outcome,

and third, the repeated presentation of the counter-script, preferably while in a deeply relaxed or hypnotic state. The L/S [light/sound machine] is used both to facilitate the uncovering and the rescripting itself.” Budzynski notes that “the L/S, during the uncovering, can help produce this deeply relaxed state and, possibly, entrain the EEG pattern that was dominant at the time of the trauma.” This refers to the fact that light/sound machines can help users to enter the theta state—the brainwave state that is predominant during most of the childhood years, when the original scripts are laid down. “During the rescripting phase,” Budzynski continues, “the L/S again helps produce the deep relaxation (or facilitates the hypnosis) as the positive outcome scene is repeatedly imagined.”

Uncovering. The first step toward rescripting is uncovering. After putting on the MT, relaxing and moving into a deep theta state (or entering a self-hypnotic trance), you may find suppressed memories surfacing spontaneously in the form of visual flashbacks or images. You may want to proceed with a conscious process of uncovering by using ideomotor finger signals. You may ask if the problems you want to deal with are the result of a single traumatic experience. If so, you may continue using your ideomotor signals to narrow in on the date (how old were you when the experience occurred), the location, etc. You may combine this with suggestions that you can visualize the experience. Dr. Budzynski points out that “Uncovering is a very sensitive and potentially anxiety-evoking process” and recommends it be attempted only by trained mental health professionals. However, you may feel confident that you can confront these past experiences; and you may provide an additional safeguard by having another ideomotor finger signal (such as the movement of the thumb) that indicates to you, “I

The combination of self-hypnosis and mind machines is one of the most effective and rapid ways of creating powerful anchors that has yet been discovered.

don't want to deal with this material at this time," and is a signal for you not to delve more deeply until a later time.

Rescripting. Once the harmful script has been uncovered, the next step is to develop a counter-script. Budzynski mentions several types of rescription: "The client can change the way he or she was thinking in the situation (cognition), or the external behavior (behavior), or the words that were said (verbal), or any combination of the three. Usually, a change in external or verbal behavior will produce a change in the other person's behavior and therefore, a different, hopefully more adaptive, outcome."

While in your deeply relaxed state, you should recreate the original traumatic experience, using as much concrete detail and as many sensory modalities as possible.

However, as the scene is recreated, you should alter it in such a way that it produces a positive outcome. Budzynski describes a case of a woman who had an inexplicable pain in her arms who, upon going into hypnosis and using ideomotor signals, revealed that while she had been hospitalized and unconscious after a fall from a horse, and while a nurse was inserting an IV in her arm, a visiting relative remarked, "Gee, that looks like it would sting!" The woman's unconscious mind, in an altered state, apparently took this as a command. "The rescription was simple," says Budzynski, "an old but wise 'Dr. Welby' type physician was introduced to the scene. When the triggering remark was made, the wise physician said, 'Oh sure it stings for a few seconds, but then it feels as good as new.' When the client awakened, the pain was gone!"

Like anchoring, rescripting gains in power with repetition, and the more vivid the rescripted experience (engaging several senses and with concrete details) the more power it has to counter the old script.

The Swish

A slightly different rescripting technique is widely used by practitioners of Neuro-Linguistic Programming (NLP), and is called the Swish pattern. NLP teaches you how to do a Swish pattern in ordinary consciousness. However, I've found that using this (and other NLP techniques)

in the midst of an MT experience boosts it to a higher order of effectiveness. I have used this technique in many of my Megabrain Workshops, and have found that it can produce rapid and dramatic effects. As Anthony Robbins writes, "A swish pattern takes internal representations [i.e. scripts] that normally produce states of unresourcefulness and causes them to automatically trigger new internal representations [i.e. counterscripts] that put you in the resourceful states you desire."

Having uncovered, for example, the script that causes you to overeat, you create a script that would counter the overeating script, and establish a mental link between the two scripts, so that each time you think of overeating, the counterscript would be triggered.

Once you have entered the MT experience and taken yourself to a deeply relaxed, theta or self-hypnotized state, the first step is to identify the behavior you want to change. Having done so, the next step is to create a visual image of it—a simple but vivid scene or "picture." The next step is to create a second picture—a representation of yourself as you would be if you

had made the desired change in your behavior.

The next step is to "swish" these two pictures to that the unwanted behavior automatically triggers the new behavior. Anthony Robbins describes this procedure: "Start by making a big bright picture of the behavior you want to change. Then, in the bottom of the right-hand corner of that picture, make a small dark picture of the way you want to be. Now take that small picture, and in less than one second, have it grow in size and brightness and literally burst through the picture of the behavior you no longer desire. As you do this process, say the word 'woosh' with all the excitement and enthusiasm you can." Having done this, open your eyes for a split second to break the state, and then repeat.

The key to the swish is speed and repetition. Once you're in your theta state, or your hypnotic trance, perform the swish pattern over and over, taking only a second or so for each repetition. If you experience this swish pattern intensely enough, you should find that whenever you begin to act out your old, harmful script, you will immediately find yourself switching to your new script.

Focusing

Another learning/uncovering, mindfulness, and problem solving technique that is highly effective when used in combination with MTs is called Focusing. Developed by University of Chicago psychologist Eugene Gendlin, focusing enables practitioners to manipulate their brains in such a way that they reach new insights that lead to dramatic and beneficial behavioral changes.

In focusing, one attempts to get a "felt sense" of the problem, and through a series of focusing steps that turn attention away from the external environment and increase awareness of subtle emotional states and physical sensations, one reaches a point at which one experiences a "felt shift," an experience marked by a sudden release of tension, a feeling of deep physical relief, a sense that the problem or unclear feeling has been understood.

We've all experienced focusing and felt shifts. For example: you leave your house and soon have an uneasy feeling you've forgotten something. You "focus," trying to identify the problem: have you left the gas on? the water running? In each case you know that's not the answer because you feel no inward release. Finally you get the correct answer—you forgot your briefcase—and with a "felt shift," a feeling of understanding, release from tension, and satisfaction sweeps over your body. Aha!

One EEG researcher was curious to find out what happens to brainwave activity when one of these "felt shifts" occurs. Making a computer analysis of over 8,000 EEG readings, he discovered that just preceding the moment the felt shift occurs, there were peaks of alpha and theta activity.

If alpha and theta activity accompany the focusing process, it's likely that by actively *inducing* alpha and theta activity by using an MT, we can induce or facilitate the focusing process.

Resources

To learn more about some of the techniques and procedures I've touched on above, you might want to consult some of the following books and tapes.

Relaxation. A number of relaxation techniques are included in my work *The Book of Floating* (Morrow/Quill, 1984). See also *The Relaxation Response* (Morrow, 1975) and *The Mind/Body Effect* (Simon & Schuster, 1979) by Herbert Benson, M.D.; also *Minding the Body*, *Mending the Mind*, by Joan Borysenko (Bantam,

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MEGABRAIN REPORT

STALKING THE WILD SCALAR: THE BIOELECTRIC INTERVIEWS

In our "Bioelectric Interviews," published in issue 1 of MEGABRAIN REPORT, a variety of experts, including Dr. Glen Rein, Dr. Eldon Byrd, Dr. Bob Beck and Peter Lindemann approached the subject of scalar fields. Scalars, which our interviewees variously described as "non-Hertzian fields" and "information matrices," seemed to provide a scientific basis for a variety of extraordinary phenomena, ranging from telepathy to time travel to mind control.

These speculations and discussions have aroused intense interest and controversy among readers of MEGABRAIN REPORT. The experts we spoke with for the "Bioelectric Interviews" all cited Tom Bearden as the key figure in the field of scalar technology and scalar theory. As a result, we decided to go to the source and talk with Lt. Col. Tom Bearden, who is widely recognized as the seminal theoretician of scalar phenomena. What follows is a wide-ranging interview with Col. Bearden. At his request, Col. Bearden took many of the questions posed to him by Terry Patten and Michael Hutchison of MEGABRAIN REPORT and prepared a written response. Col. Bearden must have found our urgings to provide us with a clear statement of scalar theory and scalar technology of value, since the interview will be published in full in his new book, *Gravitobiology* (published by the Tesla Book Company, 2521 Palma Drive, Ventura, CA 93003).

We strongly suggest that readers consult the discussion of scalars in MBR #1 as an introduction to and context for Col. Bearden's discussion.

Bearden's theories are controversial, bearing as they do on "the meaning of everything." As a result, we also interviewed other experts who have differing, sometimes critical, and often enlightening views of Bearden's concepts. These include physicist Dr. Elizabeth Rauscher and Bill Van Bise, who have intimate experimental knowledge of Bearden's work and ideas.

We also re-interviewed Dr. Glen Rein, after permitting him to read the transcripts of our interviews with Col. Bearden, Dr. Rauscher and Van Bise. He provides an intriguing view that seems to synthesize many of the ideas put forth by Bearden, while countering some of the criticisms of Rauscher and Van Bise.

Some readers may find parts of Col. Bearden's interview challenging, even hard slogging, particularly the first section. But we feel that careful reading and consideration, particularly as you move into the interview, dealing with concepts such as teleportation, mind control, the brain as a sort of "wet mini-receiver" of mind, and the possibility of actually "engineering the nucleus," will produce those ecstatic rewards that occur in those moments when you feel your mind stretch, stretch, and finally, *Eureka!*, reorganize itself at a higher level.

Frequently, as the interview progressed, we felt ourselves thrilled and astonished as new visions of reality hammered open new spaces in our brains. There's no doubt that a careful reading of this interview can be not just a mind-challenging, but a mind-altering experience.

THE MEGABRAIN REPORT INTERVIEW WITH TOM BEARDEN

Lt. Col. Thomas E. Bearden is a nuclear engineer, wargames and weapons analyst, and military tactician. He has a MS in nuclear engineering from Georgia Tech and is a graduate of the US Army Command and General Staff College and several US Army artillery and guided missile schools. He has over 30 years experience in air defense systems, technical intelligence, Soviet electromagnetic weaponry, artificial intelligence, computerized wargames, and antiradiation missile countermeasures. He is a senior scientist with a large aerospace company.

*Col. Bearden personally developed and published the basis for a drastic revision of electromagnetic theory and engineering, based on the work of Whittaker and Maxwell. His work is primarily responsible for the widespread interest and research into scalar electromagnetic phenomena in this country over the past decade. He is the author of several books on this subject, including *Towards a New Electromagnetics, Parts I-IV* (Tesla Book Company).*

MBR: Can you offer the layman an extremely simplified summary of what scalars are, how they relate to Maxwell's equations, unified field theory, and the limitations of currently accepted quantum physics, relativity theory, and electromagnetics?

TB: Whew! You've asked for a complete explanation of how to unify the three major disciplines of physics, specify what's wrong with the three present versions of those disciplines that has prevented their unification, and how this was in Maxwell's original quaternion equations (some 200 of which are actually his theory, not the pale four vector equations written by Heaviside and Gibbs). You also asked for an explanation of scalars versus vectors, and how the present vector analysis (of Heaviside and Gibbs) misses the boat with respect to structured scalars. And you've asked me to do it simply, in layman's terms. To say that that's a tall order is the understatement of the decade!

Okay, we'll have a go at it anyway. We'll start with scalars and vectors.

Basically we visualize things in the universe as two sorts: those that move (have motion) and those that don't. In physics we know already that this is in error; there isn't anything in the universe, anywhere, that is motionless. At least it is moving through time, which is still a special kind of motion. Also, we know that everything seems to be made up of much finer things, and these finer things are always in motion—often very violent motion. So what we

PART THREE

observe as a passive thing—sitting still spatially, so to speak—is made up of subthings in violent motion spatially. And the whole system that is not moving spatially is still moving in time. However, we don't see "time" but just space; therefore we see the thing as "motionless." However, the "motionless" thing we look at is rather like a fixed whirlpool in a swiftly flowing river: the whirlpool seems to us to stay "fixed" and motionless, but internally its parts (the flowing water) are in constant motion.

Another example is a container of gas under pressure—such as the air tank at the service station. The tank and "the air as a whole spatial volume"

isn't going anywhere, and we see them as "motionless." But inside the gas its molecules are in violent motion, undergoing collisions, etc. Indeed, inside the walls of the tank, the molecules and atoms are in vibrational back-and-forth motion in a spatial lattice.

The point is, physically "motion" and "motionless" only apply to the *external* characteristics of the object to which we pin the label. So it represents only an overall characteristic of the object, and does not completely describe it. In a sense "motionless" is filled with motion, and all is motion.

In vector analysis, a *scalar* quantity is considered to be a quantity that has magnitude or size, but no motion. An example is pressure; the pressure of a gas has a certain value of so many pounds per square inch, and we can measure it, but the notion of pressure does not involve the notion of movement of the gas through space. Therefore pressure is a *scalar* quantity, and it's a gross, external quantity since it's a scalar.

Note, however, the dramatic difference here between the physics of the situation and mathematics of the situation. In mathematics, when you say something is a scalar, you're just speaking of a number, without having attached to it. And mathematically, that's all there is to it; the number doesn't have an internal structure, it doesn't have internal motion, etc. It just has magnitude—and, of course, location, which may be attachment to an object.

However, physically, when we say something has pressure or a scalar value, that is not all there is to it. That particular aspect of the object or system may be scalar, but internally the thing it's labeling can still be decomposed into subsystems or particles or small things in violent motion. That is, in physics the scalar quantity can mathematically be further decomposed into an ensemble of vector quantities. Since these parts are rushing around in all directions but the whole is not translating through space, then obviously the sum

of all those fractional motions must be zero. Scalar pressure, for example, can be decomposed into a myriad of opposing force vectors per unit area.

Mathematically, a *vector* is an entity that not only may have magnitude or size, but is translating through space. In physics, we apply the vector concept to something that is moving, and/or to position. However, when we think further, that "something" is made

of smaller things, which also are in violent motion, and these smaller things may be swarming all over the place with differing velocities—or even flowing at high speed in and out of the moving "system-thing" represented by the vector. So even here, the vector thing is a special case of an ensemble of smaller things.

In the physical world, in anything—even inside a single point—there are always infolded vector things in violent motion. We may say that these interior critters are "hyperspatial" or "infolded" or "virtual" or "hidden." But they're real and they're inside the point, as seen by the external observer.

The point is this: *Everything seen externally is a plenum internally.* In the real physical world, both a thing that's externally motionless (a scalar) and a thing (a vector) that's externally translating through space, are special cases of a system whose internal

parts are always in motion. If the sum of the internal motions is zero, the external object seems to be sitting still and motionless to us (though it's still moving through time with—usually—uniform motion). We describe that internal characteristic of the system as a *vector zero resultant system*. Externally we may also characterize it as a scalar, because it still possesses attributes that have magnitude. On the other hand, if the sum of the internal motions is not zero, but is a motion in a certain spatial direction, then to us the external object seems to be moving along in space. That is, it is translating spatially. Externally it has both magnitude and direction, so we view it as a vector.

To label a thing as *only a vector* is to look only at its external attributes. To label a thing as *only a scalar* is to look only at its internal attributes. To look at its internal attributes, it must be recognized as a scalar and a vector at the same time. That is, the scalar attributes must be recognized to be composed on internal vectors.

"A scalar quantity is considered to be a quantity that has magnitude or size, but no motion."

"If the sum of the internal motions is zero, the external object seems to be sitting still and motionless to us. . . .

We may also characterize it as a scalar, because it still possesses attributes that have magnitude."

MEGABRAIN REPORT

STALKING THE WILD SCALAR: THE BIOELECTRIC INTERVIEWS (PART THREE) CONTINUED

Summing that up, physically a scalar thing is a thing that (1) is a vector in time, which is hidden from direct observation, (2) externally is just a magnitude spatially, and (3) has an internal spatial vector structure, and therefore a hyperspatial or virtual-state vector structure. A vector is a thing in motion in a dimension (through a frame), whether in space, hyperspace, or time. Rigorously it is not possible to exclusively separate the notions of vector and scalar, because any scalar, to persist, is automatically a vector in time.

These concepts of vector and scalar are normally not nearly so well clarified in standard physics and mathematics texts, unfortunately. Usually discussions of this type are reserved to obscure papers in foundations of mathematics. It may surprise the casual student, for example, that the notions of line, point, space, zero, length, dimension, frame, time, and observer have no truly acceptable definitions. Neither do the notions of force, mass, field, potential, etc. In fact, mathematics no longer attempts to explain how a line can be made of points. Instead, in foundations, it is simply stated as three postulations thusly: "There is a class of entities called points. There is another class of entities called lines. Lines are composed of points."

From a physics viewpoint, one of the big problems with the present vector mathematics—which is well-known not to be a complete system of mathematics in the first place—is that the presence of a bunch of vectors that sum to zero are just treated as a zero or absence of any vectors at all. That is, the *absence* of any internal vectors at all is made synonymous to the *presence* of a bunch of internal vectors that are fighting each other to a draw. *What this does is throw away the internal energy and internal ordered structuring of the medium—specifically, the energy of all the vector fighters that is continually going on inside the local medium—inside space-time itself.*

Physically that's quite wrong, and one is throwing away exactly half the energy of the situation. There is a very real physical difference between a system of real vectors that fight to a draw and so do not translate en masse, and the absence of any vectors and vector-fighting at all. The difference is composed of stress and its

internal vector patterns—the internal energetic engines in local space-time and local rest mass—in short, the energy trapped in the local medium.

Where electrical students meet this hidden problem, of course, is in the fact that the four vector Heaviside equations of EM are not closed. One always has to assume that one or more of the "remaining potentials" is zero—that is, absent. So right there all the texts and professors reduce even Heaviside's equations to a special case of the absence of any "left-over and hanging around" scalar potentials. As an example, that little assumption gets rid of any possibility of the Aharonov-Bohm effect, where potentials alone can interfere, even in the absence of EM force fields, and produce real force effects in charged particle systems. That is, the sole agent of the interference of scalar potentials can induce EM changes, according to the experimentally proven Aharonov-Bohm effect, even in the total absence of EM force fields.

Since 1959, it has been known in quantum mechanics that the EM force fields are not primary agents at all. We know that classical EM theory is completely wrong on this. QM shows that it's the *potentials* that are primary, not the force fields. In fact, it can be shown that the E-field and B-field do not exist as such in vacuum; *only the potential* for the E-field and the B-field exist in vacuum. Feynman pointed that out, but nearly all of his modern cohorts seem not to have recognized that fact. Indeed, *vacuum is just a conglomerate of potentials*, nothing more, nothing less. And if you just look carefully at the definitions of force and E-field, you see immediately that (1) force (nonrelativistic case) consists of mass times acceleration. Therefore a force consists of an accelerated mass. An electric force consists of an accelerated charged mass, normalized for a unit. But it really isn't treated that way in the EM theory, where it continues to erroneously considered to exist as a force field in the vacuum.

At least you've got to use the adjectives "virtual" and "observable" to differentiate vacuum things from material things. One can correctly state that a *virtual* electric force field exists in vacuum, comprised of accelerating virtual masses, but not an *observable* force field. The

observable electric force field requires, and consists of, accelerated observable charged particles. And the only place observable particles exist are in a physical medium, of a collection of one or more observable particles in space.

So it doesn't take any special powers of thought to directly show that there are some very serious, fundamental things wrong with the present foundations of EM theory. There are lots of other flaws in EM, such as the fall of the Lorentz force law in modern railgun experiments. The law has always been false, but is a sufficient approximation if the energy regime is not too high. Peter Graneau's work is fundamental in this respect.

To sum this up another way: The present vector analysis (as applied to electromagnetics) discards the internal, trapped EM energy of local space-time. Now if the internal trapped energy of space-time varies from place to place, that is called a *curved* space-time, relativistically speaking. And when a space-time is curved, there is communication of energy between the internal, infolded, virtual EM energy state and the external, translating, observable EM energy state. Curved one way, the local space-time is a sink, with external energy pouring into it continually, and disappearing from observation of the external state. Curved the other way, the local space-time is a source, with energy pouring out of it continually, and appearing in observation in the external state.

"Free Energy" Machines?

What the present vector system of EM does, therefore, is *throw out the ability to use the very strong EM force as an agent to curve local space-time*. The very mathematics itself, a priori, assumes and guarantees a locally flat space-time. And in an uncurved region of space-time, for example, you are never going to make an over-unity machine—a so-called "free energy" machine that will give you more energy out than you put in—because the application of the vector theory a priori guarantees the elimination of any hidden sources from the local space-time (ST) medium. If you're going to tap the trapped vacuum energy, and make a so-called "free energy" device, you're going to have to curve the local space-time. That is the only way to produce a local energy source in the vacuum, from which a current issues. Notice that, when we put a paddlewheel in a river, we produce a free energy device because we tap some of the energy in the flow. But we tap a *current*, we do not just tap a potential per se. The entire secret of tapping vacuum energy, to build a free energy device, is

*"From a physics viewpoint . . .
the absence of any internal
vectors at all is made synonymous
to the presence of a bunch of
internal vectors that are fighting
each other to a draw. What this
does is throw away the internal
energy and internal ordered
structuring of the medium.
Physically that's quite wrong."*

to produce a current in the local vacuum potential that is self-sustained, and then tap that current.

So the present EM theory throws away exactly half of the energetics of the situation involved. From time to time yet another physicist discovers that astonishing fact, and publishes a paper on it to point it out. Nobody does anything about it, however, because no one has the foggiest notion of *what* to do. So everybody just lets it pass and nothing is changed.

MBR: Can you give us a more concrete example of the missing half of the energy?

TB: Yes. Suppose, for example, you connect a voltmeter across a wall circuit to measure the voltage. The meter needle moves against a spring with a force, as a result of the detection made by the voltmeter. The actual detection is an interaction inside the meter's probe which induces conduction electrons to move. We read the needle movement that resulted from those conduction electrons, and we *infer* so much voltage. The important point is this: The voltmeter is measuring the energetics of its own internal change; it is not at all measuring anything external. *All instruments measure only their own internal change.* We infer the external thing that interacted with the instrument to cause the internal change. We do not measure the external entity directly, but only the results of its interaction inside the probe and meter. And even then, we measure only the external, spatial-translation energy of the instrumental interaction; we do not measure or account for the internal energy of that interaction.

To state it more precisely: The needle moved because conduction electrons accelerated away from the instrument's interaction area. This current flowed into a coil and produced a force on the needle movement, rotating the needle against a spring. At the same time, another current—a time-reversed, phase-conjugate current—was induced in the atomic nuclei of the atoms in the interaction area. This “inner current” flowed Whittaker-wise through the atomic nuclei of the instrument, producing an equal and opposite force. [This is the mechanism that produces Newton's third law in the first place, as suspected by Feynman.] So the entire body mass of the meter recoiled slightly from an equal and opposite force, which we just loosely refer to—and recognize as—Newton's

“The entire secret of tapping vacuum energy, to build a free energy device, is to produce a current in the local vacuum potential that is self-sustained, and then tap that current.”

reaction force. It's there, it's real, but we completely neglect it in our electrical measurements!

Usually we don't think it had anything to do with the external entity that interacted with the voltmeter. But it was a product of the same interaction of that external “something” within the meter. It's equal and opposite to what generated our electrical measurement. So exactly as much energy was produced in the “reaction force” energetics as was produced in the “external meter needle force” part of the interaction. We only measured and accounted for half the true energy of the interaction, or else you've got to discard Newton's third law.

It follows that what actually entered into the interaction was a system of oppositely paired forces—a *stress* field, which is a *scalar* potential. This, of course, is consistent with our observation that vacuum itself is pure potential. As such, it consists of partial potentials of various kinds—it's highly charged, and the ambient vacuum scalar potential has very high magnitude. Remember that this ambient vacuum stress (potential) can be decomposed into sets of bidirectional forces. In our EM interaction, one-half of the stress pair—the half that is the normal photon-generated EM force was utilized to move the conduction electrons, involving primarily the electron shells of the atoms imbedded in the vacuum potential. The other half of the stress-pair interacted with, and moved, the atomic nucleus, causing it to recoil. The recoil of the nucleus was slight, because it is very, very much heavier than the accelerated outer electron.

To sum it up: All detection is actually binary, it's not singular at all. When we detect photons or EM waves, we normally account for only the externalized translation part of the energetics of the interaction. We miss or neglect the internalized translation part, and we miss or neglect precisely as much internal energy as we account for externally. Again, I'm not the first one to point this out by any means.

MBR: Can you give us a precise summary statement of all this?

“What the present vector system of EM does is throw out the ability to use the very strong EM force as an agent to curve local space-time.”

TB: At the interaction area, a part of the instrument and the external causal agent are coupled together as a compound system. In that area, the mass of the instrument exists as atoms, each of which has an inner part (the nucleus) and an outer part (the electron shells). In the coordinate system centered on that compound system, conservation laws apply. The compressive stress of the interaction reacts internally—i.e., against the atoms with their inner and outer parts. Reaction from the nucleus induces a tensile stress. This tensile stress, in the simplest case, can be decomposed into equal and opposite forces, since stress is merely a set of such equal and opposite forces. One of

the bidirectional interaction forces moves externally out of the atom via the electrons, electromagnetically producing a conduction electron current through the instrument and giving a needle reading.

The second bidirectional interaction force moves ever inward, since it is a phase conjugate and reconcentrates inward (“crawfishes”) rather than scattering outward. This forms a hidden Whittaker current through the atomic nuclei, producing a recoil on all of them. Precisely as much EM energy went into the inner system as went into the outer system. But we normally only measure and account for the external energy, and ignore the energy in the internal channel.

MBR: Can you give us a reference related to this, for example?

TB: I'll give you several of them that bear directly on this. See R. Chen, “Cancellation of internal forces,” *American Journal of Physics*, Vol. 49, No. 4, Apr. 1981, p. 372. Chen gives a discussion of these summation vectors and internal vectors. He points out that the internal forces occur in equal and opposite pairs; in other words, as *internal stresses*. That's certainly pointing out the internal, bidirectional force structure of a scalar stress—a scalar potential, if we're talking EM stress and EM forces. Note that this internal pattern is exactly what Maxwell's quaternion theory captured and retained, and that the Heaviside and Gibbs vector theory discards. Further, the quaternions captured the internal order of this internal force vector structure as well.

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MEGABRAIN REPORT

STALKING THE WILD SCALAR: THE BIOELECTRIC INTERVIEWS

THE MEGABRAIN REPORT INTERVIEW WITH ELIZABETH RAUSCHER AND BILL VAN BISE

Elizabeth Rauscher and Bill Van Bise are two of the leading investigators of the effects of electromagnetism on biological systems. They are currently engaged in clinical tests of a device they have developed that uses pulsed electromagnetic signals at specific frequency combinations for the treatment of cardiac problems and pain.

Elizabeth Rauscher earned her B.A. in physics and chemistry, a Masters in nuclear engineering and a Ph.D. in nuclear science from Berkeley. She spent 19 years with Lawrence Berkeley Laboratory, three of them in a theoretical physics group at Lawrence Livermore Labs. She has served as a consultant with SRI International, NASA, and the Navy. For many years she has had a special interest in quantum electronics, the biological effects of electromagnetics, and natural sources of low-frequency long wavelength magnetic field emissions from the earth. She has published influential papers in nuclear physics, astrophysics and fusion research. She is presently engaged full time with the medical research project that involves the use of electromagnetic frequencies.

Bill Van Bise is an electrical engineer who served as a consultant to broadcast companies throughout the U.S. He was an instructor at the University of Oregon Health Sciences University Medical School. During the 1970s he was a consultant to the Oregon State Health Division Radiation Section. He teamed up with Elizabeth Rauscher in 1984 when they began their current research and development in the area of electromagnetism and biological systems. The interview was conducted by Terry Patten and Michael Hutchison.

Bearden and Scalars

MBR: What is your opinion of scalar theory and scalar phenomena?

ER: Well, I think we have to go back a little bit and give a little history. Tom Bearden wrote some papers describing what he thought were deficiencies in the conventional view of electromagnetics, particularly in the description of low frequency ELF phenomena. He was interested in Nikola Tesla's work as well, and he would talk about things like standing waves or columnar waves as resonant phenomena, phenomena that might be set into activity such as in the Tesla magnifying transmitter. And he also pointed out some theorems of mathematics that are implicitly assumed by everybody that should probably

be questioned, including Aristotelian logic and that sort of thing.

He made some points that I thought were valid and deserved to be looked at. He also came up with a theory about "scalar waves." For some reason, a lot of people have begun using that term, and I think it's detrimental to the field, because "scalar waves" make no sense. It's like "jumbo shrimp," if you think about it [laughter], a "big little" fish. A scalar is something that has magnitude but no direction, like 15 miles an hour. A vector has magnitude and direction, like 15 miles an hour going north. If a wave propagates, it has direction, and so it can't be a scalar. A scalar wave makes no sense even from a linguistic point of view, just by definition.

If Tom Bearden has a point that should be examined by the scientific community by putting forth such a term, and a few others—he also talks about "time reversed waves" for instance—he's just going to make the whole consideration appear foolish and discourage people from taking unconventional phenomena seriously. I think he's right when he says that all knowledge is incomplete. That's what science is about . . . getting new information. But I think he's going to stop a lot of people because the main scientific community is going to say that this doesn't make any sense. So they won't look beyond a very badly chosen term, to these valid but subtle, or maybe even esoteric areas.

"Unseen and Undetected Phenomena"

MBR: Instead of talking about scalar waves, what if we talk, as Eldon Byrd, Bob Beck and others have advised [see "The Bioelectric Interviews, Part One" in MBR #1], in terms of scalar fields.

ER: Well, scalar field or scalar potential *are* terms used in science, and they are correct. I talked to Tom quite a bit trying to understand what his concept was, and even trying to get him to apply some better terminology to whatever that concept was. But I couldn't figure out what his concept really is. I couldn't get a definitive

idea of his theory. It seems to be used to mean anything from psychic energy to non-hertzian waves associated with Nikola Tesla's work.

MBR: And the non-hertzian waves, in your view, are a perfectly real and valid phenomenon that deserves more investigation?

ER: Well, yes. The way I would put it is this, again with some history: You may know that Faraday did a lot of fairly basic work in the early 1840s and 1850s which is when his original treatise on electricity was published. And Maxwell created a series of equations to describe electricity—sometime during the Civil War as I recall—a series of equations which had a lot of revisions even before Maxwell died. Hertz did

some additional research that was published in 1888, and he came up with two concepts. One was that light and radio frequencies were really parts of the same phenomenon, what we now call the electromagnetic spectrum. The second was that the magnetic and electric vectors—the E and V vectors—moved perpendicular to the direction of propagation

of the electromagnetic wave.

I think that the whole idea that the electromagnetic spectrum has really advanced science greatly. But there's some question in my mind, in fact, that there might be electromagnetic phenomena that are not hertzian, waves in which the V and E vectors move even tangential to the direction of motion or perhaps at some angle to the direction and motion that is not 90 degrees. But, you would have to develop an antenna system to detect such a wave. But, after all, if you didn't have a radio you wouldn't know what radio waves were going through your house.

So there are a lot of unseen and undetected phenomena that can exist that are unknown and later become known and measurable. I hypothesize that perhaps some of what Tesla was talking about in his work might be describable in terms of "non-hertzian" waves. I spent some time looking at how that might be formalized. I also agree with Tom Bearden that Maxwell's equations are not completely applicable to very low frequency phenomena. In other words, once

"I became interested in measuring these things, not only theoretically, but in actual fact, and I found that there was something that approximated a scalar. . . something with no direction, an energy field consisting of E field only and no current."

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you get down to ULF, VLF, and ELF ranges there may be a breakdown of the equations or perhaps they become more approximate. Newton's laws break down at very high velocities where relativity takes over. So this problem at low frequencies poses an anomaly to conventional electromagnetic theory, and I think that certain of the phenomena that I'm interested in studying would not be easily explained by normal electromagnetic theory.

MBR: Bill Van Bise, earlier you said that self-cancelling field devices might create a legitimate effect in terms of patterns in their nodes and anti-nodes. Can you explain what you mean by that?

BVB: Standing waves are wave forms, measured from crest to crest or trough to trough. And the trough is, of course, a lack of positive energy. So by taking a simple device such as a neon light—which kind of experiment should in fact be a part of every engineering course—and a pair of Lecher wires, named after a physicist by the name of Lecher, you can generate standing waves into a pair of wires, spaced apart from each other with an insulator. We would fill these things from laboratory bottles about 3 meters long, so we'd generate a frequency of say 300 megahertz, the wave length as given by the standard formula, 300 megahertz to 1 meter. So we'd have a student take a look at this, and move right along the wire and find the node and anti-node. The anti-node being one of these out-of-phase waves where the positive energy would go out, in between the standing waves. And standing waves are in effect generally things that one doesn't want in radio transmission. But a scalar "wave" and these anti-nodes, which are a cancellation phenomenon, in my opinion are probably very much alike. And that was something that I had argued with Tom Bearden about, and he was insisting on calling them scalar waves anyway. But the node and anti-node phenomenon is very well recognized in engineering, and physics.

ER: If you have a light diffraction pattern, you see these dark and light bands. You can view the pattern as a metaphor for standing waves, and the light bands would be the part of the standing waves that has the positive energy, and the dark areas would be like the nodal points, in which the two different sources of light cancel each other through a diffraction grading.

"To Measure is to Know"

BVB: Now, back in 1976 it came out that Russia was experimenting with peculiar jamming signals that later became known as the Russian "woodpecker" signal. Tom Bearden became very interested in their technologies, and he assumed that maybe the Russians were experimenting with these out-of-phase waves, which (my original conversation with Tom was back in the '70s) he called "standing columnar waves," which could imply that there not only was a low frequency 10 hertz repetition based on (this is off the top of my head) 7.8 hertz would have a wave length of 24,000 miles or so. And so at every quarter wave length there would be a reinforcement and cancellation, and every 8,000 miles one would find a standing wave with the high energy levels and the next 8,000 find a null.

And so in the beginning there, I believed I understood what Tom was talking about. Thus, I became interested in measuring these things, not only theoretically, but in actual fact, and I found that there was something that approximated a scalar. In other words, I found something with *no direction, an energy field consisting of E field only and no current*. That was done up in Oregon where the distance between these two things showed a sub-multiple of 6,000 miles apart. In any case, I have no argument with Tom about that at all, because what I seem to be finding substantiates it. But then later he got into the idea of the scalar wave, which is, as Elizabeth pointed out, a non sequitur.

The engineer's credo is "to measure is to know." If you can't measure something, then either you're using the wrong instruments, or the phenomenon you're trying to measure doesn't exist. It would be hard to find an instrument that can measure a scalar wave, because the whole concept is itself a contradiction in terms.

MBR: So, does your understanding pretty much preclude any validity at all to these devices that use self-canceled magnetic or other fields in order to create an effect?

ER: When you take a measurement, you correlate an instrument reading with some kind of

phenomenon. In other words, there's a cause/effect relationship one would look for. I haven't seen that with any of these so-called scalar transmitters. In other words, I've never seen a transmitter that transmitted anything measurably different from standard fields. Some of them transmit standard fields that you can measure on standard instruments, but there's nothing correlated to an instrument that measures their unconventional output and validates it.

I think we have to distinguish between phenomena and the *description* of phenomena, or between experiment and theories. I hear a lot of people talking about concepts without any data to back them up. I see a tangent forming on this whole scalar idea. It doesn't seem to have any validity, in science—that is able to be measured in some fashion. Also I think there are a lot of hucksters involved, people selling widgets that don't do anything but make money for the person producing them.

On Glen Rein, Scalar Widgets and Lunar Green Cheese

MBR: So you are somewhat skeptical Glen Rein's measurements of scalar effects on living systems?

ER: Well, Glen's background is in biochemistry and mine is in physics. And I didn't see his experiment. I have not been in the lab with Glen, so I can't really evaluate whether there was an anomalous difference between his treated samples and his control samples. I have seen other experiments that have shown such

anomalous differences, so I do believe such results are possible. But I don't know about his lab technique, having never been in the lab with him. However, he has hooked into a description ["scalar output"] that I think probably

has very little to do with whatever effect he was looking at.

I don't know why he wants to explain his findings in terms of a theory with such big problems. I've told him this in quite a bit of detail and he's still talking in terms of scalars. I don't know why. If he's a good scientist he should research standard electromagnetics. But the last paper of his that I saw talks about time

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"Certain of the phenomena that I'm interested in studying would not be easily explained by normal electromagnetic theory."

"There might be a real phenomenon coming out of something that someone is calling scalar, and maybe we don't have the instruments to measure it."

STALKING THE WILD SCALAR: THE BIOELECTRIC INTERVIEWS

THE MEGABRAIN REPORT INTERVIEW WITH GLEN REIN

Glen Rein, Ph.D. will be familiar to readers of MEGABRAIN REPORT from his provocative and intriguing description (in "The Bioelectric Interviews," MBR #1) of his research involving the biological effects of non-hertzian or scalar fields—he found, among other things, that a pulsed scalar field dramatically stimulated the in vitro growth of lymphocytes or T cells. Glen obtained his doctorate in neurochemistry from the University of London, and is now conducting research into the biological effects of scalar or non-hertzian fields in his Quantum Biology Research Laboratory. Since some aspects of his work seem to be an empirical exploration of some of what Tom Bearden theorizes, and since Elizabeth Rauscher and Bill Van Bise discuss his work directly in the preceding pages of MBR, we asked Glen to comment on Bearden's MEGABRAIN REPORT interview and on the criticisms and ideas of Rauscher and Van Bise. Glen spoke with Michael Hutchison and Terry Patten.

GR: In the past it has been hard to understand some of Bearden's writings, particularly when he has been talking about virtual phenomena. In his interview with MEGABRAIN REPORT, he clarifies some of what has previously been confusing. For instance, he makes a big distinction between scalars as defined by mathematics and physics. A scalar, according to mathematics, is something that has a magnitude and no direc-

tion—that's the classical definition of a scalar. Here, he makes it clear that the definition he's using is completely different.

Because he uses the word, "scalar," this confuses people. He's been criticized by physicists for using the phrase "scalar wave," because as Elizabeth Rauscher rightly observes, it's an oxymoron. As soon as anything moves, as any wave must do, it has a direction, and then it's not a scalar anymore. But it's important to point out, in this new interview, he doesn't use the words "scalar wave."

Scalars, Bohm and "Active Information"

He sometimes calls this phenomenon a "scalar potential wave," which is a term for talking about quantum potentials. Quantum potentials are mathematical constructs that have been devised to explain some of the anomalies that have been observed in physics, such as the non-locality implied by Epstein-Pedowski-Rosen experiments. The "EPR paradox," as it is called, shows that

things in the universe can be connected instantaneously.

The physicist David Bohm developed his theory of "quantum potential" as having properties that could account for this non-locality. The quantum potential is more than just a mathematical construct. The quantum potential is a *more fundamental energy behind the electromagnetic field*. Aharnov and Bohm did an experiment where they showed that in the absence of all electromagnetic fields, the quantum potential can have macroscopic effects on the diffraction pattern obtained when

"What all these unified field theories are trying to do is bring a link between the world of consciousness, timelessness, and the 'real' physical world that we live in."

light waves interact with each other. Therefore the idea of quantum potential is something that does have experimental verification.

Free Energy, Parapsychology, Action at a Distance and Other Anomalies

The quantum potential already accounts for a lot of the quantum anomalies in quantum mechanics. But here, Bearden is suggesting a whole new

■ RAUSCHER *continued from p. 17*

reverse waves, which don't make sense on a macroscopic scale in physics either. The breakdown of time reversal variance has only been applied to particle physics. It does not have a counterpart that has been substantiated in the mainstream of science.

I think that if you're looking at something anomalous it's very important to tie that into the mainstream of science, and use those tools. What's it's like is measuring something you don't know what it is with an instrument you don't know how it works. If you're using a theory that means nothing to describe something you don't understand, you're going to come up with more confusion.

MBR: So you are not questioning whether Glen saw the phenomenon he describes but that he discusses the phenomenon in terms of scalar theory?

ER: Yes, I object to that strongly. If he's got something valid, he's discrediting himself by discussing it in that way.

Let's say this, there are things that I was initially very skeptical about that turned out to be true, with careful research. There are others that turned out to be false.

I would believe Glen Rein's experimental work less now than when I first talked to him a number of years ago, mainly because he's still invoking a theory that he's had ample evidence to re-examine. So I would be more critical if I see his concepts and theories being inaccurate, wondering what the experimental setup was. And I have asked him about his experimental setup, and he has not really described it to me. If he would describe the experiment in detail, I would be more likely to believe the experimental results, because he's able to give details of how I might replicate the experiment.

BVB: However, in all fairness, I should mention that Glen Rein brought a device to me which was supposed to be generating scalar waves, and scalars usually register as nothing, and I was able to measure actual magnetic field emissions from it. So that device happened to be real, doing something real, but they were not scalar waves. Those were magnetic field impulse waves that I was looking at.

MBR: Are you familiar with any of the scalar widgets, that are now on the market ranging from the Teslar watch to Peter Lindemann's generators?

ER: The few that we've looked at don't seem to emit anything. The Teslar watch seems to emit the oscillator frequency of a chip that's used in a normal watch.

BVB: As far as a real phenomenon, there *might* be a real phenomenon coming out of something that someone is calling scalar, and maybe we don't have the instruments to measure it. But until we do, it's like saying, "Well the moon really isn't made of green cheese," if you want to go back 2000 years ago, and you don't have a telescope to look at it. Or, more so, it could be like looking at the sun without a good telescope. You can look at the sun every day, but you are never going to see a sunspot or solar flare without some sort of optical instrument. Perhaps there's an instrument that hasn't been invented yet, something real that can measure phenomena that people are calling scalars. But I don't have one of those instruments and I haven't heard of one.



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dimension, an internal substructure which gives it even more unusual properties.

Now I might add that David Bohm himself has also added to the original concept of quantum potential, and he now believes that the quantum potential is composed of “active information” that guides and directs the quantum potential, which in turn guides and directs the quantum field, which then interacts with elementary particles like electrons. Bohm’s theory states that the quantum information is related to the form of the fields, not the magnitude of the fields. So the magnitude of the fields can be very, very weak but the active information can still affect the form. Thereby you can have action at a distance. So David Bohm’s concept of active information imparting form into matter is actually very similar to what Bearden is saying.

Bearden’s idea of adding a substructure to the quantum potential is not such a crazy idea. In fact, really, his whole theory is just based on the work of Whittaker and Bohm and using Maxwell’s quaternion theory. So he’s taken these three theories, put them all together, and extended these theories into the realm of just about everything. It is a unified theory. But then, of course, Pujarich has a unified field theory, Wing Pong has a unified field theory, and Bill Goth and Shackley have another unified theory of physics.

What all these theories are trying to do is bring a link between the world of consciousness, timelessness, and the “real” physical world that we live in. You could say that the timeless, consciousness domain is the domain of mind, and distinct from the world of brain or matter, which is the dimensional physical reality we live in. So you could say that these theories are looking at mechanisms to explain the mind/brain interface. Some people name that interface “consciousness,” some call it “the vacuum,” some call it “zero point energy,” some call it “quantum potential,” and Bearden calls it “scalar.”

The quantum potential as a theory probably has the most experimental data behind it. The way to put these many theories into perspective is to identify what they have in common, which is an interface between higher dimensions and our dimension.

The focus has been on exactly how information is brought down from the higher dimensions into our world and utilized. Of course that’s also where the whole matter of free energy devices

come in. One way to bring information down from higher dimensions into our own is through the brain, and the other major way to bring information down is through a greater-than-unity device, also called a “free energy” device, which, at least theoretically, translates energy from a higher dimension into our own ordinary reality. There are actual devices that apparently “break unity” consistently, and some of these machines definitely have anomalies associated with them.

It should be said that anomalies are at the origin of all of these theories. The Study for Scientific Exploration based out of Stanford is devoted to exploring these anomalies. You could consider cold fusion as an anomaly, because nobody can fully explain it. As I mentioned, the greater-than-unity devices, such as DiPalma’s Homopolar generators, are another example. The EPR paradox I mentioned is an anomaly because there’s no known energy that can explain the instantaneous interaction between electrons when they’re spatially separated by that distance.

And then, of course, there are anomalies in the field of parapsychology, such as psychokinesis and psychic healing, because these things occur at a distance independent of any known mechanism of action. And the Russian plasma tube device, the Rife device, the Preory device using the vacuum tubes. A number of the free energy devices use either a caduceus coil or a Möbius coil. Various other kinds of devices use plasma tubes, such as the Rife beam ray tube, which most of your readers will know about. It causes all kinds of anomalies, and you can measure very complex non-linear phenomena

going on inside it. Plasma physics is a very complicated subject, and I won’t try to address that here. The person who has summarized these things best is Moray King, who has written a very good book called *Tapping the Zero Point Energy* in which he surveys all of these different devices and various methods for doing this from the theoretical point of view.

These devices do exist, and there are anomalies associated with them. So then theories are offered to explain the anomalies. Bearden’s theory is one such theory.

MBR: And Elizabeth Rauscher. . .

GR: Instead of saying that there’s a structure inside the quantum potential, like Bearden and Bohm are saying, Elizabeth Rauscher says, we’re going to modify the quantum potential, transform

it mathematically into a higher dimension, using standard mathematical transform analysis. She takes a regular electromagnetic field and quantum potentials, and transforms both of these things mathematically into a higher dimensional model of reality—I think it’s an eight dimensional model—in which an information or longitudinal wave or non-hertzian wave can propagate. I think that Bearden would basically go along with her approach.

By virtue of calling it a wave, which cannot propagate in a four-dimensional space, there’s the tendency to develop an impossible construct (“scalar wave”). So one way to get around that is to say that it’s a wave by virtue of the fact that it’s moving, not in our four-dimensional space, but in *hyperspace*. Then it interacts with our four-dimensional space at some point, and we’re talking about energy from a higher dimension that interacts with our own reality—zero-point energy.

But Bearden/Bohm say, Let’s not transform it into a higher dimensional reality; instead, let’s look at the substructure within it. Theoretically speaking, this is perfectly valid. In fact there’s a lot of mathematics behind what these guys are saying. Now when Bearden talks about the substructuring, the internal order, the Whittaker structure—he gives it a lot of different names—he’s talking about virtual phenomena, and this is where it was a little bit confusing in the past, which I think he helped clarify in the MEGABRAIN REPORT interview.

What he’s saying is that this internal structure is composed of *virtual vectors*. He used to just leave out the word ‘virtual’ and just talk about vectors, and say that a scalar was composed of vectors. Well, that doesn’t make any sense, because a vector is a four-dimensional thing and a scalar—the way he is using scalar—is a higher dimensional thing. In other words, the quantum potential itself is not a higher dimensional thing, it’s four dimensional. But the substructure within it is a higher dimensional or virtual phenomenon. So he’s saying physically that it’s composed of virtual vectors—and you’ve got to give him credit, he’s characterized this internal structure pretty carefully.

The Structure of Scalars

MBR: Maybe you could characterize it in your own words.

GR: Physically it’s composed of virtual vectors. These virtual vectors cancel, but they are moving with respect to time. That internal movement gives it structure. But because that internal movement sums to zero, it therefore appears as if it is not moving. He calls it a stress field. He goes on to say

“All I’m doing is saying that this energy also has biological effects. I’m the first person to actually demonstrate that this energy, whatever it is, is biologically active.”

MEGABRAIN REPORT

STALKING THE WILD SCALAR: THE BIOELECTRIC INTERVIEWS (PART THREE) CONTINUED

that the energy is trapped by virtue of this summation to zero phenomenon. You can extrapolate and say that on a macroscopic level, not on a virtual level, the same kind of cancelling occurs in the Caduceus and Möbius coils.

Bill Van Bise, in his interview, talked about the voids in standing waves, the null points as being a self-cancellation phenomenon. So what some of us are doing is extrapolating from this concept of Bearden's of cancelling virtual vectors, and saying, What if you cancel real vectors? In fact Bearden quotes some scientific/mathematical papers that address the mathematics of cancelling real vectors.

One other thing to go back and say about his internal structuring. He's got these vectors that are cancelling. Now he also calls this an "infolded vector" or a "virtual vector substructure." "Bi-directional wave" is technically the word he uses. Now that's confusing. What he means by that is that each virtual vector has two components: one that moves in positive time and one that moves in negative time. The one that moves in negative time he calls a "time reversed replica." And the one that moves in positive time he actually calls an "electromagnetic vector," which is very confusing because it is still a virtual vector. But these two virtual components combine to make a scalar wave.

Testing Scalar Biological Effects

MBR: What bearing does this have on your own research?

GR: Elizabeth is saying that by introducing the obscure scalar concept and Bearden's unique interpretation of it to explain the phenomena behind the Caduceus coil, we're explaining an anomaly with an anomalous theory, which doesn't get us too far. That's why she's against my explanation of the coil I used in my so-called "scalar" experiment. She says that I'm barking up the wrong tree. But it isn't even my own idea that the caduceus coil generates this kind of energy. This is the theory that's being discussed in the literature. All I'm doing is saying that this energy also has biological effects. I'm the first person to actually demonstrate that this energy, *whatever* it is, is biologically active.

The whole focus of my research is to prove that the residual electromagnetic field that you get with these [caduceus or Möbius coil] devices

(because you never totally cancel the electromagnetics) is *not* ~~cancelled by the real world~~ sponge. And therefore I have developed methods for determining whether there is an energy above and beyond electromagnetic fields in terms of its biological effects. That's all I'm trying to do.

The interpretation of it, using Bearden's "crazy" theory, is not my idea, really. I am proposing, however, that cancelling the vectors in that way, creates a new energy. That's true. I am proposing that.

Now it's possible that this is not the case, that all that you do by cancelling them is to distort the electromagnetic fields and then you're getting the biological effects by virtue of this weird distorted electromagnetic field. Now Bill Van Bise and myself actually measured the residual electromagnetic field coming off of a caduceus coil, and

it is a very non-linear, complex electromagnetic field. We've done further experiments in that regard, and there are some other anomalies associated with it.

In his interview with you, Bill keeps saying that you cannot measure the scalar or non-hertzian component, which is quite true. He says, "just give me something I can measure. I've never

seen one of these devices that generates anything measurable." He's very much into measurement, which is good. So here we have something that we can measure. And we have measured it, and it has some anomalies associated with it.

Experimentally, Bill and I took the caduceus coil and a very sensitive magnetometer, which measured the residual electromagnetic field that was not cancelled. We got a particular spectrum. Then we put a piece of plastic in between the caduceus coil and the magnetometer. Traditionally an electromagnetic field *should* pass through the plastic unaltered. But what we measured on the other side of the plastic was a *completely different spectrum* than what we obtained when the plastic was present! Our interpretation of that was that the non-hertzian components were interacting with the plastic and generating new electromagnetic frequencies, which are then measured on the other side of the plastic by the magnetometer. Bill was quite stunned by that. He said that he'd never seen anything like it, and this was definitely an anomaly.

If these devices are in fact causing biological effects, then the question is what effects might

they have on the brain . . . or the megabrain [laughter].

Scalars and Brain, Mind, Memory, Unconscious, Soul and Spirit

In our last interview I said that I had done some preliminary work with the Teslar Watch with and without its Möbius coil and found that it was, in fact, capable of influencing the neurotransmitter function of nerve cells and tissue culture. When you added the Möbius coil there was a substantial increase in the biological effects. That indicates at least that there's some indication that this kind of energy interacts with the brain.

Bearden essentially says that what's happening is that these non-hertzian longitudinal scalar potential signals are not influencing the brain but the mind. And conventional electromagnetic fields that are used in electrostimulation devices affect the physical organ, the brain. This leads into the whole theory that Bearden has developed about the mind as a scalar interferometer.

Basically he's saying that there is a quantum potential in the realms of physics and mathematics, and in the realms of biology we have a biopotential. And this biopotential can exist at every level—at the atomic level, at the level of a quantum potential for a molecule, an overall quantum potential for a cell, an overall quantum potential for an organ, a body, an individual, and even for a species. Then of course he brings in Sheldrake's morphogenetic field. But the important concept is that *all of these quantum potentials are connected to each other by virtue of the scalar infolded virtual substructure*. That's a very important concept. *These quantum potentials communicate with each other*.

In the EPR paradox, you've got your two electrons separated, but there is an instantaneous energy that communicates. That's a non-locality concept in physics. So Bearden is extrapolating that non-locality, bringing it into the biological realm, and saying that, all biopotentials in the body communicate with each other. So you have an overall biopotential for a cell or for a person. He's saying that the mind, memory, thoughts, the unconscious, even the soul or the spirit, are composed of this structured quantum biopotential. And that thoughts are generated by fluctuations in the pattern of the biopotential.

Technically you could measure thought directly by measuring these fluctuations. What you'd have to do according to Bearden is take an EEG at time one and an EEG at time two, and then measure the change between the patterns, the Delta. He says that the change in the pattern

"According to Bearden, all of these quantum potentials are connected to each other by virtue of the scalar infolded virtual substructure. That's a very important concept. These quantum potentials communicate with each other."

contains within it an internal substructure. That's where the catch 22 is. You can get the Delta easily enough, but he says then you have to decompose it in order to obtain the internal scalar substructure.

MBR: Which would be an objectification of the thought itself.

GR: Exactly. He claims that Valerie Hunt has approached that. What she did was took EEG frequency spectra at a given point in time, and then time-delayed them by a fraction of a second, and superimposed the real-time spectra with the time-delayed spectra. What she got was what's called a chaos attractor in chaos theory. The attractor is a pattern within the chaos, and therefore it very well may represent the order within the chaos. And this order is what Bearden is calling the structure behind the quantum potential. It's also what David Bohm calls the implicate order behind the explicate order, the order within the active information, the higher dimensional substructure.

Broadcasting "Mind Control" Frequencies

In Bearden's definition you could measure the biopotential of the brain because that's four-dimensional. But the virtual substructure, which is unmeasurable, comprises the mind. Therefore, you can ultimately do mind control by broadcasting the right non-hertzian or scalar frequencies. So if you can generate that scalar information, you can change the mind, change the behavior—according to Bearden even *change the personality*—of an individual. But a conventional electromagnetic field won't do that. You need to work at the level of the underlying implicate higher dimensional substructure.

MBR: Which is the level of the mind itself.

GR: Right.

MBR: This would be a mechanical, or technological interaction with the domain of mind.

GR: Exactly. So now we're back to the original question: Can the machines that are out there do that? And he says that if you get the right information, you can do it by working with the substructure of the quantum potential.

MBR: The implication of Bearden's theory, then, is that we can build machines that can directly

interact with our thoughts, and even control them, or influence them in desirable or undesirable ways.

GR: Yes. As he mentioned, it could go either way. It's very powerful stuff, and the implications are enormous.

MBR: What is your opinion of this theory and its implications?

GR: I think that it's one of many theories. That's why I tried to outline some of the others. The idea of a quantum potential is a good theory, because it's got some good direct experimental evidence in quantum physics. The idea of substructuring or transforming the quantum potential to bring in higher dimensional components is attractive. I like that idea. We still need to look to the interface between the higher dimensional world and our own world.

Here you're talking pure theoretical physics and mathematics, and as a biologist I can't really comment on the validity of the mathematical treatment of the quantum potential to incorporate the virtual component. But intuitively it feels that these people are on the right track.

MBR: When you say "these people," speaking globally to include not just Bearden, but also Bohm and also maybe Elizabeth Rauscher?

GR: Definitely. The only thing that I would say about Bearden is that he wants to apply this mathematical, theoretical concept to everything in physics and biology and parapsychology and quantum physics and Einstein's theories and not only biology, but

medicine, and psychology. So it's a pretty ambitious attempt. As a theory at the quantum level, it's great. To infer that it has all of these macroscopic manifestations is still pretty speculative.

MBR: So, at the level of your own work as an experimental biologist, you've seen a phenomenon that is accounted for reasonably well by Bearden's theory. . .

GR: No, I can't even say that. All I can say is that I have a phenomenon. You can't call the biological response an anomaly because there are so many other things that will cause biological responses. What is an anomaly is the fact that there seems to be new energy that can be modulated by barriers, like plastic, that can be stored in water for long periods of time, like in homeopathy.

Naturally, Bearden addresses that as well. He talks about hydrogen bonding when he talks about

hydroencephaly. This is another example of a piece of evidence that the thoughts, the consciousness, and subconsciousness of the individual don't reside in the brain. The normally functioning hydroencephalocoele whose brain is 95% water and 5% brain, demonstrates by inference that the consciousness resides in the water, and that the mind and the virtual substructure, higher-dimensional reality resides in the water.

When Bearden describes that he uses a different term instead of quantum potential or biopotential. He calls it the *neopotential*, and he's saying that the hydrogen bonding between water molecules forms a substructure, which he calls the neopotential. And he says that the substructure within this neopotential acts as a transmitter and receiver of information. That way it acts just like a brain, and it can communicate this information to the 5% of the physical brain that's present, which is enough to link it to the physical body so the individual can function normally.

Re-Engineering Reality

Bearden's idea about the neopotential order and the information stored within the substructure could explain an interaction between the energies generated by the caduceus coil and the substructure. Bearden is saying that this substructure exists, and it can be changed or "engineered" in his words. To engineer it you need a non-hertzian or scalar potential; it cannot be done with conventional electromagnetic fields.

In one of my experiments, I generated this new energy from a machine and (according to the theory) affected the substructure of the water, causing a subsequent biological effect. I found that water treated in this way can be made to be biologically active, and that the effect can be reversed. By virtue of the fact that I can do that, I am supporting his case.

This experiment may be the first example of how we can engineer the substructure in the "neopotential" of the water. One of the experiments that we did with Ted Gagnon was to structure the water with one set of frequencies and then show that that particular set of frequencies stimulated the growth of the cell culture. We then took that same water and restructured it, or in Bearden's terms, re-engineered it, and we added a second set of frequencies. And that second set of frequencies caused the cell growth to be inhibited. So we were able to reverse or re-engineer the substructure.

To my way of thinking that provides some experimental evidence generally supporting Bearden, because conventional electromagnetic fields won't do that.



MEGABRAIN REPORT

THE NEW SCIENCE OF BRAIN GROWTH & IQ IMPROVEMENT

Intelligence and Giftedness: The Contributions of Heredity and Early Environment

by Miles D. Storfer

© 1990 Jossey-Bass Inc., San Francisco
Hardbound 636pp \$35.00

Enriching Heredity: The Impact of the Environment on the Anatomy of the Brain

by Marian Cleaves Diamond

© 1988 The Free Press, New York
Hardbound 191pp \$24.95

Reviewed by Terry Patten

An important new theory of intelligence? Groundbreaking evidence that brains actually spring new connections and increase in size? If you're interested in the science of intelligence, or just in increasing your own (or your children's) IQ or brain size (or both) two "definitive sourcebooks" have arrived.

Both Marian Diamond and Miles Storfer are highly-respected experts in their fields. She is "the woman who measured Einstein's brain," the researcher who rewrote the book on brain physiology by doing *accurate measurements* of brain anatomy. Her work startled the world when she began showing that laboratory mice exposed to "enriched environments" not only performed better on intelligence tests than their deprived cousins, but actually grew new brain cells, extra neuronal pathways, and heavier brains! He, with the publication of this book, becomes a formidable theorist of human intelligence. *Intelligence and Giftedness* offers a rigorous and insightful review of the whole field of intelligence research, culminating with a new theory that describes a fascinating interplay of hereditary and environmental factors.

[Those familiar with Michael Hutchison's writings are already well aware of the importance of Marian Diamond's researches. Readers of *Megabrain* will remember learning about Diamond's groundbreaking work documenting the effects of brain stimulation on brain anatomy in rats, and we have followed her more recent research in MEGABRAIN REPORT. (See Vol 1, No 1 "Research Update.")]



Marian Diamond is not only a brilliant researcher, but she writes well, with an engaging, commonsense voice. *Enriching Heredity* recapitulates a long series of sophisticated measurements of brain anatomy, but in a fashion that

remains clear and readable, despite the complexity of the hypotheses, experiments, and findings she describes. She begins by contextualizing her work in terms of the ageless "nature-nurture" controversy over human behavior. She proceeds to assert her central thesis: that the environment has an important role in shaping brain structure, and she reviews the history of this idea in modern science, tracing it back to 1815, and through a distinguished lineage that includes Spurzheim and Darwin.

From there she goes on to describe her own extensive work on brain measurement. She introduces herself by describing a thoughtful challenge from Roger Sperry, the Nobel laureate from California Institute of Technology, who had said to her, "Marian, all you are doing with your enriched environments is stimulating the maturation of the cortex." This provoked her to go through a painstaking series of experiments in which she measured the anatomical changes that take place throughout the lifespan of male and female rats, raised in and out of enriched environments. Only by establishing a baseline for developmental changes could her variations between individuals be contextualized in a way that ruled out Sperry's challenge.

But, obviously, Diamond has been no mere data-gatherer, establishing baselines for bolder thinkers to use creatively. In fact, she has set the scientific community abuzz with groundbreaking work—which proves that enriched environments stimulate brain growth and increased cortical weight and thickness, as well as higher levels of acetylcholinesterase and other crucial brain chemicals. She has shown that these changes take place throughout the lifespan of laboratory mice, an observation that may apply equally to human beings. Her studies show that even severely deprived brains benefit from stimulation, even late in lifespan. And she has even demonstrated similar brain-growth evidence in rats who were raised in negatively-ionized environments, as contrasted with rats raised in "normal" non-ionized indoor air environments.

In her conclusion, Diamond cites as "the single most valuable piece of information" to emerge from her studies, the finding that *increased stimulation at any age results in structural cortical growth*. However, she notes, "it is essential not to force a continuous stream of information into the developing brain but to allow for periods

of consolidation and assimilation in between." And she identifies important questions yet to be answered, such as the effects of "too much" brain stimulation, or the possibility of a "ceiling" effect, in which a limit on environmentally-stimulated brain growth is reached, beyond which no further expansion will take place.

She also suggests that "enriched environments" may vary widely, from interaction with objects to obtaining information, to working with creative ideas. Even before this next generation of questions is answered, Diamond's work has clearly established "the plasticity of our cerebral cortex." She concludes her book by calling for efforts "to work towards enriching heredity through enriching the environment... for everyone... at any age."

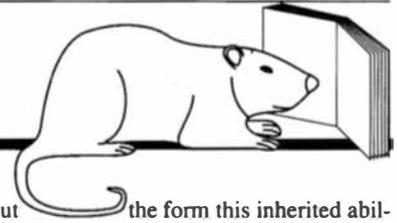
For those of us exploring the possibilities of using brain machines to provide "enriched environments" and increased or optimal levels of brain stimulation, this book is not only a fascinating summary of scientific research and theory, but a unique and invaluable practical guide to action and self-experimentation.



If you've ever wanted to test your hunches about what environmental or hereditary factors make people smarter, then read *Intelligence and Giftedness* by Miles Storfer. Here you can review the evidence of dozens of intelligence studies and consider a strikingly precise analysis of the effects upon intelligence of both environmental and genetic factors.

Reviewing the actual data contained in this book was a riveting experience: study after study compared identical twins and other siblings, raised together and apart, first, second, third, and fourth-born children, children of fathers, then mothers, with varying IQs, correspondences of IQ between parents and natural vs adopted children. The data analysis is detailed, creative, and revealing. Storfer explores the relative bearing of maternal and paternal IQ upon offspring IQs, the comparative impact of low birthweight upon IQ, then looks at that within comparisons of blacks and whites, then subtracts out nonracial factors as he considers the racial variances between IQ scores, then he turns attention to factors which may contribute to the dramatic upward trend in overall IQ scores over the past century. This review only skims the surface; Storfer's analysis is broad, fascinating, and deep.

Her "single most valuable piece of information": increased stimulation at any age results in structural cortical growth



Perhaps the most useful sections deal with early childhood environmental factors that have been proven to stimulate high IQ scores. Storfer offers a thorough and probing analysis of early childhood environments among Jewish and Japanese families and traces factors that may contribute to the elevated IQ levels of these particular groups. He probes further into methodologies for specifically raising children's IQs, including the dramatically successful methods of William Fowler (whose forthcoming *Talking in Infancy: How to Nurture and Cultivate Early Language Development* may be another extremely important contribution to our consideration of intelligence, specifically, what represents an "enriched environment" for stimulating the intelligence of human beings).

Storfer reviews the evidence linking high intelligence with allergies, left-handedness, and nearsightedness. He offers a fascinating theory to explain these links: the "Cholinergic Recruitment Theory." He suggests that the brain produces a limited supply of a key acetylcholine-making enzyme (ChAT) "and that a well-above-average level of *cholinergic activity* by some cell networks results in a somewhat smaller allocation of ChAT to the remainder of the cholinergic system." In short, smart people "use up" more of their brain's limited capacity with cognitive functions, redirecting brain capacity away from the analysis of scents and from

a reliance on holistic mechanisms for analyzing and responding to the external world. Since allergies and myopia are associated with deficits in the workings of the cells responsible for the analysis of incoming sensory stimuli, the cognitive demands placed on the brain increases the likelihood of analytical deficits in the olfactory-analysis system, with consequent increases in likelihood of myopia and allergies (especially pollen or food [olfactory-related] allergies).

Storfer further speculates that the cells responsible for encoding and transmitting images in the portion of the visual field disrupted in myopia have been recruited to facilitate linguistically related shape analysis essential to reading and abstract information-processing. So the nearsighted, allergic egghead may be not just a stereotype, and not just a statistical reality, but an inevitable by-product of the limits of the human brain's cholinergic capacity.

By far the most ambitious component of Storfer's work is his new theory of evolution, "The Adaptive Evolution of Intelligence." This is a formidable thesis backed by careful analysis of data and logical weighing of hereditary and environmental influences. He sees the beneficial impact of environment occurring primarily during critical early childhood periods. This, in turn, can be passed down *by males* to their offspring. These offspring are born with an improved ability to take advantage of their own early stimula-

tion. But the form this inherited ability takes is in the way inherited genes are expressed, rather than by an alteration of actual genetic material. Women, on the other hand, are born with all their ova already formed, so they cannot transmit their own gains. Instead, they boost their child's intelligence through mother-child intimacy and stimulation. Thus, on balance, the contribution of the parents to the intelligence of the child is usually about equal: the father's influence primarily genetic, and the mother's environmental.

Worth noting: Storfer includes a detailed, albeit speculative, justification for his apparently Lamarckian thinking, analyzing various types of evidence for chemical modification of genetic information by factors which can be related to increases of intelligence during a lifetime.

Storfer's consideration moves ahead energetically, despite his scrupulous attention to detail throughout the 600 plus pages of *Intelligence and Giftedness*. This review only scratches the surface of his consideration, which is highly recommended to anyone seriously interested in intelligence, intelligence-boosting, or the interplay of hereditary and environmental factors in human growth, change, and evolution.



ROLL YOUR OWN, REVISITED: CORRECTIONS IN THE SCHEMATIC FOR A PULSED SCALAR FIELD GENERATOR

Many MBR readers have pointed out that our "Roll Your Own: Schematic for Peter Lindemann's Centron Pulsed Scalar Field Generator" in MBR #2 (pp. 34-5) contains several errors. We spoke with Peter Lindemann, and he sent us along corrections as well as a few additions to the article. Writes Peter:

"In the 'Parts List,' $R_2 = 22.4K$, NOT 224K. Also, the resistor values for the various pulse rates 1 Hz - 18 Hz must be *inverted* so that the slow pulse values have the large resistances (i.e. 1 Hz = 1.4 M) and the fast pulse values have the small resistances (i.e. 18 Hz = 15.0 K). Other than this inversion, the values are correct.

"Many people quickly realize that the components are not available at Radio Shack. They are all available from mail order supply houses like: DIGI-KEY CORP., 701 BROOKS AVE. SOUTH, P.O. BOX 667, THIEF RIVER

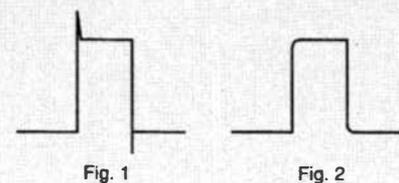
FALLS, MN 56701-0677. They should get a current catalog and order the parts by catalog number. Digi-Key will send the parts UPS-COD.

"The final addition that should be made is to use 'silver bearing solder' (96% tin, 4% silver) when wiring the unit. *Use no lead-based solders at all.*

"Many people with a background in electronics may look at the schematic and say to themselves that there are some parts in this design that are not needed. I say that they are all needed, and it illustrates the difference in engineering for simple *electronic* effects and the finer art of engineering for *psychotronic* effects. Parts C_1 , D_1 , and C_3 , are most often mentioned as being unneeded.

"The benefit derived from adding these parts can easily be seen when viewing the waveform generated by this oscillator on an oscilloscope.

The wave shape without these parts looks like fig. 1, while the wave shape generated with these parts included looks like fig. 2.



"The elimination of the transition 'spikes' at the leading and trailing edges of the pulse and replacing them with a small rounded shape creates a 'smooth' feeling from the device instead of a subliminal harshness. The elimination of lead-based solders further refines the effect. Avoiding aluminum in case selection completes these refinements."

BRAIN TECH BREAKTHROUGHS IN TREATING LEARNING DISORDERS

Several years ago I received some calls and letters from a man in the middle west who suffered from a severe learning disorder. He asked if he could come to the coast and work with me at Megabrain—he told me he'd do just about anything to get a chance to try out some of the brain machines, on the off-chance something might be able to help him. Touched by his willingness to give up everything and relocate in a strange city in hopes of, as he put it, "getting smarter," I invited him to come out.

For the first few months the man I'll call "Bill" was a dedicated worker, a good-hearted, warm and loving person, but it was clear he had severe problems: a low IQ, difficulties in reading, writing and expressing himself, and such a lack of self-esteem that he was always apologizing in advance for any mistakes he might make, telling me how he wasn't sure he could do a certain task, how he was afraid he might screw it up.

Among the heap the academic journals I'd been reading I recalled some studies in which psychologists had used biofeedback to treat learning disorders. Basing their work on discoveries by neuroscientists that certain learning disorders (specifically Attention Deficit Disorder [ADD], known commonly as Hyperactivity) were linked to abnormally slow brainwave activity in specific parts of the brain, including the premotor cortex and the superior prefrontal cortex, which are used when people pay attention or keep still, these therapists had used biofeedback EEG to teach their ADD-Hyperactive subjects to speed up their brainwave activity into the beta range (over 14 Hz). The results had been impressive: average increases in IQ of 12 to 20 points or more. One subject had showed an IQ increase of an astounding 33 points as a result of using biofeedback to speed up his brainwave activity.

Curious, I hooked Bill up to a Neurosearch 24—a 24 electrode brainmapping EEG that provides you with a color topographic map of brain activity. As the EEG was running, I instructed Bill to perform different tasks: do a mathematical calculation, read a passage from a book, recite a poem, visualize himself running, and much more. As the topographic maps rolled across the computer monitor I was astonished: virtually all of Bill's brainwave activity was in the theta range (4-8 Hz), with some in the slower

delta range, present in deep sleep or coma, and with some in alpha; there was no activity at all in the beta range, none above about 10 Hz. Here was a clear case of learning disorder; no wonder Bill had such a hard time reading, writing and expressing himself—he was in a semi-comatose state all the time.

I had to leave the next day for a month and a half long trip to Europe, but I asked Bill to try doing a one hour session each day on one of our light/sound machines at a frequency of 18 to 25 Hz or greater. I also asked him to make regular use of one of our CES devices, since I had recently read a study by a CES researcher in

Texas, Dr. Alan Childs (executive medical director of the Healthcare Rehabilitation Center and assistant professor of pharmacy at the University of Texas, Austin), who had used CES to treat patients who were suffering from "attention-to-task deficit" as a result of head injury. After three weeks he had found the patients showed "striking and significant improvement in the post treatment scores," in such areas as mental speed, visuomotor functioning, impulse control, visual and auditory perception, mental control and concentration and much more. Childs had also used CES to treat patients suffering from short-term memory disorder and amnesia as a result of traumatic head injuries, and had great success in restoring memory.

Bill assured me that he would make regular use of both the light/sound machine and the CES. When I returned six weeks later, Bill was a completely transformed person. He was now reading and writing rapidly and confidently. What was more striking,

he was now filled with self-assurance, and his voice had changed from a tremulous timid semi-whisper to a resonant baritone. He was now taking charge of certain aspects of the office business, and making suggestions about how we could operate more efficiently. I began finding Post-It notes pasted all over the place with messages from Bill containing suggestions for

new undertakings, keen observations and funny jokes.

Sadly, Bill was suddenly called back to his home in the midwest due to an illness in the family—the family where he had been so bitterly unhappy. I insisted he take a CES device and light/sound machine with him. Several months later he called, and I could hear by his voice that

he was slipping back into his old and in his words "stupid" self. He was not using the machines, his family didn't approve. I got a Christmas card from him some months later. I haven't heard from him for a long time now, and I fear I won't hear any more. If you're out there

reading this Bill, get in touch. We miss you.

The scientists found that light/sound stimulation at beta frequencies improved the cognitive functioning of attention deficit disorder hyperactive children.

One subject had showed an IQ increase of an astounding 33 points as a result of using biofeedback to speed up his brainwave activity.

That was my introduction to Learning Disabilities, and the possibilities of treating these disabilities with brain technology. In recent months there seems to have been increasing interest and research in this area. In the wake of the biofeedback studies I mentioned above, several researchers have suspected, like I did in the case of Bill, that brainwave entrainment in beta frequencies using light/sound devices might be a more rapid way to achieve these sharp increases in IQ than the multiple training sessions and frequent visits to the doctor's office required by traditional EEG biofeedback training. Harold Russell, Ph.D. and John Carter, Ph.D., for example, presented some preliminary research at the 1991 annual Association of Psychophysiology and Biofeedback conference suggesting that attention deficit disorder can be treated by photic stimulation brainwave entrainment. They found that light/sound stimulation at beta frequencies (18-21 Hz) improved the cognitive functioning of ADD hyperactive children. (Those who showed a greater than 10 point difference between their Verbal and Performance scores of the WAIS IQ test could improve their IQ significantly following stimulation of the brain hemisphere that performed worst: i.e. students with a lower Verbal score were given stimulation with beta frequencies over the left hemisphere, and improved their Verbal scores significantly; those with lower Performance scores would receive light/sound stimulation of the right hemisphere, and again improved their Performance scores significantly.)

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They and others are now interested in exploring the effects of goggles in which the light bulbs are placed around the eye, leaving an open visual field, so that subjects suffering from learning disorders can wear the goggles, and be exposed to the beta-frequency flickering lights, as they read, work, and go about their daily activities.

Colored Lights Used for Learning Disabilities

Another recently completed (12/91) study of the effects of photic stimulation—in this case colored light stimulation—has produced exciting results. Carol J. Rustigan, a Learning Disability Specialist at California State University, Sacramento summarizes her work in a paper called “The Effects of Colored Lights and Relaxation Exercises on Learning Disabled Adults’ Visual and Learning Skills.” Rustigan compared the effects for 17 learning disabled adults of 20 sessions of listening to relaxation tapes (control group) with 20 sessions on a Lumatron (experimental group). The Lumatron, developed by Dr. John Downing, is based on the theory that light stimulation of the optic nerve sends stimulation not only to the visual cortex but also to many other brain centers, including the hypothalamus, the brain’s master controller, and thus has profound effects on physical and emotional well-being.

Rustigan was aware of past research linking learning disorders with vision problems and treatment of learning disorders with visual stimulation (including work by Jacob Lieberman showing that learning disabled children and adults significantly benefited from colored light [Syntonic] therapy, in the areas of memory, visual field expansion and reading skills—Lieberman’s book *Light: Medicine of the Future* is reviewed elsewhere in this issue of MBR). She had done preliminary research herself indicating that colored light therapy could have significant effects in the treatment of learning disabilities (1989-90). But many of her subjects in this pilot study had commented upon how relaxing the colored lights sessions had been. The question was raised as to whether it was the colored lights or the relaxation that had produced the dramatic improvements in learning. So Rustigan designed this study so that there would be a direct compar-

son of the effects of relaxation exercises with the effects of colored lights stimulation.

All her subjects had learning disabilities, including visual stress symptoms when reading, a slower than normal reading rate, and retention difficulties. The subjects were randomly divided into a relaxation exercise group and a Lumatron group after having taken tests in reading (Nelson Denny Reading Tests) that measured both vocabulary and comprehension; tests in auditory memory (Wechsler Memory Scales including tests for Logical Memory [measured immediate recall of logical material presented orally], Memory Span and Associate Learning); and several tests for visual acuity. Both groups had 20 sessions—one group 20 sessions of listening to relaxation tapes, the other 20 sessions on the Lumatron.

The results were clear. In the reading tests, the colored lights group showed a significant increase in the number of answers attempted (on both the Vocabulary and Comprehension test), which demonstrated substantial gains in that group’s reading rate. The colored lights group also showed significant increases in the number of Comprehension questions they answered correctly, implying that their comprehension skills

Subjects treated with colored light photic stimulation showed “gains in reading rate, reading comprehension, and auditory memory.”

increased concurrently with their faster reading rate. The colored lights group also showed significant increases in the auditory processing of information, including increases in auditory retention skills on the Wechsler Memory Scale (Logical Memory), which supports the findings of Lieberman and Downing that the benefits of this type of photic stimulation therapy are not limited to visual perception. The relaxation group, on the other hand, showed no significant changes at all on any of the scales.

“It is possible,” Rustigan observes, “that an increase in the number of light sessions . . . would have yielded even greater research results. Lumatron practitioners generally have prescribed up to 60+ colored lights sessions (with music) . . . Since many learning disabled adults have responded favorably to multisensory input, future studies designed to study the effects of colored lights combined with relaxation exercises or music could be very beneficial.” Rustigan concludes that “The results of this research study determined that the effects of colored lights

significantly benefited learning disabled adults. Documented gains in reading rate, reading comprehension, and auditory memory skills carry promising implications for learning disabled adults confronted with inhibitive visual, reading, and retention difficulties.”

Nootropic Drugs and Learning Disorders

Several studies of cognition-enhancing drugs have recently come to my attention that lead me to believe certain of these substances may have great benefits for ADD sufferers. A German journal of psychopharmacology has reported that the effects of *Piracetam* on the EEG spectra of boys with learning disorders was compared with the effects of a placebo in a double-blind study. Intriguingly, “piracetam caused a decrease in the amount of delta activity and an increase in the average EEG frequency.” By speeding up brainwave activity and decreasing delta activity, the drug should increase alertness, concentration and learning among the learning disabled.

In a recent double-blind placebo-controlled study in Pakistan, researchers compared the effects of another “smart drug,” Hydergine, with a placebo on improving cognitive functions and behavioral symptoms associated with learning disorders in children. They found that the Hydergine group showed significant improvement in speech (acquisition of new words, comprehensibility/meaningfulness of speech), sociability, attention/concentration, comprehension and memory. They also showed improvement in behavior (emotional lability and cooperativeness).

(For more about Piracetam and Hydergine, see “Cognition Enhancing Drugs and Peak Performance Pills in MBR #1)

—Michael Hutchison

(Ed. note: Look for More Light, an upcoming issue of Megabrain Report that focuses on light technology, including an exploration of the Lumatron and recent light research, as well as illuminating discussions with Jacob Lieberman, John Downing and John Ott, and a Consumers Guide to Light Technology.)



ACOUSTIC FIELD GENERATORS: THE ULTIMATE CONSCIOUSNESS

by Terry Patten

[This article is an introduction and foretaste of a much longer, in-depth discussion of the new Acoustic Field Generators scheduled for publication in the next issue of MEGABRAIN REPORT.]

As the volume goes up, not only does the music fill her ears, but it seems to envelop her whole body. With each exhalation, she relaxes even more profoundly, and the music seems to resonate more and more deeply, until she feels as though her body and mind are themselves vibrating every note. At first it is sensuous, a sonic massage, and fun, like a 21st century amusement-park ride. But as the session goes on, she begins to swoon, feeling long-forgotten emotions as she is transported by this all-consuming whole-body "trip." She is alternately swept up by the sensation and pleasure and then awestruck by the profundity of her own deep feelings, goosebumps zinging up her spine and shoulders, followed by a wave of profound surrender. Finally, after a half-hour of moving experiences while listening to nature sounds, rock & roll, new age and classical music, during the final crescendo of Pavarotti's trademark "Nessun Dorma," she begins crying uncontrollably. As she gets off the table, she says, "It's so wonderful, even sexual, and yet deeply moving. You know, I haven't let myself feel this deeply in so long!"

A new category of large, powerful consciousness-expanding tools are built upon a simple observation: vibrating the body with music is powerful medicine!

ACOUSTIC FIELD GENERATORS range in price from \$3,000 to \$65,000. Some incorporate relatively few frills—being essentially massage tables with a series of speakers built into them. Others incorporate extremely sophisticated additional features. These range from deluxe computer-assisted units that incorporate neural-network-moderated biofeedback to maximize relaxation to beds that are accompanied by a full audio console, incorporating sound-and-light goggles, programmed for entrainment and modulation by the music (allowing you to "see" the music while you are hearing and feeling it throughout your body). Some transmit the music through fairly ordinary speakers. Others have super-powerful subwoofers capable of producing tones that vibrate the body well below the lowest bass threshold of human hearing. Several incorporate impressive state-of-the-art sound

systems including CD players, synthesizers, and elaborate signal-processors.

Researchers and practitioners who use these devices with clients report extremely powerful results. In the interviews I have conducted, I have been repeatedly heard phrases like "life-changing catharsis" and "uncontrollable sobbing." One of these units (the Vibrasound) was in the Megabrain office for over a year, during which time the scores of people who used it maintained a uniformly high estimation of the experience. And personally, my own experiences have been powerful and impressive. The testimonials have even compared acoustic-field induced experiences (favorably!) to such powerful experiences as sexual intercourse, or having one's "mind blown" during the sixties while listening to music stoned. Other particularly impressive anecdotes were several reports of users spontaneously re-experiencing primal birth trauma on the sound table and one report of a curiosity-seeker at a trade show being suddenly transported into an out-of-body-experience.

Spine-Tingling Thrills and Endorphins

If you search the scientific literature, you'll discover a biochemical basis for reports of musically-induced euphoria. It is on this basis that they have found their way into hospitals and biofeedback facilities for use in pain control and stress reduction. As of January 1992, Dr. George Fritz has conducted over 3000 sessions on several such devices (primarily the Genesis and Betar units) and he has found them highly effective in clinical pain control applications. By what mechanism? Perhaps heightened endorphin production stimulated by thrilling musical experiences controls the pain biochemically. Fritz cites a study conducted by Dr. Avram Goldstein, a prominent endorphin researcher, known for having connected laughter to increased endorphin levels. In an article titled "Thrills in Response to Music & Other Stimuli" (for a summary description of this study see *Megabrain: New Tools and Techniques for Brain Growth and Mind Expansion* Updated and Revised Edition, page 146) he reported on research which demonstrated that the experience of "spine-tingling thrills" when listening to music is directly connected to increased endorphin levels.

The mechanism for such powerful effects may be evident in our physiology as well. Dr. Jeffrey Thompson is an innovative sound researcher and musician and a longtime user of the

Somatron. He points out, "A huge section of the brainstem and nervous system is devoted to sensing and processing vibration. The spinal cord is composed of nerve bundles carrying different kinds of sensation such as heat and cold, pain, pressure, vibration, etc. Two entire columns sense vibration and take up almost the whole posterior half of the spinal cord. Large portions of the deep, primitive portions of the brain near the brainstem are devoted to vibration-processing. So when you are lying on a sound table, powerful emotional information, in the form of musical vibrations, gets processed right in the part of the brain where our most deep-seated emotional programs reside. This is one reason sound tables produce such powerful effects."

Clearly, the hardware doesn't produce these results without software. Everyone who works with these tables emphasizes this point: music itself is not neutral input; in fact, it is powerful emotional medicine. It seems to be doubly powerful when you can feel it resonate throughout your body. Well-chosen musical or other sound selections and a skillful practitioner seem to be essential. I have heard of people vibrating especially powerfully to certain subconsciously recognizable sounds and tones as well as music itself. Since these "sound tables" seem to magnify the emotional dimension of musical experience to an extreme degree, they provide a new panorama of direct empirical information to investigators who want to learn about the particular effects of certain sounds, tones or music.

This new emphasis on the physical aspects of sound is not surfacing only in the field of consciousness technology. Popular music (especially rap and techno) are increasingly "sculpted for maximum impact. Never mind the ears, go for the innards." In a recent article in *Newsweek* (January 27, 1992) John Leland explored the impacts of technology on popular music, stressing the importance of "the way music feels hitting your skin, palpating your organs." Leland sees bass-boosted car stereos and the exaggerated clarity and separation of CD players engendering "a fetish for texture" and "sound that pounds," profoundly influencing the language and emphasis of new popular music.

In fact, a well-funded Japanese corporation, Body Sonic, manufactures a whole range of products that exploit the power of physical vibration on human beings. In addition to vibrating dance floors, Body Sonics makes theatre seats that envelop the listener with sound, even bringing the rumble to you through your legs and back.

ACHINES?

Perhaps their most remarkable products are elaborate sound-powered vibrating beds found primarily in Japan at "Love Hotels." [Married couples in Japan frequently find privacy for lovemaking away from their small, crowded apartments. The hotels that cater to their needs are not tainted by the illicit and sleazy connotations of such establishments in America. The amount of money spent on such recreation has produced a market for elaborate, aesthetically-refined environments for private trysts.] Body Sonic's beds—some of which I have been told are equipped not only with vibration, but with dual headphones and even flashing-light goggles) may be bringing overwhelming new powers of stimulation to what was once the most private dimension of experience.

This article, however is intended to introduce Acoustic Field Generators as consciousness tools. Below, I briefly describe several Acoustic Field Generators currently available. The information contained here has been obtained from a variety of sources, including the manufacturers. Note that these summaries do not criticize the theories of operation. Also note that the theories and technologies have not been independently verified. Readers should bear in mind that all of these devices have gone through—and continue to go through—many generations of upgrades and improvements. Except where otherwise indicated, what I describe here is, in my understanding, the state-of-the-art version of each device.

The Genesis

Probably the first (in its earliest models it was called "The Cotyledon") and certainly one of the most top-of-the-line Acoustic Field Generator devices, the Genesis consists of a table suspended from a geometric cube octahedron frame including a super subwoofer capable of extremely low frequencies below the range of human hearing. It is powered by an elaborate and complete high-quality audio console.

One of its unique features, which its developer, Michael Bradford, regards as central to its effects, is its "biostatic field biofeedback" capacities. Eight sensors are placed under the mat on which the client/subject lies. Half of these are analog, half are digital. Analog neural networks (sophisticated computer circuits capable of a simple form of learning from experience) process these signals and then they pass into a computer contained in the console that controls a digital signal processor capable of modifying

the sound signal in a wide variety of different manners (volume, EQ, separation, reverb, etc.) What results is a machine that can teach itself to support maximum levels of relaxation and opening.

The Genesis user is not only enveloped in sound, but also lying at the maximum energy point of a large pyramid-like geometrical form that focuses energy. As the user relaxes, the sound changes. It may become fuller, louder, deeper or softer. As the neural networks acquire sufficient feedback to "learn" from the changes noticed by the sensors in your body's energy field, you get on a self-reinforcing feedback loop, in which the more you relax, the more the music helps you relax, until you reach profound states of openness and expansion. Even beyond its applications for stress and pain control, Bradford believes the Genesis is a tool for consciousness-expansion.

Originally \$56-68,000, the Genesis is now available for less than \$25,000. (Cheap!)

The Betar

BETAR stands for "Bio-Energetic Transduction Aided Resonance." Available in various versions, ranging from a fairly simple unit, the "Baby Betar," to the full computerized "Betar Grande Salon," these devices were developed by Peter Kelly (and according to rumor, recently improved with some help from Eldon and Jeff Byrd). The full Betar consists of a geodesic dome structure from which a naugahyde-covered table is suspended. In the table are 12 strategically-placed transducers, supplying sound vibrations to the whole body.

Two sensors on either side of the head measure changes in the (electrical? magnetic?) fields surrounding the head and supply data to a feature that is unique with the Betar—a simulated magneto-EEG. The computer allows storage of session data and intuitive visual display (modelled after the Mind Mirror) of activity between 4 and 16 cycles per second. Without having received a detailed description of how this works, I have been told by clinicians who have used the device that the changes in the display in general appear to correspond fairly accurately with the user's observable and subjective shifts.

Beyond that, the Betar units contain esoteric circuitry. This primarily works to time-reverse the sound waves, using "phase conjugate wave" technology essential in the field of nonlinear optics. Kelly writes, "Inputs of opposing complex sound waves produce a variety of standing

scalar sound waves in the body tissues." Kelly's complex rationale will be discussed in our fuller, later article, but his bottom line is that his circuitry changes the sound to which the body is exposed, resulting in profound physical release of stress at all levels. Kelly writes, "The mechanism is one hundred percent efficient, specifically targets stress, reaches the deepest and most minute levels of the body, and possesses an automatic self-regulation mechanism to prevent any harm to the tissues."

Additionally, the Betar is equipped with an elaborate sound console, allowing the operator to mix sound from several sources, including CDs, cassettes, and synthesizer. Models range from \$4,200 to \$45,000.

The Vibrasound

This device contains two unique innovations: A waterbed-like "sound table" and sophisticated visual stimulation using a MindsEye Plus Sound and Light machine.

Instead of communicating the sound to the body via speakers imbedded in a cushioned table or bed, the Vibrasound uses a waterbed-like surface filled with a colloidal suspension. This liquid is thicker than water and its sound-propagating properties are similar to those of the soft tissue within the human body. This liquid is vibrated by powerful transducers capable of outputting subaudible signals as deep as 1 Hz. This achieves an effect in which the vibration of the body is *generalized* as a continuous experience across the whole underside of the body. There is no true stereo separation, but there is tremendous contact with the sound. Extra transducers placed on the belly and soles of the feet can involve even more of the body's surface in the experience.

The result is powerful and comprehensive: While wearing top-quality headphones with six transducers, listening to music processed through a super-high quality audio console, while feeling that music tingling the whole underside of the body, the user is also wearing top-quality sound-and-light goggles that entrain deep relaxation states, and which are also modulated by the rhythms of the sounds, so he is also *seeing* the music dancing before his eyes.

The Vibrasound's originator, Don Estes, calls the result "sensory resonance." He believes that the total, convergent, simultaneous stimulation of all the senses produces a profound consciousness shift. Normally, in order to allow us to focus attention on a single stimulation, our reticular activating system must screen out countless

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"background" sensations. When intense stimulation of all the senses effectively "drowns out" all distractions, we don't need to screen out distractions. The attention and mental energy that would otherwise be absorbed by that task becomes suddenly available. This is such an unusual situation that it in itself makes one more likely to have a profound experience.

The Vibrasound costs about \$14,000 depending on options chosen and shipping requirements.

Somatron Chairs and Tables

Somatron units are high-quality massage tables and reclining chairs, equipped with a series of speakers of various sizes, usually 12. Deluxe models include a full audio console and even a cover that produces sensory isolation.

Many hundreds of units have been sold, making Somatron units the most widely known and widely used Acoustic Field Generators discussed here. Units have been installed in hospitals, universities, and private and government

institutions. Double-blind research has associated the Somatron primarily with relaxation, but in certain studies this has been linked with specific symptoms such as headaches or levels of pain medication required by a class of patients. The Somatron has found use in numerous settings where retarded, deaf, psychologically disturbed, handicapped, and multi-handicapped patients are said to obtain tremendous pleasure and comfort from their sessions.

The Somatron designer, Byron Eakin, has obtained two US patents on aspects of their design. He emphasizes that the Somatron units are the only Acoustic Field Generators that use *speakers* as opposed to *transducers* to create their vibration of the human body. He feels that this provides for bodily-experienced vibrations over a fuller spectrum of frequencies than is possible with transducers. His system allows separation of the stereo channels across the parts of the body, so that sound can be made to seem to travel and move spatially from right to left or up and down the surface of the body.

Six different models range in price from \$1,200 to \$6,000.

Others

In addition to the devices described above, there are other units. Discovery Sound Tables are custom built, less-portable versions of the Somatron tables, with larger speakers. They start at \$3000. The "Altonator" is very similar to the Vibrasound in description and price, but observers say it outputs a lot more sound into the surrounding environment. Dr. Jeffrey Thompson, after years as a clinician using the Somatron, plans to begin manufacturing units in the \$1200 price range later this year (1992).

And new, as we go to press, is the Restrider, a partially enclosed bed that vibrates the body with sound via a gel filled "dry flotation" bed while sound reaches the ears via separated speakers inside the enclosure. Plus TV, VCR and super stereo console! Only \$15,000.

For an in-depth discussion, including full details on all Acoustic Field Generators and their applications, see my upcoming article in the next MEGABRAIN REPORT.



BEYOND ENTERTAINMENT *continued from p. 11*

1988), and *The Fine Arts of Relaxation, Concentration and Meditation*, by Joel Levey (Wisdom Publications, 1987).

Mindfulness. Perhaps the best introduction to mindfulness meditation is *Full Catastrophe Living*, by Jon Kabat-Zinn, Ph.D. (Delacorte, 1990). Other excellent works are *Seeking the Heart of Wisdom: The Path of Insight Meditation*, by Joseph Goldstein and Jack Kornfeld (Shambala, 1987), Stephen Levine's *A Gradual Awakening* (Anchor/Doubleday, 1979), Shunryu Suzuki's *Zen Mind, Beginner's Mind* (Weatherhill, 1986), and Ellen J. Langer's *Mindfulness* (Addison-Wesley, 1989).

Open Focus. The best introduction to Open Focus is *The Open Focus Handbook* by George Fritz, Ed.D. and Les Fehmi, Ph.D., or the *Open Focus Audiotapes*, available in a six-tape or twelve-tape series, leading from a basic introduction through advanced tapes for pain control and sports training.

Accelerated Learning. A fine overview of

accelerated learning techniques is *Superlearning* by Sheila Ostrander and Lynn Schroeder (Delacorte, 1979) and the more recent *Super-Memory: The Revolution*, (Caroll & Graf, 1991) which includes information about the use of brain machines for enhanced mental functioning.

Self-Hypnosis. An introduction to self-hypnosis is included in *The Book of Floating* (William Morrow/Quill, 1984), which I wrote before writing *Megabrain*. For more, see Leslie LeCron, *Self-Hypnotism* (Prentice-Hall, 1964). A superb and consciousness-transforming work that includes much valuable information

about self-hypnosis, including sample induction and self-suggestion scripts, is *The Psychobiology of Mind-Body Healing* by Ernest Rossi (Norton, 1986). See also *The Answer Within: A Clinical Framework of Ericksonian Hypnotherapy*, by Lankton and Lankton (Bruner/Mazel, 1983).

Anchoring and the Swish Pattern. For a good introduction to these and other NLP techniques, see *Unlimited Power* by Anthony Robbins (Fawcett, 1986). The "H-Plus" tape series from the Monroe Institute of Applied Science provides numerous "action signals" (i.e. anchors), deliv-

ered in combination with binaural beat frequencies and a spoken induction that guides you into a hyper-suggestible state, delivers the action signal, then brings you back to waking consciousness.

Rescripting. See Thomas Budzynski's excellent articles, particularly "Brain lateralization and rescripting," *Somatics*, 3, 1-10 (1981), and "Clinical applications of no-drug-induced states." In B. *States of Consciousness* (Van Nostrand-Reinhold, 1986). A wonderful classic is *Programming and Metaprogramming in the Human Biocomputer* by John C. *valuable Software for the Mind: How to Program Your Mind for Optimum Health and Performance* by Emmett Miller (Celestial Arts, 1987).

Focusing. See *Focusing* by Eugene T. Gendlin, Ph.D.

Visualization. An excellent introduction is *Seeing with the Mind's Eye*, by Mike Samuels, M.D. and Nancy Samuels (Random House, 1975). See also *Creative Visualization* by Shakti Gawain (Bantam, 1986) for helpful guided visualization and self-suggestion techniques and scripts.



PRODUCT REVIEWS: NEW APPROACHES TO MOTION, COLOR, GANZFELD AND SUBTLE ENERGY TECHNOLOGY

GROW WITH THE FLOW: NEW MOTION SYSTEMS

One chapter in *Megabrain* described the Graham Potentializer, a cot that slowly revolved the user, producing such effects as profound relaxation, sharp increases in slow brainwave states and alterations in the *neural efficiency quotient*, a measure of how rapidly electrical signals are transmitted by the brain's neurons—a characteristic that has been shown to correlate very closely with IQ. However, the Graham Potentializer was quite costly (models ranged from over \$8,000 to over \$14,000), had frequent breakdown problems, and the company went out of business several years ago.

But now three new motion systems have emerged—the Integrated Motion System, the SAMS Potentializer, and the IQ Symmetron. Each of them is much less expensive than the GP, and each is producing impressive results.

A great amount of research has demonstrated the importance of movement to human development and mental-physical well-being. From the time of our conception, movement is an essential nutrient: without it, as research has clearly shown, the brain does not develop fully. As babies we are rocked, as kids we roll down hills and spin until we're dizzy, as adults we scuba dive, skydive, drive fast around turns, dance, and, when tired, sit in rocking chairs. This movement is not only pleasurable, but stimulates our body and nervous system.

One major effect of movement is that it stimulates the fluids of the inner ear, known as the vestibular system. This stimulation sends a flood of energy into our cerebellum and from there into the rest of the brain, including the pleasure and learning centers of the limbic system. This may explain the beneficial effects motion has on learning and intelligence.

Motion also effects the fluids that compose some 90 percent of our body, including cerebrospinal fluid, blood and lymph. In other words, what vigorous or repetitive motion is doing is "massaging" your body from the inside as the fluids move about, and providing an efficient form of neurological "exercise" for the nervous system.

Unlike the GP, which went round and round in a circular path, each of the three new motion devices provides a different sort of kinesthetic/movement stimulation.

INTEGRATED MOTION SYSTEM. Like the GP the IMS is a moving bed, but its movement

is quite different: it tilts gently as it revolves through a 360 degree circular rocking motion (the bed moves through a pattern 8 degrees above and below the horizontal in all four quadrants; i.e. when the head of the bed is 8 degrees below horizontal the foot of the bed is 8 degrees above; when the right shoulder is 8 degrees below horizontal the left foot is 8 degrees above, etc.). The motion is fluid and slow: the bed revolves between one and six times per minute, though about three revolutions per minute seems to be the most effective rate. When you stretch out on it, the effect is like lying on a raft that is gently rocking on ocean waves.

My own interest in this device has turned up some interesting anecdotes. In one of my Megabrain workshops an M.D. had a session on the device and when he got off remarked that he felt extremely limber and energized. He proved this to himself by performing a back flip—the first time he'd done that since college! The next day, he told me he felt like his musculature and sense of body awareness had been noticeably changed. This M.D. is now planning to use an IMS in his drug treatment clinic.

Two other cases are notable. The IMS was installed in the hospital room of a young man in the San Jose area who had been in a coma for many months. As he was placed on the device, his family was in the room. The change was so noticeable and rapid that his grandmother broke into tears. In the coming weeks, the young man was on the IMS for 12 hours a day or more. The lung congestion he had been suffering from improved dramatically. His muscle tone improved. Most interestingly, he now has his eyes open during much of the day, and is capable of focusing on or watching people and movements and objects around him. As this article is written, he is still improving.

In another case, the parents of a young girl who had been born with severe brain damage due to lack of oxygen at birth, obtained an IMS and placed the girl on it. Before using the IMS the girl had been blind, unable to move by herself, subject to more than a dozen seizures a day. Within days after beginning use of the IMS the girl's seizures diminished to less than six, sometimes less than three, and the father told me how surprised he was one time shortly after beginning to use the IMS to hear noises coming from her room and when he

walked in he found that the girl had been able to move herself from one end of the IMS bed to the top. The father told me this kind of movement was unprecedented. Again, as this article is written the child seems to continue improving.

Personally, I find the IMS extremely relaxing, and conducive to deep trance-like states. Most users also find that for many hours, even days after a session on it, they feel energized and a sense of enhanced physical awareness. Many of us who have been experimenting with it find that when used in combination with a sound and light machine, CES device or a beat-frequency tape, the IMS adds a whole new kinesthetic dimension to the experience. The IMS is available on a customized basis, and the suggested retail is \$5,500. The designer, Dr. Larry Schulz, can be reached through Megabrain Report.

IQ SYMMETRON. Created by Dr. Larry Schulz, who also designed the Integrated Motion System, the Symmetron consists of a comfortable leather contour chair coupled with a variable speed "orbital platform" that revolves the chair through a "multiphase wave experience." The chair moves through a six-inch horizontal orbit (i.e. seen from above the chair remains facing in one direction while it traces a six-inch diameter circle) while it gently tilts between 0 and 5 degrees on the vertical plane.

The movement is small but the effect is huge—most users are plunged into states of profound relaxation within minutes. One writer has called the effect "tidal weightlessness." Users who have combined the Symmetron with a light and sound device have found that it intensifies the effects dramatically. Says designer Schulz, "adding the kinesthetic dimension to the light and sound makes it a whole new experience." The Symmetron takes up less room than the IMS (it requires no more space than any reclining chair) and costs much less (suggested retail is \$3995):

THE SAMS POTENTIALIZER. The name of this device is an acronym for Sensory And Mind Stimulation, but it's also the name of the designer, medical professional Marvin W. Sams. Sams has many years of experience in clinical and research EEG, and is the inventor of a variety of EEG, EKG and other biomedical equipment.

Sams spent years monitoring the brainwave activity of subjects using the Graham Potentializer, using a variety of EEG equipment, including the Ertl Brainwave Analyzer, that measures the Neuro-Efficiency Quotient (NEQ), i.e. the speed with

The motion provides an efficient form of neurological "exercise" for the nervous system.

After getting off, he performed a back flip—the first time since college.

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which neurons are functioning. At the same time Sams was monitoring the brainwave pattern of advanced meditators, noting such characteristics as hemispheric dominance and brainwave "coherence." He then designed his own device, using careful EEG analysis to determine what produced the desired physiological state, i.e. the same brainwave patterns as highly experienced meditators.

What he came up with is a comfortable recliner chair that rotates (spins) at an almost imperceptible one to three RPMs (Sams tells me he tested units that rotated much more rapidly, but that the optimal brainwave effect seems to be in the one to three RPM range). He combines the vestibular stimulation of spinning with what he calls "Silent Audio Frequency Electronics," an inaudible tone that is projected across the body as it rotates.

I have seen some of the EEG readings of subjects who have used the Sams Potentializer, and it's clear that the chair can produce rapid, dramatic and long lasting changes. Most subjects seem to show increases in slow brainwave activity (particularly in the alpha range, associated with relaxation), enhanced neuro-efficiency quotients, and a higher degree of brainwave coherence (says Sams, coherence is "a highly desired brainwave state that is seen only in highly experienced meditators").

Like the other motion systems mentioned above, light and sound machines, binaural beat tapes and CES devices seem to gain in effectiveness when used synergistically with the Potentializer.

I recommend each of these devices, and suspect they will be especially valuable to chiropractors, physical therapists, therapists, athletes and athletic trainers, physical fitness centers, educators specializing in learning disorders, corporate relaxation programs, drug and alcohol treatment centers, brain-mind gyms, and those interested in using vestibular stimulation for the treatment of brain damage.

—Michael Hutchison

THE "STRESS SHIELD"

Reviewed by Julian Isaacs, Ph.D.

The Stress Shield is a colored "ganzfeld" device. "Ganzfeld" is German for "whole," or "total" visual field. Looking into a ganzfeld you experience a uniform, evenly illuminated and colored but completely featureless visual space. This is a very unusual situation which we normally never experience. Because the nervous system is built to detect change, supplying an *unchanging* visual input creates some powerful and interesting effects.

First, the color tends to drain out of the visual field, so a bright blue might change to a khaki or even gray; then as the retina adapts out even more, a misty space seems to open up, and it can even get difficult to know whether your eyes are open or

closed. At this stage, studies have shown that alpha brainwaves can be present, which are normally impossible to produce without training if your eyes are open.

Finally, the monotony of the unvarying visual input gently lulls you into lower and lower states of arousal, producing deep relaxation and possibly first stage sleep (the "twilight state") with its accompanying theta brainwaves. Ganzfeld-treated individuals usually report deep relaxation, reverie, imagery, and often altered states of consciousness, even bordering on Out-of-Body Experiences.

Used initially for research into vision and color theory, the ganzfeld found its first major application during the 1970s in ESP research, where, coupled with a pair of headphones supplying "pink noise" (a gentle shushing sound), it shuts down the busy sensory processing which normally drowns out the whisper-soft ESP signals, allowing much better reception of ESP. Now it is finding further applications in relaxation and de-stressing, taking its rightful place in the field of psychotechnology.

I have run many subjects under ganzfeld conditions, using the effective but clumsy trick of taping halved ping-pong balls over their eyes, then shining a red light on them. Some of these subjects reported definite altered states, imagery and hypnagogic experiences. But we always longed for a neater, less fragile and less time-consuming method of producing ganzfeld. The two then commercially available alternatives (one was in prototype form, the other was the "Theta One") both employed blue electroluminescent panels as the light source. These need 200 volts of relatively high frequency (2000 cycles/sec) electricity and in use are positioned very close to the face—not nice for electricity sensitive individuals! The prototype device was very physically uncomfortable to wear—a veritable nutcracker on the head. Both devices had unacceptably intrusive edges to the fields of illumination they produced.

At one time I was even part of a development team trying to produce an acceptable portable ganzfeld device, but we never succeeded—a portable ganzfeld is a very difficult goal to achieve. In their laboratories psychologists have created fixed ganzfelds by putting subjects' heads inside large illuminated plastic globes, or have used two adjacent walls, one whitewashed and illuminated, the other equipped with eyeholes to allow subjects to peep at the illuminated wall—not a remarkably portable design! I was therefore very interested to see how the Stress Shield compares to its predecessors.

The Stress Shield looks like a chunky pair of white plastic sunglasses. It is billed as a "color therapy" machine and projects a switch-selectable field of gentle red, green or yellow illumination into each eye. Its manufacturer, Australian Peter Harvey, claims that the green light acts as a sedative, reducing anxiety. In private he relates how

several seemingly "miraculous" cures of physical ailments have followed use of the Stress Shield in its green-light mode. The yellow light is supposed to act as a mental stimulant, facilitating creativity, while the red light is supposed to increase physical energy, counteract depression and stimulate the senses.

These are the claims—how does the Stress Shield measure up? It's well built, light and comfortable—a crucial requirement. Each eye is placed into a circular hole made in a soft foam plastic bag—one for each eye. The front of each bag is flattened out onto the inside front surface of the sunglasses frame, forming a uniform surface placed too close to the eye for the eye to be able to focus on it properly—a necessary requirement to prevent detection of small irregularities in the surface. For each eye, the bag assembly is independently movable on the sunglasses frame, to accommodate variation in inter-ocular distance—an essential feature. In each of the two assemblies, the light is supplied by two Light Emitting Diodes (LEDs) positioned at the rear edge of each bag. Power is low voltage (1.5v) and DC—supplied by one AA battery placed inside each eye-unit, so the Stress Shield should pose no problem for even the most electricity sensitive individuals. Battery life in intermittent use is claimed to be 20 hours.

The LEDs spread their light across the inside surface of each enclosure, and although there is a slight variation across the surface, for most of it, the illumination is reasonably even. However, from the extremely demanding standpoint of the experimental psychologist, three imperfections remain. The first and most serious is that if you swivel your eyes to the side you completely destroy the ganzfeld effect because you can see the back edges of the eyeholes and the concentrated beams of light from the LEDs. Effective use therefore requires that you look forward and keep your eyes fairly still. The second potential source of irregularity in the visual field is that strong overhead light will seep through the plastic foam enclosures into the top of the visual field—but using the device with low ambient illumination, or simply covering the top surface with opaque cloth will cure this problem. Finally, on the model tested, a part of the inner surface of the eyepiece for the left eye intruded slightly into the visual field. I was informed that later models of the device have the eyepiece mouldings trimmed down, removing this problem.

So the ganzfeld is not as perfect as that supplied by ping-pong balls ("halved acetate spheres" as they say in the trade). This is very forgivable, remembering how it is so extraordinarily difficult to create a perfect ganzfeld, short of the ping-pong solution. But—and this is the point, the Stress Shield does indeed supply a sufficiently good ganzfeld for the serious user who wants a ganzfeld device for purposes of relaxation. Also, as the eyes adapt out, the minor imperfections in field uniformity tend to disappear. In fact, the ganzfeld from

this device is by far and away the best the author has experienced from any reasonably priced, commercially available, truly portable unit— well done Aussie!

The Stress Shield comes with Jacob Liberman's interesting book *Light, Medicine of the Future*, which gives an extensive, if not very scholarly, introduction to the fields of environmental lighting, light therapy, seasonal affective disorder (SAD) etc. The message from his book is very clearly that the duration, intensity and spectral composition of light to which we are exposed does indeed make a difference to our physical and psychological health. As a SAD sufferer myself, I have to agree, and welcome this extension of environmental awareness to our luminous environments. It looks to be very well established that exposure to light of different intensities and spectral composition really does produce specific physiological and physi-

ological effects.

It's the lack of exposure to sufficiently intense, blue-green light that appears to precipitate SAD in the short dark days of high-latitude winters. Interestingly, the peak spectral output of green LEDs comes very close to the wavelength which is optimal in counteracting SAD.

Regarding the color therapy claims which are made, both by the Stress Shield's manufacturer and by the color therapy community, I have to admit that I am not an expert in this field. The research I am aware of does suggest that exposure to "cool" colors—blue or green light—is relaxing and that exposure to "hot" colors such as red light is stimulating. But the testing of the effects of visual exposure to different colors can never, by definition, be done "blind," double or otherwise! So with color therapy it remains unclear whether we are really dealing with responses in patients caused by cultur-

ally implanted beliefs and associations (e.g. "red equals danger"), and possibly even the covert "mental healing" ability of the color therapy practitioner, or whether something else more physiological and causally related to color is going on.

Certainly, regarding the effects of deep relaxation, there are many experimental studies (e.g. those on biofeedback, progressive relaxation, autogenic training, meditation, and the "relaxation response") relating deep relaxation procedures to a wide range of positive effects, both psychological and physiological. Insofar as its users find the Stress Shield to supply a deeply restful experience, it would be reasonable to expect these kinds of benefits to follow. I found the Stress Shield very pleasant and relaxing to use, especially with a good audiocassette. Its colors provide interestingly different experiences and I would unhesitatingly recommend this device to anyone wishing to try the ganzfeld experience.

NEW BIOCIRCUITS RESEARCH PROVIDES EVIDENCE OF "SUBTLE ENERGIES"

Biocircuits can hardly be called a new product, since they've been in use for decades, and have become extremely popular in recent years following the publication of the excellent book *Biocircuits: Amazing New Tools for Energy Health*, written by Leslie and Terry Patten (the latter of whom is a contributing editor of MBR and served as Managing Editor of MBR issues 1 and 2). But there is something new about biocircuits: a striking and important new scientific study that demands we take a fresh look not only at biocircuits but at the whole domain that has come to be called "subtle energy" and "energy medicine."

Biocircuits are nonmechanical tools (flat plates or pads made of copper or silk, connected by copper or silk cables) that are said to enhance the flow or circulation of subtle energy or bioenergy throughout the body. They introduce no external electrical or magnetic energy to the body, but simply connect different parts of the body with simple copper or silk linkages. One configuration, for example, links the base of the spine with the right hand, the top of the spine with the left hand, and then links the base of the spine to the top of the spine (this is called the Eeman Optimal Circuit).

First developed over 60 years ago, biocircuits had been used by thousands of people, and there were a lot of compelling reports (well presented by Leslie and Terry in their book) that the devices produced states of profound relaxation, balancing and energizing of the system, and much more.

I first began using biocircuits personally about three years ago when I was introduced to them by Terry. After noticing significant effects, I began using them in a number of Megabrain Workshops, where participants reported noticeable effects. Interestingly, the biocircuits seemed to work synergistically with many of the brain machines I was

experimenting with, including CES devices, sound and light machines, ganzfelds, and binaural beat frequency tapes.

And yet I didn't feel fully comfortable reporting about them in MEGABRAIN REPORT. The reason was that while there was a wealth of anecdotal and quasi-scientific evidence that the biocircuits worked, there was no really "hard" scientific evidence of the sort that was acceptable to mainstream science.

Now the scientific evidence has emerged. Recently Dr. Julian Isaacs of John F. Kennedy University investigated the effects of biocircuits in a rigorously designed double-blind study (i.e. neither subjects nor the experimenter knew whether they were using biocircuits or a "dummy" imitation of the biocircuits, thus eliminating the placebo effect). Isaacs measured a variety of physiological factors (such as EMG for muscle tension, EEG alpha, beta and theta frequencies) and psychological factors (subjective depth of relaxation, sensations of warmth, perceptions of "non-ordinariness" of the experience, etc.). When Isaacs correlated the data, the results were astonishing. You may read about them below, where we publish for the first time a report on his research by Dr. Isaacs.

The results reported by Isaacs have aroused great interest among scientists, including Dr. Elmer Green, and Dr. George Fritz (who describes some of his own experiences with them in the "Megabrain Forum" elsewhere in this issue), and have strongly confirmed my own belief that the effects of the biocircuits real, and due to something other than the placebo effect. And they're satisfying to me, because it means that I can now strongly and without any reservations recommend these tools to you.

The Copper Biocircuit system is the one tested by Dr. Isaacs. It is said to produce the most powerful and easily discerned effects. Crafted from copper screens, wires and handles, this two-part biocircuit will form the Eeman general relaxation circuit (head to left hand, spine to right hand). It comes packaged with full instructions and a special audiotape with voice, music, and brain synchronization signals.

An *extra copper segment*, that links base of spine to the head, permitting the Eeman optimal circuit and other configurations, is available at extra cost. This segment formed part of the biocircuits system tested by Dr. Isaacs; for this reason and as a result of my own experiences, I strongly recommend that purchasers of copper biocircuits obtain this segment as well.

The Silk Biocircuit is said to produce more subtle, longer lasting effects than the copper, and is recommended for those with meditative experience, or who are already sensitive to subtle energies. It has three parts, permitting a variety of biocircuit configurations, as well as the instructions and audiotape.

Adding to the attractiveness of the biocircuits is their low price. Both the copper and silk biocircuit sets cost \$49.95, and the extra copper segment another \$20. They are widely available through a variety of catalogs. I also recommend Leslie and Terry Patten's book, *Biocircuits*, as the definitive introduction to the use of biocircuits. After you've read the intriguing research report that follows, I believe you will be interested in exploring biocircuits yourself.

—Michael Hutchison



NEW EVIDENCE FOR “SUBTLE ENERGY”: A DOUBLE BLIND

Julian Isaacs Ph.D.
John F. Kennedy University

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Tools for Exploration

Dr. Isaacs has been an active researcher in the field of psychotechnology since 1979. He is a faculty member of the Graduate School for the Study of Human Consciousness of John F. Kennedy University at Orinda, California. He is currently Director of Research for Tools for Exploration, a leading mail-order corporation specializing in the supply of psychotechnological and subtle energy products.

Introduction: Subtle Energy, Biocircuits and Relaxation

The present study was conceived as an attempt to test a “subtle energy” device in the most carefully controlled way that our resources would allow. As far as we know, this is the first fully controlled double blind study of a subtle energy device ever performed. Certainly this study is the first such investigation of the biocircuit, and we invite other subtle energy device manufacturers to follow our lead. We would be happy to assist in any such projects.

Many non-western cultures have developed models of the human body which include subtle energy (e.g. “Chi”) and extensive patterns of subtle energy flow, such as the meridians of Chinese and Japanese medicine. In India the yogic system of chakras and nadis fulfilled similar functions. In Europe subtle energy is a concept familiar to the general population and especially to spiritual or mental healers and the myriad practitioners of variants of those practices (e.g. Pavlek 1987). The biocircuit, invented by an English healer, L.E. Eeman (1947), later developed by subtle energy researcher Peter Lindemann, and further researched and popularized by Terry and Leslie Patten (1988), is hypothesised to achieve its relaxation effects by improving the circulation of subtle energy. It is a purely passive device which is supposed to facilitate subtle energy flow by adding extra paths for subtle energy to flow between body-parts of opposite “polarity” (hence “bio-circuit”).

Western science and medicine accept only directly observable or instrumentally detectable phenomena. But no purely mechanical instruments for detection of bodily subtle energy have been developed as yet. Thus investigators of subtle energy and energy medicine face an invidious choice: either to use non-instrumental

techniques of (assumed) measurement such as applied kinesiology, which is in fact a form of dowsing, as are radionics and radiesthesia; or else to use conventional instrumentation to detect only the physical side-effects of subtle energy flow—the secondary changes in bodily functioning presumed to have been caused by the as-yet-undetectable subtle energy flows. The present study used the latter approach, based on the relaxation phenomena claimed to accompany biocircuit use (Patten 1991).

Biocircuits can be made of copper, silk, or silver plate on copper. They are reported to induce deep relaxation, often leading to sleep, and mind/body integrative trance. They are supposed to bridge imbalances in the body’s energy system and users frequently feel “waves” of subtle energy flow. The physiological measures utilised in the study were therefore all selected to detect physiological consequences of relaxation. Forehead muscle tension (EMG) was monitored because it is an accepted indicator of bodily muscular tension. Electrical skin resistance (EDR) was monitored because this is known to reflect emotional arousal. Finger temperature (TEMP) was monitored because this too is known to indicate relaxation. One channel of EEG was used to detect the onset of stage one sleep—the switch-over from alpha brainwave dominance to dominance of theta brainwaves, which is a sign that relaxation has reached its sets in. Finally, to measure psychological factors, subjects completed a ten-item comparative questionnaire used to assess various aspects of their experience with the four different biocircuits used in the study.

Hypotheses Tested

The hypothesis tested was that the “relaxation” biocircuit would relax subjects more effectively than the “dummy” biocircuit. This was the primary hypothesis because it amounts to the scientific validation of the biocircuit as a relaxation tool. We included a treatment with a “tension” biocircuit in the study because Eeman had claimed that if individuals used a biocircuit that circulated energy in the opposite direction to the individual’s normal flow it would create tension rather than relaxation. However, since no one deliberately uses a tension circuit, our interest in this question was based purely on curiosity to test Eeman’s theory in this area.

Procedure

Twelve subjects each performed four experimental sessions of 30 minutes duration while

resting in a recliner chair and listening to the same quiet music in each session via headphones, to mask background noise. The first session for each subject was run using a regular, undisguised copper biocircuit. This first session was used simply to familiarise subjects with the protocol and to expose them to the action of a biocircuit. In psychological studies the first session often elicits extreme or paradoxical responses, so that the first session was regarded as a “throw-away” and its data were not analysed. The results we cite below do not include any data from the first session.

The following three sessions were conducted using “super” copper biocircuits, sewn inside blankets to disguise their identity. “Super” biocircuits, an innovation created by Lindemann, differ from regular biocircuits in connecting all the body parts of opposite “polarity” with copper pads or copper handles, and copper wire, whereas the regular biocircuit does not produce so many connections. The super biocircuit is supposed to produce a stronger effect than the regular biocircuit and we wanted to maximise the possible effects so as to increase our chances of detecting them in our study.

The sewing or concealing of the super circuits inside blankets kept both the experimenter and subjects ignorant of the identities of the disguised biocircuits, providing the double-blind. The disguising of the super biocircuits was accomplished prior to their delivery to the experimenter. Subjects were told that the disguised devices were three newly-developed variants of the original biocircuit which were being compared with each other in a double blind study in order to assess their relative effectiveness. A disguised “relaxation” biocircuit, a disguised “tension” biocircuit and a disguised “dummy” biocircuit were each used for one session with each subject.

The placebo-control dummy biocircuit had its leads cut, preventing connection between its elements. The relaxation device was wired to produce maximum enhancement of relaxation, according to the theory accepted by Eeman and Lindemann. The “tension” device was wired “the wrong way round” compared to the relaxation biocircuit to maximize tension, according to Eeman’s theory. The order of use of the three different disguised biocircuits (the “treatment order”) was counterbalanced across subjects. There are six treatment orders, so each treatment order was utilised twice in running the twelve subjects. Subjects were assigned randomly to an order of use.

STUDY OF THE “BIOCIRCUIT”

Controls Against Artifact in the Experimental Design

We wanted to provide maximum control against artifact in our study design, since subtle energy products are regarded with great suspicion by sceptics. First, the study was conducted double blind. Neither subjects nor experimenter knew the identity of the three special biocircuits until after data analysis was concluded. The beliefs and expectations of subjects and experimenter could not therefore affect the outcome, since the identities of the disguised biocircuits were concealed.

Second, objective physiological measures were used as well as self-report experiential measures, providing a convergent technique to characterise shifts in state caused by the biocircuits. We chose not to use applied kinesiology or any other form of dowsing as a measuring technique because of the lack of double blind evidence of its accuracy under test conditions. Our measurements are therefore fully comparable to those used in conventional experimental psychology and medical studies.

Third, first-time effects were avoided by using the first session as a familiarisation session and rejecting its data.

Fourth, the order of treatments was counter-balanced across subjects, so that effects due to order of treatments would be minimised.

Fifth, effects due to “ultradian rhythms” were controlled. This is a very important but frequently overlooked factor in the research of any relaxation procedure. Human arousal level (and hence liability to spontaneous sleep onset) seems to follow a roughly 100 minute cycle—the same cycle that controls dreaming. The arousal cycle produces a natural, endogenous alternation between sleepiness and wakefulness. In many studies (e.g. Lavie 1985), it has been found that the ability to go to sleep during the day varies in step with this 100 minute ultradian rhythm. The cyclic liability to spontaneous sleep is quite strong in the morning, reaches a peak with the “mid afternoon droop,” then becomes much weaker until bed-time approaches. If subjects are run at different times of the day on different days, they might be run at different sections of the 100 minute cycle and show differences in the ability to relax and sleep due purely to the ultradian rhythm, differences which are unrelated to the specific relaxation treatments they receive. In this study the ultradian rhythm factor was controlled by running subjects at the same time each

day, and running all the sessions for any particular subject within 10 days, since the ultradian rhythm slowly changes phase over periods of several weeks.

Sixth, environmental factors were kept constant. All sessions were conducted with subjects listening to the same relaxing taped music, using headphones, with eyes closed, within a temperature range of 70 degrees to 75 degrees Fahrenheit.

Seventh, in order to reinforce and stabilise subject’s memories of the subjective aspects of their sessions, they were asked to fill out a comparative questionnaire ranking experiential aspects of their just completed session at the end of each session from the second session onwards, and were then interviewed about their experiences in the session just concluded. However, the data used for the analysis of the comparisons was taken only from the questionnaires filled out by subjects after their fourth and last session. The data from the first sessions was removed from the rankings data derived from these questionnaires.

Physiological Measures

Physiological monitoring was performed using a “J & J” brand computerized electrophysiological monitoring unit, type I330. This is the industry-standard biofeedback monitoring and recording device. No feedback was given to subjects. As stated above, four measures were taken. EEG: (P3 electrode placement)—the EEG record allowed the duration of periods of theta-dominant brainwave state, indicative of trance or lightsleep, to be measured. EMG: frontalis (forehead) muscle tension. Forehead muscle tension is a good indicator of relaxation level in the whole body. EDR: Skin resistance was measured between the first and third finger of the right hand. Increasing relaxation is indicated by increasing electrodermal resistance. TEMP: the skin temperature of the middle finger of the left hand was measured. Increased relaxation is often associated with vasodilation and increases in finger temperature. Physiological data was automatically digitized and then 30 seconds of data were averaged to produce measures for each of the sixty trials of one half minute duration for each 30 minute experimental session. Figures of merit for each session performed by each subject were computed for EMG, EDR and TEMP. The data from physiological measures were evaluated statistically using the Wilcoxon signed ranks test for paired related measures (Bruning and Kintz 1987).

Results

Significantly more theta-dominant trials (indicating trance or light sleep) occurred with the relaxation biocircuit than with the placebo-control “dummy” biocircuit, with an associated chance probability of 0.025. Significantly lower muscle tension occurred with the relaxation biocircuit than the dummy, with an associated chance probability of 0.01. Neither the skin resistance measure nor the temperature measure reached significance in any direction across any pair of treatments (relaxation-dummy, tension-dummy, relaxation-tension).

Ranking the relaxation biocircuit against the placebo-control “dummy” biocircuit, five of the ten questions of the comparative questionnaire produced significant results favoring the relaxation device. No significant results were obtained favoring the placebo-control “dummy” over the relaxation device for any of the ten measures. The comparative measures were evaluated using the Sign test based on the binomial distribution with an a priori probability of 0.5.

Significant experiential measures favoring the relaxation biocircuit compared to the dummy were:

- **Perceived depth of relaxation**—12 out of 12 subjects ranked the relaxation biocircuit above the dummy (chance probability of 0.0002).
- **Perceived benefit from the treatment**—10 out of 12 subjects ranked the relaxation biocircuit above the dummy (chance probability of 0.02).
- **Perceived effectiveness of treatment**—10 out of 12 subjects ranked the relaxation biocircuit above the dummy (chance probability of 0.02).
- **Perceived non-ordinariness of the biocircuit experience** (an attempt to get subjects to estimate the “energy” quality of their experience)—10 out of 12 subjects ranked the relaxation biocircuit above the dummy (chance probability of 0.02).
- **Sensations of warmth** (a frequently reported effect of biocircuit use)—9 out of 12 subjects ranked the relaxation biocircuit above the dummy (chance probability of 0.03).

The overall probability of obtaining these results with the psychological measures by chance, assuming they are independent of each

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NEW EVIDENCE FOR "SUBTLE ENERGY": A DOUBLE BLIND STUDY OF THE "BIOCIRCUIT" CONTINUED

other, which is rather debatable given the vagueness and therefore probable overlap of some of the concepts employed, is much less than 1 in 10,000. No significant experiential measure favored the dummy device over the relaxation biocircuit.

Ancillary Considerations

Curiously, and in contradiction to Eeman's anecdotal findings, the so-called "tension" biocircuit came out as intermediate between the relaxation biocircuit and the dummy in most measures of relaxation. The relaxation biocircuit scored significantly higher than the tension biocircuit on the psychological measures of "subtle energy sensations" (chance probability of 0.02) and "non-ordinary in-session experience" (chance probability of 0.02). On no measure of relaxation was the tension biocircuit superior to the relaxation biocircuit, nor was it significantly superior on any measure of relaxation compared to the dummy biocircuit.

The lack of obvious tension in the results from the "tension" biocircuit was a surprising result, since Eeman relates stories of individuals seemingly almost driven temporarily mad by being exposed to tension biocircuits. Our results suggested that Eeman's theory needs careful testing under double blind conditions, since we also found in some pilot attempts to gauge the "polarity" of individuals (i.e. the direction of their normal subtle energy flow) made after the study, that his simple concept of "polarity" seemed to break down. We look forward to pursuing these inquiries further when our resources allow us to do so.

Conclusions

The results decisively demonstrate that the relaxation biocircuit produced deeper relaxation than the dummy biocircuit under double blind conditions. The significant differences in the EEG measure indicates that more sleep and trance state occurred with the relaxation biocircuit than the dummy. The EMG results indicate that greater physical relaxation accompanied use of the relaxation biocircuit compared to the dummy. The fact that no less than 12 of 12 subjects ranked the real biocircuit above the dummy for relaxation strongly indicates that they perceived the real biocircuit as being more relaxing than the dummy. The other psychological measures tell the same story. Overall, the results are surprisingly strong, especially in view of the fact that only twelve subjects were used—indicating a very large effect size.

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Acknowledgements

The authors would like to thank Ron Gordon for his very generous provision of laboratory space at "The Other 90 Percent," Sunny Turner for her labors in data analysis, Drs. Jerry Solvfin and Ephraim Schechter for their statistical consultation and STENS corporation for excellent service during the hire of the monitoring equipment. Thanks are also due to James Spottiswoode for advice and suggestions.

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EDITORIAL *continued from inside front cover*

advent of this human-technology fusion that, by demonstrating to us for once and all that we are not the lordly rulers of our domain but components of other more complex information processing systems, will open us up to the unitive vision. What a paradox it would be, and what a refutation of the reductionist view, if our growing fusion with hard material technology, far from reducing us to something mechanical, was the catalyst for a spiritual transformation!

It's been said that the energy of human evolution has moved from genetic evolution to cultural evolution—human beings have remained genetically unchanged for millennia, while our culture has evolved convulsively at an ever-

increasing rate. Yet despite our dramatic evolution we remain a flawed species, violent, frightened, unhappy, isolated from one another, destined to die alone and return to dust.

Perhaps the next great evolutionary leap will be the techno-human one. Perhaps, in learning to fuse ourselves with technology so that not only are we operating it but it is operating us; in learning to link our own biological capacities with machines, so that they expand our own powers even as we enrich theirs, we may learn to leave behind our primitive sense of separateness from the universe. In doing so we may learn to see it all—our own physical bodies and minds, the hard materials of technology, the vast universe—as configurations of active information, emerged from the implicate order, each partici-

pating in all the others and partaking of the whole, with the clear knowledge that, in Bearden's words, "The entire universe is everywhere alive, with everything. . . . All life is eternal. Nothing is everlost." With such knowledge, we might begin to awaken and begin our next evolutionary step, moving at last beyond violence, fears, miseries, isolation and death. Such an awakening might bring us, at last, to our Childhood's End.

—Michael Hutchison



STALKING THE WILD SCALAR: THE BIOELECTRIC INTERVIEWS (PART THREE) CONTINUED FROM P. 15

Second, in a beautiful article Kidd bluntly states that all our measurement/detection is really binocular. See Richard Kidd et al., "Evolution of the modern photon," *American Journal of Physics*, Vol. 57, No. 1, Jan. 1989, p. 27-35. Of course, in 1903, E.T. Whittaker wrote the definitive engineering methodology of how to do all this with EM waves—how to infold the EM waves into a bidirectional wave structure that produces a standing wave of externally force-field-free scalar potential.

Now these hidden internal wave structures exist in all scalar potentials, whether they are electromagnetic or not. For example, Ziolkowski has pointed out what is actually Whittaker's 1903 infolded bidirectional planar waves inside the acoustic scalar wave, in work on acoustic missiles. *Acoustic missiles* are slugs of very strong sound energy that stay together in a slug as they travel, and strike a target a terrible blow, just as if it were a "missile made of sound energy." A Soviet scientist, Ignatovich, has pointed out the same remarkable bidirectional wave structure inside the scalar potential associated with the Schroedinger wave equation itself. [See V.K. Ignatovich, "The remarkable capabilities of recursive relations," *American Journal of Physics*, Vol. 57, No. 10, Oct. 1989, p. 873-878. Ed.] And I've pointed out a mechanism by means of which you can make a quantum potential, so that separate things—even widely separated—can interact as if they were all pieces of the same system, and all located together at the same location. Further, I've pointed out that you can deliberately structure that quantum potential with a Whittaker bidirectional wave structure.

"Vacuum Engines," Time Travel, Teleportation and "Action-at-a-Distance"

MBR: Can you make that last part a little simpler?

TB: What that means is that in QM, there's a special kind of potential you can make, that can connect spatially separated things and translate energy between them, in hidden fashion and essentially instantaneously. This "connection at a distance" directly results in *action-at-a-distance*.

I've advanced the mechanism for *making* one of these quantum potentials, so it is subject to laboratory test. Further, in that artificial quantum potential you make, you can put in a hidden EM wave Whittaker structure—hidden pipes inside space-time itself, so to speak. Then you have established hidden EM-wave-energy channels through space-time, connecting widely separated entities together. You can then put energy and specific energy patterns—*vacuum engines*, if you will—directly through those hidden channels. You can have the hidden energy emerge at a distant point and interact in and on a distant physical system

there. This distantly-emerging interaction energy can be positive (disordering, or scattering) or negative (reordering). Transmitting scattering energy, you get distant heating—the production of heat energy at a distance. Transmitting reordering energy, you can extract energy from the distant object or system through those hidden channels, accomplishing distant electrostatic cooling.

The other thing to note is that EM energy transmission through the hidden channel is not limited to the speed of light. The speed of light refers to energy transmission *through* 3-space, and the internal channel refers to energy transmission *around* 3-space, or in other words, through hyperspace. And it's testable on the laboratory bench.

MBR: Are you saying that real energy can be transmitted faster than the speed of light?

TB: Yes. But hyperspatially. Not through 3-space, but "around" it.

Again, this means that it's possible to produce energetic changes in a distant system at a distant place, without transmitting energy "through space" in the normal sense. You transmit "around" space, so to speak, and directly in time or through a higher dimension, depending on the model you're using to understand this. Further, the speed of the internal EM energy transmission is not limited to the speed of light. *Whittaker already specifically pointed this out!*

Quantum mechanics also predicts instantaneous action-at-a-distance *and has essentially proven it experimentally*. Finally, you can specifically Whittaker-engineer this "hyperspatial" transmission, if you will, to do essentially whatever you wish to do in that distant system. It all depends on how far you develop the technology: the basis is there. Hypothetically, you can eventually even develop a kind of teleportation. Whittaker transmission through the internal channel is already "teleportation" of energy, so to speak.

MBR: Does this have anything to do with Sheldrake's morphogenetic field?

TB: Yes indeed. Sheldrake's morphogenetic field is pure-and-simply a species quantum potential, created amongst the members of a species. As experiences are met by the individual members, they steadily input infolded EM structures into the "inner" EM channels of that quantum potential. Since any infolded EM wave has its phase conjugate—or time-reversed replica—produced and infolded automatically, a sort of "negative feedback" corrective EM signal pattern for all inputs of the bad external EM stuff exists inside the quantum

potential. One can show that, for detrimental changes to the species' members, time reversal provides infolded signals that represent an exact counter to the "overstress of the species," so to speak. These "corrective antidotes" for the overstressed species, however, are in the virtual state. But as more of the same detrimental changes are experienced over generations, the countering signal structures residing in the species quantum potential will be increased over the same period of time. Gradually the hidden EM structure—which is like jillions of little "vacuum engines"—is changing and internally structuring the Schroedinger potential for that species.

Then one day the internal corrective charge is sufficient to breach the quantum threshold. One could also say that the space-time potential occupied by the species members is now sufficiently

curved and structured to serve as a specific-signal-pattern energetic source for genetic change. Breaching this threshold causes specific new genetic changes to occur in the entire species in a single jump. At that point, the actual genetics of egg fertilization (conception) is altered, and shortly thereafter members of the species start

being born with the new change, specifically designed to counter or partially counter the former detrimental aspects in the species overstress. In a dramatic example, that's how a reptilian species can "suddenly" develop light, air-filled bones; feathers; and wings, for example, and change from a reptile to a bird in one single jump.

Sheldrake's morphogenetic field is a species quantum potential and the charged-up Whittaker structure is the inducing agent.

MBR: You're saying, then, that living systems use this inner, hidden EM energy channel in addition to the external energy channel that we know in ordinary external electromagnetics?

TB: Absolutely. In fact, the distinction between a living system and a nonliving system is precisely the fact that the living system deterministically utilizes the inner EM energy channels inside Whittaker-structured scalar potentials. And those scalar EM potentials are centered on the atomic nuclei of atoms comprising the living system's molecules, cells, tissues, and mass.

MBR: How does that relate to present brain-wave research, and measurements of brain-waves electromagnetically?

TB: It says that present research is devoted almost entirely to measuring and pondering the

"The spirit of the living system is—in the virtual state—everywhere in the universe—and everywhen as well. It's all a giant hologram, not only in space, but in space-time."

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surface waves in the ocean, so to speak. The mind, thoughts, emotions, and real living functioning systems are deeply hidden, underwater waves in that ocean. Science will have to instrument for detection and recording of the hidden interior energetics region, or they will never solve the mind/brain/body problem. And without the interior energetics, they will never understand life, memory, personality, thought, and primary biological control, or human intent.

MBR: You are saying, then, that this hidden internal electromagnetic energy channel is intimately connected with the mind, life, and personality?

TB: Absolutely. The mind consists of stabilized Whittaker structures inside the living system's bio-potential. Thoughts are a special class of changes/waves in that overall Whittaker-structure ensemble. The personal unconscious is a single small, localized sample of yet a greater collection that represents even deeper unconsciousness.

The conscious mind is a serial processor—one thing at a time. The unconscious mind is totally conscious, but it is a parallel processor—jillions of things at one and the same time. The serial conscious mind can only make sense of a "single slide in the slide projector" at a time. When it looks at the unconscious mind, it sees a multitude of slides in the slide projector simultaneously—hence it just sees blackness, or nothing recognizable at all.

Jung's collective unconscious, for example, consists of archetypal infolded EM structures acting in common in an overall bio-quantum-potential for the entire species. Gaia, the living earth/biosphere, really does scientifically exist as a common bio-quantum-potential with infolded living EM structures for the entire earth biosphere. The bio-potential in a single body is an overall quantum potential that links and joins all the atoms and cells of the body. The "spirit" of the biosystem, if you will, is its "living biopotential"—its living quantum potential. We already know that a potential is everywhere nonzero all the way out to infinity. *So the spirit of the living system is—in the virtual state—everywhere in the universe—and everywhen as well. It's all a giant hologram, not only in space, but in space-time.*

The entire universe is everywhere alive, with everything. Note that if you simply examine the "ghost forms" requirement of quantum mechanics, this conclusion is inescapable. All life is eternal. Nothing is ever lost.

A thought or thoughtform is just a specific, dynamic Whittaker structure in the hidden EM channels of the biopotential. Thoughts and thoughtforms are real. They are virtual spatially, but they occupy one real space-time dimension, time. Physics and metaphysics share one common, nonobservable dimension: time. So long as physics

continues to have to have time, which is nonobservable a priori, then it also must contain everything that is a structure or action in time. Skeptics of parapsychology, who believe that humans are robots and the mind is just a meat computer, just have little or no foundations knowledge. And if you get carried away by the "observable, objective science" bit, remember that the choice of fundamental physical units in physics is arbitrary. You can—and it's actually been done—build all of physics from time as the single fundamental unit. That means that you can build the whole observable, detectable physics model out of the totally unobservable and nondetectable. Quantum mechanics long ago destroyed materialism for all time, but it just hasn't percolated through the prevailing scientific dogma yet.

With Whittaker EM engineering, you can conceivably "make" thoughtforms to order, and input them directly into the mind and long-term memory. If we view the conscious mind as a special serial computer, we have now found where the software is—for mind, long-term memory, and personality. As scalar EM technology develops, we will have direct access to the software, so to speak, for the very first time. And we will be able to engineer it at will.

MBR: But is this good or bad?

TB: Actually it's either, or both. We are describing a set of hidden internal EM energy structures, the fundamental mechanism for internal EM structuring, and a tool. A tool is amoral; it has no morality, and is inherently neither good or bad. The intent of the user of the tool, however, may be either good or bad. So the tool can always be used either way, for beneficial purposes or for evil purposes. It's the hand that wields the knife that is moral or immoral; it is not the knife. The same cutting tool can be used by the surgeon to heal, or the murderer to kill. Human intent differentiates amorality into morality and immorality.

MBR: What is the biological impact of the forthcoming new technology that directly accesses and engineers the internal energy regime?

TB: It will be both a tremendous blessing and a terrible curse. It's the most powerful tool ever conceived. By engineering the Schroedinger equation, for example, one can theoretically engineer physical change itself. *One can actually engineer physical reality*, change the laws of nature, and determine if a thing shall even emerge into physical

quantum change at all, or if it shall change its physical form.

Mind-wise, eventually one will be able to directly input material into the mind—whatever is desired. Education, for example, will simply be achieved by "loading the proper software." Everyone will be enormously educated, by today's standards. That should for the first time allow the complete alleviation of unemployment due to lack of employable skills, for example. It should be possible to virtually eliminate unemployment and poverty. Any sort of disease whatsoever—physical or mental—will be rapidly curable, simply and cheaply.

It will be possible to regrow limbs and straighten misshapen spines—and directly remove the causes of mental diseases and cure them as well. Lifespan will be staggeringly increased, without "old age's debilitation." AIDS, cancer, leukemia, and genetic diseases will be completely conquered. The potential for a true golden era is upon us, for all humanity.

On the other hand, it will also be possible to simply pull out a personality-structure from a person, without his or her consent, and insert another. Or to alter a given personality structure by just altering and re-recording the software. This technological possibility, of course, will certainly be noticed by would-be egomaniacs and dictators, for it can yield the ultimate mind control. It will also be possible to provide direct input inside the mind, surreptitiously, from a distance and without the knowledge and consent of the individual affected. This can be beneficial if it's just "instantaneous telepathy"—instantaneous communications, so to speak, and if it's desired by the recipient.

It can be highly detrimental if it is undesirable material, or if it's a forced internal change, or enslavement, or used to overwhelm and destroy the mind, or used to jam the body's immune system, induce virulent diseases en masse, etc.

Unless the present inhumanity of one human for another is overcome, future wars are likely to take on aspects that stagger the imagination. In 1975 Brezhnev called these new mass destruction weapons of the future "...more frightful than the mind of man has ever imagined." He should know. When he made the statement, the Soviets had already been inducing diseases in persons in the U.S. Embassy in Moscow for nearly 30 years.

"You can 'make' thoughtforms to order, and input them directly into the mind and long-term memory. If we view the conscious mind as a special serial computer, we have now found where the software is—for mind, long-term memory, and personality."

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MBR: Can you explain that part about direct, forced input to the mind, just a bit more?

TB: Yes. It involves a characteristic of the mind and brain that has been experimentally shown. For example, if anything (thought, feeling, emotion, image) arises internally in one of the cerebral hemispheres, that hemispheric personality thinks that it did it. That is, it thinks that it not only thought the thought, but that it also created the thought. So if you have a hidden channel to pipe in inputs, you can take over or implant the thoughts, behavior, and actions of a person. Or of a very large group of persons. That alone allows a mind-numbing direct control of behavior externally and from a distance.

MBR: Can you really control behavior electromagnetically? Can you give us an example?

TB: Yes you can control it readily and deeply, if you develop and utilize the internalized EM energy channel technology. As to proof, Delgado certainly has demonstrated profound control over animal behavior experimentally, for all the world to see, using implanted probes and precise injection of EM signals. The Soviet LIDA machine, using a 40 MHz carrier and complex waveforms—and actually the hidden Whittaker-infolded EM structuring, unknown to Western technologists—has demonstrated the ability to place a mammal—either a human or a cat—in a cataleptic state. That state can be induced in a few minutes exposure and then persists for some minutes after the stimulus signal is removed. That proves that you can profoundly alter the mental state, electromagnetically.

Perhaps the very best example is provided by the two cerebral hemispheres in your own head, or those in a rat, or those in a cockroach. As we know from split-brain research, each hemisphere has a separate personality. That's a separate being, if you will, to put it bluntly. Yet even though you are two beings in one body, so to speak, you are only conscious of one being. How is that, you might ask, since both brain halves are operating? How do you integrate two beings consciously into one functioning being? Such as is already done in your own head?

The answer is this. Suppose your left brain sends a signal to your right thumb to move. While the signal is on the way to the right thumb, the left brain also sends a replica of the signal over the connecting corpus callosum, into the right brain half, where it emerges inside. [When the signal emerges inside a brain half/mind/personality, it thinks that it itself originated it. That's because it

perceives no time delay between appearance of the signal in its "transmission" section, e.g., and the appearance of the signal in its "receiver" section. The ultimate definition of identity, after all, is the absence of all distinction. The absence of functional distinction in time constitutes the creation of identity in time. The whole arises when and only when distinction between the parts is lost.]

The right thumb is continually communicating back to the left brain half, telling its progress. Replicas of those return signals from the thumb are continually being sent by the left brain across the corpus callosum into the right brain. The right brain thinks that it originated the thumb-move-order, and that the right thumb is reporting its progress. The right brain thinks it did the whole thing itself. A similar process occurs, of course, from left brain to right brain. Each inputs to the other, at least insofar as awareness of the order and the event is concerned. Each thinks that it did it. In that way, there is a loss of distinction between the parts of the functionality. Accordingly, there is only one sense of being in the bi-system, even though there are two separate beings.

It has also been shown that, when the corpus callosum is severed, the two brain halves now function much more independently. In that case, two separate personalities really do emerge and function in one body. That also has been shown in the laboratory.

The Brain is in the Head—Where is the Mind?

MBR: But aren't you actually saying that the mind and thought, then, are not really just electrical wiggles in the brain after all? That they are actually separate from the physical brain, and the brain is just a special sort of tuner or "workstation"?

TB: Exactly. The real functioning of mind, thought, memory, and personality occurs in the infolded Whittaker bidirectional EM wave structures of the overall body's scalar potential—its bio-potential. And one of the great neural scientists has already pointed out that mind and memory are not precise functions of physical location in the brain.

MBR: Is there any real proof of the internal energy channel operation of the mind, or is it just all still a theory or hypothesis?

TB: The basis can be shown, and it is directly subject to laboratory test, with a decent laboratory

and a little effort. Let me give you a very strong datum point.

There exists a rare, completely baffling medical phenomenon—which has until recently been concealed—called hydrancephaly. To the normal materialistic Western biologist, this condition is astonishing, to say the least. In hydrancephaly, a person's cranial cavity is filled almost totally with fluid, not with brain matter. There may be only 5% or so of the brain in there; typically just the small portion on the tip of the spine. The other 95% of the brain case is filled with fluid. Yet the individual may be as normal as you or I. Except, of course, that x-rays of his head will astonish all the doctors. A few years ago, for example, such a hydrancephalic individual graduated from a university in Great Britain, with a degree in mathematics. British news actually made a video documentary on this subject, and particularly on that individual.

Now obviously hydrancephaly proves rather conclusively that it isn't really the brain matter or the electrical wiggles in the two hemispheres that constitute the mind. Those wiggles normally are correlated with, and communicate back and forth with, the internal Whittaker dynamics of the bio-potential. The brain is a special communications and processing station, interfacing sensors and processed stuff from the external world to the Whittaker-sets, and outputs from the Whittaker-sets to the body and cells. If just a small functioning part of this "way station" remains fully functional, the interfacing still exists.

MBR: Can you shed any light on the functioning of the fluid that fills 95% of the brain cavity of a hydrancephalic?

TB: Perhaps a little bit. There's an interesting thing about fluid—about water. The hydrogen bonding structure of water is enormously complex and richly varying. Bond-structuring of water constitutes a special kind of "neo-Whittaker" substructure inside a special kind of potential for that particular body of water. A glass of water, for example, has an overall neo-potential comprised of its hydrogen bond structuring. That water will change its internal bonding structure if you enter the room, or if you blink your eye while observing it. It continually adjusts to everything in its surroundings. The reason is, everything in its environment has charges, and clumps or orderings or structures of potential. And the internal Whittaker structures of all those potentials overlap because the potentials overlap. Therefore the internal bidirectional Whittaker EM waves intercommute. The internal dynamics of the water receives inputs from the surroundings this way, and the water's bonding structure changes accordingly. We've only known the complexity and richness of this water structuring for less than two decades, and so far as I know, no one else seems to be considering

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the Whittaker infolded EM wave structure aspects of it.

The point is this: In the fluid inside the head of a functional hydrancephalic, the water structuring is quite sufficient to provide the rest of the needed "way-station two-way tuner, processor, and transmitter-receiver." The reason is quite simple: The potential of the fluid constitutes a partial potential in the overall bio-potential of the body. It's like the pressure of a mixture of gases: the overall pressure consists of the partial pressures of the component gases. The Whittaker structures insure intermingling and intercommunication through the internal energy channels of the total bio-potential to all its constituents. Therefore the water structuring of the fluid in the head of the hydrancephalic serves—bridgewise—as a substitute brain.

Other supporting evidence, of course, is that quantum mechanics experiments have essentially established action-at-a-distance and quantum correlation. The quantum potential, therefore, is something real and functional after all.

And even more evidence is provided by the nature of a nonlinear material versus the nature of a linear material. However, that would take a book, and is just too much to cover in this interview. Suffice it to say that a strong argument can be made from the nonlinear characteristics and phenomena themselves, such as production of time-reversed waves, amplification of time-reversed waves, negentropy (re-ordering of scattering energy), etc.

The bottom line is that there's certainly enough evidence to substantially support these hypotheses, and move them from the realm of idle speculation to the realm of "worthy for further experimentation and development." The ultimate proof, of course, will be when one demonstrates the actual production, recording, and functioning of a living mind. With the internal energy approach, that is hypothetically quite possible, and will eventually be demonstrated.

"Snapshots" of Thoughts and Breaking the Brain Code

MBR: How is this related to the neurons, synapses, and dendrite firings in the normal human brain?

TB: The same "internal electrical structure" thing is true of the brain and its dendrite firings, EM waves, and tiny but extremely numerous currents and fields.

Take an instantaneous snapshot of all the dendrite firings—billions of them—frozen for an instant. The actual pattern or structure represents the internal state of the brain's bio-potential at that instant. Take another snapshot a moment later. The change of the internal structuring represents the brain's internal structuring at a new moment. Interfering (subtracting) the two snapshots provides a delta that represents

"The real activity of the mind occurs in hidden variables, in hidden channels inside the normal 'envelope/external electromagnetics' represented by normal brain wave measurements."

the exact and total change that occurred in the brain-state during that tiny interval between snapshot one and snapshot two. But since thought itself is a change in internal brain-state, then the thought patterns during that interval must be contained in those changes. And of course a myriad of other brain control actions are in there as well. Commands to

beat the heart, direct biochemistry of cells, etc. To detect the internal state precisely, one now needs to decompose that delta pattern into its Whittaker-structure components and sort them all out.

MBR: How would one go about detecting the internal state, to get at the actual thoughts themselves?

TB: Well, one has rather much got involved with the standard chaos problem. You've got hidden order (the thoughts) buried up in a lot of extraneous material. In other words, you're looking at something statistical, and it's got several kinds of hidden order hidden in there in what to you appears to be a whole lot of noise. So you do something very similar to what we described in the snapshot analogy, but apply Whittaker-channel detection at the same time. Actually, a first step in this direction has been beautifully done by Dr. Hunt. She divided the external brain-wave region into several frequency bands. (Actually, harmonic intervals are best, per Whittaker theory.) She set up individual detectors for all the frequency channels simultaneously. Then she divided each of these channels in two branches: one branch straight through without a time delay, and the other delayed by a bit, say, 6 milliseconds or so. Then she mixed all the delay channels onto all the nondelay channels, and recorded the superposition. And lo and behold, she got beautiful traces of hidden chaos in brain wave activity. The traces exhibited the standard chaos attractors. Her magnificent work is very strong evidence that the real activity of the mind occurs in hidden variables, in hidden channels inside the normal "envelope/external electromagnetics" represented by normal brain wave measurements. Hunt has shown that there is a hidden, deterministic, dynamic order "inside" the normal statistical EM brain activity.

Over two decades ago, a Russian scientist, Lisitsyn, obliquely spoke of Russian breakthroughs in this area. Lisitsyn stated that the Soviets had "broken the human brain code." He further stated that some 23 channels were involved, reaching all the way up to optical frequencies. However, only 11 of these frequency channels were independent. He also mentioned that the brain coding did not number over 44 "digits."

Now I interpret his remarks as indicative of direct application of Whittaker theory. Lisitsyn of course did not give the details; that's highly classified in the Soviet Union, as witnessed by the Petukov/Toth incident in Moscow. However, I interpret Lisitsyn as having obliquely referred to 11 independent Whittaker frequencies—the fundamental frequency and 10 harmonics—that are used by the brain workstation to intercommunicate between the mind and the external electrical/physical functioning of the organism. I interpret the remark about 44 digits to probably mean that there are some 44 different independent Whittaker spectrum sets, where each spectrum consists of the fundamental and 10 harmonics. And in each frequency channel of a set, there are two bidirectional EM waves—actually, an EM wave and its time-reversed antiwave (phase conjugate replica).

The Case of the Missing Chaos—Finding "Hidden Order"

MBR: Could you return to your discussion of what's wrong with present electromagnetics, quantum mechanics, and general relativity? Perhaps you could address them in order.

TB: Okay. I've already stated the case for electromagnetics. Half of it—the really interesting part, the internal energetics—was discarded by Heaviside and Gibbs. By discarding the scalar component of the quaternion, they threw out the internalized EM energy of local space-time and its communication with distant spatial points. Since the localized energy density of space-time is essentially synonymous with gravitational potential, they threw out the ability to turn EM force field energy into gravitational potential energy. They threw out the interaction and entanglement of EM and gravitation, and wrote the special subset of Maxwell's theory that is restricted to the case where gravity and electromagnetics do not interact. As a subset, their work is perfectly okay. However, a priori you will never use their approach—nor the applied technology that follows its principles—to produce electrogravitation, overunity machines, tapping of vacuum energy sources, etc. You will never electrically change the inertia of a body at rest, structure the electric and magnetic flux itself, or achieve and utilize action at a distance. And your instruments developed in accord with the Heaviside/Gibbs EM principles will never detect or measure the mind, thought, and emotion—for those

instruments a priori discard and ignore the internal energy arena where mind, thought, and emotion reside and function. And since the externalized EM energy is scattering energy, energy once scattered will produce entropy—increased disorder, and only the positive flow of time. And that science and technology will never be able to translate EM energy into G-energy and vice versa. Every system built under its principles will be at extreme best a “break-even” system. It will never produce more energy out than is input in. It is at best a diode engineering technology.

MBR: What about present quantum mechanics?

TB: Quantum mechanics has a severe foundations problem: the missing chaos, or in other words, the problem of the missing hidden order. Let me explain how that came about. When physicists were constructing quantum mechanics, it was of necessity a statistical theory. They simply lifted the Gibbs thermodynamics statistics, and utilized it as the quantum statistics. Furthermore, Gibbs statistics was based on the theory of the random variable; that is, the variables were considered random. So, because random variable statistics were utilized, the QM postulate that “quantum change is statistical” was over-restricted to the special case of “quantum change not only is statistical, but also is random.” The second case, “quantum change is statistical, but can contain hidden order and be nonrandom,” was thus excluded a priori, simply because of the statistics utilized. Now the random change hypothesis is easily falsified, as follows: If you collect large numbers of random change, the resulting collection is still random. The next collection will not necessarily produce the same collection at all. (In fact, if it does, then this is prima facie evidence that the variables are not all random.)

What this means is that, if quantum change is random, then collections of these random tiny changes could never integrate to provide us the ordered macroscopic universe we live in and observe. You couldn't have a flower, or a tree, or anything, for that matter—just total randomness. Obviously that is not true, or else you and I do not exist and this macroworld does not exist.

For integration of the statistical quantum changes to yield an ordered macroscopic universe, quantum change must contain hidden order. That is, the variables must be chaotic, not random. If the changes are chaotic, then integration of them will see large scale forms emerge and stabilize—which is what we actually observe in physical reality.

So ironically, the biggest foundations problem in quantum mechanics today is the problem of the missing chaos! Try as they will, quantum physicists cannot find the missing hidden order, because they continue to use the Gibbs statistics that already excludes it. So they now know that somehow QM is wrong, and many of them fear that this most suc-

cessful of physics theories will have to be completely redone.

David Bohm, of course, long ago pointed out that hidden variables could contain the hidden order. Actually all of experimental physics is consistent with his hidden variable theory (HVT). Mainline QM theoreticians, however, shun hidden variables (and therefore hidden order). They avoid hidden variable theory by applying a kind of Occam's razor: They say that Bohm's HVT seemingly predicts no new phenomena, so why adopt it at all, or even seriously investigate it? And since Bohm did not know how to actually engineer his hidden variables, nothing could be found experimentally with it that could not also be explained by the present QM.

Now this is where Whittaker's work—and Maxwell's original quaternion theory of EM—saves the day and decisively decides the issue. Whittaker's hidden variable theory is directly engineerable on the lab bench. It's testable, and when applied to quantum mechanics, it predicts hordes of new phenomena and effects, so it certainly gets by the old “Occam's razor” saw. When you apply Whittaker's approach to QM, again you provide testable internal EM bidirectional wave structures to the scalar potential, including the Schroedinger potential. Whittaker's work allows direct engineering of quantum change itself, and constitutes testable hidden order inside the “Gibbs statistics.” In other words, application of the Whittaker work to QM produces a superset of QM, where the missing chaos is restored.

The postulate that “quantum change is statistical” now has three special cases, theoretically: (1) the case where no internal order is present, and quantum change is random; (2) the case where some internal order, but not total, is present, and quantum change is already chaotic; and (3) the case where quantum change is perfectly engineered and hence perfectly ordered and deterministic.

Notice that, by adding the hidden order and the internalized EM energy, we've now extended both QM and EM, and unified the two on a common subset: each's Whittaker-applied subset, which is the same subset shared by the two.

Einstein's Error

MBR: So how about general relativity? How does it fit in?

TB: A similar thing also happened to general relativity, believe it or not! Einstein unwittingly re-

stricted general relativity to a subset of the theory he intended to write. This over-restriction was again an indirect result of the fundamental Heaviside/Gibbs error in electromagnetics.

Unfortunately, Einstein's view of electromagnetics approximated the classical view. In classical EM theory, EM and gravitation were mutually exclusive. That is, the strong EM force was not usable as an agent to curve space-time.

Therefore, as a curvature agent, Einstein only considered the weak gravitational force due to the attraction of mass. Now the G-force is far, far weaker than the E-force. For two electrons, for example, the attractive G-force between them is on the order of only 10⁻⁴² times as strong as the electrical repulsion. The G-force is very, very weak! If only the weak G-force is considered for curving space-time, then there will never be an observable space-time curvature, except in the immediate vicinity of a very large mass—such as on the surface of the sun or a star.

Einstein reasoned that the laboratory, and the observer/scientist and instrument, would never be on the surface of the sun or of a star. Therefore, he reasoned, the local space-time where the lab, the observer, and the instruments are—would never be curved. The local—space-time would always be flat.

Unfortunately, Einstein then made a fundamental error. He overgeneralized his thought examination. He stated one of his fundamental postulates of general relativity as “The local space-time is always flat.” This is overly restrictive, and did not follow from his thought process. His postulate can be more accurately stated as follows: “The local space-time is always flat, whenever only the weak gravitational force is used for the agent of curvature and the local region of interest is not near a large collection of mass.”

“Quantum mechanics has a severe foundations problem: the missing chaos, or in other words, the problem of the missing hidden order. . .”

Notice the difference in the two statements of the postulate. Einstein's overstatement does not allow the far stronger EM force to be used for curvature. In effect, his own overstatement excluded electromagnetics from curvature unity with

gravitation, in his own general relativity theory. Ironically Einstein then tried for the rest of his life to fit electromagnetics back in there—never realizing that his own too-strenuous statement of the flat local space-time postulate doomed all his efforts to failure.

On the other hand, the corrected statement of his postulate admits the following corollary: “When a very strong force such as the electromagnetic

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force is used for the agent of curvature, the local space-time may be curved, even though the local region of interest is not near a large collection of mass."

As can be seen, Einstein unwittingly wrote only a subset of his intended theory. Correct restatement of his overstated postulate of uncurved space-time dramatically extends general relativity, and unites it with electromagnetics in a unified field theory.

Einstein's error also excluded the present general relativity from ever being a laboratory experimental science. If no detectable space-time curvature is available locally, it obviously can't be measured in the lab. The vanishingly small local curvature waves following from mass-attraction gravitation are still predicted to be several orders of magnitude below the ability of the finest available detector. And that detector is a huge, monstrous, very costly thing. A priori, if the observer's local space-time is always flat, there is no local experiment or local apparatus that involves or yields a curved local space-time!

Unfortunately, Einstein's modern followers have raised Einsteinian general relativity to a dogma. They ruthlessly uphold the overstatement of the flat local space-time postulate. Physicists who would dispute it—and quite a few would do so—are essentially barred from obtaining funding. If they persist with their heresy, their scientific stature is lost, and they are ostracized and cut off economically. Simply read Santilli's book, if you wish a clear inside picture. Contrary to the scientific propaganda, orthodox science is ruthless in defending its doctrine against all would-be heretics. Much of science has been converted to a religion, instead of a science. Any person knowledgeable of scientific history can cite numerous examples of scientific suppression, character assassination, and essentially banishment. Gauss's nonlinear geometry, Wegener's continental drift, Mayer's discovery of the conservation of energy, Ovshinsky's amorphous semiconductors, physical therapy, the EKG, and the clinical use of hypnosis come readily to mind. Scientists form a distribution, just like any other group. Some of them are saints. Some of them are devils. The broad majority is neither, but is made up of just ordinary people like you and me, doing a specialized job. Every scientific model is known to be falsifiable and imperfect in the first place, if you believe Godel's theorem. Scientific method does not yield total truth anyway, by its own assertion; at best it yields a partial truth. By the Heisenberg uncertainty principle, every measurement distorts the entity

with which the instrument interacts, changing what actually appears to be measured. Real scientists know that scientific models are progressive. For any model, sooner or later a better one, an improvement, will be found.

At any rate, when one looks at Maxwell's quaternion theory, the scalar component captured the ability to enfold and utilize the strong electromagnetic force to make a trapped potential filled with a structure of dynamic EM vector energy. However, if the translation components of the quaternion were zeroed, the system of trapped spatiotemporal energy did not translate spatially, but only temporally. That, of course, is a scalar EM potential without an external force-field gradient. Since it is really trapped energy that gravitationally attracts other trapped energy, then all potentials are gravitational—as is well-known. In fact, in 1968

Sakharov pointed out that gravitational field is not actually a primary field of nature. Instead, it's always a conglomerate produced from other fields. If his hypothesis is true, then to the first order gravity should be composed of electromagnetics, since it's the strongest force we normally will be able to meet or utilize.

"We can reach directly into the atomic nuclei with magic, gentle, accurately controlled fingers. We can for the first time begin to do actual tailoring of the nucleus itself."

Maxwell's quaternions and Whittaker's profound two papers directly show that. They also show how to engineer all this on the laboratory bench. So the Whittaker scalar EM approach is testable, which meets the major criterion for the difference between a hypothesis and a theory. Any decent university physics and/or electromagnetics staff who put their minds to it can test the approach.

Tesla and Scalar Pioneers

MBR: Are there other physicists or scientists to whom we should also give credit for these things?

TB: Yes. I'd like to mention that Nikola Tesla experimentally discovered the standing scalar EM potential wave on the night of July 3-4, 1899, in his Colorado Springs laboratory. He found it being radiated from a traveling thunderstorm. He recognized it as an "electromagnetic sound wave." This was four years before, unknown to the world, Whittaker wrote and published the precise theory for that same electrogravitational wave. Tesla always stated that, in the remarkable systems he later referred to, he was not using Hertzian waves. Rather, he pointed out, he was using EM sound waves—which must be modeled longitudinally. Today we know Tesla was correct—and all his detractors were wrong.

I'd also like to point out the patents and work of Hooper. Hooper seems to be the only physicist who ever methodically investigated EM stresses, structuring of those stresses, and the gravitational implications of those stresses in the laboratory.

I'd like to also point out Sakharov, and honor him for his clear statement that gravitation is not primary, but is a conglomerated field made from other fields. One should also point out the explosive progress made in stochastic electrodynamics as a result of Sakharov's suggestion, by Hal Puthoff and others. And one should definitely honor scientists such as Peter Graneau, who have struggled to point out the foundations problems of electromagnetics and experimentally back up their findings.

And finally I'd like to mention that I've been privileged to work with some extraordinary inventors. In deference to their requests, I will not give a straightforward list of them at this time. But a great deal of any insight I may have gained is in large part due to painstaking, maddening, persistent experiments they have done in the thousands. We will have more to say—and powerfully—about their actual contributions at a later date, hopefully later this year. Lots of other brilliant inventors—Moray and Sweet come readily to mind—have also struggled in this field and produced astonishing and unrewarded results.

Balancing the Two-Elephant and the Two-Flea Systems

MBR: Can you spell out again what effect excluding the internal EM energy had on physics, as simply as possible, and how that is related to vectors?

TB: The thing that casting out the internal order and internal structure of the local ST does, is to remove any consideration of hidden, deterministic variables that could be manipulated to create and control quantum change itself.

As can be seen, then, in the physical world scalar quantities are very often really zero vector systems, where the "scalar" or motionless system is actually filled with hosts of smaller "vector" things in violent motion. We have to be very careful, therefore, when we apply mathematics (which does not decompose fundamental scalars into vectors, or identify them as vector zeros) to a physical situation. To use an extreme example, two elephants pushing strongly head-on against each other may produce a "two-elephant" system of opposing forces (vectors), where the system is stationary. The system is thus a zero resultant vector system, whose motion is represented by a vector zero. The same would be true for two fleas pushing against each other and not moving as a system; the system would be a zero resultant vector system, whose motion is represented by a vector zero.

And here's where the mathematics betrays us, if accepted unquestioningly. In vector analysis, all vector zeros are identical. Here we are saying that the translatory motion of the flea system and the elephant system are the same. That's true, but there's a whale of a lot of difference in the two systems that must be accounted for physically! If you don't believe that, put yourself in between the two pushing elephants, and see if that's the same as being between the two pushing fleas! You'll certainly notice a lot more stress on you from the elephants than from the fleas.

That illustrates a fundamental problem with vector analysis. In the concepts of the math itself, one conceives a "vector space" as a sort of "place where one can put vectors." Further, no matter how many vectors we put in there, or how they interact, the vector space itself is never under any stress. In other words, in that space, elephant-pushing and flea-pushing are identically the same. And that's the problem. When vector analysis is applied to physical situations, imbedded inside the mathematics of vector analysis itself is the absolute discarding of the stress of local space or space-time, resulting from the interaction of vectors representing interacting motional physical quantities.

Now in quaternions, that is not the case. Quaternions that interact capture this "local stress of space-time" and "locally trapped energy of space-time" in the scalar component, inside it. When the motional parts of interacting quaternions produce a motionless or translationless state for the interacting parts as a system, the stress, energy, and exact geometric patterning of the interactants that are now locally trapped in space-time is gathered in and accounted for. The motional aspect may go to zero, but the scalar aspect will capture not only magnitude but internal motion and the exact dynamic structure of that internal motion.

Quaternions already incorporate a beautiful hidden variable theory, analogous to Bohm's beautiful work. They incorporate two channels: the external energy channel (which is addressed, for example, by classical Heaviside/Gibbs EM theory), and also a hidden internal energy channel (which is not addressed by Heaviside/Gibbs). Quaternions also incorporate hyperspatial aspects, since they are an extension to complex number theory. Notice that Heaviside had to stick back in complex numbers, to get his spatial vectors to unite magnetism and electricity. So he essentially added one extra dimension, typified by the first hypernumber, the square root of minus one. Quaternions already had that in there, and a lot more that Heaviside threw out.

MBR: Would you sum up how general relativity, electromagnetics, and quantum mechanics are unified by the Whittaker approach?

TB: Yes. Applying Whittaker's work to each of the three, a superset of it is produced. The new superset has two subsets: the present discipline and the extension containing internal EM energy and hidden variable theory. Since all three extensions are actually the same thing, then all three supersets superpose on the common extension set. Each of the present three disciplines is revealed to be a special case, which unfortunately omitted the unifying extension set. It's like a topless cardboard box that you've cut the bottom out and unfolded the sides separately. To be joined, those separate sides need the bottom of the box. Whittaker provides the bottom. And it's testable.

Magic, Gentle Vacuum Engines: Homeopathy and Engineering the Nucleus

MBR: Are there any other fundamental things from all this that you'd like to point out, that you haven't mentioned, that follow from the eventual development of this new physics?

TB: Several. Please notice that Whittaker's work and the characteristics of Maxwell's scalar component of the quaternion allow the direct electromagnetic engineering of the vacuum. In fact, they allow the actually structuring and variation of massless electric charge flux itself. Now, in the new approach, one electron can be quite different from another, because its electric charge flux can be varied and patterned. Not only can its overall electrical charge be varied, but its charge can be dynamically structured. Now the charge of an electron or other fundamental particle can vary, and the charge flux of a single particle (or a group) can be spatially structured—or activated.

The activation concept, for example, allows an immediate and testable explanation of the mechanism by means of which homeopathy works. Recall what I said about water structuring and hydrancephaly. A chemical compound has a deterministic infolded EM Whittaker structure. If you make a solution of the compound, you change this hidden internal energy structure of the fluid. If you then get rid of the physical carrier—the mass of the original compound—and just leave the inner energy structure for that compound, you have homeopathy. Chemistry is totally due to charge and charge distribution. In homeopathy you're retaining the charge template in the potential, and that affects charges in the treated body just like the

actual medication. In fact better, because you now do not have the "physical residue" to worry with, but do things directly. These new concepts are profound and controversial changes to the present foundations assumptions of physics and biology.

In the new approach, you can't just automatically apply random variable statistics. You have to apply chaos. In structuring the vacuum's virtual photon exchange with the mass of a charged particle, we have moved to a completely new and much more fundamental level of engineering. Now the massless virtual particle charge flux can be activated with a particular dynamic structure—a *vacuum engine*, if you will—to perform a special job. Or we can activate a local space-time itself, curving it and internally structuring that curvature to our will. That locally curved space-time then becomes a continuing, inexhaustible source of a specialized vacuum engine or engines.

We can tailor the local vacuum so as to be able to violate any and all of the present conservation laws, not just two out of three as the present CPT theorem permits. Literally we can use the vacuum's incredibly powerful flux to produce localized vacuum engines. We can reach directly into the atomic nuclei with magic, gentle, accurately controlled fingers. We can for the first time begin to do actual tailoring and engineering of the nucleus itself. We can further directly collect and integrate virtual state energy forms, which in QM are called "ghost forms." Literally, eventually anything at all can be materialized and brought into physical reality, or dematerialized so as to disappear from physical reality. And we shall be able to engineer and change the local laws of nature, since we can directly engineer and control the Schroedinger equation, the quantum potentials, and the entire local vacuum potential in all its partial potential parts.

Whether we're ready or not, God has now seen fit to hand to humankind the ability to engineer its own physical reality and its own destiny. We can make of the new engineered reality a heaven or a hell. Whichever we do, we will reap the benefits or face the consequences. It would indeed be wonderful if, for the first time, we could develop this powerful new tool to save humankind rather than destroy it.



THE MEGABRAIN DIRECTORY — ACCESS TO TOOLS

THE MEGABRAIN DIRECTORY: AN INTERNATIONAL USERS' GUIDE TO BRAIN GYMS, CLINICS, THERAPISTS, RESEARCH CENTERS, RESORTS, COMMERCIAL AND PROFESSIONAL USERS OF BRAIN TECHNOLOGY.

It's probably the single most-asked question we get here at Megabrain Report: "Is there somewhere near me where I can . . ." (experience a variety of brain machines? . . . find a therapist who uses brain technology to help clients lose weight/stop smoking/overcome phobias? . . . volunteer as a guinea pig for brain technology research? . . . find others who are actively exploring the effects of brain machines. . . ?)

Who knows? Well, we know a *little* bit here at MBR. We know that commercial/professional use of brain machines has expanded explosively in the last few years. We know this from information that flows to us from various sources. We know, for example, about organizations using photic stimulation for the treatment of learning disabilities in Salt Lake City, Sacramento, Santa Cruz, and Arizona; and for the treatment of Seasonal Affect Depressive Disorder in Sweden and Norway. We know about scores of brain

fitness centers in places ranging from Los Angeles to Munich, from Buenos Aires to Tokyo. We know about researchers exploring a variety of brain technologies in Sausalito, Oslo, and London. We know about dentists, psychologists, sports trainers, educators, hypnotherapists, ministers and priests, management trainers, bodyworkers, M.D.s, and drug counselors using mind machines in their professional practices in towns and cities around the world. . . .

In short, we have some information, but it's never been put together in any systematic way. And as the information about new uses and users of brain technology continues to flood in, we have become increasingly aware that what we know about who, what, where, when and how brain technology is being used around the world is pitifully small, painfully inadequate. We want to know more.

And, from the constant questions we get from readers, you want to know more too. And we all want to have the information in an easily accessible form. Since it is part of the mission of MBR not only to facilitate the flow and interchange of information about brain technology but also to help create and systematize new information, it's time to get to work. We therefore announce our intention to gather all available information about individuals, centers and organizations throughout the world that are actively using brain machines, and to organize this information into a single sourcebook (or computerized database).

A CALL FOR CONTRIBUTIONS: WE NEED YOU!!

So here's the pitch: the field is expanding and changing so rapidly, with centers and clinics opening in such numbers around the world, that the project can only succeed if it's fed by up-to-date information from around the world, that is, by you. At best, this will be a bit like trying to nail jello to a tree, or making a daguerreotype of a fireworks display. But surely the best way to capture the rapidly changing information is not to rely on a single information-center, but through a multi-dimensional network of information nodes: i.e. you and the information you can contribute.

What we want to know is: do you know of any individual, or group, that is using brain technology in such a way that it would be of interest to MBR readers? This would include:

- Commercial users (Brain-Mind Gyms, etc.)

- Professional practitioners (therapists, medical professionals, pain and stress clinics, drug rehabilitation centers, learning centers)
- Research centers
- Individuals (owners of machines who rent out sessions, etc.) and whatever/whoever/wherever else that might be useful or informational in helping us gain access to brain tools.

Send us whatever information you have or can gather. Among the information that would be of use: the name and address of the facility; what type of equipment the individual or organization is using; the name, professional credentials, and a brief bio of the individuals operating the facility; a description of the type of work/treatment/exploration/research being done at the facil-

ity; the cost of sessions; descriptions of the facility and individuals involved; subjective impressions of the facility; and so on. From the information we already possess, we believe that this Directory will have

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A Message to Subscribers *continued from inside front cover*

Syndrome. Fortunately and at long last, I believe I've been able to put that behind me, thanks in large part to the effects of several mind machines—something I plan to write about in a future issue of MBR. As a sign of my re-emergence, in the last month alone I've completed a substantial chunk of a new book (MEGA BRAIN POWER: HOW TO USE MIND TECHNOLOGY FOR PEAK PERFORMANCE, to be published in 1993 by Hyperion Books), written several articles, and prepared this massive double issue of MBR for publication.

The final, and perhaps most insurmountable reason for the delay that followed MBR #2 was that MEGABRAIN REPORT was insolvent. In my first letter soliciting subscriptions I said MEGABRAIN REPORT would not be "a thin or paltry bulletin made up of brief summaries or snippets" but would contain fully "16 to 24" pages each issue. We set our original subscription fee based on that estimate. But of course it turned out that to publish the kind of in-depth journal the field deserved, far larger (and far more expensive) issues were required. The four issues published thus far have averaged well over 40 information-packed pages each: each issue larger (in terms of number of words) than a book of *over 200 pages!*

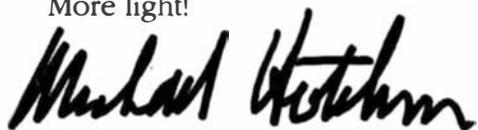
There's no escaping the hard economic fact: it has cost more to publish MBR than we obtain from subscription fees. And so, after considering our options, we've decided to raise the subscription price from \$36 to \$48 per year (i.e. four issues). However, as a charter subscriber, you've been with us from the start, you've supported MBR when we needed it, so *we'd like to thank you for your support by making you a special, money-saving offer, available only to charter subscribers:* for a limited time you can resubscribe at the old rate of \$36 (\$41 Canada and Mexico, \$48 international), and receive as a bonus an extraordinary free performance-enhancement tape produced by the Lind Institute for Accelerated Learning. With a two year subscription you'll receive *in addition to the tape* a copy of the newly published updated, revised and expanded edition of *Megabrain*. You can find out the details on the centerfold pages of this journal.

I urge you to resubscribe now. I could ask, where else can you get so much for the price? One year the equivalent of four 200 page books in terms of actual words, yes, but where could you find four books anywhere, *whatever* the size or price, that could bring you such a wealth of fresh and important information about mind technology?

Most of all, I urge you to resubscribe because the best is yet to come! Future issues will bring you in-depth features on sound therapy, light technology, cognition enhancing drugs, new consumer EEGs, acoustic field systems, unbiased explorations of subliminal tapes (do they work?), new product reviews, reports on breakthrough research, interviews with the most innovative, insightful and controversial figures in the field. And much more.

I know some of you felt let down by our delay. You were. But now we're back in gear, ready to roll and keep rolling, producing hot new issues regularly and reliably. In fact, substantial chunks of MBR #5 are almost ready for publication, and we're in the midst of some exciting investigative journalism that we think will result in some surprising and important revelations. We're chomping at the bit to start producing Volume II. I hope you'll be with us.

More light!



Michael Hutchison

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