

300

# BRAIN

# TUNERS

## The EM Cure For ADDICTION

Brain Tuners, The EM Cure For Addiction	
Notes from the Dr. Beck lecture. . . . .	1 - 6
Los Angeles CA, Aug. 3, 1983	
Brain Tuner by Kathleen McAuliffe	
From January 1983 "Omni" . . . . .	7 - 13
New Universal Field Therapy	
By Dr. Wolfgang Ludwig . . . . .	14
CES Reduces Anxiety and Depression	
From FOCUS on Alcohol & Drug Issues. . .	15 - 17
The Quiet Revolution In Pain Control	
From "California Health Review". . . . .	18 - 20
Pandora's Box	
From the New Zealand "Listener". . . . .	21 - 24
Sing the Body Electric by Frankie Slater	
From the "Whole Life" Monthly. . . . .	25 - 56
ELF Wave Generator Schematic. . . . .	27
A Proven Cure for AIDS? . . . . .	26

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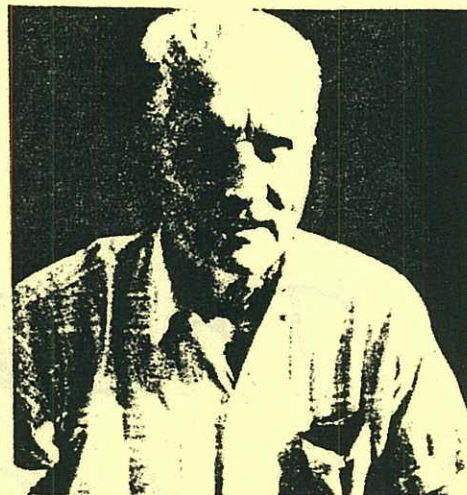
# BSRF

Borderland Sciences Research Foundation

2/16 Tamariki Avenue, Orewa,  
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Fact Sheet on RILEY HANSARD CRABB, Editor-at-Large,  
BSRF. This is a non-profit organization of  
people who take an active interest in unusual  
happenings largely ignored by orthodox science.  
These are phenomena of the borderland between  
the visible and invisible worlds.

Headquarters at Mr. Crabb's home in Orewa is  
a clearing house for the observations, ana-  
lyses, experiences and reports of the BSRF  
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as ESP, Telekinesis, Flying Saucers, Metem-  
psychosis, Radionics, Radiesthesia, Hypnosis,  
Dowsing, Psychic Surgery, Absent Healing, etc.,  
and their articles and letters are published  
in the Journal of Borderland Research, 40 pages  
printed, six issues a year, edited and pub-  
lished at their home by Mr. and Mrs. Crabb.  
Membership in BSRF is \$20.00 a year and includ-  
es the Journal. Mr. Crabb lectures widely on  
these subjects on a donation or fee basis.



Riley "Alapai" Crabb

He became interested in the borderland sciences in 1934 when he disco-  
vered the magnificent metaphysical library of the Theosophical Society  
in Minneapolis, Minn. and tried to read through it in record time.  
He also did his first psychic research then with Mrs. Nellie Peyton,  
mystic and seer, whose talents were sometimes used by detectives of  
the Minneapolis Police Force to trace missing persons.

Military service took Mr. Crabb to Hawaii in World War II and he re-  
turned as a civilian in 1946 to remain there a total of 13 years. This  
gave him ample opportunity to study Pagan magic at first hand with such  
Kahunas as Charles Kenn, David Bray, Kino Lau and others. He was given  
a Hawaiian name, Alapai, by his native friends while producing Hawaiian  
legends for the Star-Bulletin on the CBS outlet, KGMB radio. At home in  
Vista, Mr. Crabb was friend and neighbor of the late Max Freedom Long,  
whose book "Secret Science Behind Miracles" is the standard reference  
work on Hawaiian healing and magick. He is a Doctor of Metaphysics in  
the Society of St. Luke the Physician. Mr. and Mrs. Crabb moved to  
California in 1957. He was soon active in the space race as a Visual  
Information Specialist for the U.S. Navy's Pacific Missile Range, Pt.  
Mugu, California. In 1959 he took over as director of BSRF at the in-  
vitation of Meade Layne, but moved to New Zealand in 1985.

Our invasion of outer space is also an invasion of inner space, or con-  
sciousness! Mr. Crabb is conducting research with Associates and lec-  
turing and teaching in this area of the last frontier, the mind. Dis-  
ciplines in Directed Consciousness have been developed, using self-  
hypnosis or auto-suggestion, also electronic equipment operating in  
the radio, magnetic, and light (color) spectra. The philosophical ap-  
proach is that of the Tree of Life and the Kabala of the Western Mystery  
Tradition, as developed by the Golden Dawn Lodge in England.



## BRAIN TUNERS, THE EM CURE FOR ADDICTION

Notes from a talk by Dr. Robert C. Beck  
in Los Angeles, California, Aug. 3, 1983

Recent scientific breakthroughs in neuro-electronics reveal that the body's own immune system and the brain's neuro-transmitters can be activated by micro-electronic "black boxes". Tomorrow's alternative to drugs and surgery is coming from the new Electronic Medicine.

European literature on this dates back thirty years! This includes the frequency wavelengths of known neuro-transmitter frequencies in the ELF wave region, 1 to 100 Hertz and higher. Electro-acupuncture was developed and used in Germany, Sweden, England and the Orient, but it was Dr. Wen who discovered its effectiveness in treatment of drug addiction, by accident, at his clinic in Hong Kong. There 20% of the population is on heroin. It's cheaper than tobacco! Addicts who came to him for treatment for other conditions found that they no longer needed a "fix". Even more important, they were being cured without withdrawal symptoms!

A Scotch doctor, Margaret "Meg" Patterson, was operating a free clinic in Hong Kong at this time, the 1970s, and heard about Dr. Wen's discovery. She collaborated with him in developing clinical data on it. The cure rate for nicotine, the smoking habit, was found to be 4 Hertz or cycles per second, and the time, three to 10 days.

Dr. Wen was using the #50 lung and heart meridian points inside the ear to place the electro-acupuncture needles when this was discovered. That was all right for Orientals but the western whites did not like it. Experimentation proved that a good alternative was the mastoid bone just behind the ear. After thousands of tests it was found that the best place for treatment was the hollow underneath the ear and behind the jawbone. Put your finger there and open and close your mouth. Where it moves is the spot. This is because a great many nerves cross at this point. Trial and error revealed that the frequency setting for heroin was 111 Hertz, and alcohol 70 Hertz.

Now you all know that vaccination stimulates the Immune System in the body, so it will produce antibodies to fight the invading foreign germs. Now it is proven that a little electric signal device can do the same thing to the body and system to stimulate it into making the same type of immunity antibodies. It's all a matter of producing the same frequency, by chemical or electrical stimulation.

So Meg Patterson developed her own NET, Neural Electric Therapy device. It has four dials and goes from 0 to 22 milliseconds. An earlier single-dial unit had a range of 4 to 2000 Hertz. Dr. Wen did not think too much of her earlier unit --

which was used on rats to verify the production of extra amounts of endorphins in the blood. He wrote and published twelve papers on the Tuner. His work got Joe Kamiya interested in Brain Tuners. Joe did so much work on Bio-feedback. He is now with the Langley Porter Neuropsychiatric Research Institute in San Francisco.

#### THE MOVE TO AMERICA

Dr. Patterson gave up her free clinic work in Hong Kong and came to America. Alpha Metrics Company was formed last January to help her develop and market her instrument. A knowledgeable friend of mine, Capt. Paul Tyler, a government official flew back to Los Angeles with me from the east. He knew of Meg's work and of her efforts to get her NET device approved by the Food and Drug Administration. She wanted to get it approved as a brand new proprietary device.

I found that she could get it licensed and into production and use under Section 510K of the Food and Drug Administration Act as being related to the already accepted TENS units (Transcutaneous Electric Nerve Stimulation for pain control) coming in under the "grandfather clause" and she refuses to do this! She wants to get credit for a new discovery in therapeutic method. So, she is not able to get a new certificate for this, as there is no certification for such a thing in that field, to cause production of neuro-transmitters in the brain.

The FDA has over 80,000 items, drugs and devices, awaiting testing and approval or licensing. It would be at least six to eight years before the FDA could even get to her application and opens it up. Then after it is tested and accepted it would take at least two years to get the patent granted!

I used to teach at the University of Southern California graduate school, and thus knew where to search for the records on this particular principle, of electric nerve stimulation with weak micro-pulses. It was first discovered in 1895! And it has been lost and rediscovered repeatedly over the years, with detailed articles published. So there is very little now that could actually be called and patented as "proprietary" or original discovery. The big drug companies have funded research in this area and have reported that there is nothing to it. There would be no benefit from it. Now remember, they all have a vested interest in drugs, especially drugs that are used up and renewed. They do not want something that cures people in only one treatment! So Neuro Electro-therapy will not be popular in the US as it cures people without drugs.

Valium, a tranquilizer, has a \$13,600,000,000 sale yearly in the US and there's \$90 billion in illegal drugs sold. There are 27,000,000 tobacco users in the US and they spend \$25 billion on this addictive narcotic drug yearly. Knowing this the drug companies don't want NET or TENS, even though top level research people are turning more and more to electronic as the new area for affecting changes in cell life. Stim Tech is a case in point.

The inventors of this TENS device for controlling pain sold out to the makers of a pain-killing drug Tylenol, Johnson & Johnson. When the drug firm refused to put Stim Tech on the market, the inventor sued for suppression of the device and won a settlement of \$140,000,000. They didn't want drugless control of pain.

#### THE JAPANESE BRAIN TUNER

I learned of Omron, which can be bought over the counter in Japan. To obtain one and have it brought in to America I had to be finger-printed, get two doctor's prescriptions for it, show my birth certificate, and have it registered. When I asked for all the reasons for this, I was told that the US is their biggest market for electronic devices and they didn't want to jeopardize this market by having the FDA to close in on them for selling a device that is "illegal for Americans to have"! I had a native born Japanese student at University of California Los Angeles smuggle an Omron into the US for me in a box of candy. I evaluated this and made my own improved version of a Brain Tuner.

The medical trade says it costs \$1000 to build a Tuner and they offer them for sale on the open market for \$5000. The Tuner has about \$20 worth of parts in it, which can be bought at Radio Shack. TENS units are being offered for \$600 and they have only \$15 worth of parts in them. Holistic health centers and doctors are charging \$8000 for 10 days treatment with the Brain Tuner and some sell them for \$10,000! It is rumored that one outfit sells their unit for \$50,000 and only to franchised doctors.

I tried to find out where I stood in making and selling BTs so I called a friend in the FDA in Washington DC. The answer was, "You can make all you want of them but you cant sell any! But you can sell your customer a Bugs Bunny Comic book, and you can give him a Tuner. Never, never mention that it cures or heals anything. Make no medical claims about it at all. If you could declare it as a religious artifact of your church, that would be even better to tie it up for your safety."

One of the makers is Neuro Systems of Garland, Texas. The head of this was working in a 600 bed hospital in Washington DC when he heard of the Russians' Electrosleep device. Some units were brought to the United States and tested on patients, many of them being alcoholics and it was found they got better results than with drugs. They were curing people of their alcoholism! You see, too many Russian generals were becoming alcoholics from Vodka, and the Russian Electrosleep device was developed to cure alcoholics, not just to put them to sleep! Washington had a problem with too many Generals becoming addicted to gin and bourbon. It was the CIA that heard of the Russian results, in Washington, and found that the doctors at the hospital there were planning on spreading word of their success, and some Electrosleep units. Shortly thereafter the project was terminated, and the doctors and research scientists were scattered around the US! So word of this great benefit was not spread. Dr. Smith of Varo

Instruments was one of the scientists. In Garland they make highly sophisticated electronic instruments for the military. They make use of the multi-dimensional Solaton or Solenon, an electrical wave or signal that maintains an energy after the original impulse is gone, for instance, ball lightning -- little bundles of electrical oscillations in all cells including the RNA and DNA, and they tell other cells what to do, instantly! Try to decode those!



At the Dr. Ross Adey hospital Congress in June at the Veterans Administration in Loma Linda, California they all agreed that man is a bio-cosmic oscillator who can be influenced by mini-mini frequencies. But these things that affect us the most are the most hidden. Neuro-transmitters for instance. Years ago there were only 29 known. Now they've discovered and identified over 2000.

#### CURE AN ALCOHOLIC IN THREE DAYS! ARE YOU CRAZY?

Dr. Smith of Varo made one of these Electro-sleep devices and tried to sell it to one of those alcoholics treatment groups -- I'm not going to tell you whether it was Raleigh Hills or Shick-Shadel or another of those -- but he never got any response. He could not figure out why? Then one day a deserter from one of the treatment centers came to him and asked him: "Just what the hell are you guys trying to do? Don't you know it's worth \$9000 to them from the insurance company for every person they treat for alcoholism? It takes eight days of treatment at the center for them to collect the cost of their advertising, and then four or five days more for the alcoholic to dry out. Then they know that in six months 75% of those 'cured' will start drinking and have to come back for another 'cure'. This is a guaranteed income! And you guys are going to cure them permanently in only three to five days? Get outta here!"

The other major drug is tobacco. It is  $4\frac{1}{2}$  times more physically addictive than morphine and normally it takes almost five years to get it out of the system, but the Brain Tuner does it in a very short time. Hong Kong, Red China and Soviet Russia use the Tuners. They have proven that no matter how badly brain damage has caused the reduction of endorphins, beta blockers or enkephalins, twenty minutes on a Brain Tuner restored the balance in the body and the person no longer had withdrawal symptoms. The word endorphins is from endogenous and morphine. Endogenous means producing from within one's own body; so endorphins means the body's own production of its own pain killing morphine

We are bio-electric organisms, so other functions can be altered by micro-frequencies. Jose Delgado implanted a small radio receiver in the head of a bull. When it was allowed to charge at him in the bull ring he stopped it when it was 20 feet away with an impulse from a little hand-held radio transmitter. Now kids are using the same principle to control electronic toys! But Delgado has gone even further! He can stop the charging bull at a distance without the implant. He and Soviet researchers

are far ahead of us ELF wave technology. Delgado received inter-agency offers from our military Chiefs of Staff and the CIA to contract for a research grant for development of a "Crowd Control" device but he refused. He knows that eventually such a device will be researched and perfected, once all the parameters are identified. The U.S. Navy had no equipment which could detect the H factor in ELF wave transmissions from Russia -- until I made one and demonstrated it to officialdom. Shortly after I did this my Hollywood home was broken into and equipment stolen.

TENS devices deliberately have a direct current offset to block pain. The neurotransmitters cannot and should not do this. ELF wave devices for use above the neck cannot use this. My Brain Tuner has no direct current offset. A new development is called CDS stimulation. Electrical, it causes the body's inner system to wake up the subconscious. This is a shotgun effect which in three to five days time is supposed to heal and correct anything, but. . .

#### THE DEFEAT-THE-HEALER SYNDROME

This type of sick person needs the secondary gains, the negative ones, to get attention. You come along to try to heal them, but these people would even commit suicide to escape being healed. They might be improved by the CDS system, but they'll go out and drive into another car head on and kill several other people in the act.

Many people have an unconscious death wish, and that's where subliminal advertising comes in. There's a big sign on the San Diego Freeway advertising the gambling capital, Las Vegas and the Dunes. Analyze the face there and it is just a skull with cheeks very carefully colored and eyes and mouth painted in. This is directed at gamblers who want to punish themselves because of their death wish, their unconscious desire to lose. Similarly smokers, hard drug users and alcoholics have a death wish. You are trying to cure them and they are waiting to die! They will say they want to get better but they really do not, and they continue to get subliminal messages that appeal to their death wish.

Governor Brown called me in to make an electronic surveillance of the new State Capital building in Sacramento. It was all air conditioned, with non-glare lighting, and yet the secretaries could not stand the place. They would get migraine headaches, and within three or four days couldn't stand the place. The cause was negative vibes in the electro-magnetic spectrum in the ELF range. My findings were published in the California "Consumer", over the Governor's name. I called it the occult or hidden cause. You may be getting negative ELF waves from the air conditioner in your home, another hidden or occult cause.

Now we have a real live countess here from an institute in San Francisco, visiting her mother. She got one of my Tuners three days ago and has been using it, because she's in an uptight stress situation with lots of pressure. On the third day

this morning, she felt extremely relaxed, like she had taken a dose of Valium tranquilizer, but without the drugged feeling; though the stress situation was still there. She loaned the Tuner to a friend and got her to relax also.

"I was able to go to sleep immediately after using the Brain Tuner," said the Countess. "I had difficulty before. It loosened up the Chi energy in me. Places in my body that had previously been blocked were opened up so I could feel them. Also the Los Angeles smog doesn't bother me this time, as it did before when I came here to visit mother."

#### TUNER USE INSTRUCTIONS

Asked if the Brain Tuner could be used safely by a pregnant woman? The answer is no, nor should it be used on those who may have a brain tumor. A brain tumor may have its pattern altered by the Brain Tuner, even accelerate its growth! And change it from benign to progressive cancer. At this stage we do not know. It should not be worn, used while driving a car or operating other hazardous equipment.

The pads on the end of the curved holder are covered with Chamois and soaked in salt water for better connection. Bring it up under the chin and each pad into the hollow beneath the ear. Don't touch the earlobes with the pad. Also avoid the Carotid arteries in the throat on each side of the Adams Apple where you feel the pulse. This spot is very low impedance in electrical current and it may cause problems if the electrodes are put there.

Plug the electrode cord into the unit and turn on the switch. Continue turning that dial until a prickly feeling comes. Keep it on that setting until you feel a sort of tapping. Turn the dial a little higher about every five minutes until the body acclimatizes itself to the pulsed current. Go through the prickly feeling to a pulsating feeling. It is an off-on-off-on sensation. In about five minutes after using the Tuner you'll get a flush, just as though you have taken a large dose of Niacin. This is not unpleasant at all, but you will feel as though you are perspiring for some reason. In about six minutes your voice pitch will drop to a lower level. Treatment time should be fifteen to thirty minutes. After 40 minutes the effect seems to fall off -- so no longer than 40 minutes at one treatment time.

(Beck asked for volunteers to try out the equipment for a 15-minute treatment and urged them log their dreams for several days after to note any significant change in the subconscious area of the mind. The guest who sent us these notes dreamed that night of being unsuccessfully attacked by gangsters who slunk away. His internal stresses being released? Who knows? For those who want to contact Dr. Beck directly, this address is 1538 Cassil Place, Los Angeles, California 90028 USA, phone 213-463-8901)



# OMNI®

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## THE BLACK BOX: SECRET DRUG TREATMENT OF ROCK SUPERSTARS

*Currents from a black box, designed  
by Dr. Margaret Patterson (right), restore harmony to addicts'  
discordant lives. Listen to the*

## BRAIN TUNER

BY KATHLEEN McAULIFFE

**I**t looks like a Walkman," explains Pete Townshend, the lead guitarist of and chief songwriter for the Who, the British rock band. "You clip this transistor-size unit onto your belt, and there're two wires leading from it that you attach behind your ears. Then it's a question of tuning in to the right frequency."

The thirty-eight-year-old rock star is not describing the latest advance in recording technology, but a novel treatment for drug addiction—a treatment that may

PHOTOGRAPHS BY EARL MILLER



*Patients feel only  
a slight tingling, yet this mild therapy  
subdues violent reactions.*

work by striking a melodic chord in the brain. The Walkman look-alike transmits a tiny electrical signal that appears to harmonize with natural brain rhythms and, in the process, reduce craving and anxiety. Or at least it worked for Townshend. The little black box, he says, saved him from a nearly suicidal two-year alcoholic binge that eventually drove him to heavy tranquilizers and virtually any other drug he could get his hands on. "The treatment works not only for boozers," Townshend emphasizes. "It's helped people give up cigarettes, heroin, barbiturates, speed, cocaine, marijuana—you name it. There is a different frequency that works best for each kind of addiction."

Dr. Margaret Patterson (above), a Scottish surgeon currently residing in southern California, is the owner and inventor of this magical device. Her black box (innards of an early model are pictured on the page opposite) sounds suspiciously like quackery. Just twiddle a few knobs and—presto—you can be cured of every imaginable vice. But the magic is real to people in the rock 'n' roll industry, who call her a miracle worker. Apparently Townshend is not the only celebrity who has benefited from her unusual remedy. She is credited with having reformed more than a dozen top recording stars, including ex-heroin addicts Eric Clapton and the seemingly indestructible Keith Richards, of the Rolling Stones, whose reckless abuse of drugs became as legendary as his music. (For Townshend's personal account of combating drug addiction with Patterson's black box, see page 48.)

Happily, Patterson does not fit the image of either a charlatan or a cult figure. She is in her fifties, slender of frame, with a kindly face that radiates compassion. Her pale blue eyes are set off by a magnificent mane of auburn hair, which is swept up into a graceful, oversized bun. "I hesitate to use the word *cure*," she says in a soft, lilting burr. "I prefer to call it a method of rapid detoxification. The electricity quickly cleanses the addict's system of drugs, restoring the body to normal within ten days. Most patients report that their craving also subsides in the process."

Patterson's electrical stimulator is currently pending clinical approval by the Food and Drug Administration (FDA) in the United States, where she has lived since 1981. Over the last decade in Britain, however, almost 300 addicts have received NeuroElectric Therapy (NET), the technical name for her treatment. Patterson claims that all but four left drug-free at the end of the detoxification process—a remarkable 98 percent success rate. "NET should not be confused with ECT—electroconvulsive therapy for mental



patients," she cautions. "NET is far milder, involving currents at least twenty times weaker. Patients feel only a slight tingling sensation behind their ears where the electrodes are taped on." Yet this "mild" therapy, she insists, will subdue the violent physiological reactions that can make "going cold turkey" intolerable for even the most strong-willed person. Though normally soft-spoken, Patterson asserts unequivocally, "I can take anyone off a drug of abuse, no matter how severe his or her addiction, with only minimal discomfort."

Of course, not all those who complete the detoxification program remain abstinent. Patterson

emphasizes that NET is most effective when backed up by counseling, remedial training, and a supportive home environment. For many individuals, however, the treatment does appear to have long-lasting effects. If we are to believe the recidivism figures she cites, they are many times lower than the national average for every class of addictive drug.

A glance at Patterson's credentials provides reassurance that she is both serious and highly capable. At twenty-one, she was the youngest woman to qualify as a doctor at Scotland's Aberdeen University. Only four years later she obtained her Fellowship at the Royal College of Surgeons, at Edinburgh University—an elite circle that few surgeons penetrate before their thirties. And just before her fortieth birthday she was presented one of her native land's highest honors by the Queen—an M.B.E., or Member of the Order of the British Empire—for her outstanding medical work in India.

Colleagues and patients describe the tiny Scottish surgeon as warm, confident, and virtually unflappable. "You can't con her," says one patient who had spent years cheating and lying to get bigger drug prescriptions. "And if you try to put one over on her, she won't turn her back on you like other doctors."

"She's the sort of mother you always dreamed of having," says a female addict. Still another views her as a saintly figure "with the selfless devotion of someone like Mother Theresa."

Patterson's close rapport with her patients has made some professionals question whether her dazzling record in drug rehabilitation is really attributable to the powers of electricity. "It's her personality" is the chief disclaimer psychiatrists have attached to her work. "She doesn't control for psychological factors such as people's expectations," says Dr. Richard B. Resnick, an associate professor at New York Medical College, who is recognized as an innovator in the treatment of heroin addiction. "For





## PETE TOWNSHEND ON THE BLACK BOX

Who guitarist Pete Townshend traces his downward slide toward drugged oblivion to the troubled spring of 1980. Long months of touring had brought him to the brink of a marital rift. Gross financial mismanagement had left him \$1 million in debt to English banks. And all the while he brooded incessantly about the future of the Who. "I started drinking about a bottle and a half of cognac a day," Townshend recalls. "And to cut through the drunken stupor I was in, I got into this deadly alcohol-cocaine oscillation. Eventually I became such a physical wreck that I went to this doctor, who prescribed me sleeping pills and an antidepressant called Ativan. These Ativans made me feel great, and soon I was taking eight to ten tablets a day, plus three sleeping pills every night. By Christmas, though, the Ativan stopped working, and so I turned to heroin. A month later it dawned on me that I was actually dying, that my macho, 'I-can-do-anything' mentality would kill me. It was then I contacted Meg [Margaret Patterson].

"Even though I'd seen startling successes with her technique, I didn't know whether it would work for me. But by the second day I knew I was on the home straight. And on the third day I felt feelings of sexual desire returning, feelings of just wanting to go out for a walk. It was incredible! There was a sense of inner joy as I started to gain independence from drugs. A natural energy flow slowly returned to my body. I could feel the old me coming back, and the first emotion I felt was arrogance. I thought, 'This will be easy. A few more days on this machine, and then I'll shoot up to L.A. and go dancing.' That was my frame of mind. But the fourth day I got depressed. Initially I had been given low electrical frequencies for heroin, but when I became depressed, I was given some high frequencies for my cocaine addiction. And at this high setting, I would sometimes have psychedelic experiences. The colors in the room would suddenly start to go woo. Then I had another setback, followed by a day when I felt superhuman. It was just like being on heroin. But the next day I again felt like death warmed over. Some withdrawal symptoms even returned.

"Gradually, though, your mood levels off so that by the tenth day you feel fairly normal. In retrospect, I realize that the treatment is an education in itself. NET reeducates the brain to produce its own drugs, and in the process you learn something about your human potential. You come to realize that somewhere within you is the power to deal with crises, tensions, and frustrations. So the treatment reaffirms one's faith in the self-healing process.

"Of course it seems incredibly crude to shoot a thousand-cycle pulse through the brain—and *voilà!* Yet that's the beauty of it. There's something almost mystical about recovering by such a ridiculously simple technique. Somehow a simple little gadget has made me feel whole. And if I'm ever raped by a crazed pusher and become hooked all over again, I won't hesitate to call Meg and have my addiction handled in this straightforward, completely technical way." □

example, what happens if you fasten electrodes to patients' heads but don't turn on the electricity? You just talk to them and feed them chicken soup. Will they do better, the same, or worse than the group that got current?"

Such skepticism is less common in England, where Patterson's clinical practice was based until recently. There, a number of doctors have already begun to obtain the same beneficial effects with her electrical stimulator model.

Dr. Margaret Cameron, a psychiatrist with the National Health Service, in Somerset, England, reports that NET gives "very, very good results—better than any other treatment I've encountered." Since May 1981 Dr. Cameron has treated 40 alcoholics, 2 methadone addicts, 4 heroin addicts, and a few individuals with mixed addictions involving cocaine and barbiturates. In follow-up interviews conducted six months to a year later, 60 percent of the alcoholics were still off alcoholic beverages and none of the other patients had relapsed. A private practitioner based in New Jersey, Dr. Joseph Winston, shares Cameron's enthusiasm for NET: "As a benign, effective technique for withdrawing people from drugs, it is virtually unmatched."

If NET has met with resistance, it is because its mode of action strains the explanatory powers of modern science. Until recently orthodox medicine refused to recognize that infinitesimal electrical currents may influence the behavior or function of living organisms. Currents less than 100 millivolts—or below the threshold for triggering a nerve impulse—were assumed to have no effect on biological processes. This dogmatic view had to be reassessed when accounts of such unsettling phenomena began appearing with increasing frequency in technical journals over the last decade. NET is, in fact, only one branch of a young, controversial discipline that is still struggling to achieve respectability—the science of electrical medicine.

In the early Seventies scientists began introducing very small currents via electrodes to different parts of the body—with dramatic results. A rat amputee was induced to regrow a forelimb down to the midjoint, according to one exciting—though sometimes contested—report. In human applications, the FDA has approved the use of such currents for stitching together stubborn bone fractures. Recent experimental trials also indicate that trickling flows of electricity promote the healing of chronic bedsores, burns, and even peripheral-nerve injuries. The external currents, it is theorized, stimulate rapid healing by augmenting the body's internal currents.

"By contrast, weak currents applied to the brain affect different physiological processes," says Dr. Robert O. Becker, a pioneer of electrical medicine who recently retired from Veterans Administration Hospital, in Syracuse, New York. "But I believe Dr. Patterson is producing profound alterations of the central nervous system.

CONTINUED ON PAGE 115



# BRAIN TUNER

CONTINUED FROM PAGE 48

The psychological set that makes a person become an addict seems to disappear."

Researchers are now starting to elucidate NET's scientific rationale, winning over new converts from the more conservative ranks of the medical profession. In the process, Patterson's black box is helping to unlock the mysterious inner workings of that other black box: the human brain. The stimulus goes in and the response comes out, but seldom are we afforded a glimpse of what happens in between. By probing NET's effects on experimental animals, investigators are shedding light on the underlying mechanisms that control everything from addictive behavior to our most basic drives and emotions. As Dr. Becker surmised, the stimulator does indeed cause "profound alterations of the central nervous system." Underlying consciousness is an intricate orchestral arrangement of trillions of brain cells, firing in concert. Like different instruments in a symphony, subpopulations of neurons are now believed to produce frequencies within a specific range. Frequency, so to speak, is the music of the hemispheres.

Like penicillin and X rays, NET was born of scientific serendipity. It began with an accidental discovery in the fall of 1972. At that time Patterson was head of surgery at Hong Kong's Tung Wah Hospital, a large charity institution with a poor clientele. A neurosurgeon colleague, Dr. H. L. Wen, had just returned from the People's Republic of China, where he had learned the technique of electroacupuncture. Primarily interested in its usefulness in the suppression of pain, he began testing it on patients with a variety of ills. Dr. Wen, however, did not know that almost 15 percent of his patients were addicted to heroin or opium of extremely high purity. At that time the drugs were easily affordable at a daily cost of less than a pack of cigarettes.

"One day," Patterson says, "an addict approached Dr. Wen, announcing that the electroacupuncture had stopped his withdrawal symptoms. 'I felt as if I'd just had a shot of heroin,' he said. Wen initially thought nothing of it, but a few hours later a second addict reported a similar experience, equating the electroacupuncture with a certain dosage of opium."

Further inquiries revealed that a few alcoholics and cigarette smokers in Wen's experimental group had also been freed from their craving. To the eye, however, the electroacupuncture produced the most dramatic response in the narcotics addicts deprived of their drugs. The characteristic runny nose, stomach cramps, aching joints, and feeling of anxiety usually disappeared after 10 to 15 minutes of stimulation by needles inserted inside the hollow of the external ear, at the acupuncturist's lung point. At first these good effects lasted only a few hours. But with repeated treatments,

patients remained symptom-free for periods of longer duration.

The results of Wen's first study with 40 opiate addicts were published in the *Asian Journal of Medicine* the following spring. Of this group, 39 were drug-free by the time they left the hospital, roughly two weeks after starting treatment. When Patterson returned to England in July 1973, however, she found that addicts there were far less enthusiastic about the procedure. The Chinese loved acupuncture; the British hated it. "As bizarre as it may sound," Patterson explains, "Westerners—even those who maintained drugs—often had an aversion to the needles."

There was another reason not to use needles. Patterson had suspected from the outset that acupuncture was essentially an electrical phenomenon. Even the traditional explanation hinted that this might be so. The ancient practice revolves around the notion that all living things possess vital energy, called *chi*, which circulates through

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*From the moment  
the electrodes were put  
on my head,  
my craving immediately  
diminished. When  
I had passed the three-day  
mark, I felt  
no craving at all.*

---

the body by way of a network of channels, or "meridians." Sickness was seen to be the result of disharmony, manifested by an obstruction in the flow of *chi*, which the needling was thought to remedy.

Was *chi* the ancients' concept for what modern man now recognizes as the internal currents that course through the body? Could it be that the Chinese, more than 2,500 years before the discovery of electricity, had intuitively sought to alter this life force in an attempt to alleviate pain and to cure disease? Perhaps, Patterson reasoned, the twirling of needles generates a tiny electrical voltage. Viewed in this light, the more recent practice of electroacupuncture was simply a more intense form of the original twirling technique. If so, the electrical signal would be of crucial significance in the treatment of addictions.

Years of clinical trial and error eventually confirmed her hunch. First Patterson replaced needles with surface electrodes. Then she went on to compare direct current with alternating current, while varying the voltage, shape, and other aspects of the electrical signal. Next she altered the electrode placement, finding a position just

4

behind the ear over the mastoid bone to be more effective than the lung point. But, of all the variables explored, electrical frequency quickly emerged as the single most important element for success. Those addicted to narcotics and sedatives preferred frequencies within the 75-hertz to 300-hertz range, barbiturate addicts responded to lower frequencies, and still other addicts, especially those dependent on cocaine or amphetamines, benefited most from frequencies as high as 2,000 hertz. "Musicians," she fondly recalls, "really helped to strengthen my guesswork during those early days. They invariably found the correct therapeutic setting right away. It was as if their brains were more attuned to frequency."

A further refinement of the therapy was prompted by still another fortuitous discovery: A heavy abuser fell asleep with the electrical stimulator on and awoke 30 hours later, well-rested and eager to take Patterson's children ice skating. From that moment onward, Patterson advocated continuous current application in the initial phases of treatment. She began the search for more comfortable electrodes that could be worn during sleep and for smaller electrical stimulators that could be clipped onto belts, permitting mobility during the day.

By 1976 Patterson had transformed electroacupuncture into an exciting new experimental treatment mode that she christened NeuroElectric Therapy. In her first clinical study, which was reported that year in the U.N. *Bulletin on Narcotics*, opiate addicts given NET as in-patients were all found to be drug-free an average of ten months after completing treatment. In contrast, opiate addicts who received NET only during the day as out-patients did not fare as well: 47 percent were drug-free at the time of the follow-up.

Because this preliminary investigation was limited to 23 patients, her results could not be extrapolated to a larger cross section of addicts. To provide better information about the long-term effects of NET, and also to assess its value in the treatment of other kinds of addictions, Patterson was recently awarded a research grant by the British Medical Association.

Last fall, at a Washington, D.C., symposium sponsored by the American Holistic Medical Association, Patterson presented the findings from this follow-up evaluation, which tracked the progress of patients treated between 1973 and 1980. Data were obtained from confidential questionnaires and, when possible, from personal interviews. Fifty percent responded to the survey, and these respondents included 66 drug addicts (mostly mainline heroin or methadone users and mixed-addiction cases), 9 cigarette smokers, and 18 alcoholics. At the time of the follow-up, total abstinence was said to be achieved by 80 percent of the drug addicts, 44 percent of the cigarette smokers, and 78 percent of the alcoholics who stated abstinence to be their goal. An additional

7 alcoholics whose goal on admission was controlled drinking all reported success. (As Patterson herself cautions, however, these figures probably represent too favorable an outcome since patients who relapsed, especially alcoholics, may have been less likely to reply to the survey.) Of those who were successfully weaned from their dependence, 68 percent said they never or only rarely experienced craving, 15 percent said they occasionally felt craving, and another 17 percent said they frequently felt craving.

Interestingly, none of the drug addicts at the time of reporting had substituted alcohol for their earlier addiction—a finding that contrasts sharply with the figures cited in other studies. In one national survey, for example, 60 percent of addicts who had given up narcotics became heavy drinkers or alcoholics. Equally noteworthy was the extremely low dropout rate of all addicts enrolled in the program: Only 1.6 percent did not complete detoxification.

All things considered, the success of Patterson's patients is probably most remarkable from the standpoint of the brief duration of the therapy, which, including counseling, rarely extends beyond 30 days. According to a large study of drug abusers admitted to a variety of government-sponsored programs, addicts treated less than three months did not fare any better than those in a no-treatment comparison group.

So NET seems to achieve in a few weeks what few, if any, orthodox treatments can accomplish after months or years.

Not everyone, however, is convinced by the report's conclusions. A look at the history of drug reform in the United States shows that their cynicism is not ill-founded. Consider the government's efforts to curb narcotics use. The first U.S. Public Health Service hospital for heroin addicts opened in Lexington, Kentucky, where 18,000 patients were admitted between 1935 and 1952. All except some 7 percent of the alumni promptly relapsed after dismissal from the institution—a dreary record that other institutions scarcely improved upon in subsequent decades.

By the 1960s heroin addiction had spread like cancer through inner-city ghettos. To control the expanding epidemic, health professionals turned to methadone, a synthetic opiate that is legally prescribed. Today thousands of clinics throughout the nation dispense methadone to certified addicts, and those maintained in these programs show higher rates of employment and fewer criminal offenses than before they began treatment. But methadone, alas, is even more addictive than heroin. As one medical authority points out, "The tragedy of methadone is that we cannot get people off methadone."

For narcotics addicts who aspire to a drug-free existence, society offers two main

alternatives: the highly structured and insulated environments of such residential homes as Daytop Village, Phoenix House, and Odyssey House or out-patient clinics, which provide daily counseling services. As many as 30 to 40 percent of the people who enroll in these community-based programs remain abstinent a year after leaving treatment. But to enter most of these programs, one must first detoxify in a hospital. And here's the hitch: 64 percent don't make it past the acute withdrawal phase to qualify for further treatment.

"It is still not understood why simple detoxification is so ineffective, but the facts are clear and inescapable," says Dr. Avram Goldstein, professor of pharmacology at Stanford University. "As I see it, the reason for the dismal failure . . . is that the newly detoxified addict, still driven by discomfort, physiologic imbalance, and intense craving, cannot focus attention on the necessary first steps toward rehabilitation, but soon succumbs and starts using heroin."

Jean Cocteau, the French writer, who resumed smoking opium after medicine had "purged" him of the habit, put it another way: "Now that I am cured, I feel empty, poor, heartbroken, and ill."

In sharp contrast, NET patients are said to emerge from treatment feeling healthy, energetic, even cheerful. Dr. Joseph Winston, the American physician who collaborated with Patterson in the treatment of

Keith Richards, recalls that the musician "came to us terribly ill. He was literally green. But he slept eighteen hours the first day, and ten days later he was playing tennis, and the group said he had not looked so good in years."

If Patterson's findings seem at total variance with the bulk of the clinical literature, the firsthand accounts of NET patients may help explain why.

Stuart Harris started shooting heroin as a sixteen-year-old cadet in the Royal Navy. By the time he underwent NET in the spring of 1981, he had been addicted to heroin 15 years, and for 11 of those years he had also injected methadone intravenously. "I had the sweats very badly," he says of his experience on NET. "You're emitting all this bad grunge from your body and you feel like you're speeding [on amphetamines]. But there's no withdrawal at all. That much I'll say for it. I mean when they told me about it, I just took it with a pinch of salt—another treatment they've fobbed off on the poor junkies. But, believe me, if I was getting any pain as I used to have with withdrawals, I wouldn't have stayed there, 'cause I was a voluntary patient. When I discharged myself from hospital, I didn't go searching out for drugs as I would normally have done in the past, say, after methadone reduction or narcosis (that's when they sedate you up to your eyeballs on sleeping pills). After completing all the other methods, I felt so uptight all the time. The first thing I wanted to do was have a massive great fix. But, after NET, all you really want to do is sleep. Everything is so easygoing. I can't say that it [heroin] doesn't

drift into my mind. Like the other day, I fancied a fix. But it passed over in a few minutes. Before, if I'd felt the slightest urge for a fix, off I'd go to London. Something has changed. You feel calmer. You can accept the ups and downs."

A man in his thirties, who requested anonymity, had injected heroin for eight years, combining this dosage with prescribed methadone during the last five years of the period. He received NET in 1974. "The treatment was rough," he says. "I felt as if I had a mild case of the flu, combined with short periods of feeling spaced out—even a bit euphoric. My anxiety and craving subsided right from the beginning, but a few weeks later my craving for heroin went back up again. I wanted to go out and score. And, as a matter of fact, I did. But it was different. It wasn't satisfying. It didn't make me feel that great. I know this treatment changed my head, because I never thought about heroin again after that. You see, I had gotten off heroin for as much as a month, even two months, at a stretch. But the whole of that time I would be thinking of heroin and nothing else."

A twenty-eight-year-old man, who also requested anonymity, combined a high level of alcohol and marijuana consumption with a cocaine habit of two to six grams each week for more than seven years. (The cocaine alone usually cost him more than

\$1,000 a month.) He agreed to speak to *Omni* immediately after completing NET treatment in the summer of 1982. "Until this therapy," he says, "I couldn't go three days without feeling an enormous craving for drugs. Cocaine and, to a lesser degree, alcohol would always be on my mind. But from the moment the electrodes were put on my head, my craving immediately diminished. When I had passed the three-day mark, I felt no craving at all, and I still don't. Drugs never enter my mind. Now that I remember what it's like to feel good—to be clearheaded after all these years—I'm certain that I won't go back on drugs."

Rachel Waite, a heavy smoker for five years, was treated for her cigarette addiction in June 1981. "For the first three days on NET," she recalls, "I still had the urge to smoke, and I probably would have lit up had a cigarette been handy. However, by the end of the treatment I definitely did not want one. When I took an experimental puff, it was a different sensation altogether. It tasted foul, and there was no hit whatsoever. It was as if I was drawing on hot air."

Surprisingly, many patients who go on to build drug-free lives do not receive any formal counseling beyond that provided during the brief detoxification program. Yet NET, by itself, cannot remove the root causes of addiction, nor can it replace years of maladaptation with healthy skills for coping with life's stresses and disappoint-

ments. Why then do so many patients experience such a metamorphosis?

The treatment, Patterson believes, simply sets the stage for further growth. "Because they feel so good," she says, "they are better able to face the sort of problems that drove them to addiction in the first place. You see, most people who come off drugs without NET enter a phase of prolonged dysphoria: They suffer from fearful depression and pessimism. They can't eat. They can't sleep. They have no energy. This can last for six months in the case of heroin, and even longer in cases of methadone and barbiturate addiction. But NET restores physiological normality within ten days, which enormously reduces the amount of time needed for readjustment."

If anything, Patterson thinks that euphoria—not dysphoria—is to blame when rehabilitation fails. The newly detoxified addict is optimistic to the point of being overconfident. "In their elated state," Patterson says, "they think it will be easy to stay off drugs and then end up stumbling, because they don't make enough of an attempt to change their ways."

As if obeying Newtonian mechanics, the black box appears to counter one mood shift with an equal swing in the opposite direction, until the emotional pendulum finally comes to rest. Is the black box, in reality, an electronic substitute for a chemical high? How can a physical treatment

cause such a swing toward euphoria?

As fate would have it, a scientist who had taught Patterson years earlier, Dr. Hans Kosterlitz, would once again serve as her mentor by illuminating the mainspring of euphoria in the brain. While working with Dr. John Hughes at the University of Aberdeen in 1975, Dr. Kosterlitz identified an endorphin, a natural brain chemical, with a molecular structure very similar to the opiates. For this outstanding discovery, the investigators later received the prestigious Lasker Award, revered as America's equivalent of the Nobel Prize in medicine. Almost overnight their finding triggered an explosion in the understanding of the biochemical basis of behavior, opening a new vista on the controlling factors behind addiction. Opium, heroin, morphine, and other related drugs owe their potency to what Avram Goldstein calls "one of nature's most bizarre coincidences"—their uncanny resemblance to the endorphins.

Over the succeeding years researchers uncovered evidence of myriad other brain hormones that mimic psychoactive drugs, from Valium and angel dust to hallucinogens. Almost every mind-altering substance, it is now assumed, has an analogue in the brain. And the precise mixture of neurojuices in this biochemical cocktail can mean the difference between tripping, speeding, crashing, or seeing the world through sober eyes.

These insights immediately suggested how the addict becomes trapped in a nightmarish cycle of dependency. In the initial phases of narcotic use, for example, the individual is assumed to have normal levels of endorphins in the brain. Injecting heroin causes a sudden and drastic elevation of opiates, which is subjectively interpreted as ecstasy. If, through repeated use, the brain is regularly flooded with opiates, it redresses the imbalance by cutting back on the production of its internal supply. Hence, the well-known condition of tolerance develops. The addict steps up his dosage, and the brain further compensates by calling a massive shutdown of production. Eventually, according to theory, the addict is shooting up solely for the purpose of "feeling normal." Should the drug supply be cut off at this stage, the opiate shortage cannot be instantly remedied. Drought ensues, unleashing withdrawal symptoms.

If an exogenous drug depletes the brain of its natural counterpart, it seemed logical that NET might quite literally juice up the system, rapidly replenishing the scarce neurochemical. Might certain frequencies of current catalyze the release of different brain hormones? Patterson wondered.

To find out, she conducted animal experiments in collaboration with biochemist Dr. Ifor Capel at the Marie Curie Cancer Memorial Foundation Research Department, in Surrey, England. Simply by monitoring the blood of NET-treated rats, the investigators discovered low-frequency currents can indeed cause as much as a threefold elevation of endorphin levels.

In another experiment the researchers examined NET's effects on rats rendered unconscious by massive doses of barbiturates. Once asleep, all the animals had electrodes clipped on to their ears, but only half the group actually received electrical current. The result: At one particular frequency—ten hertz—the experimental group rapidly regained consciousness, sleeping on average 40 percent less than the rats that received no electricity.

Why is the detoxification process hastened? One clue surfaced when the rats' brain tissue was analyzed: It was learned that the ten-hertz signal speeds up the production and turnover rate of serotonin (a neurotransmitter that acts as a stimulant to the central nervous system).

Similar experiments have now been repeated on rats made unconscious by injecting them with alcohol or ketamine (a cousin of angel dust). In almost every instance the frequencies that reduced sleeping time had earlier been proved therapeutic in the detoxification of human addicts. "Virtually every single parameter of current that I had stumbled upon during my clinical work was corroborated by the rat studies," Patterson declares, with barely concealed excitement.

How a weak electrical current can open the floodgates of the mind is still a matter of conjecture, but the implications are ob-

vious. Like a citizen's-band transmitter that infiltrates television frequencies, the black box must broadcast through brain frequency channels. And just as a TV receiver can pick up CB transmissions from a passing truck, the brain undoubtedly responds to the foreign-generated signal as if it originated from within its own communication network.

"As far as we can tell," says Dr. Capel, a rugged Welshman with a melodic voice, "each brain center generates impulses at a specific frequency based on the predominant neurotransmitters it secretes. In other words, the brain's internal communication system—its language, if you like—is based on frequency."

Unfortunately, neuroscientists are not yet fluent in this new tongue. "NET is still a very blunt tool," Capel acknowledges. "Presumably, when we send in waves of electrical energy at, say, ten hertz, certain cells in the lower brain stem will respond, because they normally fire within that frequency range. As a result, particular mood-altering chemicals associated with that region will be released. That's what we hope is happening. In reality, however, much of the signal may be lost before it actually reaches the target cells. We just don't know. But if we can fine-tune the signal, I am confident our results will steadily improve."

At her small, two-bedroom home in Corona del Mar, Patterson has begun testing a new, improved model of the stimulator. Her goal—and the major impetus behind her decision to come to the United States—is to obtain funding for the establishment of a center where human and animal research can proceed in tandem. Until FDA clearance is given, however, she cannot begin treating addicts on a routine basis.

Will NET open a new route to salvation for the millions of Americans who each year flock to Alcoholics Anonymous, Smoke Enders, and methadone maintenance clinics? Clearly the final verdict is contingent upon replication of controlled studies. But if a feeble electrical current can truly curb the mind's excesses—from uncontrollable lusts to extremes of mood—its impact is sure to be far-reaching.

"Addicts may represent only a tiny fraction of the people who will eventually be helped by NET," Capel predicts. "In all likelihood it will find an enormous range of uses, especially in the area of pain control. In one preliminary trial, terminal patients suffering from chronic pain found NET just as effective as their daily dose of morphine. 'By stimulating the brain's own painkillers, we didn't have to administer drugs,'" Capel marvels.

Early data also indicate that NET may prove highly promising in the treatment of mental disorders. The frequencies that induce euphoria and reduce tension, according to Dr. Cameron, of Britain's National Health Service, "seem to work wonders for patients suffering from severe depression and acute anxiety. Though it is far too soon to draw any conclusions



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she notes that "a few of the half-dozen  
chronic depressives we've treated have  
found themselves jobs after years of un-  
employment."

As for Patterson, she hopes eventually  
to broaden her practice to include behav-  
ioral addictions, from overeating and com-  
pulsive gambling to video-game fanat-  
icism. Absurdity aside these wider  
applications follow a certain logic. "Her  
ideas make perfect sense if one accepts  
the idea that behavioral addictions have a  
chemical basis," says Dr. William Regel-  
son, at the Medical College of Virginia. "It  
is very likely, for example, that all activities  
vital to survival—from sex to physical ex-  
ercise—are physiologically addictive. It is  
now thought that the phenomenon called  
jogger's high is actually endorphin-me-  
diated. In all probability, eating also re-  
leases some kind of pleasurable molecule.  
After all, why do we crave food? Low blood-  
sugar levels don't explain why. The truth is  
that we feel abnormal when we haven't eat-  
ten in a while. Some chemical in our brain  
has become depleted. We become rest-  
less and agitated, and, after extreme de-  
privation, we suffer withdrawal symptoms  
commonly known as hunger pangs. The  
only way to relieve our discomfort is to get  
more food. It's a fix—plain and simple."

If basic drives are addictive, then drugs  
are an ingenious means of shortcutting the  
elaborate scheme nature devised to en-  
sure that we maintain health and repro-  
duce ourselves. Merely by popping a pill  
we can top off our neurochemical reser-  
voirs with no sweat expended. Instant or-  
gasm without any foreplay. A cheap thrill.

But can't the same be said of NET? "Is  
it not, after all, an electronic fix?" asks Re-  
gelson, who fears the black box may be-  
come addictive in its own right. Patterson  
has kept her eyes open to any signs that  
her patients are becoming physically de-  
pendent on the equipment. But she rules  
out the possibility that there will ever be a  
black market in black boxes because in-  
dividual models can cost upward of  
\$1,000—a hefty sum to cough up for purely  
recreational use. Besides, she has not en-  
countered a single instance of electronic  
addiction in her ten years of practice. The  
explanation, she believes, "is that drugs—  
for the very reason that they are foreign—  
upset the brain's chemistry. NET, on the  
other hand, simply coaxes the brain to re-  
store its own chemical balance. The body  
heals itself."

The intuitive feelings of her patients sup-  
port this view. As reformed heroin addict  
Stuart Harris says, "At first I thought it would  
be fun to wire up the human race, so we  
could all go whizzing about. But after the  
initial buzz, you feel, well, normal. Frankly,  
all NET does is help you face reality."

Patterson concurs: "All we can do is give  
people a chance. We can get them off  
whatever drug they're hooked to, but it's  
up to them to fill the void. They've got to  
find a constructive substitute for the drugs  
that have dominated their lives." ∞

Lecture by Dr. Wolfgang Ludwig of West Germany on A NEW UNIVERSAL FIELD THERAPY  
Given at the World Research Foundation Congress of Bio-Energetic Medicine at the  
Sheraton Premiere Hotel at Universal City, Los Angeles, November 7-9, 1986

Dr. Ludwig is a Doctor of Science, a Diplomate in Physics, involved in intensive research into the effects of electromagnetic fields and electromagnetic field therapy. He has won two gold medals for his inventive work at Brussels and in Vienna (at Invention Fairs). In his lecture Dr. Ludwig discussed the eight planes of existence which have been verified by computer. He discusses the theories of Burkhard Helm and Dr. Muheim, and he points out that medicine today only considers three planes of reference and so does not meet the total needs of the organism. He demonstrates that a system of using electromagnetic frequencies is most in harmony with the body.

"Using the new theories of the new math and the new logic we find that our cosmos has at least six dimensions and our world has at least four planes of existence. Dr. Muheim has written three volumes on this. He calculated the masses of elementary particles with a formula and with the help of a computer, measures these particles up to eight decimals. He discovered that our cosmos has eight dimensions. Dimensions seven and eight are not physical. The six dimensions given were: length, height, width, time and two photon coordinates Burkhard Helm named the organization coordinate and the realization coordinate.

"Although the first four coordinates or dimensions are interchangeable in matrix physics, the two photon coordinates--the organization of possibilities and the realization of imagination--are inner coordinates and are not interchangeable. Burkhard Helm showed there were logical distinguishable planes--the physical ration, the biological ration and the psychic plane and the mental plane. The seventh and the eighth coordinates, plus a new plane of existence called the spiritual regions, which the Indian calls Manas, Buddhi and Atma, are not currently in the field of physics. These higher planes can be mathematically calculated because of the interference lines which they project.

In volume two of his three-volume work, Burkhard Helm takes up the relation between the physical region, the brain waves and the mental region, showing how, when you change from thinking about one subject and move to another, your emotional body changes as well as your physical and mental body as all these regions belong together. Each of the various regions has subplanes. Subplane two of the physical plane is made up of only elementary particles; subplane three is made up of atomic nuclei; four, of atoms; five, of molecules; six, of intermolecular forces; and, seven, of complete matter, crystals and viruses. Viruses also exist on the second or biological plane as they are the first step in living systems. On the eighth plane of the physical plane are cellulose, cells and multi-cells, organs, organisms, interconnections, bones, symbiotic interconnections, and these complete the biological planes of existence. Then comes the psychic region with eight planes of its own, and then follows the mental plane of existence.

To include inter-symmetry between the various planes of existence, it is necessary to use metronic calculus instead of infinitesimal calculus. Since our physical instruments record only four dimensions, this leaves at least three further regions of being unexplored. There are correspondences of regional sequences in the cosmos and by the use of a formula of Muheim we can obtain resonances of various objects and of the chakras, of the planets and of the complete optical universe which we can see with telescopes. Special frequencies can be obtained for acupuncture areas and for all areas of the body.

The electron plasma vibrations or special resonance frequencies in our blood are very important. The same twenty-five elements we find in the blood are also in the light sphere of earth and in the same concentration. These electron plasma substances are carried by means of the magnetic field of the earth into our body. It needs these vibrations. If we shield a person from them, he becomes ill. Two-thirds of the earth's surface is water, which is an electrical conductor and creates a cavity with resonance and trans-magnetic waves which can be measured. These waves or resonances are in the same regions as human brainwaves and those of mammals.

- 14 -

WORLD RESEARCH FOUNDATION, 15300 Ventura Blvd., Suite 405, Sherman Oaks, CA 91403

## Cranial-electrical stimulation

# CES reduces anxiety and depression

CES is a process which utilizes minute electrical stimulation for therapeutic purposes. The individual taking a CES treatment normally feels a mild electrical stimulation, not at all uncomfortable. It is typically applied through stethoscope-shaped electrodes placed behind each ear, just below the mastoid processes (the indentations behind the ear).

The sensation felt by the individual is normally one of relaxation. If there is high stress or anxiety just prior to treatment, the individual may go to sleep while using CES, particularly if in a reclining chair or bed. Sleep at the time of application is not required to benefit from CES, although individuals frequently report an improvement in the quality of their night time sleep.

Usually a treatment lasts for 40 minutes and is taken once per day for 10 to 15 days. Following this initial series, the individual may use CES as desired at times of particular stress, or whenever needed to help relax or sleep.

As with a number of medicines, such as aspirin, the mechanism of action (how it works) of CES is not fully understood. Research has led to the hypothesis that it has a mild effect at the hypothalamic area of the brain. Studies have shown that both physiological and psychological changes toward homeostasis, i.e., the normal or relaxed state, take place following CES treatments.

Variations of CES have been in use in Europe and Russia for more than 30 years. Principal research in the United States however was not initiated until the mid-1960's. A series of studies were instigated in 1967 at the Medical College of Wisconsin, Milwaukee, by the founder of the company to determine if quantifiable physiological changes (reduction in gastric acidity), take place at time of high stress when small (less than one milliamperes) CES currents are applied to the head. Initial tests on monkeys, followed by controlled studies and clinical trials with human volunteers, led to the conclusion that CES was of therapeutic value. The Company was formed in 1971 to manufacture and distribute CES equipment as a non-drug and non-invasive treatment for anxiety and potentially for stress-related illnesses.

THE PROBLEM of alcoholism and drug addiction has received increasing attention in America during the past decade and evidence suggests that it will receive even more attention in the 1980's. Foremost among the treatment problems among chemically dependent persons is the need to help them through the psychologically and physiologically demanding period of withdrawal. The body reacts to the depressed physiological state engendered by alcohol and other drugs with a rebound stress reaction. This reaction commonly includes states of extreme anxiety, depression and insomnia, for which CES treatment is known to be effective.

Underlying the addictive state is an insidious and progressive destruction of normal brain functioning including an often incapacitating memory loss, inability to process information involving abstract symbols, and other dysfunctions associated with the organic brain syndrome, an advanced condition which is known as Korsakoff psychosis.

Studies on the use of CES in chemical dependencies are among the best controlled and well-designed research in the U.S. CES literature. They indicate that CES is a highly effective adjunct to methadone withdrawal in heroin addicts, significantly shortening the time to symptom-free withdrawal when compared with methadone alone, and significantly lowering withdrawal anxiety as measured by the Taylor Manifest Anxiety Scale.

Further, the anxiety and depression accompanying and following withdrawal of both alcohol and other drugs in polydrug abusers is significantly reduced when patients receive CES as a post withdrawal treatment.

Most importantly, perhaps, is the finding that CES treatment halts and significantly reverses brain dysfunction in these patients as measured on seven different psychological scales of cognitive function, bringing many such functions back to the level of the pre-addiction state in the majority of patients studied.

Another problem in the treatment of chemically dependent persons is frequently recurring "dry withdrawal" in which the individual suffers withdrawal symptoms within several weeks, then again in several months. The phrases used to describe these phenomena are a "dry drunk" followed by the "dry withdrawal." These psychological states lead to high recidivism rates among these individuals as they return to treatment after "falling off the wagon."

CES is now thought of as one of the most effective, non-drug treatments for these periods of withdrawal, and a patient who has a personal CES unit available should be able to use it to prevent a full-blown withdrawal reaction at such times. By doing so he can reduce the need for additional medical treatment in a clinic or hospital setting, and will be less likely to resort to alcohol because of the discomfort accompanying these withdrawal states.

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2119-A Hollywood Blvd.

Hollywood, FL 33020

Phone: (305) 920-9433

### CES In Relation to Alternative Treatments in Alcohol and Drug Addiction

Assuming that CES were made available via the RelaxPak in a treatment center, that it would be used constantly during the withdrawal period, then daily for one hour or more during other program activities, and finally during the post hospitalization period during periods of significant stress or dry withdrawals at which times the recidivism rate becomes most pronounced, it overcomes the following drawback to each of the treatment modes named below:

#### Biofeedback

Biofeedback success depends on the active cooperation of the



patient. Its use necessitates setting aside space in sometimes crowded facilities for just this activity, a staff member scheduled to this activity, and the scheduling of patients to equipment at periods when patients have space on their schedule, an often impossible task. It has unpredictable carry over value after the program, and any carryover may not last the months necessary to contend with distant dry withdrawals.

#### **Transcendental Meditation and Other Relaxation Therapies**

These therapies also require the active participation of the patient and an active learning process on his part. They can not be taught during other activities and usually cannot be practiced during other program activities. They require specialized staff and program time. Their carryover value has been questioned by the finding that among persons paying up to \$200 to learn TM, only 20% were practicing TM six months later. In addition, research has shown that Americans will not sit still for even the short periods of time each day required for the sustaining of these skills outside of the treatment center.

#### **Tranquilizers**

It has been estimated from blood studies of inpatient alcoholics that between 70% and 80% of incoming patients can be expected to have liver damage or dysfunction to a greater or lesser extent. In practice, most clinics do blood studies to assess this but the results of these studies are typically not known for from three days to a week or more after the patient has begun treatment. During this same period the patient is given his heaviest doses of tranquilizers and related psychoactive medication, most of which are detoxified in the liver. This equates to deliberate medical insult to disordered livers whose clinical condition is not known, a procedure to be avoided where other techniques are available.

#### **Jogging/Exercising**

While exercise is always desirable among any group of patients, it requires time and the willingness of the participant. The effects of exercise on underlying biochemical pathology are unknown or only somewhat indirectly—if not distantly—related.

#### **Psychotherapy**

Next to drug therapy, psychotherapy is the most frequently found mode of treatment in addiction centers, and the least well-supported by research findings. It is not intended to halt and reverse cognitive dysfunction-

ing, and has only an indirect influence on the biochemical pathology of addiction at best.

#### **Alcohol**

Alcohol is used in many centers for withdrawal of the alcoholic and suffers from the same drawbacks of the medications noted above. It prolongs the physical insult of alcohol abuse and prolongs the time until the patient is drug free and functioning normally.

#### **Addictive Drugs**

Methadone is often used with heroin addicts, substituting one addicting drug for another. It is not widely known that almost every psychoactive medication used in alcoholism treatment centers is also addicting. Frequently these also have a cross tolerance with alcohol, requiring heavier than normal doses for effectiveness in alcoholics and compounding the physical abuse of these patients by practitioners forced to use this means of treatment. It can play directly into the pathological value system of patients who turn to drugs and alcohol to handle periods of stress.

#### **Anxiety**

Cranial Electrotherapy Stimulation has been used as a treatment for anxiety in several parts of the world for over a quarter of a century. American medicine has only recently begun to realize its use as a safe and effective treatment for this condition.

While it is not unusual for physicians to measure changes in a patient's anxiety based on personal interviews before and after treatments of one kind or another, this summary is of only those studies which have utilized standardized ratings of anxiety based on scientifically prepared and published measuring devices. In addition, only those studies which have controls for placebo effects are summarized.

The findings show that CES treatment yields highly significant reductions in anxiety, whether the patients were in a psychiatric setting, a scholastic setting, an out-patient setting, or an in-patient general hospital setting. Further, while many different kinds of anxiety have been studied, as measured by the six different psychological measuring instruments found in these studies, they all responded significantly to CES treatment.

Less intense or less permanent forms of anxiety—the so-called "situational anxiety" in which a person habitually responds to personally threatening events in his environment with an anxiety

reaction—respond to CES treatments within a week or less. The more permanent forms of anxiety—the so-called trait anxiety, or that underlying level of anxiety that a person typically carries with him at all times—require a longer period of CES treatment. This kind of anxiety typically is not reduced significantly in fewer than two or three weeks of daily treatments. Since this form of anxiety is frequently associated with medical problems ranging from ulcers to heart attacks and cerebrovascular accidents (strokes), most physicians are expected to prescribe long-term CES treatment of most anxiety patients who reach their practice.

It has been estimated that 80% or more people in the U.S. population react to life adjustment problems with the "fight or flight" anxiety reaction. Similarly, it has been estimated that 80% of our hospitals are filled with persons who have channeled anxiety related energies into their bodies, resulting in psychogenic illnesses. For this reason, CES will in the future be increasingly looked upon by the medical profession not only as an effective treatment for presenting anxiety complaints but as a long-term prophylactic measure to reduce or eliminate anxiety-related illnesses in many of their patients.

This use of CES necessitates the patient's having a CES unit at home to be available when life stressors challenge him, or to be able to visit a physician's office for CES treatment when he feels an anxiety reaction with which he cannot cope effectively.

#### **Depression**

Depression is the most frequent presenting complaint seen by mental health professionals. Depression is so common in the general population that the saying, "... but everyone gets depressed," has become a generally accepted belief. Since it is so common, the question must be asked as to when and under what conditions outside intervention becomes necessary. The answer would involve the depth of the depression, its length from time of onset in any given instance, the frequency with which it occurs, or perhaps a combination of any or all of the three. To complicate matters further, it is now known that disorders of somewhat similar appearance may have vastly different physiological or psychological etiologies but tend to be grouped under the rubric "depression." This has often resulted in confusion as to the

*(Continued on Page 18)*

(Continued from Page 17)

choice of treatment for each of these superficially similar conditions.

In the following summary, while it is recognized that many physicians tend to rate type and depth of depression from their personal observation of patients before and after given treatments, only those studies are presented which involved measures of depression via a standardized, reliable measuring instrument.

An examination of these studies reveals that five different measuring devices were used with a variety of patients, including long-term psychiatric patients, university counseling center clients, post withdrawal alcoholic patients, and hospitalized para- and quadraplegics. CES treatment yielded a highly significant reduction of depression in each case.

Reactive depression—depression resulting from acute changes in the patient's life situation such as a job change or divorce—responded to six daily CES treatments or less. More deep seated depression—so-called endogenous depression, in some cases—required three weeks or more of daily CES treatments. For this reason, many physicians routinely prescribe a minimum of two weeks to a month of daily CES treatments in depressed patients, since it is frequently difficult to gauge the type or depth of depression with great accuracy.

Since many patients have a "depression habit" physicians should include a home CES unit in their treatment plan so that the patient can meet any new sign of impending depression with effective treatment and thereby break the behavioral reinforcement chain that has both led to and maintained the habit. In this way, a maladaptive habit can be effectively controlled or broken without the use of frequent medications and/or repeated visits to the physician's office. Other research has shown that CES, when used this way, is neither habit forming nor addictive. Such patients use it only when they experience an impending medical necessity.

### Insomnia

Because Cranial Electrotherapy Stimulation (CES) was originally called "electrosleep" in European countries, many earlier American studies were designed to learn whether or not such small amounts of electric currents would actually put people to sleep. That is, just as 50 mA of current—called "electro-anesthesia"—put an individual into

anesthesia so that surgical procedures could be performed, 1 mA of CES current was assumed to put them into a normal state of sleep if "electrosleep" worked.

Such studies discovered that while CES does not necessarily "put a person to sleep," it does accomplish some very therapeutic changes in the sleep patterns of persons who complain of insomnia. The studies below show that whether measured by the patient's own ratings, psychiatrists' ratings or by electroencephalograph or polygraph recordings before and after CES treatments, the following effects of CES in insomnia patients can be expected:

1. Sleep onset latency is reduced. That is, once a person has retired for the evening, the amount of time it takes him to actually fall asleep is reduced from one to two hours or more to the more normal twenty minutes or less.

2. The number of awakenings during the night are reduced. That is, while most insomniacs awaken three, four, or more times during the night and have difficulty falling asleep again, those treated with CES typically awaken no more than once or twice following therapy, with most reporting no awakenings. Furthermore, after awakening, they return to sleep much more promptly than before.

3. CES treated patients spend more time in stage four sleep following CES treatments. That is, patients spend more time in the deepest, most restful stage of sleep than they did prior to CES treatment. It should be noted that some patients who have deprived themselves of REM sleep—the stage during which dreaming occurs—by taking drugs or alcohol as a sleep aid, sometimes spend the first two or three nights in unusually vivid dream states when first starting CES treatments. This is considered another indication of the therapeutic effectiveness of CES in that persons are known to become increasingly disorganized mentally, some even to the point of psychotic-like symptoms, when they do not engage in the normal amount of dreaming.

4. Finally, it was discovered that many patients receiving CES treatments report feeling more rested when they awaken in the morning following CES treatments.

Treatment parameters: While some patients begin to respond after the second or third day of treatment, others do not have their best response with fewer than 24 days of treatments lasting from 15 minutes to one hour. The beneficial effects have been measured in some

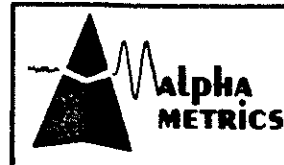
experimental groups for as long as two years. Some people with insomnia have a habitual pattern of responding to situational stress with an interruption in their sleep patterns. The best results are obtained when CES is used each time unusual stressors occur in their life situations that would ordinarily cause poor sleep. The person is thereby trained over time to expect (and get) a good night's sleep no matter what stressful interruptions occurred in the normal flow of daily life.



## The Quiet Revolution: Pain Control and Electromedicine

Dr. Fred N. Lerner  
Director  
International Electrotherapy  
Institute

From: *Calif. Health Review*, April/May 1983, pp34-37



One out of every ten Americans suffer from chronic pain. Many others seek medical assistance for temporary or occasional pain. On the average, most have had their pain for seven years, have undergone from three to five major surgeries and have spent from \$50,000 to \$100,000 in medical bills. Many of these patients have been given several different prescriptions including analgesics, sedative-hypnotics, tranquilizers, mood elevators and anti-inflammatories. While drugs of this nature are invaluable for acute problems, dependence, tolerance, prolonged side effects and addiction all become a part of chronic use.

The patient will frequently try a behavioral approach, such as counseling, autogenic therapy, bio-feedback, hypnosis or other techniques. These therapies work well for well-motivated patients, and are frequently geared toward helping the patient to accept the pain they cannot escape from. All in all, the pain business has added up to an annual \$55 billion search for relief.

When dealing with chronic pain, steps must be taken to control it. These patients are frequently in pain twenty-four hours a day. As one might expect, there is also a great deal of depression, anxiety, insomnia and emotional stress concomitant with the problem. The practitioner should take into account such factors as emotional, environmental, dietary and familial stress, the levels of pain and the patient's own level of motivation in seeking relief.

There are basically three forms of electromedical pain control currently available. These are the transcutaneous Electrical Nerve Sti-

mulator, Bioconductive Therapy™, and Transcranial Electrotherapy.

In 1965, R. Melzack and P.D. Wall published their "Gate Theory."<sup>1</sup> This theory proposed that hypothetical "gates" existed in the substantia gelatinosa of the spinal cord and thalamus which could modify pain perception. It explained pain on an anatomical basis, and suggested that it was a more complex event than was previously thought.

In 1967, C.N. Shealy, M.D. utilized a low volt, low frequency milliampere electrical device which proved to be highly effective at mediating pain based on the "Gate Theory."<sup>2</sup> Working through the skin, the Transcutaneous Electrical Nerve Stimulator (TENS) offered new hope to chronic pain patients. Over fifty companies manufacture TENS devices.

By stimulating A-beta afferent nerve fibers, the pain impulses can be effectively blocked. Relief may last anywhere from several hours to several days. With repeated treatment, effects seem to be cumulative. Patients seem to need less and less TENS as time goes on, as opposed to most alternative therapies. It is thought that some new equilibrium may be established between the pain-carrying (excitatory) nerve fibers and the pain-relieving (inhibitory) fibers.

Caution is advised in masking the pain of progressive pathology, especially where there are beneficial aspects needed for diagnosis. Pain should not be regarded as the enemy. It is, after all, a life-saving alarm system. As an analogy, most houses now are equipped with smoke alarms. One would not want to turn off the smoke alarm while the fire was still burning. It would make

much more sense to extinguish the fire and let the alarm turn itself off. Acute pain usually works this way, and usually does not need to be blocked.

The alternative of bioelectricity has produced some very exciting results. In 1975, investigators isolated an endogenous transmitter substance manufactured by the pituitary gland which modifies pain impulses.<sup>3</sup> These substances were called enkephalins and endorphins. They have an activity similar to that of morphine, thus providing a chemically-mediated system of pain relief. Activation of this system may be brought about pharmacologically by stimulation of higher brain centers and by electrical stimulation.

As far back as the eighteenth century, Galvani proposed that animals generated their own electricity.<sup>4</sup> When injured, the body produces its own electrical signal based on a direct current control system. This has been demonstrated recently by Robert Becker, M.D. and several other investigators, who have found that this electrical system regulates growth and healing.<sup>5</sup>

Self repair is initiated after injury by signals within this electrical system called the Current of Injury (COI). The COI is generated when the mechanical stress of injury is converted into an electrical signal. Experiments have shown that cells can dedifferentiate into more primitive forms and then, by DNA coding, redifferentiate into whatever cell type is necessary for regeneration. Entire limbs have been regenerated in certain animals by electrical stimulation after amputation.<sup>6</sup>

Through evolution, mammals have lost much of the peripheral electrochemical potential due to a diminution of the ratio of nerves to other tissue. Instead, greater ratio of central nervous system tissue to peripheral nervous system tissue has occurred as the evolutionary order increases. This phenomenon, called "encephalization", has resulted in an insufficient COI to stimulate "ideal" repair in more evolved mammals.

The concept serves to explain the fact that lower forms of animals, such as salamander, are capable of

regenerating entire new tails, while higher forms of animals generate mostly scar tissue. It is now believed that electrical stimulation of an injured site may speed up this process by increasing the COI.

It has been well documented that all cells generate a weak electrical current. Tissue conductivity can be easily measured with a common voltmeter. Pathological tissue has been shown to have a lowered conductivity than the surrounding health tissue. By analyzing the lowered conductivity, the specific area of injury can be located. Utilizing low frequency microampere stimulation, the COI can be boosted to levels equal to or greater than the surrounding healthy tissue, effecting a rapid repair. This type of analysis and treatment is called Bioconductive Therapy™.

Bioconductive Therapy™ can be

practical for most offices. Harmful side effects have yet to be clearly demonstrated with this type of therapy. Contraindications, as with all electrical devices used on humans, are the same as those listed for TENS. Results of treatment have been quite exciting for most practitioners, and have opened up a new dimension in health care.

Several years ago, psychologists coined the term "Alpha State" to describe a condition of being more relaxed and more aware. It could be induced by meditation, relaxation, biofeedback, sensory deprivation, guided imagery, low level microstimulation and several other methods. Transcranial Electrotherapy (TCET) is based on passing a low frequency, microampere current across the cranium to induce an alpha state.

TCET is thought to affect the

states, but is believed to stimulate endorphine release in chronic pain patients. Patients have shown a marked decrease in their pain after treatment, and appear much more relaxed. Applications have had marked results on sleep disorders, lowering blood pressure in hypertensives, and relieving anxiety. Although treatment usually takes no more than ten minutes, effects usually last from twelve to forty-eight hours.

TCET has not shown harmful side effects or addiction problems. Care should be taken to alleviate any fears the patient may have regarding hypnosis, "mind control," or electroconvulsive therapy. TCET is none of these things. Success of the therapy depends a great deal on the patient's ability to relax during the treatment. Although not necessary, it is advisable to have the patient lie supine in a quiet room undisturbed for the duration of treatment. Some patients will experience feelings of weight change (feeling heavier or lighter), and may become so relaxed that they have difficulty focusing their awareness back to normal for a few minutes. It is advisable to have them wait for a short time before leaving if this occurs.

In almost all cases, patients will report feelings of increased relaxation, heightened awareness, improvement in memory, increased concentration time and a greater sense of well-being lasting one to two days after a ten minute treatment. TCET has become a powerful tool in a practitioner's arsenal for combating stress and related disorders.

Once the basic mechanisms of pain control are understood, applying them to the analysis and treatment of disorders has many combinations. One of the most exciting areas utilizing electro-medicine is sports medicine. Athletes have noted a more rapid rate of healing of injuries, enabling them to return to the rigors of their profession. It also provides them with a greater degree of confidence.

Karlis C. Ullis, M.D. a member of the UCLA Medical Advisory Committee for the 1984 Olympic Games has said "I have been ob-

## *The Transcutaneous Electrical Nerve Stimulator offers new hope to chronic pain patients.*

applied to most conditions, whether acute or chronic. Since any type of pathology will usually decrease conductivity, one can promote healing by increasing conductivity. Some conditions such as inflammation, result in an increased area of conductivity.

Inflammatory responses evoke pain, redness, increased circulation and edema. The increased amount of fluid, mostly water, is highly conductive. This state would actually raise the conductivity in an injured area, thus producing a "falsely" high conductive reading. In this case, the practitioner should analyze and treat on either side of the inflamed area, thereby inducing a current through it.

Accupuncture and trigger points can be located by searching for high conductive areas, and can easily be stimulated with low levels of electricity (microamps) to yield beneficial results. Alternate forms of stimulation include needles or pressure on acupuncture points, injection, "spray and stretch" (ethyl flouride spray), massage and deep pressure for trigger points.

Bioconductive Therapy™ is painless, non-invasive, simple and very

reticular activating system (RAS) of the brain stem. This part of the brain controls the wake/sleep cycle. The technique is also known as "electrosleep" and "electronarcosis."

TCET has its primary applications in managing stress and relieving anxiety. Emotional stress is a highly prevalent phenomenon in Western culture, and many types of therapy abound to help patients "cope" with daily pressures.

Several illnesses are stress-induced, such as certain forms of hypertension, insomnia, headaches and weight problems as has been documented by Selye and others. TCET is becoming an acceptable tool for managing these stress related conditions.

By passing a low frequency (0.5 to 8 Hz.), microampere current through the cranium for five to ten minutes, patients report that they are more relaxed, more alert, sleep better and generally feel better. These symptoms parallel those reported by patients who have used means to induce alpha states. Studies in this area date back approximately forty years, mostly from Russia.

TCET not only induces alpha



serving the effects on athletes for the past year. There is no question that electromedicine helps relieve pain and facilitates a more rapid recovery from injury."

Electromedicine and pain theory is altering the way many physicians are practicing. As new facts are uncovered about healing and pain perception new research yields more information. The result has triggered a quiet revolution in medicine away from chemistry, as the master science, towards biophysics.

The burgeoning amount of information that is evolving has created a need for one source of education for the health care professional. The International Electrotherapy Institute was organized by professionals to collect, organize and disseminate research from around the world.

IEI dispenses the fundamental information necessary for the progressive practitioner. In short, IEI acts as a "clearing house" for education in electromedicine and pain management.

Electromedicine has provided a new dimension of analysis and treatment for all health professions. As more is learned about pain and the endogenous bioelectrical system, exciting methods have evolved that are painless, non-invasive and have little or no side effects. The technology has arrived and the education is easily available to any concerned health practitioner. There is little doubt that the doctor of the future will utilize electromedicine as a mainstay in everyday practice.

The Transcutaneous Electrical Nerve Stimulator offers new hope to chronic pain patients.

Utilizing low frequency micro-ampere stimulation, the COI can be boosted to effect a rapid repair of tissue. This process is called Bioconductive Therapy.

Transcranial Electrotherapy is based on passing a low frequency microampere current across the cranium to induce an alpha state. The primary applications are in managing stress and relieving anxiety. ■

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# Pandora's box





## "PANDORA'S BOX"

Neuro-electric therapy, a treatment for drug addicts developed by Meg Patterson in Britain, has caught on at one addiction unit in New Zealand. But the staff at Stratford, Taranaki, have put their own interpretation on Patterson's "black box" methods and guidelines for use.

**F**OR 12 YEARS, a Scottish surgeon called Meg Patterson has been fighting to convince the medical system that she has a worthwhile treatment for drug addiction. Her work is based on the latest advances in brain research, and even anticipated some of them. Depending on which authority you consult, says British writer Gavin Martin, Patterson is either a media hype, the Mother Teresa of the drug world, or a pioneer of one of this century's major medical breakthroughs. While this controversy still rages, a small drug-dependency clinic in Stratford, New Zealand, claims to be using Patterson's treatment on its patients.

"You don't have to be in the world's metropolitan centres to be ahead," Stratford unit director Tom Joll recently told the *Sunday Star*. For three years, he says, Stratford has been using Patterson's Neuro-Electric Therapy (Net). The drug addicts referred to his unit, Joll confirmed to me, receive the same withdrawal treatment that rock stars like Pete Townshend and Boy George have had from Patterson in London. My inquiries showed, however, that Stratford does not observe several of Patterson's guidelines on how Net should be done — and that under the Medicines Act there is no protection for any patient in this situation.

So what is Net? Patterson does not claim that she has a cure for addiction. It's not like hepatitis or the flu, she says wryly, where we feel cured as soon as the symptoms disappear, even though we know we'll catch another dose next year.

Cures for addiction must be for life, she says at the outset of *Hooked?*, her 1985 book on Net. Such cures involve detoxification and follow-up counselling. Addicts, she says with sympathy, not only have successfully to endure the pain of withdrawal: they must then be helped to resolve the range of personal, social and spiritual problems that put them in bondage to the drug in the first place.

To date, Patterson says in a soft Scottish burr on the phone from London, the publicity about Net has homed in on its claim to be a simple, non-addictive tool in the withdrawal process. With Net, very low-frequency signals are passed through the brain from a battery-operated gadget the size of a cigarette packet, via two electrodes placed behind the ears. It is nothing like electro-shock treatment, and patients feel only a slight tingling sensation. Patterson believes that the current stimulates the brain to produce several natural chemical messengers — the main ones are called endorphins — that govern the body's anxiety, stress and pain-control mechanisms.

As a rule, patients receive 10 days of continuous treatment on this electric "black box" and then undergo about three weeks of intensive counselling. Most patients not only report relief from craving and the sleeplessness, nausea and body-aches of withdrawal; the follow-up studies also suggest that Net shows a far higher level of long-term freedom from drugs than alternative methods like methadone. In many patients, Patterson claims, Net eliminates the "chronic withdrawal syndrome", a key reason why addicts relapse into drug use. This lingering syndrome of illness and depression can, for instance, dog heroin addicts for up to 18 months after they try to come off methadone.

Patterson, now 64, has the kind of credentials that lend support to her claims. She graduated in medicine at 21 and within five years had been admitted to the elite Royal College of Surgeons. In the early 1960s she won an MBE for her efforts in establishing hospitals in rural India, and soon afterwards stumbled across the basis for Net.

While she was surgeon-in-charge at a large Hong Kong hospital in the late 1960s, Patterson and a colleague found that the acupuncture they were using to relieve pain was also treating the opium addiction in their patients. In 1973 she decided to work full-time to refine the process of electrical stimulation involved. As she says, it seemed apt that the British who introduced opium to China

should now be turning to ancient Chinese medicine for ways to combat their own social crisis in narcotics.

In 1975, Patterson's work got a boost when one of her former teachers isolated endorphins for the first time. Since then researchers in fields like sports medicine, drug addiction and the treatment of schizophrenia have learnt a great deal about the body's own drug system. A number of receptor sites and natural opiate-like peptides have been discovered strung along the major neuron pathways in the brain, spinal cord and pituitary gland.

In the course of an addiction, she has reasoned, the addict's drug intake floods the receptor sites, creating feelings of ecstasy and signalling the body to suspend production of its own natural opiates. Over time, as the natural supply lessens, more outside opiates are needed, finally even just to make the body feel "normal". On withdrawal the body then

needs time (or, instead, a Net signal) to restart the supply of endorphins, serotonin and certain other neurochemicals with exotic acronyms (Gaba, ACTH) that seem to trigger our feelings of pain and well-being.

Are endorphins really the chemical keys to consciousness? The claims made about them often tend towards overkill. As John Hughes, an endorphin research pioneer, said sardonically in a recent review article, the euphoria that endorphins are supposed to cause in experimental animals somehow seems to infect the people who study them.

Patterson is wary enough: "I believe that so many of the neurotransmitters are so interlinked that you get chain reactions and it is impossible to say that any one neurotransmitter is responsible for any condition." Over 20 identifiable substances, she adds, have been found among the whole group of endorphins. "But all that aside, there is no doubt that endorphins play the major role in addiction."

So what, I asked her, is holding back the wider acceptance of Net? Well, she replies, Net has made some progress towards mainstream acceptance. A 1982 study, funded by the British Medical Association, confirmed the long-term benefits of Net to patients at various stages along a seven-year study period. Sceptics attribute these results, however, to other factors: like Patterson's ability as a counsellor or healer. "You can imagine how those same doctors would have reacted," Patterson sighs, "if I had made personal claims to be a healer."

To counter these sceptics, she and Dr

Ifor Capel of the Marie Curie Memorial Foundation in Surrey published the results of their tests on sets of addicted rats. The rats, presumably impervious to the charms of Patterson's personality, showed high endorphin and serotonin responses at the same frequencies she had been using on humans.

As Capel admits, a Net signal is still a somewhat "blunt instrument" to be using, given the subtle flows of natural electricity that trigger our neuron populations and pathways. To date, the only independent comparison-study of Net and methadone was published in 1984 by Michael Gossop and other staff at the Royal Bethlem Hospital in Kent. This gave mixed, but generally unfavourable results for Net. Unfortunately, as Gossop admitted, there were serious design flaws in his study, and Patterson pointed out several more in her reply to the *British Journal of Psychiatry* in February, 1985.

The road ahead seems no easier. In January of this year the *New Scientist* reported sympathetically on her efforts to gain a fair trial for Net. The British Department of Health and Social Security, however, still refuses to fund research to evaluate the "black box". Money for *any* kind of medical research in Britain, Patterson told me, is drying up. In the late 1970s the Rank Foundation put up money to fund a treatment clinic for her in Sussex, but mismanagement and an "open door" policy of admittance put paid to that within a year.

Her present efforts are being bank-rolled to the tune of £50,000 by an American organisation called the Frontiers of Science Foundation, and her work with rock-star addicts like Eric Clapton, Keith Richards and Pete Townshend had their pragmatic side. "I'm in favour of socialised medicine," she told Gavin Martin, "but at the moment I'm forced to see wealthy individuals to stay alive and fund my research."

One major stumbling block has been that nursing staff require six months' full-time training to use her present black box properly. To cut down that expense she is now working on a fully computerised model that can adjust itself to the daily and hourly responses in the patient. Most of her patients, she explains, are addicted on average to three drugs at once, so the new model will have multiple programmes: one for heroin, one for cocaine, for heroin plus cocaine plus valium, and so on. The frequencies will vary as the symptoms peculiar to each drug ebb and flow in the patient.

Around Christmas, she says, she will publish *The Power Factor*, her book on

drug counselling. In the new year, she will re-open a clinic in London to treat the "desperate" addicts that come her way. With the help of some Californian electronics experts she is confident that her new-model black box will meet the stringent standards of the US Food and Drug Administration.

The cost of the new model, she says, will depend on the demand for it. "But it will cost less than the present model, which costs £500."

EVEN ON a fine day Stratford Hospital is a fairly grim prospect. Long low buildings tilt away at various angles. The yellowish paint that coats every visible exterior — surely an analogue for some gastric juice or other — seems to be eating its way into the walls.

Tom Joll proves to be tall and affable, still athletic in late middle-age. A former alcoholic, Joll is a fully trained social worker with no formal medical background. The Stratford unit is under the administrative wing of the Taranaki Hospital Board, and it services the Taranaki region as well as adjacent areas like Wanganui, Waiouru and Hamilton that do not have in-patient facilities. Occasionally addicts are referred from further afield.

Alcohol is still a major drug of abuse in rural areas, Joll says. Homebake and dodeine are more of a big-city concern, and ports like New Plymouth are now seeing some cocaine. He gets a few heroin addicts, but most of his patients are alcoholics. About five patients a month are put on Net, and some 90-95% of them report some relief from the pain of acute withdrawal. This, he agrees, is about the same success rate as that for the drug chlormethiazole. "But with Net, the patient is not drowsy, is not confined to bed but is moving around taking things in far sooner."

Net is just one of the treatments used at the unit, Joll stresses. In 1980, he read an article about Patterson's work in a British medical journal and shortly afterwards his medical colleague bought a Spembley 10-200 stimulator in London. The Stratford unit now has two. And is Joll confident that these can perform Net therapy adequately? "I have no doubt about that."

What evidence does Joll have that Net is anything more than cold turkey with a tingling in the ears? "Well, research-wise, none. We can say we believe it isn't that. But the answer to the question you're asking in terms of scientific evidence is that we have none. We're going by the evidence presented in her papers, basically."

So how do you know it isn't a placebo? "The short answer is you don't. Unless

you've researched it correctly, which we haven't . . . But, as a non-clinician, does it matter? If it works, use it. How or why it works becomes a matter of academic interest."

So how can any patient in this situation give their *informed* consent to the treatment? "We explain how we think it works, through the production of endorphins, and what that is likely to mean. They give their informed consent on that information."

The Stratford nursing staff, Joll concedes, have no training in Net. "That sounds bad, and I suppose it is in a way." Senior nurses have been trained how to put the electrodes on, he says, and how to set the amperage. "They may, well many *would*, be able to get to the point where they knew it was a reaction to Net or something else." The safeguard, he suggests, would be that if the symptoms could not be alleviated the nursing staff would call a doctor.

Routinely, Stratford gives drugs in conjunction with Net. In a 1984 medical-journal article, it was stated that three out of 10 Stratford Net patients were given chlormethiazole before treatment, and five were given propranolol. Nowadays, Joll says, patients are given *either* Net or chlormethiazole, but propranolol is still "quite commonly" given to Net patients.

Patterson, however, is emphatic that no drugs should be used in conjunction with Net. "The whole principle of Net," she told me, "is that we are sending in signals which stimulate the empty receptors to send signals to the endorphin-producing cells to start producing again." If suppressants like propranolol or clonidine are occupying the receptors that heroin or other drugs have just vacated, she says, the signal will do nothing at all. "It becomes only a placebo if you use other drugs at the same time." Moreover, she adds, even if the combination of Net and suppressant drugs seems to help in acute withdrawal, the patient may be left with "a full-blown chronic withdrawal" once the drugs are stopped. At Stratford, according to Joll, no follow-up study has been done on those who use Net.

All Stratford patients are put on the same electrical frequency, setting four on the Spembley machine. This is shifted downwards at night, or if the patient begins to feel disturbed. Treatment usually lasts for two or three days, Joll says. Alcoholic patients, he explains, would have a shorter withdrawal period than the heroin addicts Patterson usually treats.

But Patterson is adamant that the frequency, wavelength and wave shape of



the electrical impulse must be set correctly if the signal is to achieve its goal. On the basis of her clinical experience, she has published the frequencies suitable for particular drugs and indicates that staff may have to shift these frequencies daily, or even hourly, to meet the symptoms peculiar to each patient.

Some of these frequencies — 75Hz to 300Hz for narcotics and sedatives, up to 2000Hz for cocaine and amphetamines, and a night-time level of 10Hz for most drugs — lie both above and below the 15Hz-to-200Hz range of the Spembley machines in use at Stratford. Three years ago, Patterson told me, she wrote to the Spembley manufacturers asking them to curtail their advertising about the suitability of their product for Net. The manufacturers agreed to do so.

In sum, Stratford has a stimulator without some of the features that Patterson advocates. At best, the staff are trained in the general symptoms of withdrawal, not in Net. The treatment is of shorter duration, and shows little or no sensitivity to the parameters Patterson cites for different drugs and combinations. What does Joll say to the charge that this does not add up to Net, according to Patterson's research?

Joll laughs explosively. "I don't know. Back to the drawing board, I suppose." This is important, he says "from a unit point of view" but as far as he is aware, Net is a descriptive word for a type of research, not a brand name. "But I give her full credit . . . it was her work that we claim to be using. It's an interesting postulate that it may not be. You're blowing me away and that's fair. I simply don't know the answer."

Later, I queried Dr Geoff Robinson, the director of Wellington's Alcohol and Drug Dependence Centre and someone who has referred two patients to Stratford for Net. To date, he says, Net has not "caught on" in any important way in the addiction-treatment field. "That isn't to say it isn't appropriate, it just hasn't been taken up." He finds it "mysterious" that there hasn't been more interest in it, and also mysterious that Stratford has got into it.

Stratford, I suggest, doesn't seem to have much of a methodological framework for it. "They don't. They're of the belief that if the patients think it's helping them, then that's good. Because that's an important part of addiction treatment, isn't it?"

JOLL AND HIS staff seem confident that their version of Net has delivered some benefits. An obvious safeguard exists: from Joll's account, it is quite clear that Net is discontinued at the first sign of

rejection by the patient. Joll and his colleagues also report, however, that some patients have had "paradoxical" negative reactions to the treatment.

So to what vetting process at the Health Department must a doctor subject a device brought back from overseas, before it can be tried on patients? None, says Dr Bob Boyd, the department's head of clinical services. The same is true for medicines. "The legislation is quite clear that anyone wishing to *market* a medicine has to get consent. But any medical practitioner can concoct or obtain anything whatsoever to treat his or her patient. It is absolutely clear that any medical practitioner can treat a patient in any way that seems appropriate. Of course, he or she must face the full professional and legal responsibility in doing so."

Doesn't that assume a great deal of sophistication in the patient? Wouldn't most people blame themselves and not the doctor?

Boyd: "That's for them and the doctor to discuss. One would hope that any practitioner would advise the patient that they are using an unregistered drug. But they don't need to talk about an unregistered device because there is no registration of devices in this country . . . no one has suggested that it was necessary to go through Parliament and change the trust between the practitioner and the patient."

NZ LISTENER, NOVEMBER 15, 1986 23



*(Editor's Note: The following is an account of a weekend conference on the fascinating new field of Bio-Energetic medicine held in November 1986 at the Sheraton Hotel in Universal City under the sponsorship of the World Research Foundation headquartered in Sherman Oaks. Fourteen international researchers gave presentations during this weekend. Whole Life Monthly will continue its coverage of these presentations in coming issues)*

## "SING THE BODY ELECTRIC"

By Frankie Slater

When Walt Whitman first wrote about "The Body Electric" in *Leaves of Grass* was he anticipating what Einstein would later proclaim in the theory of relativity? Had Whitman tapped on to the "universal mind" that many scientists today believe resides at 7.83 to 8.00 Hertz (frequencies per second)—a band on the alpha-beta border which great thinkers like Thomas Edison, Bernard Baruch, and Leonardo Da Vinci are said to have tapped into during their frequent catnaps; the same wave band as the earth's own lithosphere. Did Whitman see humans as the "bio-cosmic resonator" which scientists, medical doctors, and metaphysicians would come together to discuss at the world-wide Congress of Bio-Energetic Medicine?

According to West German Dr. Wolfgang Ludwig, grandfather of the bio-energetic movement in Europe, the earth resonates in the same frequency range as the brains of humans and other mammals. If a person is shielded from the magnetic vibration of the earth's lithosphere by interference from other, often artificially produced electro-magnetic currents in the atmosphere, giving way to an imbalance in the inner ecosystem, he or she will become ill. Ostensibly, then, sickness can be understood as an omission of a frequency or vibration. Bio-energetics suggest our bodies pulsate with direct current, and this pulse, or frequency, changes when toxins are present in our system. Thus, the human organism is in a constant flux between stable and unstable conditions, ever leaning one way or the other towards wellness or illness.

Today bio-energetic science is serving to prove the laws that govern us, the laws of cellular intelligence. Data compiled by such widely-regarded scientists as Dr. Ludwig and Dr. C.W. Smith of Great

Britain who has done extensive research on the interaction between electromagnetic fields and living systems (see adjoining interview) indicate that we are delicately attuned to the electro-magnetic forces which surround us. Like the water in the ocean, and the water in a laboratory vial, the water within us is a living communications system, resonating with information.

Their research, along with others in the field, confirm the possibility of an internal energy system in the body. Technology has reached a stage where it can finally probe the theories stalking mankind since the yogis first identified "prana" as life force, and the ancient science of acupuncture began operating on the principle of "chi".

However, until 1883 when Nikola Tesla introduced the first alternating current power system at the Chicago World's Fair, and later harnessed Niagara Falls, introducing the modern era of electricity, we lived among relatively simple environmental energies. This is not the case now when nearly every human occupation involves electricity of varying frequencies and there is a whole range of new chemical substances affecting those frequencies. There is good cause to know more about the body electric!

In fact, Bio-Energetic medicine may hold the key to many long-standing mysteries of nature, paving the way both to more holistic health practices and a healthier environment in which to live. At least this is the hope unanimously expressed by the men and women of many disciplines who gathered at the Congress of Bio-Energetic Medicine, sponsored by the World Research Foundation of Sherman Oaks.

One of the most substantial documentations presented at the Congress came from Dr. Bjorn Nordenstrom, Professor of Radiology at Stockholm's Karolinska Institute. During the past eight years, Dr. Nordenstrom has had remarkable results treating otherwise inoperable cancer tumors in the breast and lung. He has stirred the medical community with his discovery of a biologically closed electric circuit (BCEC) which provides new insights about how the body heals itself.

According to Nordenstrom, "When we injure ourselves the catabolic liberation of energy can be measured as a difference in electrical charge between the inner and surrounding tissue. Injury is a source of energy release which induces closed circuit transports over biologically closed electric channels, leading in turn to structural modifications in the tissue. This

represents the result of the process of healing."

Mimicing the action of a conventional battery, the body controls the current through arteries and veins and across the capillary walls, while drawing metabolic compounds and white blood cells back and forth through surrounding tissue. Dr. Nordenstrom suggests that cancer may result from a disturbance in this complex electrical network.

Conversely, tumor cells are known to be extremely sensitive to change in their immediate environment, which is the basis for most cancer treatment today including radiation and chemotherapy.

Nordenstrom's method addresses the micro-environment electrically. In order to influence the supply of mobile material in and out of the tumor, he implants electrodes which distort the ionic composition in the tumor area, resulting in high acidity. This destroys the proteins, killing the tumor from the center. Water moves and compresses in the surrounding vessels, and there is a massive accumulation of white blood cells, strengthening the immune system and contributing to ending the tumor.

Dr. Nordenstrom's simple treatment, which is harmless to the general body, takes only two to three hours and can be done under local anesthesia. It has been tested on 100 people since it was developed in 1978, but time must be the true judge of its effectiveness. Meanwhile, his treatment is part of the new holistic approach to medicine emphasizing nature's innate self-healing power. Bio-Energetic medicine thus focuses on the enhancement of the whole system rather than on chemically addressing the symptoms, a stop-gap measure with its own intrinsic side effects.

Many of the speakers at the Congress emphasized that, in the past, Western medicine has relied substantially on biochemistry with little attention given to other disciplines. However Europe, and particularly the countries of the Far East, have embraced bio-Energetic principles for some time.

Many at the conference also voiced frustration that "Big Business" is keeping their products and approach off the market. With \$13.6-billion a year going to mood-altering drugs such as valium and lithium, and another \$27-billion supporting the tobacco industry, (tobacco is four times more addictive than heroin!), vested chemical interests stand to lose considerable dollars to preventative and curative medicine.

Nevertheless, researchers have developed a wide array of bio-electronic



diagnostic and treatment equipment to work with the body's own cellular intelligence. Included among these are "Colorplate" Kirlian photography, Vega color therapy, the Cymatic sound device, and any number of brain tuners, psychotronic and neuro-electric devices. One such example, the NET (neuro-electric treatment) brain tuner, made famous by Dr. Margaret Patterson's success with rock luminaries Pete Townshend and Keith Richards, is a novel treatment for drug addiction. The device re-educates the brain to produce its own pain killing hormones called endorphins, circumventing the effects of withdrawal while introducing the patient to his own self-healing process.

The mind and its thoughts may have proved to be the most magnificent healer. In all, a controller of the all-important pulsations (or basic frequency) of individual cells. What we're seeing much more is an overlapping of many different

understandings and disciplines.

Psychologists are now cooperating with physicists and biologists, as collectively they realize how much the mind influences the body's functioning.

Dr. Elmer Green of the Menninger Foundation is using bio-feedback to explore the mind-body relationship. Dr. John Zimmerman is studying sleep and the REM state. Dr. Bob Beck is exploring extremely low frequencies (ELF) and their implications to psychic well being. And Dr. Vernon Woolf has developed a holodynamic model which indicates that "The mind takes in world experience and changes it into an electromagnetic coding system...Life energies are transformed into ego states which cluster at various levels of maturity and create all

behavior."

Bio-energetic medicine marries many disciplines, providing fundamental insights into healing, wellness, consciousness, the effects of our environment on us, and our part in the whole. Yet the more we know, the more we question, standing in awe of our miraculous self-regulating nature. To return to Whitman, "The universe is a procession with measured and perfect motion."

## To Learn More:

World Research Foundation  
Ventura Blvd, Suite 405  
Sherman Oaks, CA 91403.  
(818) 907-5483.

Neuro Systems "Relax Pak", 2705 National Drive, Garland TX 75041  
A Brain Tuner? phone 214-271-5418

# Impulses Help Aids Volunteers

NZPA-Reuter

Liverpool

Secret medical trials show a new treatment could significantly prolong the lives of Aids sufferers.

"This is not a cure. However, it has prolonged life and if it manages to do that for any reasonable length of time then it deserves serious study," said Dr Ian Ward-Baskin, technical director of the International Society of Biophysical Medicine, where the treatment was developed.

He said the therapy, derived from

a treatment for drug addicts, had been tested secretly under the auspices of Britain's National Health Service.

Details were being kept secret to avoid authorities in the area where the trials took place from being swamped with inquiries.

The treatment, which boosts the body's immune system, involves using electrodes to transmit tiny impulses to the skin.

Volunteers suffering from Aids were tested and experienced a sig-

nificant improvement, Dr Ward-Baskin said.

One victim, given only 24 hours to live, gained 19kg after the treatment and six months later was living an apparently near-normal life.

Doctors at the Liverpool-based research group, a private organisation registered as a charity, discovered the treatment could be applied to Aids sufferers this year.

Dr Ward-Baskin said the treatment was much cheaper than anti-Aids drugs such as AZT and could be administered at home.

NZ Herald 25/11/87

"The World Crystal Grid" Illustrated description of the Icosa-Dodecahedron which is the earth and the lines of force along which the Saucers fly. Where those Ley lines cross are vortexes of energy. These space-time warps can affect matter for good or for destruction. Temples and Pagodas are erected at these force centers. Thus the great secret of the priesthoods of the past is revealed in the present. . . . . \$7.50

# A Simple ELF wave generator or neural stimulator,

## TIMING PULSE 1 to 8 cycles per second

020.0

Welcome to your Explorer Electronic Project.

The Timing Pulse is an interesting project that demonstrates how your components create a beat or tempo sound. It simulates the metronome which is a well known instrument that has been used for hundreds of years by musicians to

set an exact tempo for their music.

In mechanical type metronomes, the timing is dictated by the pendulum principle. But in this demonstration the timing (tempo) can be varied by rotating the variable resistor control until the required timing is heard through the speaker.

### HOW IT WORKS

This simulated metronome consists of an oscillator which is cutting out, (blocking) the current. Its output section is coupled by the transformer to the loudspeaker which then converts the audio signal into beats of the metronome type. When a 9 volt battery is connected to the

### STEP 3

Check your board again for any "dry joints" or shorts between the circuit track. Always use the drawings provided as your guide.

### STEP 4

Take your battery clip and solder this into your P.C. board, be sure to observe the polarity, Black = negative (-).

### STEP 5

Now mount the 50K potentiometer from the copper side of the board (Fig. 1) and secure this with its locking nut. Take three pieces of the resistor offcuts and connect these between the potentiometer terminals and the board. Solder and trim.

### STEP 6

Mount the mini transformer into its position, solder in place and trim off excess wire.

### STEP 7

Now solder the two speaker wires into the board where marked (SP), then the free ends are soldered to your speaker terminals. Right one more final check of all your soldering work. OK?

### STEP 8

Mount your completed board over the speaker and secure it to the mounting box with the screws provided.

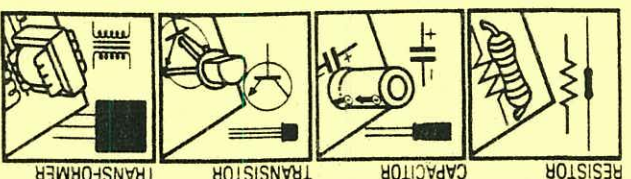
### STEP 9

Connect a good 9 volt battery, adjust the control to the speed you desire and that's it.

### TO FIT SPEAKER:

The speaker should be mounted into the grey parts mounting platform before the P.C. board is screwed into position. (Fig. 1.)

Ease the sides of the mounting platform open slightly and press the speaker firmly down. The small lugs on the inner sides of the mounting platform will hold the speaker in place.



### Parts List: Tick each box when all components in it have been identified

P.C. Board	Mounting Platform	Lamp	Battery Clip	Wire	Speaker	Transformer	Switch	Transistor	Resistor	Capacitor	Misc.
1	1 GREY	—	1	4" LONG 2x	1	1 MINI	—	1 50401	1 22K	2 ELECTRO 220mfd DISC .02	1 Potentiometer 50K

Have a good look at the diagrams provided related to your project so that before you start you are totally familiar with the layout. Ready, one more final check of your parts, right now lets go. Now that you are sure you are totally familiar with the parts for your

**Metal body contacts can be connected to the little ASSEMBLY speaker terminals, marked "X"**

Explorer project, read right through the next series of steps, then go back to step No. 1 and make a start. On projects that have a lot of components, it will be a lot easier if you only put in about 6-7 parts at a time. It is both easier to solder and trim this way.

### STEP 1

Place each of the components into its allocated position on the screened side of the P.C. board as shown in Fig. 1. Watch for parts that mount from the copper side. Be sure to check that the polarity is correct on parts like transistors.

### STEP 2

Solder each of the leads, refer "Soldering hints" and trim off the excess wire.

**WARNING:** Be sure to solder transistors quickly, as overheating will destroy them

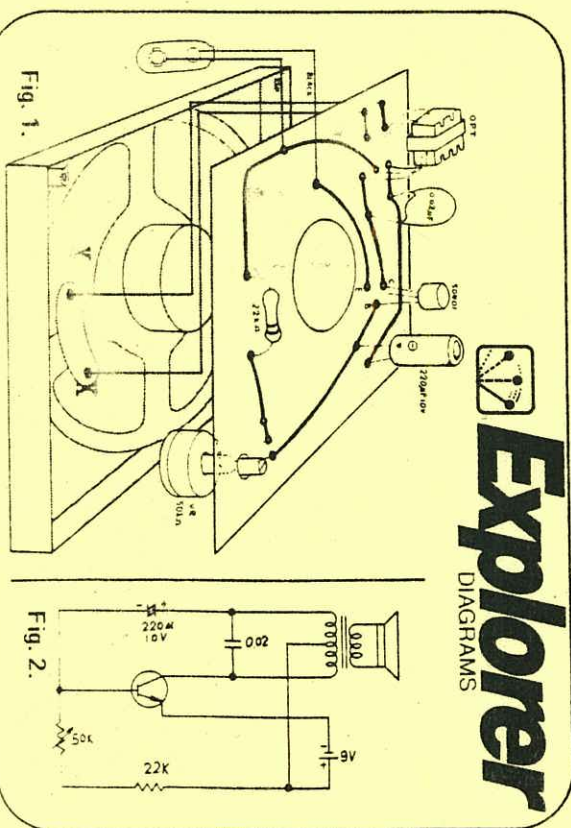
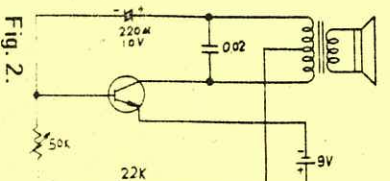


Fig. 2.



**Explorer** DIAGRAMS



