

AVS

Auditory / Visual Stimulation

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Fall '02

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Cyber-Shamanism by Zoe Seven

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AVS Journal

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HOW TO GET THE BEST VISUALS WITH LIGHT & SOUND MACHINES...

By Jeff Labno

HOW TO GET THE BEST VISUALS WITH A L&S MACHINE >

An Interview with Anadi Martel / Sensortech, Inc. 1

Attention & Learning: Part 2 2

Cyber-Shamanism 2

Overview: The Pineal Gland 2

Product Review: The EchoFone 3

New Product Review: ME AudioStrobe Decoder 3

Coming In March: ThoughtStream PC 3

One of the most common questions I get about light and sound machines is about the light show.

Where do all the colors come from? How come I don't see all those colors any more? Why do I see just one color?...

To answer these questions, there are many factors to consider. The first consideration is the quality of the light. If you are using dim light, you probably won't

see much of anything except a flicker effect. This means that all you see is a slightly pulsing field of light. When you use the newer ultra bright LEDs, you get rich colors and patterns. White usually produces the greatest array of colors. Red is otherwise the most energetic color, and you see lots of different colors using red. With other colors, you tend to see colors of the rainbow on either side of that color. When using yellow for example, you generally see orange, yellow, and green.

With blue, you see green, blue, and violet. White incandescent light also produces spectacular visuals. The Synchro Energizer, made in the early 1980's, was tops in generating a fabulous color and visual display. It used white incandescent light shinned through a clear "round shaped" piece of plastic. This diffused the light all around the eye. Some light glasses use a "milk white" filter which diffuses the light throughout the eye, refracting . . .

(continued on page 4)

Special Points of Interest:

- Explore consciousness with *Into the Void* by Zoe Seven., page 2.
- AV3X on DVD: The TV Mindmachine: page 34.
- Workshop & Seminar information: page 39.
- Subscription & Advertising information: page 40

AN INTERVIEW WITH ANADI MARTEL PRESIDENT OF SENSORTECH, INC.

Anadi Martel's background:

I've been into electronics since the age of 12, so it's a natural thing for me. I entered University at 16

and did graduate studies in Theoretical Physics. I then went to India for a few years, learning meditation and an appreciation of the inner qualities of the mind. When I came back to Can-

ada I felt I didn't want to get into an academic career, so I started my own company in electronics design, Sensortech Inc.

(continued on page 17)

PART 2: ATTENTION & LEARNING

BY DAVE SIEVER, COMPTRONIC DEVICES LIMITED

Neurology of ADD

Single Photon Emission Computerized Tomography (SPECT) is a process where a small amount of radioactive tracer is put into the blood stream, usually through a needle in the wrist. The parts of the brain that receive the most blood flow, and absorb the tracer through metabolism (the parts that are really

working), show up bright on the image. Areas that aren't working don't absorb any radioactive tracer and appear as black. Figure 5 shows the pre-frontal blood flow and metabolism in a person diagnosed as having ADD. Notice that the pre-frontal lobes do not function well in the best of times. During concentration the pre-frontal lobes shut down

quite completely, making it very difficult for this person to pay attention to what is being read. After an application of Adderall, pre-frontal lobe function improves tremendously, improving attention and reducing hyperactivity. SPECT imaging has proven itself as a reliable diagnostic aid for diagnosing many . . .

(Continued on page 6)



The DAVID Paradise XL is the system utilized in this program.

CYBER-SHAMANISM: THE FUSION OF MODERN TECHNOLOGY WITH ANCIENT, PLANT-BASED SHAMANISM

By Zoe Seven

Ever since life here on Earth began, all of its species have strived to explore it. From the microscopic organisms which were spawned deep in the seas and which later emerged to explore the landmass and become the land spe-

cies we have on Earth today, to the caveman that ventured out of the familiar and safe surroundings of the caves and into the woods - the outside world - Man has constantly continue to venture into the unknown. Indeed from Columbus to Armstrong some individuals have dared to

go where no other has gone before. But a different type of explorer has also existed throughout the ages. I am referring to the individuals that have opted to leave behind the . . .

(Continued on page 22)



OVERVIEW: THE PINEAL GLAND CENTER OF THE PHYSICAL BRAIN

By
Richard Bennett, Ph.D.

If anything could be called the center of the physical brain, it would have to be the Pineal Gland. This solid cone-shaped structure

located at the roof of the posterior third ventricle is about the size of a grain of rice and weighs approximately 100 - 180 milligrams. It begins its composition at about the 36th day of gestation when two

small cell masses-anlagen-fuse together to form the gland. Almost undetectable at its beginning and still when it reaches differentiation . . .

(Continued on page 35)

PRODUCT REVIEW: THE ECHOFONE

The Echofone is a distribution audio amplifier, it takes a stereo input and routes it two ways: 1) headphone out and 2) electrodes out.

The key ingredient of the Echofone is the Piezo electronic transducers (electrodes) which are better able to reproduce high frequency sound because

there is no massive voice coil to move in and out as in a conventional speaker. The Echofone electrodes reproduce frequencies over 100 Khz and can act like a super treble control since you can directly set the electrode volume.

High frequency audio transmitted through the atmosphere is very narrow; that is, it doesn't spread out

like low frequency sounds, and it is easier to localize a high frequency source in space.

With the Echofone electrodes on the skin however, the high frequency signals are more difficult to localize and sounds more like high frequency audio is coming . . .

(Continued on page 22)



The EchoFone

NEW PRODUCT REVIEW: THE MINDEXPLORER AUDIOSTROBE DECODER

The MindExplorer AudioStrobe Decoder is an AVS system based on a stand-alone AudioStrobe decoder + light goggles + full version of MindExplorer SW software. So it can work with AudioStrobe CD's, it can work con-

nected to PC and play AVS sessions. MindExplorer SW can export sessions to wav files which can be burned to CD, so it is possible to create sessions on PC and then burn them to CD's and play using any CD player.

Our product also includes MultiMode Light Frames - a special sort of light glasses which can work in several different modes (2 colors, left/right mode and combinations of colors and modes). . .



AVAILABLE IN MARCH: THE THOUGHTSTREAM PC

Summary

The ThoughtStream PC is the latest in Syntec System's emerging line of personal biofeedback training systems. It can provide up to four simultaneous chan-

nels, and transmits its signals to either an IBM-compatible PC or Proteus.

Six channels to choose from

Two channels each of gal-

vanic skin response (GSR), skin temperature (ST) and heart rate (HR) are available via sensors which plug into the two input jacks. A sensor channel consists of either a single HR or a . . .
(Continued on page 38)



The Thoughtstream, pictured above, will be upgraded to the Thoughtstream PC in March.

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How to get the best visuals with light and sound machines

(continued from page 1) . . . the light towards the center of the eye because of the curve of the plastic filter. The color display is thus subdued.

Of course not everyone cares about seeing a wonderful color show when they use light and sound. At the same time, when I bought my first machine for \$8,000, I would never have spent that kind of money if the light show were not extraordinary. I find that people tend to use their machine more frequently when the light show is spectacular, and therefore will consequently derive more benefits.

A newer generation of light glass colors been initiated using two colors, or bi-color. Blue and red combo is one, and another is red and green. Red and green, for some reason produces some very interesting colors. The color show is more hallucinagenic-type colors versus when white is used. People comment quite a lot using red and green combo, they truly like it.

Yet another factor in the light show is using true sine waves, not sinusoidal, also produce some very fluid visuals. Machines typically are manufactured in a fashion that turns the light on, then off. This is called a square wave. Sine waves, on the other hand, gradually increase in intensity to full illumination, then gradually decrease. Sine waves are what occur in nature, but are also much gentler on the eye when doing a program. You may have noticed when doing a sleep session where the light flicker is very slow, it can be uncomfortable at times, especially if the light is too bright. With sine waves, the eye remains more comfortable as the sine wave action is more fluid and gentle. Sine waves also produce a more fluid visual effect which is hard to describe. The new Innerpulse allows you to select sine waves. Also the Future Mind utilizes sine waves.

The time of day you use a session also impacts the light show. You will see more colors doing a session during daylight hours versus at night. This happens because the light receptors in the eye shift function from daylight to night. The cones which occur in the center of the eye process colors and are most active during daylight. When the sun sets, the cones are not active, and the rods which occur outside of the center of the eye more in the periphery become active. They do not process color, but instead process intensity of light.

You can produce greater colors and patterns at night and a greater sense of dimensionality in the light show during the day by doing eye exercises at the beginning of your session. All you need to do is move your eyes clockwise several times, then counterclockwise several time right at the beginning of your session. You will be very impressed at the results. The color display will not only be enhanced, but also the visuals appear much more 3-D!

Another important element in the visuals comes vis a vis the music you select to listen to when doing a session. Music directs the visuals you actually see in an extraordinary way. Your eyes are not the actual agent that produces visual, but instead it is your brain that produces the visuals. When you select any particular music which "pushes your buttons," the visuals change dramatically. It is irrelevant which style of music you choose, except that higher frequencies of sound have a more energizing effect on the brain. The third octave above middle C on the pi-

and is where the ear is the most sensitive. Higher frequencies that produce more overtones, and even though the ear actually hears frequencies up to 20,000 to 24,000; the ear is sensitive to frequencies as high as 40,000 Hertz. So, you may not hear the sound, but your ear is still processing the sound in those higher realms.

Using standard headphones however limits the frequency range, because the electronics inside the headphones can't process the lower and higher frequencies in the first place. You can spend up to \$10,000 on headphones, however check out Sennheiser because they have a good frequency range, and are also very comfortable.

An even better technology for increasing the high frequency range is vibrational transducers. Separate from headphones, you put two transducers on the forehead with a runner's-style head-band. Tactile information is processed by a completely different part of the brain, and brings a more engaging focused experience to your session. Vibration also increases the harmonics you experience in the higher frequency range. Specifically you get more of the frequencies generated above 20,000 Hertz! The Neurophone and also the Echophone are great delivery systems for this technology.

When you introduce higher frequencies into the light and sound experience, you begin to enter an arena called "synaesthesia." Synaesthesia is a mixing of the senses. You might start to see colors from hearing sounds, or hear sounds by being introduced to colors.

AudioStrobe CDs were created specifically to amplify the synaesthetic experience. Not all machines are configured for AudioStrobe, but you truly enjoy these CDs because the light show follows the music.

An incredible synaesthetic experience can easily be induced by introducing aromatics to your session. Studies using the Mind Mirror have shown that aromas very quickly and effectively influence your brainwave state. Try smelling any aroma during your session, and the colors and patterns will immediately change and take you on a very different type of experience.

The music you choose distinctly impacts the light show. When it comes to introducing music you can use popular music to induce "flash-back" memories of eras gone by. Gregorian chants work well to put you in a religious or contemplative mood. Baroque music helps organize your mind and gives you lots of energy. Classical, Impressionistic, and Romantic music are great for drifting and bring forth imaginative states.

Not all aromas are created equally. High quality aromas smell like having that fruit or flower right in your hand, as if you were smelling it fresh. No chemical smell should be present either. Quality aromas also last a very long time the effect lingers for quite some time because they are concentrated. If you smell the juice of a freshly squeezed lemon, the effect lasts only about 30 seconds. If you smell a quality lemon aroma, the effect lasts for up to five minutes!

You will find hundreds of different scents available, so how do you choose? It is best to stick with "single tone" aromas and not use blends. Men tend to prefer aromas created from the lower part of plants such as barks; while women tend to prefer the aromas generated from efflo-

rescences of plants and trees such as flowers. Citrus is generally energizing while lavender is used for relaxation. There are aromas which induce romantic states such as gardenia, rose, and ylang ylang. For focus, peppermint is often used. You can even induce joy with aromas such as blood orange.

Try lining up several aromas to use during your light and sound adventure. Here is an example of how to proceed for a "romance-type" session. Line up the aromas in a precise order that you have pre-determined for a specific effect and where you can easily reach them while hooked up to your machine. Smell each aroma in the order you have set them up and wait about five minutes before smelling the next aroma. For a romance session, first use lavender to relax and let go, then use peppermint to focus on the type of person you would like to meet, then use ylang ylang to generate a romantic response to that person, finally use frankincense to meditate on achieving that goal.

You can set up many different types of sessions by being creative. Also pick romantic music to set the mood for your session and finally the type of light and sound program which best represents the brainwave state appropriate for you.

Finally you can use foods to help enhance your experience. So how can eating an orange, or drinking a cup of coffee impact the visuals? You will never know unless you try of course, but this helps the synaesthesia overall.

Foods have very different effects on different people. But here are a few examples based on my personal experience and how foods effect me. You will have to find out for yourself what works the best, however, whole foods, picked when ripe, unprocessed are the best ones to use.

For a focus session, try drinking a cup of espresso! For romantic sessions try tropical fruit. Freshly picked ripe apricots are an aphrodesiac for me. When I drink orange juice freshly squeezed picked ripe from local trees, I feel suddenly extremely alert.

Well that just about wraps it up on ideas for you to increase the visuals while using light and sound machines.

Enjoy your sessions!

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Attention & Learning - Part 2

(continued from page 2) . . . neurological disorders. Daniel Amen, MD., the author of these images, is a well-respected clinician from Los Angeles. For more information on SPECT imaging, refer to Amen's book, "Change your Brain, Change your Life".

Figure unavailable in downloadable format.

QEEG Analysis of Brain Function

Figure 6 shows an example of a quantitative EEG or QEEG of a teenager with ADD. As mentioned earlier, one subgroup of ADD typically shows higher than average alpha, more prominent on the right frontal side (left image). During a reading task, all the alpha increases frontally (instead of suppressing) with larger increases on the right side (center image). This increase in alpha during a cognitive task is known as *inversion*, meaning higher alpha or theta levels during reading than just when eyes are open, experienced by mental "fog" while reading. Following a session on the DAVID *Paradise XL*, alpha becomes very close to normal and reading speed and comprehension are improved.

Notice the similarities between the "holes" in Amen's SPECT (centre image) and the alpha intrusion shown on the brain map (centre image) during the task conditions. Both Adderall and AVE increase cerebral blood flow. Notice the "smoothing" of brain function in Amen's third image and the alpha "smoothing" following 8Hz AVE on the DAVID *Paradise* (third image).

Figure unavailable in downloadable format.

Studies of Attentional Disorders Using Audio-Visual Entrainment as the Treatment Modality

Before we begin, I should explain my concerns over the terminology of "audio-visual stimulation" (AVS) versus "audio-visual entrainment" (AVE). We receive AVS continually throughout the day. However, we rarely receive AVE. There are millions of people watching the "AVS" of TV every day yet it doesn't drive up cerebral blood flow nor alter brain activity in any meaningful way. This is why I prefer to use the term AVE.

By the late 1980's, there were a variety of case reports using AVE to treat autism and ADD, although no group studies existed. They have reported improved grades due to an increased ability to focus attention on their studies. In 1990, Carter and Russell began studying the effects of AVE on 26 eight- to twelve-year-old learning disabled boys from a private and public school.

Fourteen children (from the private school) received two minutes of 10Hz., one minute - no stimulation and two minutes of 18Hz. for five cycles over a 25 minute period. The students received AVE once a day, five days per week for eight weeks, totalling 40 sessions. They also listened to a tape of binaural beats (recorded from the AVE sessions) for 40 sessions at home. The public school children (n=12), received three treatments per week for six weeks totalling 18 treatments. All children could see out of their eyesets and were encouraged to play checkers and hand-held electronic games during treatment.

The results of the first group were considerably better. They received 22 more AVE treatments than the public school children. Unfortunately this large difference in AVE treatment had confounded the study, making it unclear as to whether the binaural beats on cassette tape had any influence or not. Following in Figures 7 and 8 are the pre-post results of IQ and Burks behavior indexes for the private school children. Referring to Figure 8, which class of students would you prefer to teach?

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Audio-Visual Entrainment Program as a Treatment for Behavior Disorders in a School Setting

In 1997, Michael Joyce tested a unique dual frequency AVE session using the TruVu eyesets (independent field stimulation used with the DAVID *Paradise* units) to treat ADD and reading-challenged students in two Minnesota primary schools (Refer to *Appendix E*). He measured the children for behavioral changes in inattention, impulsiveness, reaction time, and variability (inconsistency of the responses) using a computerized continuous performance test (CPT) called a TOVA. Figure 9 shows the children's improvements after an average of 33 sessions (over a 10 week treatment period). A normal score is 100. A score of 85 represents one standard deviation away from the norm (abnormal).

Figure unavailable in downloadable format.

These results clearly show a reduction in impulsiveness, inattention and so on. Reading is the one most important skill necessary to succeed in school. The reading-challenged group showed academic benefits from using BWE. Joyce selected the students with the poorest marks in the Spalding reading class for his study. The children were tested on the STAR (Standardized Test for the Assessment of Reading). Figure 10 shows their improvements in grade performance. The grade equivalent (GE) ranges from 0.0 to 13 and represents a child's actual grade reading level. For instance, if a child is assessed with a GE of 4.7, then the child is reading at the level a typical child in the seventh month of grade four. Figure 11 shows the differences in performance between the treatment (AVE) group and the control group. The percentile rank (PR) ranges from 1 to 99 shows a student's performance compared to his/her peers nationally. For instance, if a child has a PR of 78, then the student is performing at a level which equals or exceeds that of 78% of the children in the same grade, based on the national average. This figure shows that the control group fell a little while the BWE group improved considerably.

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Hershel Toomin, a long-time pioneer in the field of neurofeedback (NF), began looking into the role of cerebral blood flow in brain regulation and attentional disorders. He developed a product called the "Thinking Cap" which used a near-infrared beam of light, shone through the scalp while a sensor nearby detected the amount of light that was not absorbed into the brain. He found that ADD children absorbed less light shortly into a reading task (as in Figure 5 and 6), indicating a reduction in cerebral blood flow (CBF) coincident with reduced reading ability. It's been shown that at certain frequencies, AVE increases CBF substantially as well. Because of this common philosophy, Hershel analyzed six well-respected NF studies with ADD children (thankfully) and found that with the Joyce study, while treating ten children simultaneously showed better improvements on the TOVA than did NF, one child at a time.

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Academic Performance and the Alpha Rhythm

Several studies have been completed showing the comparison between peak alpha frequency and intelligence. In 1996, Anoukhin and Vogel observed 101 healthy males ranging from 20 - 45 years of age. They discovered that those who scored well on the Raven's IQ tests had a scant 1Hz. Faster alpha rhythm than did the poor performers.

In 1971, Oloffson reported that healthy human alpha production was in the range of 9.3 - 11.1Hz.. A 1990 study by Markand showed that a dominant alpha frequency of 8.5Hz. or lower reflected a state of mental dysfunction. Other studies by various research teams; Vogt, Klimesh and Doppelmayr (1998), Jausovec (1996), Giannitrapini (1988) showed a distinctive relationship between mental performance and peak alpha frequency. Roughly speaking, peak alpha production of less than approximately 10Hz. can be associated with poorer than average academic performance while dominant alpha production higher than 10Hz. is associated with better than average academic performance.

Some AVE manufacturers have claimed that "super-learning" can be achieved with their "Learning Sessions", however as of yet there is no research available to support these claims.

While there is now enough research to support that learning can be accelerated following a treatment program of AVE, it cannot be assumed that AVE can produce "super learning". We have observed that the best method to improve academic performance is to study after an AVE session has ended, as shown by increases in peak alpha frequency and A3/A1 ratios (see Budzynski next section and the brain maps previously in Figure 6). AVE is also effective for inducing hypnosis where we can effectively learn new habits and emotions.

Budzynski's Study Using AVE to Improve Cognition and Academic Performance

Using this information, Budzynski and Tang conducted some experiments with AVE. They gave 14 people 15 minutes of photic stimulation at 14Hz. Figure 13 shows the dominant alpha frequency before photic stimulation (Pre), during (P.Stim), immediately following the cessation of photic stimulation (Post) and after 5, 10, 15 and 20 minutes. Notice the increase in alpha frequency in the minutes following stimulation.

Figure unavailable in downloadable format.

Tom and Helen Budzynski further divided the typical alpha band (8-13Hz) into three separate bands; they were: "A1" from 7-9Hz., "A2" from 9-11Hz. and "A3" from 11-13Hz. Then they looked at the A3/A1 ratio. If, for example, there was 15 uv of A3 activity and 12 uv of A1 activity, the ratio would be $A3/A1=1.25$. Figure 13 shows the ratio between A3 and A1 for various tasks.

A ratio above "1" correlates with higher alpha frequency and good mental performers. A ratio below "1" is associated with low dominant alpha frequency and poorer than average mental performance. They observed the peak alpha frequency of struggling college students from the Western Washington University who were given different mental tasks. As shown in Figure 14, an alpha slowing indicated by the negative ratio is typical of ADD and occurs most apparently during the Digit Span task. This task requires remembering a long string of numbers until they can no longer be remembered. It is a sensitive measure of cognition and short-term memory. During the D. Span task, their brains slow down, similar to that of ADD. Following 30 sessions of 14Hz. AVE, mean alpha frequency (positive ratio) is increased. Their alpha frequency con-

tinues to increase during different tasks, indicating good slow-alpha suppression during task conditions (a reversal of the control group).

Figure unavailable in downloadable format.

The 30 AVE sessions were completed in the Fall of 1997 and the student's marks from their spring exams were recorded (Figure 15). Notice the AVE had an improvement in grade-point average (GPA) over the course of the year while the controls showed a decrease in PGA. This study shows that a substantial carry-over effect following the cessation of AVE continued for five months.

Figure unavailable in downloadable format.

The Use of Auditory and Visual Stimulation for the Treatment of Attention Deficit Hyperactivity Disorder (ADHD) in Children

This study by Lawrence Micheletti is unique in that it is the largest ADHD/ADD study to date (n=99) and it contains a control group and a group receiving psycho-stimulants (Ritalin & Adderall). The breakdown for participants was as follows:

Control Group	31
Stimulant (Ritalin & Adderall) Group	20
AVE Group	21
Combined AVE & Stimulant Group	27

The testing was done just prior to treatment (pre), immediately following (post) and after four weeks (post-post). I.Q. was tested on the Wide Range Achievement Test (WRAT), Peabody Picture Vocabulary Test (PPVP) and Raven's Progressive Matrices (Raven). The children received a 20- minute session, five days a week for a total of 40 sessions. The first training session was administered by the researcher while the remaining 39 sessions were completed at home and were supervised and recorded by a parent or legal guardian.

The AVE unit was programmed to begin with both auditory and visual stimulation at 10Hz for two minutes and at that time visual stimulation would cease and only auditory stimulation would continue for one minute. After the auditory-only stimulation, the AVE unit would switch to both auditory and visual stimulation at 18Hz for two minutes. In essence, the subject would experience four complete cycles (five minutes per cycle) for the completion of a 20-minute training session. Figure 16 shows the effects of Ritalin and Figure 17 shows the effect of AVE.

Figure unavailable in downloadable format.

New Visions School NeuroTechnology Replication Project: 2000 - 2001

This hallmark study is the largest, most convincing study showing the effectiveness of the DAVID Paradise driving a multiple system to treat children with attentional disorders. The data generated in the NeuroTechnology (NT) replication project are the result of the efforts of seven

Minnesota public schools (five elementary, one middle and one K-12). The NeuroTechnology sites, referred to as Designated Learning Sites (DLS), provided one to several school personnel to participate in a three-day NT training at New Visions School (NVS)/Minnesota Learning Resource Center (MLRC). This training (by Michael Joyce and Dave Siever) provided the skills used to initiate brain training on the children in their home districts. All of the hardware, software and related supplies were provided for each site through a charter school dissemination grant. Scheduled on-site mentoring was offered along with email and telephone correspondence as needed. The following report describes the results of their efforts.

Four of the elementary schools are located in rural Minnesota (Cold Springs, Perham, Naytahwaush, Bemidji) and another is located in the west Minneapolis suburb of Hopkins. The middle school is located in a north Minneapolis suburb, Fridley. The K-12 school is in the small northern Minnesota farming community of Greenbush. The Bemidji site was represented by several elementary schools that were serviced by a Bemidji State University psychology professor.

All sites, at this time, continue to successfully operate their programs. Through the successful implementation and demonstration of these sites, there are presently nine public elementary schools and one parochial school in Minnesota, along with three schools in Wisconsin and a K-12 school in South Dakota, who have started NeuroTech programs without grant assistance. These visionary schools have found that developmental neurological functions are a necessity for all successful learners and that NT tools can address essential developmental foundations of learning. (For more information call the "New Vision School" at 612-706-5551).

The Education Challenge

Traditionally, educators have viewed conditions such as Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (ADHD), and Obsessive Compulsive Disorder (OCD) as primarily medical conditions and therefore outside the realm of education. Typically, children with such conditions are referred to the medical world to identify an appropriate medication to ameliorate the problem behavior. Therefore, one of the critical factors for the success of this project is training for educators so they understand the neuro-physiological basis for such problem behaviors and the effectiveness of NT, in this case, Audio Visual Entrainment (AVE) in re-educating the brain.

ADD/ADHD spans a broad diagnostic category, which is being applied to more and more disorders and therefore evaluation and treatment has traditionally been left to the medical community. ADHD is recognized as one of the most complex psychiatric and neurologically-based disorders of childhood with significant representation in adolescents and adults. ADHD rarely occurs in isolation and is often combined with other conditions including depression, oppositional defiant disorder, conduct disorder, obsessive compulsive disorder, learning disabilities, anxiety disorders, and other significant psychological, psychiatric, and neurological problems (Barkley, 1981; Ross & Ross, 1982; Rutter, 1983; Whalen, 1983).

ADHD is also one of the fastest growing conditions leading to children receiving special education services in the public school setting. Children with ADHD are often disruptive in the classroom, require frequent teacher input, do not generally keep up with their peers in academic

pursuits, and often require additional services due to their significant difficulty with all aspects of learning. Additionally many children are misdiagnosed and actually have conditions of depression and anxiety. Medicating such children with stimulant medications in these cases is contraindicated and can even make their conditions significantly worse. More recently, schools have become involved to a much greater degree, and now provide screening tests to identify students with attentional disorders.

This scenario suggests that a training program that results in more or less permanent resolution of ADHD symptoms be preferred over the traditional medication management approach. NeuroTechnology (NT) is such an approach. NT has been studied extensively in clinical and research settings for the past twenty years. This approach, however, has not been utilized on a large scale in the school setting - until now. This project substantiates previous projects in schools in Minneapolis and Perham, MN and in Yonkers, NY. These demonstration projects illustrate that the public school setting is an ideal environment for conducting this type of training. This is particularly true for low-income inner city and rural families who do not have access to such training.

This project demonstrated the viability of utilizing this type of training/education process in the public elementary school setting. Because this intervention is a training process and not a clinical intervention, it is more appropriately applied in the educational setting rather than in the clinical setting. It is also clear that this intervention will not be available to the vast majority of children who need it due to the medical profession's reliance on medical management, rather than educational approaches for such problems. Additionally, the evidence that medication compliance is significantly lower in low income families suggests that applying this training method in inner city and rural schools in low income areas would be a more effective method of addressing such impediments to learning. Further, low-income students cannot afford such training from a physician or psychologist and so do not have access to such an alternative approach for the remedy of their disability, even if it is available in their area.

This project provided the opportunity to demonstrate that effective alternatives are available that offer, in many cases, an essentially permanent resolution of student learning and behavioral challenges. This project employed AVE to address the inattention, impulsiveness and behavioral challenges in school-age children, thus reducing the need for medication management of these children and reducing the educational resources that are devoted to responding to their disabilities.

Method

Participants

Students selected had a history of learning and reading challenges, impulsiveness, and a propensity to be distracted and to distract others. The students were selected by an ongoing, dynamic evaluation process based upon referrals from classroom teachers, parents, special education staff, and/or other concerned people in the student's life. Parents were notified about their child's possible inclusion in the project and they were invited to information sessions conducted by project staff. Parents and teachers completed a behavior rating scale, while the students com-

pleted a standardized reading inventory. The majority of the 204 students participating in the NT project were of elementary age.

Apparatus

The AVE device used was the DAVID Paradise XL (manufactured by Comptronic Devices Limited, Edmonton, Alberta, Canada). The eyeglasses for the DAVID Paradise XL are field independent, in that they are able to independently stimulate the individual left and right visual fields of each eye thus producing a different frequency in each hemisphere of the brain. In this project, independent field stimulation was chosen.

At two sites the DAVID Paradise XL was attached to a multi-user amplifier, which enabled up to ten students to receive treatment simultaneously. Each student has his/her own station, which consisted of a set of headphones and an eye set. The students could control both the audio volume and the light intensity. The students preferred brighter intensities, between approximately 400 and 600 lux (full spectrum) measured approximately 0.3 inches from the eyeset screen (approximating their average eye distance from the screen).

Procedures

Students participated in two or three AVE sessions (20-30 minute) per week. Occasionally there were compelling reasons to increase the frequency of sessions, so some students with severe impairments may have had daily sessions. The training is part of the student's regular curriculum, scheduled around other activities. Training is accomplished using protocols established by the foremost clinicians and researchers in the field, modified to reflect New Vision's experience working within the school environment. Protocols were occasionally updated to reflect the continuing growth of knowledge in this field.

Results

Data was gathered for a total of 204 students from seven different school districts that participated in the NeuroTechnology Program statewide. The average student completed nearly 30 twenty-minute sessions over a period of three months, and gained eight months in grade-equivalent oral reading scores. Pre- and post- intervention data was obtained using direct assessment and behavior rating scales completed by both parents and teachers. Oral reading proficiency was assessed with the Slossom-R reading test. Behavioral and personality ratings were obtained via the BDS, both the home and school versions.

This concludes Attention & Learning: Part 2. Next issue will feature Dave's final chapter about this fascinating subject. To contact Dave Siever, call: 800 / 661-6463 or visit: www.Comptronic.com.

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The Fossil Phil Way

An Interview with Anadi Martel, President of Sensortech, Inc.

(continued from page 1) . . .

Q) How did you initially get involved with Sensora technology? What equipment did you first use? When was that?

“In the late seventies we were experimenting in psychotherapy groups with ways to induce inner experiences through a deeper perception of sound. At that time I started to design a variety of electronic devices, which culminated in an audio processor that enabled the creation of moving sound environments surrounding the listener. Omnisound, a company that I started with a partner in California, commercialized that device around 1985 as the SSP-1 Spatial Sound Processor. It was quite original for the time, and was adopted by researchers (including some at NASA) and multimedia artists; I always find it amusing that this device won a prize as the “*most innovative sound instrument of the year*” at a trade show in 1991... six years after its creation! I designed two further generations of these Spatial Sound Processors with Omnisound (which has since folded), and they are often being used in cinema studios now that spatialized sound has become a mainstream technology, with Surround Sound in most theatres and Dolby Digital on DVDs.

Anyway, in the eighties after working on sound I became interested in using other senses as gateways to inner exploration. I started to experiment with light, colors and stroboscopic pulsations; I acquired one of the early EEG brainwave monitors made by pioneers Geoffrey Blundell and Maxwell Cade; with a group of fellow artists and researchers I put together various multimedia installations involving video, multi-slide projections, ultrasound and infrared detection, odor diffusers, MIDI control... These early experiments were pretty wild!

Over the years of designing and testing various sound / light techniques, my psychotherapist associate M. Premo and I worked with hundreds of people and gradually found out which approaches were most effective for our purposes. By the mid-nineties we had identified and integrated various elements into a coherent multi-sensorial system constituting the first generation of what we called the Sensora.

One of the main breakthrough happened when we started to integrate brainwave entrainment into light projections. In order to achieve this I eventually developed (and patented) a process that I call “*Light Modulation*” involving many Low Frequency Oscillators modulating each other to control light intensity and color; essentially it involves applying the principles used in sound synthesis (one of my early electronics interests) to control light. As with sound synthesis, the tricky part lies in finding ways to organize and synchronize a large number of modulation parameters (more than 100 in the case of the Sensora) into a coherent whole; this required years of research and fine-tuning. I also had to design special light projectors that could accommodate the high reaction speed required to modulate light at up to Beta rhythms of 20Hz.

All these elements finally came together into a complete, commercial system in the year 2000.”

Q) What do you consider to be the essential elements of the Sensora? Were they developed separately and later incorporated or were they developed 'as one'? Which element do you deem most important? Why?

“An essential feature of the Sensora is its multi-sensorial nature: we found that the deepest experiences brought about by sound / light stimulation occur when many senses merge into a harmonious whole, a phenomenon known as synesthesia. That is why the Sensora integrates sound (hearing), light (vision) and kinesthetic vibrations (touch).

(We also experimented with odors and tastes, but while these senses are undoubtedly very conducive to synesthetic experiences they are unfortunately more difficult to handle with current technology! Diffusing beautiful smells is easy enough, but getting rid of them once they are released is not so simple...)

So the Sensora in its current form uses three separate inventions: the Spatial Sound Processor to create an encompassing sound-field, the “Sensor Driver” which performs light modulation, and a Transducer Chair that generates waves of kinesthetic sound vibration. While each was invented in succession, I have spent the last ten years refining them so that they integrate seamlessly into the Sensora multi-sensorial system.

If one element is to be singled out, it has to be the light projection - simply because of all senses vision occupies by far the most resources of our brain, and has the greatest impact on our perception. The Sensora uses a hemispherical projection screen large enough to cover your whole field of vision and light projectors using high-quality dichroic filters, so that you feel immersed into a field of exquisitely pure colors - a very powerful and moving experience. Since the “Sensor Driver” allows the generation of brainwave pulsations right into the light projections, the Sensora simultaneously works with both color therapy and photic brainwave entrainment.”

Q) What distinguishes the Sensora from other Audio-Visual Stimulation devices?

“I think the Sensora must be the most *impractical* AVS device ever designed! It is complex, expensive and occupies a whole room... The Sensora is what happens when you let passionate researchers loose for years, with their emphasis on the most uncompromising quality of the AVS experience rather than on the technology's cost.

Seriously... the distinguishing quality of the Sensora is that it not a *device* but an *environment*. It uses a set of instruments that transform a dedicated room into a multi-sensorial projection space, an open environment into which you can walk, sit and relax. This approach is obviously much more costly than working with small devices such as light goggles and headphones; we have chosen it not only because it allows the generation of high-quality AVS experiences, but also because we have always felt that it is more readily acceptable by the general public, less threatening and more comfortable.

So the Sensora is by its very nature a rather exclusive, high-end system that will appeal to

those who are looking for the very best that current technology can offer, regardless of cost (about \$25,000US for a complete single-chair system).

I should add that in terms of functionality, the Sensora has some features found to my knowledge in no other system. Among these: the ability to project a light field with five independent zones (two left, one central, two right) each with its own color and brainwave frequency / depth. This opens unique possibilities both in terms of the laterality of brainwave entrainment, and in expanding color therapy along the lines of Dr. Jacob Liberman's SRS (Spectral Receptivity System). Also unique is the ability of the Transducer Chair to distribute kinesthetic vibrations across eight independent zones (2 rows of 4 across the chair surface), allowing transversal as well as longitudinal wave patterns."

Q) The Sensora is a fascinating technology. How often do you personally experience a Sensora session? Where can people go to experience it?

"While I'm creating the Sensora programs, I'm continuously immersed in it for days on end! Otherwise under normal circumstances I enjoy one to a few sessions per week.

Still now after years of using it I marvel at the extraordinary splendor of pure colors, always fresh and invigorating... Many times during the long development period we went through self-questioning phases, where we doubted the wisdom of investing so much time, energy and money into a project so far off mainstream society's norms. Each time this happened, when we sat down in the Sensora after a few days or weeks break we were again so startled by the beauty of colors and sound that we knew we had to continue!

We are just now starting to commercialize the Sensora, so it is a brand-new product; at this moment the only place where it can be experienced is at our demo room, located at our Ste-Adele headquarters in Quebec, Canada. This may soon change as the first systems get installed in Asia and the U.S."

Q) Could you please explain, in simple terms so us neophytes can understand, what the Sensora actually does and how an individual can learn how to operate it?

"The Sensora consists of a large hemispherical projection screen, a special light projector, a special transducer chair, a surround-sound system, and a special computer driving the whole installation.

The Sensora surrounds you into a field of pure colors, moving sound and kinesthetic vibrations. Within the color projections are embedded brainwave entrainment pulsations that gently help your brain towards specific mental states. These sensorial components are programmed into sessions lasting 20 to 25 minutes, each one bringing you through a complete inner process. Currently we have created three families of sessions: "Relaxation", "Energy" and "Meditation."

The Sensora is extremely simple to use: you just select a session, sit in the chair and press the

“Play” button! From then on everything happens automatically, all the complexity of the system being hidden in the session’s programming. You simply relax and let yourself be taken on an inner voyage of light and sound.”

Q) *What are some of the benefits of using Sensora?*

“On the whole the benefits are the same as those of all AVS systems: relaxation, stress reduction, increased alertness... The Sensora has an additional key advantage because it creates a truly *aesthetic* experience, through its captivating environment of beautiful shimmering colors and softly moving sounds.

This opens up a whole extra dimension in terms of psychotherapeutic applications of AVS, because you don’t only work with a raw technological process (as you would with LEDs flashing in your eyes, for example) but you can actually touch people’s heart and sensitivity through the sheer beauty of the environment. So you can use the Sensora process to assist in work on psychophysical and emotional levels.

We see the Sensora being used in two main modes. Firstly as an “*inner entertainment*” system in places where people go to relax and be nourished, such as spas, resorts and health centers; also in corporate settings, for example to help managers in restoring creative energies for brainstorming meetings; finally in upscale homes - we have plans to create the ultimate multi-sensorial bedroom!

Secondly, the Sensora can be used as a powerful adjunct to different types of therapeutic processes. In this mode a therapist uses it as an amplifier to enhance his/her specific process. In the safe and stimulating environment of the Sensora, whether before, during or after therapy sessions, the client can reach deeper levels in less time. We have already seen interest from various health professionals, including doctors who see potential applications in the treatment of addictions or rehabilitation of cerebral poly-traumatisms. We are planning to encourage studies in that direction.

I would also like to mention that we have found the Sensora to be an excellent tool to bring you into the present moment, and we have been exploring this aspect in the “Meditation” series of sessions. In each of these sessions, a voice gently guides you through a different meditation technique.”

Q) *How would athletes incorporate the Sensora into their peak performance training regimen?*

“Peak performance training is an ideal application of the Sensora, which can directly enhance programs of relaxation, mind training and creative visualization used by athletes. We are not ourselves specialists in peak performance training (it is a whole field in itself), but we are looking forward to design Sensora sessions specifically adapted to the requirements of professional trainers.”

Q) Can the Sensora experience be made available in group situations?

“Oh yes, we have actually used the sound and light components of the Sensora during public concerts, illuminating the entire stage with brainwave-entraining color projections - quite wonderful...”

In terms of Sensora installations, we can create rooms with a single chair (for individual sessions), with 2 chairs (nice for couples), or more. It is also possible to make larger rooms with a continuously-running AVS environment into which people can walk in and out at their leisure; we are currently planning such an environment in a dome-shaped room with a high-end spa developer.”

Q) What do you project for the future of this new and interesting experience?

“Currently I am developing a new user interface based on a touch-screen attached to the Sensora chair. Its first function will be to allow the user to preview and select sessions right from the chair.

I will then add a whole programming interface that will allow advanced users or therapist to create their own Sensora sessions. This is not a simple matter: up to now, the Sensora sessions have only been programmed in our lab because of the complexity of all the multi-sensorial parameters involved. The new touch-screen interface will encapsulate much of that complexity in pre-programmed “scenes” that can easily be tuned and assembled in sequences by the user. I am hoping that this will make Sensora more accessible to other developers and open up new collaborative possibilities.”

How can people contact you for further information?

I can be contacted through the web site www.sensora.com, by email at amartel@sensora.com, or by phone at 450-229-3992.

Anadi Martel, M.Sc.
President, Sensortech Inc.

Product Review: Echofone Listening System

(continued from page 3) . . . from all around you. For the listener this has tremendous implications.

In the recording environment, information about the position of sounds is encoded in the overtones. These overtones can often be above your normal hearing range. With the Echofone you are able to perceive them. This perceptual expansion adds a sense of depth to many recordings. For example, you can close your eyes and perceive where instruments in a recorded orchestra actually are in space.

Dolphin researchers use the Echofone with underwater microphones to hear the high frequencies made by dolphins. Using Echofone with a good microphone and high frequency amplifier, you can hear things in the environment that are ordinarily above the normal hearing range.

Listening Tips:

The Echofone will greatly enhance music and sounds of many kinds from a variety of sources. The Echofone really shines with audio sources other than ordinary CD, such as super-CD. (CDs can reproduce frequencies up to 22 Khz, super-CDs can reproduce frequencies up to 48 Khz).

A way to make your Light & Sound experience extraordinarily dimensional is to include Echofone technology. High pitched sounds significantly alter the colors and patterns one sees in session.

Experiment with the electrodes - The electrodes can demonstrate Echofone's ability to generate the sensation of sound without any mechanical stimulation of the listener's eardrums.

To experiment with this phenomenon, try plugging your ears while the electrodes are positioned on your forehead or temples; you will perceive the sound without using your ears at all.

Contrast listening with, and without Echofone. When listening using the Echofone electrodes you may disengage the ultrasound component of the sound by turning the "Trode" volume knob all the way to the left. This allows you to quickly contrast the Echofone enhanced sound with normal headphone sound. The results are often surprising. You will perceive a loss of tone, crispness and depth without Echofone ultrasound engaged. For the music lover, this machine spoils you.

Cyber-Shamanism: The Fusion of Modern Technology with Ancient, Plant-Based Shamanism

(continued from page 2) . . . familiar confines of their conscious awareness and ventured *inward* to explore the psychological landscapes of the mind. From Shamans to Zen masters, these individuals explore and even chart the unexplored regions of the psyche and hyperspace so that oth-

ers brave or curious enough may follow.

These individuals, also known as *psychonauts* or mind explorers, depending on their cultural background, use a number of techniques as well as tools to accomplish their psycho-navigational feats. Tibetan yogis for example, have used fasting, sensory deprivation, and even “technology” in the form of bowls and rattles to access various mind states. Similarly, shamans have used drumming, chanting, and the flickering light of campfires to help alter their consciousness. It is interesting to note - at least from a neurological/technological standpoint - that the accessories used by both yogis and shamans in these cases is for the express purpose of slowing down or rather modifying brainwave activity. In turn this facilitates the entrance into alternate states of consciousness. But a little known fact is that some Tibetan yogis as well as other spiritual practitioners use psychoactive compounds and plants, such as hashish and mescaline, as part of their spiritual practices.

Shamanism also appears to be greatly influenced by geographical location as well as cultural factors. Therefore shamanism can be thought of as being not a fixed modality, rather, it appears to be an open-ended practice that is very much creative in nature given its wide number of incorporated belief structures and artifacts, which are fused into its practice.

For example, the Santo Daime and UDV churches based in Brazil practice a combination of plant-based shamanism and Christian doctrines. This curious fusion may very well be because of both Christianity and shamanism having large followings in South and Central America.

Similarly, in north America native Americans have been known to use another (psychoactive) sacrament, peyote, a cactus, in their spiritual ceremonies.

Interestingly psychoactive plants and compounds afford users entrance into exotic states of consciousness in a single sitting as opposed to having to practice mental exercises for years. On the other hand of the spectrum shamans feel that plants are a sentient species capable of interaction and likewise capable of bestowing states of illumination and transcendence on those that ingest them. In addition, the states of mind experienced while under the influence of shamanic *teacher plants* (another term for them and one which, I like to use) allows users to experience reality and even their own state of being from a number of perspectives than the usual, day-to-day linear one. Indeed, under the proper guidance and care, a shamanic journey with a teacher plant can be one of the most life-changing events ever.

A wide variety of psychoactive plant species are used in plant-based shamanic practices, such as datura, salvia divinorum, psilocybe mushrooms and San Pedro (another cactus) to name but a few. But the most infamous shamanic sacrament used in the south American countries of Brazil, Peru, and other regions of the Amazon, is a potent psychoactive brew called *ayahuasca*, also known as yage or vine of the dead, which is prepared and used by shamans called *ayahuasqueros* in their ceremonies. The effects of this brew last anywhere between three to six hours.

Ayahuasca’s content and preparation, much like shamanic practices, varies according to locale as well as shaman, as some shamans oftentimes add extra plants - native to the shaman’s

region and culture - to their ayahuasca brews that others don't. Some of these additives being a number of different plants including tobacco, datura and others. But for the most part, ayahuasca is made up of two components, *Banisteriopsis cappi* and *Psychotria viridis*.

Now from a pharmacological standpoint this particular combination is impressive to say the least. You see, the brew's potent psychoactive active ingredient which is dimethyltryptamine (DMT) - one of the most potent psychoactives known to man - gets destroyed in the gut because of MAO. Briefly, MAO stands for Mono-Amine-Oxidase and it is an enzyme in the human body that breaks down a number of chemicals and foods. Therefore, the MAO enzymes destroy the DMT molecules before they have a chance to cross the blood/brain barrier and elicit their powerful and life-changing effects on the user. However, if an MAO inhibitor (MAOI) is added into this psycho-chemical equation, it will prevent the stomach enzymes from destroying the DMT.

This is impressive and defies a logical explanation, as shamans in the jungle, with no laboratory equipment to speak of, somehow resolved the problem around MAO inhibition with no formal pharmacological or biological training! Again, they figured that in order for DMT to be orally active, it had to be combined with an MAOI so that it could reach the brain. But this is almost impossible to figure out empirically as there are literally hundreds of thousands of plant species in the jungle not to mention the almost limitless number of potential combinations. Therefore this had to be more than simply a lucky guess. Not only that, but even more unbelievable is the fact that this type of biological mechanism (MAO inhibition) has only come to be discovered and understood in modern medicine in the past seventy years or so, while shamans have been preparing ayahuasca for several hundreds of years if not longer...!

Curiously, when scientists and anthropologists first encountered this brew and studied its effects and how it worked in the body, they asked the jungle shamans how they figured out the way to get around the MAO problem lacking modern pharmacological training, they simply replied: "The plants told us how to and which ones to mix."....

One may not know what to make of a statement like that, but, nonetheless, a solution was found by very unconventional means to say the least.

As far as the effects of ayahuasca are concerned they can be extremely strong, as this brew is easily one of the most if not the most potent psychoactives on the planet. Hence, ayahuasca generally caters to experienced psychonauts. Oddly enough, DMT is also an endogenous neurochemical secreted by the pineal gland and is part of the human brain's natural metabolism. Many researchers believe that DMT is what enables humans to dream at night, hence its highly visual characteristics.

The effects of ayahuasca are not only psycho-spiritual in nature but biological as well, as it sometimes induces vomiting and diarrhea in some individuals. People whom have had experiences with ayahuasca as well as the shamans that use it in their ceremonies and rituals, feel that these side effects are actually the physical manifestation of the release of psycho-spiritual traumas and blocks.

On the other hand, the mental effects bestowed by this teacher plant can best be described as those of an awakened dreamstate. In other words, one is *dreaming awake*.

This unusual state of mind gives the waking ego or conscious mind access to previously unconscious material via the subconscious mind - a spectrum of consciousness that few people are consciously aware of or familiar with. Yet this interior landscape of the mind has the potential to offer vast amounts of experiences including healings, transmission of various types of information, and even insights into the true nature of reality and the soul.

Earlier this year I was fortunate enough to sample this legendary shamanic potion while giving a lecture and workshop in the Amazon at an ayahuasca retreat. In the first couple of experiences I had with this teacher plant, I did have a play of dazzling colors and shapes before me - the typical psychedelic imagery - but what I felt was of most value was the release of lots of emotional energy - basically, I cried a lot while I recalled stuff that had happened to me when I was young - which indicated that apparently, I had a number of unresolved childhood issues to deal with. Now this was never apparent to me in my day-to-day life, but every so often I would become very depressed without knowing why. But after these two initial experiences with ayahuasca not only did I understand the reason for my sometimes ill emotional feelings but, apparently, I actually resolved these issues by confronting them on my own. In fact, months after my first encounters with this teacher plant people that know me commented that they saw changes in me and that I seemed much more relaxed, happy, and grounded. These comments alerted me to the immense therapeutic potential that teacher plants have to offer, especially the psychological healing offered by ayahuasca.

During my first stay in the Brazilian Amazon I also had the opportunity to try a plant/tech combination: ayahuasca together with my brainwave synchronizer (Photosonix Nova Pro) running a program targeting delta brainwaves. This particular combination seemed interesting to me as I had achieved some excellent “cyber-shamanic” results by combining various neuro-technology devices together with psychoactive compounds. These combinations, experiments and resulting experiences are chronicled in my first book, ***INTO THE VOID - Exploring Consciousness, Hyperspace & Beyond, Using Brain Technology Devices, Psychedelics & Altered Mind-States*** (ZON Media, 2001)

Because of all my previous experimentation and research, I consider myself an experienced psychonaut, so I really had no problem, hesitation, or fear in taking the plunge of combining light and sound stimulation together with this potent shamanic brew. However, I should make it extremely clear that there are no studies on the short or long term effects of this particular combination. And as most of you may already know, on its own, light and sound stimulation may induce seizures in some individuals, while psychoactives may trigger psychotic episodes - BEWARE.

The third time I tried ayahuasca I decided to combine it with photo-sonic stimulation so as to have the device “guide” the experience and target a specific window of consciousness. The reason for this being that neurological EEG studies have shown that those who ingest this brew go into an altered state most comparable to the hypnagogic state (but in full awareness), and I wanted to go “deeper” so as to see what was doing, so I dialed-up a low frequency delta session

on my brainwave synchronizer.

I started by first ingesting the brew since it takes roughly between thirty minutes to about an hour for one to start feeling the effects. But this worked out great for as soon as the session with my brainwave synchronizer was over (about forty-five minutes later) the effects of ayahuasca began. But this time they were different than before, as I knew that I had effectively shifted my awareness to a different window of consciousness - deep delta, as opposed to alpha/theta. In my earlier experiments for *INTO THE VOID*, I discovered that if I decided on a whim to smoke say salvia divinorum for example, I had a particular type of experience. But if I first slowed down (or ramped up) my brainwave activity by way of binaural frequencies, neuroelectrical stimulation or photo-sonic stimulation, I would then have a significantly different experience when intaking a psychoactive.

On the night I decided to fuse this ancient shamanic wisdom with modern technology, I recall being in a large room together with about forty people, including psychiatrists, psychologists, anthropologists, artists and even housewives from all over the world. The lodge where the retreat/seminar takes place is in the Amazon, near the city of Manaus, Brazil. There participants have access to a lecture hall complete with PA system and a film screen as well as a large space - a circular room with a roof but no walls - surrounded by a large net which is there for the express purpose of keeping bothersome mosquitoes out of the ceremonies.

After a short meditation, each one of us was given the brew - a bitter-tasting tea - and were instructed to “put the intention into the brew by mentally talking with it and stating one’s intention for the journey”. My only intention during this first attempt in combining ayahuasca together with brainwave synchronization was not to have a seizure or psychotic break and to see what was there - in this combination - to be explored.

Near the end of my forty-five minute session with my Photosonix Nova Pro I began to feel thoroughly relaxed, with all of my extremities feeling warm and heavy. In turn my sense of awareness felt as though it was slowly rocking sideways as well as back and fourth. With some effort I removed the eyesets with my right hand and gently opened my eyes. I should state here that my eyes were completely open during this entire experience. (In fact, most of my experiences are now done with eyes open as opposed to shut.) By this time the room was almost pitch black and the only discernable light was coming from the moon and the stars outside in the night sky.

My consciousness entered a colorful and fluorescent landscape that boasted various shapes and forms which were suspended in mid-air above me. Some of these were brightly colored patterns of swirling light which began to form around the empty space of the room in which I was having my experience in. These interconnected and flowing lines, which formed the most exquisite patterns I have ever seen, appeared to be “alive” as well as though they were being weaved by an invisible spider of sorts - seemingly appearing out of nothing. Then, within a few minutes, these lines and designs, which at first appeared to be “organic” and “alive”, given their curvy, flowing and wavy nature, began to morph themselves into highly complex and intricate geometrical patterns. When this change began to occur the patterns stopped moving, stopped being alive, and everything became sterile and “un-alive”. I remember wondering what had hap-



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pened and as soon as I had this thought in my mind, suddenly, a thought popped into my head: I somehow understood that my consciousness was shifting from the human perspective that I was familiar with to a non-human one that I had not experienced before. It was as though I was entering a different type of psychological space.

Again I wondered what exactly was it that I was seeing and experiencing and seemingly got another answer in the form of a thought. I was seeing the framework - the blueprint, if you will - of what we perceive as three-dimensional reality. I also understood that what is manifested here, in physical reality, not only has a counterpart in the non-physical dimension, but it's composed of focused, electromagnetic energy pulses which are shaped by thought and intent. In other words, the whole basis of physicality are not its physical (atomic and subatomic) building blocks but rather mental ones.

I also recall seeing what I can only describe as tiny pinpoints of electric-blue light. Strangely, I somehow knew what to call them as well as their function - *reality weavers*. They are what helps weave together the fabric of reality. Hence, the reality weavers are the actual builders of the blueprint of physicality, while consciousness is the engineer. As these insights and accompanying imagery were swirling through my consciousness I suddenly found myself not at the shamanic retreat but rather encased in a seemingly large and long structure. What I mean is that the landscape wasn't expansive and square but rather long and narrow, as if my perceptual focus had been somehow altered. The structure was something akin to a rectangle, but had no walls, ceiling nor floor. Yet somehow I could detect its "shape". Light or more like a shimmer seemed to emanate from within the structure and tended to fade into darkness as soon it left the structural space. Outside this space was nothing but pitch black darkness. While I was observing my new surroundings I noticed two things: First, I saw what I can only describe as beings; and second, I realized that they really weren't beings. Let me explain.

What I mean is that as soon as I noticed "something" that was "alive" in front of me my perceptual mechanisms immediately began to put an anthropomorphic shape on it. But since I had actually caught myself doing this I apparently short-circuited this mechanism. At any rate, what I am trying to say is that at one point during this experience I came in contact with another form of intelligence. These "beings" (to me they appeared as tall and lanky stick figures) are actually mechanisms that exist to insure the safe and proper running of the Universal Mind through *balance*. They are actually *archetypes* of balance. And according to what I received during this experience, one of the reasons why I happened to see them was because I had expanded my consciousness enough to enter into their psychic space.

This experience, like the other ones I've had with this particular teacher plant lasted about five hours and, during it, I felt a definitive interaction with another form of intelligence. While my earlier two experiences with ayahuasca alone were more introspective in nature. Nonetheless they affected me deeply and further changed the notion I previously held regarding the nature of reality.

What's more, the times I first combined ayahuasca together with brainwave synchronization, I felt as though I was having a very interactive experience because I was being downloaded with information about specific questions as soon as I wandered about them. This was not however,

a communication with an anthropomorphic being(s), but rather communication with some sort of intelligence network.

Shortly after this encounter - with what I felt was a form of non-human intelligence - I became so intrigued that I began another type of research in earnest: Human/plant communication. After all, if shamans created this brew under the direction of another species, in this case, plants, and I in turn had the type of experience with it I just related, perhaps there was really something to this man/plant communication business after all. Indeed, as I continued with my new research I came to the realization by way of direct experience that plants are not only a sentient species capable of facilitating healing and modified states of consciousness but they are also capable of actually communiating with humans and much more.

The Secret Consciousness of Plants

In the mid-sixties, a scientist by the name of Cleve Backster, the world's leading lie-detector examiner at the time, revolutionized and shocked western science by documenting that plants are a conscious species capable of emotions and decisions - much like human beings. His experiments with plants and resulting findings made headlines around the world press and became known thereafter as the "Backster Effect."

As the story goes, one night on a whim, Backster decided to attach the electrodes of one of his lie-detector machines to a plant he had in his lab. Then, when he *thought* of burning one of the leaves, and before he could even light up a match, he was shocked. The tracing pattern on the graph jumped - the plant sensed the threat of being burned! But that's not all. In a later experiment, Backster brought a colleague of his to demonstrate his discovery. However, this time he really wasn't intending to burn the leaf. He was just going through the motions. And to his surprise, the needle on the graph didn't move... After thinking it over, he wondered if perhaps the plant was somehow sensing his *intent*...

The second time around he was actually going to burn the leaf but the plant reacted. Backster concluded that the plant was able to differentiate between real intent and make believe intent. Indeed, this experiment further concluded that plants could think, make decisions, and even receive and pick up thoughts telepathically. He even found the same reaction even if the leaf was separated from the plant itself! So, during the next few months, Backster collected a large number of polygraph paper charts that tracked the behavior and reactions from a wide variety of plant species.

Another experiment by Backster demonstrated that plants displayed *memory*. In this experiment Backster had two plants set up in his lab. One was attached to his galvanometer and the other wasn't. He then instructed one of five of his students to walk over to the plant which wasn't attached to anything and destroy it. Immediately, the plant that was attached to the machine reacted, and its reaction was recorded on the graph paper. Following this, Backster had all five of the students enter the room one by one. When each of the students came near the surviving plant the graph showed no activity. However, as soon as the culprit entered the room, the plant's polygraph's reading went off the chart! Apparently, the plant that was still alive was able to recognize the electromagnetic field of this person.

In yet another trial, Backster noted that there is a bonding between the plant and its keeper. And, as it turns out, this bond is unaffected by distance. For this experiment Backster traveled fifty miles away from his laboratory and tracked his plants reaction when he was on his way back. As he approached it, he was later able to correlate that his plants had indeed perked up and showed definitive signs of activity when he neared the lab. What this demonstrated is that plants apparently establish a link with their caretakers and are able to maintain this attunement regardless of space. Another possible explanation might be that these carrier waves work beyond our known electromagnetic spectrum.

This spectrum may be the same as the one proposed by British biologist, Rupert Sheldrake. In his books, Sheldrake postulates that morphic fields are invisible fields of information that carry behavioral and genetic information, which all species including plants tune in to and use in order to grow, develop, and even behave. This may suggest that all plant life, for example, is organized by fields that carry the genetic information of a specific species. And such a field must cover entire locations where specific species of plants grow. This may be one of the explanations of why some plants grow in some locales and others don't. Therefore, said morphic fields may play an organizing role in all of nature.

As it turns out, everything in existence is created and designed from these blueprints or morphic fields, which in turn are encoded with specific information of how to build everything from what constitutes matter (i.e., subatomic particles, atoms, etc.) to organisms (i.e., proteins, cells, etc.). Therefore every thing in existence, be it living organisms such as plants, animals, people, or 'non-living' objects such as stones and metals, is emitting and also capable of receiving what can be described as informational or morphic fields. Therefore, at some level everything in the universe *is* alive and conscious.

Talking from personal experience I feel that when I'm under the influence of a teacher plant I sometimes access a field of information - perhaps one that has been accessed by some shamans - in which various "shamanic techniques" (for lack of a better term) are seemingly given to me. Perhaps I am tuning in to the morphic fields that house information about shamanism and its various techniques. (In talking about this a few months ago with a dear friend of mine, Pablo Amaringo, a Shipibo shaman from Peru, I mentioned how some people get annoyed when I start talking about my experiences and compare and even think of myself as a shaman, given my work and experiences while having no formal "shamanic instruction" from a "real shaman", and he said: "Next time that happens ask them who do they think taught the first shaman?" Indeed.)

Another ability of plants is that they react to sonic frequencies and have preferences over styles of music... Dorothy Retallack, a professional organist from Denver, ran a series of experiments for her biology class, including one where she played music for plants to gauge their reactions (they were later observed by way of time-lapse photography). During this particular experiment, speakers were placed near the plants and, when they were exposed to rock music, for example, they leaned away from it. Whereas, when they were exposed to classical, Indian, or Tibetan music, the plants leaned towards the speakers. (This may explain why I have had excellent results when combining hemi-sync CD's and tapes featuring music embedded with psychoactive frequencies together with salvia divinorum, magic mushrooms, and

even ayahuasca. Because I have to admit that my most memorable experiences occurred to me while combining technology together with plants.)

Ancient Wisdom Meets Modern Technology in the Cyber Age

In 1665, a Dutch scientist by the name of Christian Huygens discovered that two or more pendulum clocks mounted side-by-side on the same wall would gradually come to swing at the same rate. This is the basis of what is known today as *entrainment*. This is the same as having two tuning forks that produce a frequency of say, 440 Hz. If one of the forks is struck, the second fork will begin to vibrate. This sympathetic vibration, if you will, is also an example of entrainment.

The principle of entrainment is the same one used to drive brainwaves. Research in this area shows that there is a correlation between brainwave response and external pulses or frequencies introduced to a subject's brain. Likewise using this same principal, shamans using a simple drum beat can draw listeners from their waking Beta brain state into a relaxed Alpha state of mind, for example. As you may begin to see, by making a simple noise at a specific frequency, and keeping it steady and rhythmic, it is possible to drive brainwaves.

On the other side of the spectrum discoveries in the field of neuroscience over the past few decades have enabled scientists and researchers to learn more about the inner workings of the brain than ever before. Many of these discoveries, such as the properties of various brain chemicals and their effects on consciousness, as well as the fact that brain activity can be altered by external sources including electromagnetic fields and various frequencies of sound and light have been the rage in brain research. In the case of hemispheric synchronization via modern light and sound stimulation technology, two separate frequencies of sound are fed into each ear (via headphones), which in turn produce a sympathetic vibratory response in the brain. The pulsating sound frequencies - heard through headphones - end up stimulating the vestibular system, cerebellum, limbic system, and cortex via the nerve endings of the ears; while the flashing light frequencies of the device's eyeset stimulate the desired frequency rates (beta, alpha, theta, delta) in the visual cortex and hippocampus brain centers via the photoreceptors of the eyes. This leads to the coordination of both brain hemispheres. In essence by using a brainwave synchronizer one can program the device with a specific light and sound rhythmic patterns that will coax the brain hemispheres to pulsate in near perfect unison and synchrony by way of flickering lights and pulsating sounds.

Again, although all of this is indeed fascinating and this technology is superb, I have to honestly admit that the most interesting and valuable insights and experiences occurred to me from my *combination* of both modern neuro-technology devices together with shamanic plants. The reason I say this is because it's as though the devices (or meditation, chanting, yoga, etc.) only take the user up to the *threshold* of particular psychological states. But in order to fully enter 'into' them one needs certain keys - chemical in nature. These keys are specific chemical codes that our brains read and incorporate into their mode of operation at the time of ingestion. In this

case the molecules of the psychoactives *are* they keys that open these doors or windows of consciousness.

In turn, the four brainwave states [predominant] - beta, alpha, theta, and delta - at their various potential frequency rates result in different “locations” in the psychological landscape of one’s psyche when *combined* with psychoactives.

A problem that most psychonauts report is poor recollection of their experiences. Now to get a better idea of the training I underwent in order to successfully translate inner experiences into verbal descriptions I suggest you read my first book, ***INTO THE VOID***. In it you will find a number of exercises, techniques, and tools that will help you in this endeavour. But here I will briefly go over one of the tools and some of the research that enabled me to retain the full memory of my psychonautical experiences.

While I was engaged in my research for my first book I came across the work of a neuroscientist by the name of Allan Hobson, whom interestingly, theorizes that when the brain enters REM sleep it apparently stops manufacturing the neurotransmitter chemicals responsible for memory. This perked up my interest since Hobson’s theory made perfect sense - at least to me anyway. I say this because although humans have typically about six dreams each night, we have very poor memory of them, if any at all. And when I began to work with neuroelectrical stimulation I began to notice one of its universally recognized side effects: vivid dreaming.

Now to me this made perfect sense since neuroelectrical stimulation users, while undergoing this type of therapy, report that both short-term and long-term memory begins to come back . So as you can see, this explained - at least to me - why it was that I was beginning to successfully recall most of my nightly forays into the dreamworld.

The neuroelectrical stimulator I use is the **BT-6**, which stands for Brain Tuner model six, which was developed by the late (and great) doctor Bob Beck. This device consists of a small base unit the size of a pack of cigarettes, and an electrode headset that is attached behind the ears. Once attached it sends an electrical current into the brain; but the current is in the micro-ampere range. According to bioelectric research this current is similar to the current produced by the body’s cells. And when the brain is electrically stimulated at appropriate frequencies and amplitudes, the body responds by increasing its manufacturing of neurochemicals, including acetylcholine, dopamine, beta endorphins, enkephalins, etc.

I have also found this type of technology to be very compatible with plant-based shamanism, and would encourage researchers and scientists to take a closer look at this.

Three-Dimensional Perception

After many experiments and resulting experiences I began to wonder what exactly was happening to me or rather to my brain and mind during them. I began to take a closer look at how the brain perceives three-dimensional reality and found something very interesting.

Back in the 1920's a group of missionaries took a film projector and portable generator into the jungles of Africa to show the natives a film of the outside world. When the film began however and to everyone's surprise, the natives couldn't see the pictures on the screen! It was concluded that the reason for this anomaly was because the natives could not adequately process the visual perception of the motion-picture, for they lacked the necessary neurological pathways that are needed in order to *see* those images. Apparently, their brains hadn't made the necessary neurological connections required to see *two-dimensionally*. But the brains of the missionaries had, of course. So the missionaries saw in fact a number of moving images. But all the natives saw was a bunch of flickering lights. Therefore, their brains had to develop the special neurological pathways needed to see two-dimensionally before they could view the motion-picture. This taught me that in order for us to perceive and see anything, we must first develop the proper neurological connections that will process said type of data.

As I continued with this new phase of my research I found that there are multiple areas in the human brain specifically designated for processing (seeing) images. I learned that an object - *any* thing, person, etc - elicits a particular kind of neuronal pattern activity unique to each object, in which neurons fire in a particular rate and frequency thereby indicating what the object-image is to the conscious mind.

For example, when you look at a car, a tree, a person, etc. a corresponding pattern of neuronal activity, which *symbolizes* or represents each of those visual objects to *your* conscious mind is evoked, thereby notifying other brain centers and you of what it is that is being perceived. In that regard this is how our sense of sight *constructs* what we see.

However, what I found most compelling about this process is that when our sense of sight perceives say a moving object, like a car (we'll call this an 'input'), all that the retina perceives is a series of dots moving together. The car does not yet exist! (At least not in objective terms, but rather subjective.) This data (the moving dots) is then relayed to the brain centers which deal with *depth* and *motion*, and which in turn relay this information to other brain centers responsible for detecting *shape* and *color*. Then, all of this information is combined together with everything we have ever *learned* about cars - which is stored in our memory banks - and, consequently, all of this sensory data is *then* constructed into a model (we'll call this an 'output') which we finally come to perceive and 'see' as a car (objective reality)!

In the case of imagined constructions however, I theorize that since there is no input from the retina, the input *originates* from the *subconscious mind*, instead; and *then* travels the previously given process *backwards*, all the way back to the primary visual cortex, leading to the perception of an output. Which means that this output (object, person, or event) then spawns from the subjective realm of the subconscious mind... Yet it is experienced as objective reality! In this case - and in my opinion - the subconscious mind, the dreamstate, and the hallucinatory states produced by certain psychoactives act as a gateway to alternate realities, which exist 'adjacent' to this one (parallel universes).

Another interesting piece of information I came across while engaged in this particular phase of my research is that people who suffer from what is known as Charles Bonnet syndrome - a neurological disorder - see fully formed three-dimensional hallucinatory images. This leads

me to believe that the human brain has the innate ability to perceive (see) ‘hallucinations’. However, since these alternate images are both thought of and *taught* to be nothing more than mere hallucinatory constructions, they are disregarded by the conscious mind.

I know that some of this sounds fantastic. But these have been my experiences. For those that may feel inclined to follow my work I recommend that you visit my website, read my book, and maybe even come down to the Amazon for your own experiences with the teacher plants I’ve been discussing in their own natural habitat. However, I want to make it perfectly clear that these plants, as well as the neuro-technology tools I use are not toys. They are delicate tools that facilitate entrance into one’s psyche. These experiences should not be considered ‘recreational’ in any sense of the word. Quite contrary, they are a serious undertaking, but I feel that they have the potential of allowing individuals to understand the nature of reality as well as confront and dissolve various fears, insecurities and psychological blocks.

These shamanic experiences have changed me in a lot of ways: mentally, emotionally and spiritually. The teacher plants inherently know that the best place to go for answers of a personal nature is *inward*, and that THE “kingdom” lies within. As Buddha once said: “Look within thou art the Buddha”, while Jesus said: “The kingdom of heaven is within you”. Indeed, teacher plants make the user go inside for answers and self-healing, as opposed to making one look for an outside source for help. They encourage us to be self-empowered and to depend on the greatest force of all: ourselves.

It seems ironic to me that in a sense a different species (a non-human one) can teach us how to be better humans, yet what I feel they are trying to impart in us is simply to *be* what we truly are: beings - whatever that really means - which are at the moment undergoing what we know as the human experience. And this is not our destination, rather, it is one of many stops along the path.

In closing, a great poet, mystic and philosopher, Khalil Gibran, once wrote: “*No man can reveal to you ought but that which already lies half asleep in the dawning of your knowledge. The teacher who walks in the shadow of the temple, among his followers, gives not of his wisdom but rather of his faith and his lovingness. If he is indeed wise he does not bid you enter the house of his wisdom, but rather leads you to the threshold of your own mind.*” Ironically that is exactly what teacher plants do.

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BACK *FROM THE* **VOID**

Zoe Seven



(continued from page 2). . . at around birth, the gland is centered between the cerebellum and is attached to it. The gland is part of the circuitry involved in the translation of all visual messages received through the retina. Even though pineal glands have until recently been considered functionless phylogenetic relics, vestigiality has been imposed on the gland for no valid scientific reason as many advances in the past few decades have demonstrated its multi-faceted functions in humans and mammals. The gland has also been referred to as the epiphysis, parietal eye, and in spiritual realms as the third eye. The pineal appears to be involved in synchronization of bodily functions(s) with the environment as a “regulator of regulators” and more recent research has demonstrated that the gland performs a pivotal, and perhaps critical role, in the identification of specific patterns of malignancies to include breast cancer and lymphomas. Strikingly, it has been changes in pineal activity that have been useful indicators in the identification of these other diseases and we see that changes in pineal activity and expression are indicators in compulsive behavior that leads to substance abuse and affective disorders.

As intriguing as the individuality of a fingerprint or the design of DNA, the gland varies so much that no two glands look alike. A lack of similarity in a normal functioning gland is of little or no importance, but when similar markers appear in specific forms of disease or in those who exhibit dramatic changes in behavior, it would seem imperative that the gland be examined in order to determine if its main function, that of synthesizing serotonin to melatonin, be impaired. An understanding of how the brain and body responds to a balanced – or imbalance – of melatonin presentation, and how disease or impairment of the gland could dramatically influence response, would be prognostic and therefore aid in treatment of disease or disease categories associated with a malfunctioning gland.

The synthesis of melatonin from serotonin takes place in the pineal gland. An N-acetylating enzyme converts serotonin to N-acetylserotonin; the latter is O-methylated through the action of hydroxyindole-O-methyltransferase (HIOMT). It is then metabolized to 5-hydroxyindoleacetaldehyde by the enzyme monoamine oxidase (MAO). The activity of MAO in the destruction of serotonin and that of hydroxyindole-O-methyltransferase in the O-methylation of N-acetylserotonin provide convenient vehicles for controlling the amount of melatonin, N-acetyl-5-methoxytryptamine, present in an organism at any time. The presence of melatonin can now be quickly and accurately measured in bodily fluids and tissue, and though we have at hand the basic biochemistry and neuroanatomical connections of the gland so that we can see how normal and abnormal secretions occur, there is the unanswered question as to why. We do know that concretions of the gland can interfere with the synthesis of serotonin to melatonin and consequently the secretion of melatonin, but could these concretions of the gland be evidence of previous abnormalities that could be indicative of past, present, or impending physiological and/or psychological disease? Or could it be that healing has been achieved should there be a remission in such diseases as breast cancer or lymphoma? Or major change(s) in behavior? Considering all of this, serotonin and melatonin assay and Magnetic Resonance Imaging of the gland, applied together, could prove useful in the diagnosis, treatment, and monitoring of disease or impairment of the gland that cross-communicates to a specific disease category.

Pineal melatonin plays a major role in affective disorders such as Seasonal Affective Disorder and Binge Eating Disorder. These are just two disorders in which a single or a combination of maladies often couples with radical departures from normal behavior. Depression and self-imposed isolation are accompanied with little or no regulation of day/night cycles – a circadian rhythm – and are symptomatic of melatonin imbalance. These disorders are often resolved when circadian rhythm is restored. While circadian rhythm can be restored in a number of ways, Interactive Light Therapy that resets the biological clock is one way to induce a melatonin response as can the administration of endogenous melatonin. Sham or functional pinealectomy has also been an intervention that restores a circadian rhythm. Research has also demonstrated that the extent and action of pineal melatonin at certain melatonin receptors may account for its reputed oncostatic and immunological effects as experiments worldwide have cemented the relationship between neuroendocrine and immune systems. Other studies indicate that melatonin inhibits tumor growth when combined with Interleukin-2, as it appears to restore a circadian rhythm in those with small cell cancers, thereby pointing to a somewhat direct relationship with the pineal gland. If this were so, it would be possible that a diseased gland that does not effectively control the synthesis of melatonin might do so if treated with IL-2.

Life could begin with a genetic mutation of the gland that could interfere with the normalcy and regularity of circadian rhythm(s). As example, rhythms could be other than circadian in that one could be genetically predisposed to either ultradian or infradian rhythms that could be markers of impending compulsive behavior that will – defiantly – lead to substance abuse. Here's why. Ultradian cycles are those that occur more frequently than the normal 24-hour cycle and compares to the cycles of those who are dependent on opiates, barbiturates, alcohol, or any other depressant(s) where the wake/sleep cycle is manipulated by quantity and/or repetition. It is accepted universally that prolonged use of opiates or depressants create shorter duration of the effects and therefore requires more quantity or better quality to achieve the sought after satiation. Resultantly, the use of opiates or depressants may cause 3-4 or more wake/sleep cycles per 24 hour period, and therefore completely disrupt melatonin presentation that manage circadian rhythm. Infradian rhythms have similar responses but for very different reasons. As infradian rhythms are those that occur less frequently than 24-hour rhythms, they compare to the wake/sleep cycles of those who use psychoactive drugs such as cocaine and the amphetamines and where the single wake cycle often lasts for days at a time. Although conclusive evidence supporting the genetics of compulsive behavior that leads to substance abuse – whether infradian, ultradian, or circadian rhythms be a factor – is still in the research and mapping stage of the genome, we are finding that hormones and neurotransmitters as genetic components appear to be a result of genetic interaction on behavior. This argument for genetic influence seems to be winning out as we are learning that the switching on and off of genes can be influenced by many factors or actions that is now identified as complex behavior. It is also recognized that genes for behavior are no more unusual than genes for development and variations in both cases will be the substance for ongoing debate. Dysfunction or difference in gene characteristics can be responsible for all sorts of innate behavior simply because humans vary in the way they respond to most stimuli that is mediated through neurotransmitters or hormones. Yet once we identify the genetics that influence behavior, we can begin to design specific science-based interventions, effectively making the behavior as treatable as any other physiologically rooted disease or disorder whether the cause is a result of circadian, ultradian, or infradian rhythm that is

a result of gene expression. As demonstrated over and over again, if the instruction is faulty from the very instant the cell begins to divide, the end result will be faulty. Not enough to cause cell death, but enough to build a protein that will build the being that will be predisposed to the behavior. With that thought, let us presume that altered synthesis of serotonin to melatonin as a result of a genetically altered pineal gland will certainly affect and alter circadian rhythms because of that gene expression. Should altered circadian rhythms parallel the schedule of one who is inclined to compulsive use of drugs, it would be a fair assumption that it would be easier for those with genetically induced non-circadian rhythms to slip into compulsive substance abuse or other forms of compulsive behavior that have a dysfunctional circadian component. That component – the relationship with day and night – ties to a common denominator: the Pineal Gland! Quite a role for something so small and once considered insignificant!

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MindExplorer AudioStrobe Decoder

(continued from page 3) . . . The product also includes 3 CD's with:

- MindExplorer SW (full version).
- BWGen (shareware version).
- 5 stimulation sessions (AudioStrobe encoded) in CD audio format.
- "AudioStrobe Sampler 2002" (this CD contains a selection from several CD's from AudioStrobe original production).

The Decoder unit works with 2 AA batteries (alkaline or rechargeable). Dimensions of the main unit: 75 x 105 x 27 mm.

The suggested retail price for the AS Decoder is \$169

(continued from page 3) . . . combined GSR/ST sensor; these can be used in any combination.

Currently active sensors are indicated by six front-panel LEDs and are automatically recognized by the included software.

Why so many channels in a personal system?

Aside from the intrinsic flexibility provided by the availability of six sensor channels, a number of powerful applications become possible, for example:

Left/right GSR balancing. The left and right sides of the body can exhibit very asymmetrical GSR responses. Feeding back information from both hands simultaneously can help the user bring these responses and their physiologies into balance and greater harmony.

Heart rate matching. Two people can connect to the system (say, husband and wife), establish a baseline, then begin discussing something “difficult”. This can be approached as a game: if either heart rate increases by more than a certain percentage, the players stop talking and take a few deep breaths or meditate until relaxed again. In other words, this could be helpful for learning how to remain in an optimal communications zone. Businesspersons or even politicians could find this helpful as well.

A number of other applications exist which could benefit from the correlation of several channels simultaneously.

Proteus control

The current Proteus Editor software includes optional control of just about any aspect of a light sound session via these six biofeedback channels, providing a powerful new tool for experimentation. For example, GSR left could control the channel 1 frequency and GSR right, channel two; your goal would be to cause the two frequencies to become one. HR could control the binaural beat frequency such that, once you reach a desired HR the beat frequency is replaced by a steady tone (i.e., the left ear frequency matches the right ear frequency). The following Proteus parameters can each be controlled by any of the biofeedback inputs:

- Channel 1 pulse rate
- Channel 1 brightness
- Channel 2 pulse rate,
- Channel 2 brightness,
- Left ear loudness,
- Right ear loudness,
- Binaural beat frequency,
- Binaural beat carrier frequency,
- Crossfade between two audio waveforms.

Software

The ThoughtStream PC package will include a simple multichannel graphing application called ThoughtStream Explorer, and we are working to include additional software as part of a bundle. We are also adopting an “open source” strategy, whereby we will make the detailed data format available to anyone who wishes to develop a noncommercial, public-domain application. If you are interested in joining this program, please contact Robert Austin, Robert@syneticsystems.com.

Pricing and availability

The ThoughtStream PC package includes the control console, two infrared pulse rate sensors, two GSR/skin temperature sensors, sensor and system travel cases, software and manual. The suggested retail price is \$299. It is scheduled for production in late February and will be available for shipment shortly thereafter. For more information please see www.syneticsystems.com.

For upcoming workshops and seminars, please contact:

AVS Journal & Tools For Wellness: Light & Sound Symposium, Dec. 7th in Chatsworth, CA. For details: 818/831-7931 or 800/456-9887x125

Vicki Gaves: info@thoughttechnology.com

Rob Kall: www.futurehealth.org

Dave Siever: info@comptronic.com

Stephen Stern / Stens Corp.: 800/257-8367

Cover design: created entirely by Christopher Oliver. Mr. Oliver is known in the AVS community for his talent in designing avs sessions (including sessions in the Muse#, Nova Pro, Halcyon and 515) and musical compositions (Space Journey, L/S Voyager). Christopher's latest work "Audio Sessions for NFB Training" CD contains thirty-seven 1Hz sessions for specific brainwave frequency entrainment, with track 1= 1Hz, track 2= 2Hz and so forth. And let's not forget the AV3X, the first DVD to deliver light and sound stimulation totally synchronized with music and visuals.

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