

THE SCIENCE BEHIND THE AUDIO PROGRAMS

A PERSONAL TRANSFORMATION SYSTEM

DR. JEFFREY D. THOMPSON, DC, BFA

Director of Research and Development, Personal Transformation Systems

The Personal Transformation System is an integrated system which uses sophisticated sound technologies to entrain brainwaves and states of consciousness, synchronize the right/left hemispheres of the brain and resonate various body structures with specifically designed low frequency vibrations delivered into the body through high-end audio transducers built into an ergonomic, zero-gravity recliner chair or onto a well-constructed table.. Patented elements of either sound delivery system separate sound frequencies between the right/left body, like "headphones for the body". As you will see below, this is of extreme importance for causing a global synchronicity effect in the brain, nervous system and whole body.

History

Human beings have been using sound to access deeper states of consciousness, expand awareness and heal the body for thousands of years. Chanting, toning, Tibetan signing bowls, Chinese meditation gongs and the use of mantras are just a few examples.

Today, with highly sophisticated technological equipment, we can observe the functioning of the body and the brain in unprecedented detail and create sound frequencies accurate to multiple decimal points.

Research projects in major universities across the country have explored the neurophysiology of meditation, deep relaxation states and mind/body interactions during healing. In one study, a simple meditation technique used for 20 minutes a day caused profound changes in blood pressure, stress handling ability, immune response and feelings of well-being without using any kind of high-tech approach which could bring consciousness to very deep levels of relaxation. Using these new high-technology tools for mind/body integration and stress reduction can have many immediate and long-term positive benefits.

We have been researching the specific effects of sounds on the brain, nervous system and body for over 25 years in clinical observation with thousands of patients and volunteers. We use brainwave monitors (EEG) and Real-Time Heart Rate Variability (RT-HRV) monitors to assess the brainwave state, hemisphere synchronicity and stress levels of the Autonomic Nervous System in designing which sounds and what types of music to use for the best overall effect.

Brainwave Entrainment

The definitive work on the discovery of the phenomenon of acoustic brainwave entrainment - the ability to change brainwaves and states of consciousness with sound - was done by Gerald Oster, a medical researcher at Mount Sinai Hospital and published in the Oct 1973 issue of Scientific American entitled "Auditory Beats in the Brain". In this article, he outlined the research he had conducted which showed a brainwave entrainment response to something he called "Binaural Beats". These beats occurred when two separate tones were tuned slightly differently from one another - to be precise: within 18% of one another - a range called the "Critical Bandwidth". The speed of the beats was governed by the difference

in the frequency of the two notes: a left channel tone of 100 cycles per second (Hz) and a right channel tone of 105 Hz would cause a 5 Hz pulse to arise as an interference pattern. The brain would entrain and slow its function to this 5 Hz speed and an altered state of consciousness would result. He also found, that listening to these two frequencies through headphones caused not only the brainwave entrainment phenomenon, but a synchronicity of the electrical activity of the right/left hemispheres of the brain, as well.

Hemisphere Synchronicity

This phenomenon of hemisphere synchronicity is due to a quirk in how the brain processes information and the physics phenomenon of the Critical bandwidth. When two tones are tuned within 18% of one another (or within the critical bandwidth) the brain cannot distinguish two separate tones. It hears one single tone with a pulse within it. The speed of the pulse it hears is the difference between the two tones. Through headphones, however, the opposite hemispheres, which process sound information from each opposite ear, have to compare information in order to hear the pulse. Actually the brain is manufacturing the pulse out of thin air, moment by moment. When the hemispheres compare information, they synchronize their activity across the Corpus Callosum: thus hemisphere synchronicity occurs.

We know from other research efforts that brainwave synchronicity does not happen often and when it does, it is only for an instant. We know it is associated with the "aha" moment, the moment when the answer to a problem pops into the mind, in times of great inspiration, and certain high states of revelry and meditation. With this new technological method of entraining brainwaves with binaural beats using headphones, however, it is possible to float the brain in this hemisphere synchronicity state for prolonged periods of time. Each time we do this, it is like exercising a new brain function which makes the brain more able to engage this function as its normal repertoire of behavior. It is like going to a gym on the inside and working the "muscle" of your brain.

Using sound in these ways, it is possible to make profound changes in brainwave patterns and states of consciousness, observable on brainwave mapping equipment (EEG), as well as positive changes in the body, measurable with blood tests, bio-feedback equipment and other sophisticated procedures. We are also able to influence the core balance and functioning of the brain and central nervous system as a whole.

In the prescription-only Protocol Series of recordings based on these principles in the Personal Transformation System, I have used sound frequency patterns built into the music that have been shown clinically to cause positive changes in consciousness, brainwave and body function in large population groups of patients on a bell curve.

This process involves the use of digital technology, electronic keyboards and computer programs which make it possible to take an instrument sound, nature sound, or human voice sound, etc. and tune the sound to cause an interference pattern of pulses. If the speed of these pulses is calibrated to a brainwave speed of Beta, Alpha, Theta, Delta, Epsilon, Gamma, HyperGamma or Lambda, the brainwaves will follow the speed of the pulses and entrainment will occur. This is called the "frequency following response" discovered by Gerald Oster, whom I mentioned above.

There are other methods for building pulse rates into soundtracks that cause brainwave entrainment, but are not based on the idea of binaural beats. We can modulate the amplitude, filters and pitch of the sounds as well. This means we can build a pulsing loudness level, a pulsing bass/treble level and a pulsing sharp/flat level in the sounds. All of these systems work to cause the entrainment response, but

only the binaural beats through headphones technique causes the hemisphere synchronicity response in the brain.

A good part of the stress we all experience in the twentieth century is due to the advancements of our own technology. Alarm clocks, traffic, fumes, toxins, junk food, world catastrophes, war, etc. all cause an abnormal "marathon" of stress for a human nervous system which was designed for a "sprint". This same technology, however, combined with our traditional techniques for healing and achieving balance, can help us neutralize these abnormal levels of stress, de-stress and rebalance the nervous system and brain.

In the recordings for the Personal Transformation System, I have used three coordinated methods for bringing the mind/body into a state of deep relaxation and balance: "Primordial Sounds," "Brainwave Entrainment" and "multi-layered music" all recorded in 3-D. Many of these soundtracks have 30 layers of 3-D sounds.

Primordial Sounds

Many of the sounds you hear on these recordings are sounds you do not even notice. Certain sounds have the power to awaken deep levels of recognition in the subconscious mind. I call these sounds "Primordial Sounds," sound primordially recognizable to the subconscious mind regardless of race, sex, religion or language.

Our first sensory experience in life as a fetus in the womb is of sound and vibration. We float in body temperature amniotic fluid - weight-less. We have fluid in our nose and mouth, which eliminates the senses of smell and taste. Our eyes are closed and we are in the dark with no sense of sight. We have fluid in our ears pressed right up against the eardrum - but sound travels through water five times more effectively than through air, therefore our sense of hearing is actually amplified. The symphony of sound patterns we experience at this time will be deeply imbedded in our subconscious mind for the rest of our lives - water swishing sounds, arterial pulse sounds and voice sounds. These are our first experiences of "Primordial Sounds."

Recordings of these types of sounds form some of the "primordial sounds" you hear on this recording. Each of these sounds is intentionally altered and disguised by slowing them down and speeding them up. By changing the speed of these sounds we can side step the rational/thinking mind, which will no longer recognize the sounds. We are thus able to tap into the subconscious directly, with sounds it deeply recognizes and to which it can respond. The organic/biological intelligence, the same intelligence that grew our entire body out of two cells, will certainly be awakened with recognition of sounds recorded from the body.

An interesting thing happens when recordings of people speaking are speeded up and slowed down. If these recordings are increased in speed sufficiently, human speech patterns sound remarkably like birds chirping. When raised in speed a few more times, these recordings begin to sound like dolphin squeaks and cricket sounds.

It is also interesting that recordings of human speech patterns sound like various nature sounds. What happens if we take nature sound recordings and begin to alter their speeds? Cricket sounds slowed down sound like birds chirping and dolphin chirps and slowed down enough sound like human voices singing. It is also interesting that when human breathing sounds are slowed down enough, they sound like the ebb and flow of the ocean on the beach.

The famous Psychiatrist, Carl Jung, would have been pleased. This seems to fall directly in line with his theory of the "collective unconscious": a level of the unconscious mind deeper than our personal unconscious shared by us all, populated with universal archetypal images ("primordially recognizable" images) just as these sounds seem to be "primordially recognizable" sounds. It is close to Jung's idea of a "collective unconscious", the whole universe being one giant organic being with many parts all designed from variations of the same underlying blueprint.

Sounds from Space

In 1989 I was contacted by an aerospace engineer with sound recordings from the Voyager spacecraft. These recordings were taken as Voyager I & II passed by the outer planets of our Solar System - Jupiter, Saturn, Uranus, and Neptune.

These were recordings of charged electromagnetic particles (ions) in the magnetic fields of these planets vibrating within the range of human hearing. What did they sound like? They sound like dolphins, choirs of voices singing, crickets, birds, Tibetan bowls, and ocean sounds, plus other sounds too strange to identify, but which seem very familiar. Could these sounds be deeply recognizable at a deeper level of the "collective unconscious"?

It is these three classes of sound ("Primordial Sounds", "Brainwave Entrainment" and "multi-layered evocative music") that are embedded in all the soundtracks and recordings of the Personal Transformation System Protocol tracks to awaken the various levels of the subconscious mind.

It is at this inner level of ourselves that our bodies are self-organized from two cells by the same inner system from which daily functions of this body are coordinated and directed. It is from here that the knowledge of our problems and the answers and solutions to them reside.

This is what I mean by the use of "Primordial Sounds" to access a deep level of ourselves for healing, relaxation and balance. These sounds are mixed into the soundtrack in a way that they can be heard but not necessarily recognized for what they are by the rational-thinking mind. Some of the nature sounds you hear are actually space sound recordings or human body sounds.

A scientifically accurate reproduction of what the womb sounded like to us *as a fetus*, can cause a visceral response similar to what we experienced in the womb: safety, security, love, nurturing, no responsibilities, no worries. This is an extremely valuable clinical emotional state to revisit for those who are depressed, anxious, ill, in pain, etc.

3-D Psychoacoustic Processing and Acoustic Pacing

Brainwave entrainment is part of a larger biological function called "Biological Sympathetic Oscillation". Our biological "clock" sets itself to external cosmic events, day-length cycles, full-moon cycles and seasonal cycles to name a few. The body will set itself to the most powerful external pulse cycle to which it is exposed. In this case, we can create powerful sound frequencies pulsing at exact brainwave speeds and enable the brainwaves to alter themselves to match these external sound frequencies - that is, entrain themselves to the sound pulses via the frequency following response.

This has formed the basis for another method I developed for entraining the entire biological network in the body, which I call "Acoustic Pacing". In Acoustic Pacing I am taking nature sound recordings - recorded with special Psychoacoustic 3-D microphones - and slowing these recordings down over time in

the soundtrack. Since all the audio memories stored in the brain from past experiences are 3-D sound memories, a true 3-D soundtrack fools the brain into assuming these nature sounds are real. Since, as part of the larger world phenomenon of "Biological Sympathetic Oscillation" mentioned before, our bodies time themselves to larger nature cycles, when 3-D recordings of nature sounds are slowed down over time, the body automatically adjusts its internal timings accordingly and a global body-based entrainment of slowing down occurs. Brainwaves, heart-rate, pulse and respiration slow in response to the whole 3-D world system slowing with this method. This was the method I used with the Brookstone bedside sleep unit, one of their top sales items for the 10+ years.

When these elements are combined together - relaxing music, nature sounds in 3-D slowing down over time, brainwave entrainment pulses built into the harmonics of the music and nature sounds - a more all-inclusive and powerful relaxation response takes place in the whole organism.

We know from many research endeavors that certain deeply relaxed states of consciousness are associated with specific brainwave patterns on an EEG brain monitor. We also know that with proper brainwave entrainment processing, brainwaves sympathetically "lock onto" an external sound-pulse at a brainwave speed. This gives us the tools to gently guide brainwave function and states of consciousness into deeply relaxed and balanced states, or deep sleep states, or highly creative states, meditative states, peak performance states, etc.

On all of the soundtracks, these pulse frequencies are built into every sound you hear, including each instrument sound, voice sound, nature sound and NASA space sound.

Certain types of sounds and music have a proven effect in creating states of relaxation, balance, healing and visualization. Generally these include certain types of lyrical, flowing melodies and chord arrangements. Certain chord arrangements can create an atmosphere of peace, mystery, awe and openness, but not necessarily healing and personal growth, the intent of all my work.

Physiologic Response to Vibro-Tactile Induction Technology

The obvious stress reduction benefits of listening to relaxing music have been proven through numerous research projects in hospitals, universities and private clinical practices over the course of many years. Normally, hearing involves sound waves pushing air pulses against the ear drum, moving the mechanical joints of the middle ear bones which amplify these vibrations to the inner ear, which pushes fluids into wave pulses, which move tiny nerve endings, which fire signals through the 8th cranial nerve directly into the Temporal lobe of the brain, which interprets these impulses as "sound".

By delivering these sound frequencies through the body directly, an entirely different system of the body - spinal cord and areas of the brainstem and brain - are brought into play, with the possibility of a much deeper whole-body response. With this delivery system we have the possibility of direct cellular stimulation. Direct stimulation of living cellular tissue using sound frequency vibration has shown marked cellular organelle response with a corresponding measurable increase of cellular metabolism and therefore a possible mobilization of a cellular healing response. Since the human body is over 70% water and since sound travels 5 times more efficiently through water than through air, sound frequency stimulation directly into the body is a highly efficient means for total body stimulation, especially at a cellular level. Sound frequency pulse waves played directly into the body have a profound effect on the nervous system. The entire posterior 1/3 of the spinal cord (tracts Cuneatus & Gracilis) consists of nerve tract bundles directing vibration sense data to the specific processing neurons in the Brain Stem.

The four nerve cell bundles in the skin for processing vibration sense (Meissner's, Pacinian, Ruffini's, Merkel's) have a combined sensation range of 0.3Hz – 500 Hz. This is what the body considers to be vibration sense. Frequencies in this range can be felt through the body even by a 100% deaf person. The total range of human hearing is 20 Hz – 20,000 Hz. This means that there is a cross-over zone where sounds can be both felt and heard between 20 Hz – 500 Hz. The Personal Transformation System Protocol soundtracks specifically use this narrow bandwidth (20 Hz - 500 Hz) in the choice of instruments sounds and other sounds to maximize the synchronicity event between the hearing and vibration sense centers of the brain and brainstem to achieve the desired synchronization.

Various octaves of sound frequencies between 20 Hz and 500 Hz cause a sympathetic resonance response in various types of body tissues that have different fundamental resonance properties by way of their unique tissue density characteristics. For instance, frequencies experienced in these Prescriptive Protocols in the range of 500 Hz are felt in the skin. As the frequencies begin to drop down...450 Hz, 400 Hz, 350 Hz, 300 Hz, etc., these are experienced as resonance in the muscles, then the joints, ligaments and tendons, then as a bone conduction octave, then a cellular/fluid conduction octave. In this way, it is possible to orchestrate a completely new type of Acoustic Vibration Massage, not only around various body areas, but down into the body at various levels and back out again: skin, muscle, joints/discs, bone and fluids. There is a marked ability for the mechanical energy wave of low frequency sound to cause a fluid streaming effect in the body in blood, lymph, CSF and intra and extra cellular fluid. This is partly why we have seen such good results with circulatory disorders (bed sores, diabetic neuropathies, etc.), detox experiences and lymphatic and lung congestion.

There is a marked pain control aspect to low frequency resonance exposure in the body. This is partly due to a physiological response in which the spinal cord pain pathway information is superseded by vibration information pathway information signals crowding out the pain signals to the brain. As per the Melzac-Wall Gate Theory of pain control. In the Melzac-Wall system, tapping along the dermatome of the pain overloads the spinal cord pathways with vibration sense signals, preventing pain signal propagation. The full-body, multi-level body density physical vibration resonance phenomenon of the Personal Transformation System is simultaneously stimulating all dermatomes in the body for an unprecedented level of blockage of pain signals.

In addition, the combination of pleasant sensations of full body vibrational massage, pleasing 3-D sounds and music, brainwave entrainment to deeply relaxed states and release of pain through blocking, causes an overall endorphin release response which lingers for a long period after a session is over.

All of the techniques described so far are designed to work together to create what we call a "Synchronicity Event" in the brain, autonomic nervous system and body tissues as well as through a synchronicity event in the visual, auditory and kinesthetic perceptual centers in the brain. This is done by synchronizing the right/left hemispheres of the brain's visual and auditory processing centers and the right/left Cuneatus / Gracilis vibration sense neurons in the brainstem. All become centered in a state of Homeostasis, or the zero-stress state of the ANS. By using the Bio-Tuning or Protocol soundtracks in order from Session 1 thru Session x (We offer twenty-one brain states in the Bio-Tuning® Program) over time, on a daily basis, we are training or re-training the brain and nervous system. It is like going to a gym on the inside. We are training the body/mind to zero-stress, homeostasis, and synchronicity, which makes the body more resilient to disturbance, stress and disease, and the individual healthier and more capable of Personal Transformation, being Centered and Happier.