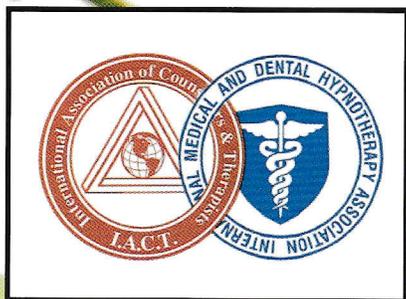


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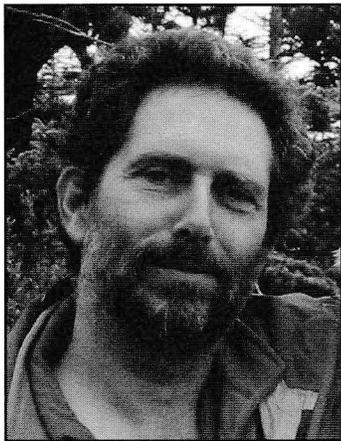
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A BRAIN IN HYPNOSIS

By Lincoln Stoller

Lincoln Stoller is a NASA astronomer from Berkeley, CA (1978); with a PhD in Quantum Physics from the University of Texas at Austin (1985). His education also includes Neurofeedback Training (2006-2009). LENS at Stone Mountain Center, Tilton, New York; 2006 and EEG Institute, Woodland Hills, California; 2007: The Enhancement Institute, Houston, Texas (2009). His hypnosis education includes successful completion of the hypnosis courses taught at HPTI and IC BCH

As hypnotists we use brainwaves as a heuristic to describe the hypnotic state, but we do not use brainwaves as a tool in hypnosis. We skip this structural picture and jump right to the content. One reason is because we don't have EEG amplifiers, and most of us would not know what to do with them if we did. More fundamentally, few hypnotists know what brainwaves mean and, lacking a framework, are indifferent to them.

I've trained clients in shaping their brainwaves for a decade, and I attach most of my hypnosis clients to an EEG amplifier. The picture one gets from the EEG is complex and ambiguous. No two people are the same, and there is no uniform progression of brainwaves through hypnosis. But some things that are generally evident and some client's brainwaves present a textbook picture. This article describes one such client.

I offer a free, 1-hour session to anyone who walks into a volunteer free clinic in Stone Ridge, New York. I provide a combined session of neurofeedback and hypnosis. I give my client a quick description of neurofeedback, attach them to the leads of my EEG amplifier, and begin my induction.

Hyper-Vigilance

Mary signed up for a session of neurofeedback. Now in her early 60's she describes herself as the child of parents traumatized by World War II, which she inherited through their dysfunction. Through the course of her formative years she developed a stable, even-keeled personality that overlaid a constant, fearful, hyper-vigilant state. This was entirely consistent with her posture and nystagmus. She was a chiropractor, further suggesting her inclination for rooting in the body.

I began by asking her to describe her safe place, and she provided a description of a woodland scene. I elicited enough detail to recreate something like this in the guided visualization that was to follow.

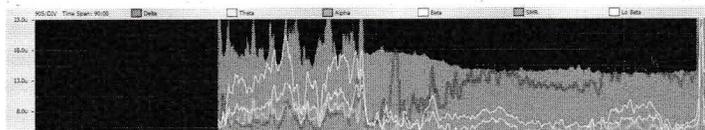
I attached a single EEG circuit between Mary's left parietal area and a site above her right ear. The neurofeedback was the alternation between the ambient sound of frogs and the sound of rain. She listened to these sounds, and to my voice, through a pair of headphones with her eyes closed.

The simple protocol is called alpha-theta neurofeedback. It presents either of these two sounds depending on whether her brainwave is dominated by theta waves or alpha waves. If there is a greater amplitude of slow theta, then she hears rain. If there is greater amplitude of faster alpha, then she hears the frogs. The computer adjusts the alpha and theta levels so that the two

sounds alternate. These sounds are unaffected by any other part of the brainwave spectrum.

The predominance of theta waves signals an open, nonverbal state generally considered hypnotic. The predominance of alpha waves signals an attentive, discriminating state of light reverie. The neurofeedback protocol draws the client's attention to when they shift their attention and, by doing this, encourages them to oscillate from one pattern to the other. As you might imagine, this feedback is hypnotic by itself!

Having started the feedback, I guided Mary through progressive muscle relaxation, and then down a set of 10 steps. This served both as a deepener and an introduction to a state of active visualization. The amplitude of her brainwaves over the course of the session is shown in the figure below.



The various colored lines show the amplitudes of the different brainwave bands.

Time runs across the horizontal axis from left to right. The session begins where the background teal color first appears and ends at the right edge. The background grid is 90 seconds for each rectangle's width, and 5 microvolts for each rectangle's height.

The background teal color is the total amplitude of the delta waves. This varies rapidly up to point shortly after the start of the induction. Delta is a measure of Mary's relaxed state. The fuchsia-colored line measures alpha amplitude and starts at a level below all others. The frequencies above alpha -- alpha is between 8 and 12 Hertz -- are levels of vigilance and anxiety.

Near the start of the hypnotic induction there is a dramatic change in Mary's state. Her delta waves calm down, her anxious frequencies drop in amplitude by half, and alpha -- her non-vigilant verbal state marker -- doubles and continues to rise.

I guided her on a journey through a woods to a lake. I asked her to walk into the lake, and walked with her until we were far under the water, still warm, comfortable, and breathing easily. Then I asked her to conjure a presence that represented her fearful, anxious self. I asked her to interact with this presence, and to allow it to speak through her. I asked her for details of its appearance and mood, and I asked her to understand its role in supporting her.

A Brain in Hypnosis

Continued from page 30

In this case Mary did not speak even though I asked her to. Speech requires a contribution from the beta frequencies which support the muscle movements and reflexes. She could hear me perfectly well, but was in a state of light paralysis. For her to be able to speak her beta levels would have needed to be higher. However, excessive beta-related anxiety was her main complaint, and I did not want to interfere with obtaining the relief she had come for. Instead, I asked her to answer my questions silently to herself.

I then asked her to turn her attention to the conjuring of a strong, fearless, healing presence, to bring that presence into focus and establish a personal connection with it. Finally, in a kind of phantasmagorical parts therapy, I asked her fearful and fearless selves to join with each other, and with her, in establishing a triad of support and understanding. I asked for tokens from each, anchoring these presences in idea, image, and sensation. This was the point on the chart where the alpha levels were the highest, and delta the smoothest.

I took 4 minutes to lead her back out of the lake, out of the woods, and up the 10 steps to reawakening. At this point she opened her eyes and began readjusting herself. These movements generated high muscle voltages that overwhelmed the brainwaves during the final 90 seconds, on the far right of the chart.

What We Can See

Mary's brainwave state shows a shift in state as a result of hypnosis that is more dramatic than most. And these shifts could be understood as shifts in cognitive state. You are seeing the emergence of new awareness -- defined in the space of frequencies -- that differs from her initial state. I see Mary's new state of mind as an open, receptive, verbal consciousness stripped of vigilance and detail.

The EEG provides a clear, second angle onto Mary's state. It gives a metric to subjective states, and reveals patterns of change that you might not notice or expect. For the most part the connection between the brainwaves and the subjective states is unexplored and unknown. As hypnotists we have the knowledge of these states that neurologists lack. We can interpret the EEG in ways that no one else can.
