

“Changing the World, One Neuron at a Time!”

October 17, 2010

Unitarian Universalist Congregation of South Jersey Shore

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Introduction- The Sufi story is told of the village clown Nasurdin who is riding through town on a donkey. A group of hecklers seeing the old fool yell out to him, “Nasurdin, where are you going?” He simply replies, “Don’t ask me, ask the donkey.” It would seem many people are riding through life unconscious of where they are headed other than being swept along by the conventionalities of culture and the herd. And when that culture is built on greed and competition, they find themselves saddled to that particular donkey, along with all the concomitant anxieties and fears that such a culture engenders (and unconsciously creating a supersonic speed, multi-tasking, nervous, angry, or irritable brain).

In some ways the first question, “What kind of brain do you want?” precedes a second question, “What kind of world do you want?” If we are serious about changing the world! If we are serious about being agents of change for peace and justice in our world (and all of the ramifications for having a worldview that includes meeting the basic needs of every being on our planet), we must begin with the peace and justice we find within our individual subjective worlds. And now we know through

the advent of a new discipline: called Neurotheology, the only way we can really change our individual worlds is to change the machinery that gives shape and substance to those worlds; our brains! Because our brains literally create our world or our reality.

But what is Neurotheology? **Neurotheology**, also known as **spiritual neuroscience**, is the study of correlations of neural phenomena with subjective experiences of spirituality and hypotheses to explain these phenomena. In other words, whatever spiritual experiences you have, you experience them in and through the mechanism of your brain.

The term was first used by Aldous Huxley. He used the term *neurotheology* for the first time in the utopian novel *Island*, but he used it mainly in a philosophical context. Dr. Andrew B. Newberg from the University of Pennsylvania's Medical School and others describe neurological processes which are driven by the repetitive, rhythmic stimulation which is typical of human ritual (particularly, meditation) and which contribute to the delivery of transcendent feelings of connection to a universal unity. They posit, however, that physical stimulation alone (as seen in some attempts to create a "God Helmet" that stimulates the temporal lobes in order to "create" spiritual experience) is not sufficient to generate transcendent unitive experiences. For this to occur they say there must be a

blending of the rhythmic stimulation with certain ideas. Once this occurs "...ritual turns a meaningful idea into a visceral or felt experience." Moreover, they say that humans are compelled to act out myths by the biological operations of the brain on account of what they call the "inbuilt tendency of the brain to turn thoughts into actions".

Carl Jung was one of the first to point out that everyone must choose a "myth to live by". Of course, by myth he did not mean the current vernacular of implying a fable or falsehood, but the older and deeper meaning (recovered for many by Joseph Campbell) that a myth is the symbolism in which we find our life experience. Thus, we experience a global myth, a chronological myth, a cultural myth and of course, a personal myth.

It is our way of making meaning of the symbols of our existence. And what makes neurotheology so exciting in 2010 is that part of our cultural and chronological myths is the technological myth in which we live. And that technological myth includes ways of understanding the brain that humans never dreamed of, not centuries ago, but just a few short decades ago. With the advent of brain imaging from the earliest computerized assisted tomography to the functional magnetic resonance imaging and single photon emission computerized tomography of today, we've learned more about the

functioning of the brain in the last decade than the last several centuries. So it was only a matter of time before neuroscientists would be asking questions like; “Where do spiritual experiences occur in the brain? Or “Do spiritual experiences change the brain?” or “Are spiritual experiences the result of brain pathology?” (specifically, temporal lobes seizures?)

What is the brain? 100+ billion neurons each with 5,000 -20,000 dendritic connections (perhaps a trillion cells when Glial cells are added and we’re just beginning to understand their contribution. For many years it was assumed they were just the “packing” for the neurons, like peanut Styrofoam, but now we know they play a critical role in brain functioning. The brain weighs approximately 3 lbs. made up of a tofu like substance that floats around inside this protective helmet we call a skull.

I. Changing our Worlds by Changing our Brains-

One of the first major breakthroughs in understanding these questions was the discovery that in many respects we can indeed go “shopping” for the brain we want. Dr. Edward Taub’s studies showed conclusively, fighting 100+ years of erroneous neuroscience, that much of our brains are *“plastic”* which means pliable and changeable. His work forever changed the treatments that stroke victims and other brain damaged individuals would

receive and resulted in amazing recovery rates for those with less than severe events (with some patients regaining as much as 85-90% reusage compared to the previous treatments that had rates averaging around 15%).

Sharon Begley's book, Train Your Mind Change Your Brain is the account of a conference held in 2004 at the exiled home of H.H. the Dalai Lama in India and a handful of neuroscientists came to share their progress in understanding neuroplasticity. The Dalai Lama asserted that any Buddhist must be open to new understandings based on reason and experience, "If science discovers that a belief of Buddhism is wrong, that it violates an indisputable truth of science, then Buddhism must abandon that view or scriptural teaching even if it has prevailed for millennia." He later wrote in The Art of Happiness, "The wiring in our brains is not static, not irrevocably fixed. Our brains are also adaptable."

Thus, we know that we aren't just victims of fate, genetics or life experience in regard to the brains that we develop. We know that there are some direct actions we can take that will change, not only the neurochemistry of our brains, but even the neural networks. A maxim grew among neuroscientists that, "neurons that fire together, wire together." By this they were referring to the fact that certain activities, attitudes and even

thoughts can create consistent neural pathways. Of course, this has a negative valence and a positive valence.

The negative valence is that if you are repeatedly exposed to stress (or worse trauma) or you become entrenched in negative attitudes or negative thinking you will make neural connections accordingly. The positive valence is that, in most case, those neural connections are reversible and changeable to more positive and life enhancing connections. Psychiatrist Jeffrey Schwartz at UCLA has applied this knowledge to treating patients with OCD and new applications are being explored for many psychological disorders. But how does this impact changing our world or in particular, what does this mean for bringing more peace, love and contentment to each of our lives?

II. Cognitive Neuroscience tackles Spirituality-

One of the leading researchers in examining the role of brain plasticity and spirituality was mentioned above; Dr. Andrew Newberg is currently the Director of Research for the Center for Integrative Medicine at Thomas Jefferson Medical College. He was previously a Professor of Radiology at UPenn Medical School and many of you may know him as a contributor to

the movie, “What the Bleep?” Dr. Newberg’s books include; Principles of Neurotheology, Why God Won’t Go Away (Brain Science and the Biology of Belief), Born to Believe, & How God Changes Your Brain. His seminal work in the field was to conduct SPECT brain scans on a group of Tibetan Monks and Franciscan Nuns to see if there were significant changes in their brains from years of meditation and a type of prayer called “centering prayer” (which is very similar to meditation). His findings were phenomenal! He discovered that there were indeed at least two very significant differences. Both groups exhibited neuronal thickening in a part of the brain called the anterior cingulate gyrus and decreased activity in the parietal lobes. The anterior cingulate gyrus is a part of the brain that gives one more emotional control by allowing more messaging from the PFC to the limbic system. One of the functions of the parietal lobes is to make us aware of our separateness from other people and things (we need it to navigate), but Dr. Newberg and colleagues surmised that these findings contributed to the calm and peaceful demeanors of the members of each group and were conducive to unitive (mystical or spiritual experiences) where there is a blurring or obliteration of the sense of separateness. Of course, some questioned, did these subjects just represent individuals whose unique brains led them to become nuns and monks?

Newberg et al went on to do subsequent research with control groups of new or novice meditators and was able to demonstrate anterior cingulate thickening in as little as 12 weeks. Newberg writes about his studies, “The circuits that generate images of a wrathful God are closely tied to the oldest structures in the brain, and the circuits that allow us to envision a compassionate and mystical God are in the newest part of the brain. We can’t get rid of the old limbic God, which means anger and fear will always be part of our neural and spiritual personality. However, we can train newer structures in our brains to suppress our biological tendency to react with anger and fear.” (p. 123 How God Changes Your Brain).

We see a parallel process between the biology of the brain centers that express love/compassion versus anger/fear and the expression of love/compassion among the mystics within Vedanta Hinduism, Kabbalah Judaism, Sufi Islam and Mystical Christianity and the anger/fear expressed by fundamentalist adherents of those traditions.

He questions the conclusions of Richard Dawkins, Sam Harris & Christopher Hitchens that religion is bad for you and the world saying that, “the lack of empirical evidence that these writers have cited that even mildly suggests religions is hazardous to your health is disappointing. The problem isn’t religion. The problem is **authoritarianism**, coupled with the desire to

angrily impose one's idealistic beliefs on others.... The health benefits associated with meditation and religious ritual cannot be denied!"

So how do we benefit from these daily discoveries? How do we develop a "spiritual brain" that will lead to more peacefulness, social awareness, and compassion for others? One place to begin is meditation!

III. Meditation as an antidote to stress and the vagaries of modern society!

Dr. James Austin in Zen-Brain Reflections quotes Ralph Waldo Emerson, "I like the silent church before the service begins, better than the preaching." And Blaise Pascal, "All human evil comes from this: man's being unable to sit still in a room." For thousands of years (not just the last few decades or centuries) we have known of the apparent benefits of meditation.

But now we have the science to prove it. For decades we have known that meditation (or the medical/model version- the relaxation response- coined by my former colleague, Herb Benson) has many health benefits; improved immune functioning (including increased t-cells and NK or Natural Killer cells), improved sleep and freedom from insomnia, assistance in weight loss,....., but there was nothing but anecdotal evidence that it might make you a happier, wiser and a more compassionate person.

Now that we have brain imaging evidence for our evidence-based society, what is the next step in bringing this life and brain changing news to the world? Well, I guess Stephen Stills was right when he spoke these words on the Four Way Street album, "If we can't do it with love in our hearts, then we have no right to do it at all!" We have to begin with each of our brains and hearts. So what type of meditation is the best? Newberg gives examples of 12 different types of meditative exercises, all of which have benefit; including yawning (intentionally) and of course there are hundreds of meditative practices.

Rather than the type of meditation, like most other types of training, it is seems to be the consistency and amount of practice that is indicative of the greatest gain. Like other types of mindfulness though, it is important not to be competitive or judgmental about your discipline. But like dream work in the last decade, meditation is no parlor game.

Conclusion- Rather than summarize the analytical points, I'd simply like to invite those of you who feel led to join me in a guided meditation to do so.

When I took the Psychology of Religion in seminary, my professor made quite a bold statement the first day of class. He said, "this course is going to be unlike any other you've had in seminary" So rather than talk some more about religious experience, we're actually going to attempt to have a one.

Our first textbook, was Joseph Campbell's The Portable Jung. So if I leave you with nothing else today, perhaps you might have a spiritual experience! If so, I'm sure it will be a most valuable gift....that you give yourself.

- 1) Begin with your breath (it comes from the Greek word *pneuma*, which can be translated as wind, spirit or breath, as does the Hebrew word, *ruach*).
- 2) Next we focus on an object of Attention:
 - a. It can be "NO-thing" (as in many Buddhist meditations)
 - b. It can be a Mantra (a word or phrase that is peaceful, loving or compassionate).
 - c. It can be a Mandala (a physical symbol most often in the form of a circle (like a yin/yang symbol) or some infinite shape (like a Celtic knot).
 - d. It can be an imaged safe place or relaxing space (imaged with your mind's eye... like the beach, the sun, by a brook, etc.... and you can attempt to feel the visceral experience of that space).
- 3) So lets begin.....sit up, with your feet squarely on the floor, supporting you and your body, hands comfortably on your lap or

thighs,... as you breath, focus on deep, diaphragmatic breathing and perhaps, count to 3-4 on the inhalations and exhalations. You can close your eyes if you feel comfortable. Now, focus on your object of attention (pause for several minutes). Now take 10-15 more deep breaths and bring yourself back into the room as you feel comfortable”

Namaste- “which translated means, “I bow to the divine in you.”

Additional Reading: Changing the World, One Neuron at a Time

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