

The Wise Brain Bulletin

News and Tools for Happiness, Love, and Wisdom

Volume 3, 10 (10/2009)

featured article:

The Self-Transforming Brain

Editor's note: This is the first chapter of Buddha's Brain: The Practical Neuroscience of Happiness, Love, and Wisdom (New Harbinger, 2009). See the book itself for the references.

© Rick Hanson, Ph.D.

(with Richard Mendius, M.D.)

The principal activities of brains are making changes in themselves.

Marvin L. Minsky

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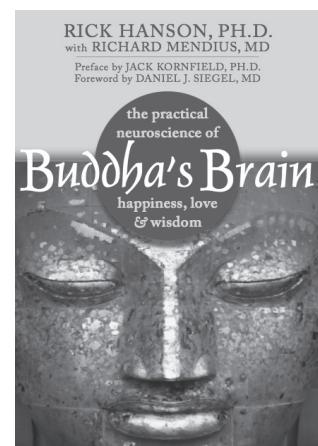
When your mind changes, your brain changes, too. In the saying from the work of the psychologist Donald Hebb: when neurons fire together, they wire together—mental activity actually creates new neural structures (Hebb 1949; LeDoux 2003). As a result, even fleeting thoughts and feelings can leave lasting marks on your brain, much like a spring shower can leave little trails on a hillside.

For example, taxi drivers in London—whose job requires remembering lots of twisty streets—develop a larger hippocampus (a key brain region for making

visual-spatial memories), since that part of the brain gets an extra workout (Maguire et al. 2000). As you become a happier person, the left frontal region of your brain becomes more active (Davidson 2004).

What flows through your mind sculpts your brain. Thus, you can use your mind to change your brain for the better—which will benefit your whole being, and every other person whose life you touch.

This book aims to show you how. You'll learn what the brain is doing when the mind is happy, loving, and wise. And you'll learn many



Click this cover to learn more about Buddha's Brain

Greetings

The Wise Brain Bulletin offers skillful means from brain science and contemplative practice – to nurture your brain for the benefit of yourself and everyone you touch.

The Bulletin is offered freely, and you are welcome to share it with others. Past issues are posted at www.wisebrain.org/bulletin.html.

Rick Hanson, PhD and Richard Mendius, MD edit the Bulletin, and it's designed and laid out by Laurel Hanson.

To subscribe, please contact Rick at drrh@comcast.net.

ways to activate these brain states, strengthening them a bit each time. This will give you the ability to gradually rewire your own brain—from the inside out—for greater well-being, fulfillment in your relationships, and inner peace.

An Unprecedented Opportunity

Much as the microscope revolutionized biology, in the past few decades new research tools such as

functional MRIs have led to a dramatic increase in scientific knowledge about the mind and brain. As a result, we now have many more ways to become happier and more effective in daily life.

Meanwhile, there's been a growing interest in the contemplative traditions, which have been investigating the mind—and thus the brain—for thousands of years, quieting the mind/brain enough to catch its softest murmurs and developing sophisticated ways to transform it. If you want to get good at anything, it helps to study those who have already mastered that skill, such as top chefs on TV if you like to cook. Therefore, if you'd like to feel more happiness, inner strength, clarity, and peace, it makes sense to learn from contemplative practitioners—both dedicated lay people and monastics—who've really pursued the cultivation of these qualities.

Although “contemplative” may sound exotic, you’ve been contemplative if you’ve ever meditated, prayed, or just looked at the stars with a sense of wonder.

The world has many contemplative traditions, most of which are associated with its major religions, including Christianity, Judaism, Islam, Hinduism, and Buddhism. Of these, science has engaged Buddhism the most. Like science, Buddhism encourages people to take nothing on faith alone and does not require a belief in God. It also has a detailed model of the mind that translates well to psychology and neurology.

Consequently, with great respect for other contemplative traditions, we’ll draw particularly on Buddhist perspectives and methods.

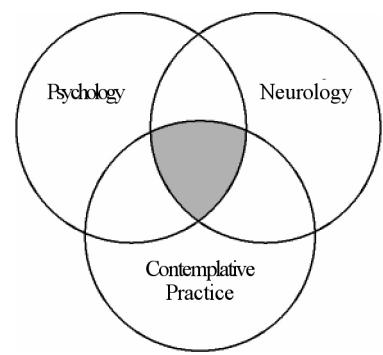


Figure 1

The Intersection of Three Disciplines

Imagine each of these disciplines—psychology, neurology, and contemplative practice—as a circle (figure 1). The discoveries being made at that intersection are only just starting to show their promise, but scientists, clinicians, and contemplatives have already learned a great deal about the brain

We have probably learned more about the brain in the past twenty years than in all of recorded history.
Alan Leshner

states that underlie wholesome mental states and how to activate those brain states. These important discoveries give you a great ability to influence your own mind. You can use that ability to reduce any distress or dysfunction, increase well-being, and support spiritual practice; these are the central activities of what could be called the path of awakening, and our aim is to use brain science to help you travel far and well upon it. No book can give you the brain of a Buddha, but by better understanding the mind and brain of people who've

gone a long way down this path, you can develop more of their joyful, caring, and insightful qualities within your own mind and brain as well.

The Awakening Brain

Richard and I both believe that something transcendental is involved with the mind, consciousness, and the path of awakening—call it God, Spirit, Buddha-nature, the Ground, or by no name at all. Whatever it is, by definition it's beyond the physical universe. Since it cannot be proven one way or another, it is important—and consistent with the spirit of science—to respect it as a possibility.

That said, more and more studies are showing how greatly the mind depends on the brain. For example, as the brain develops in childhood, so does the mind; if the brain is ever damaged, so is the mind. Subtle shifts in brain chemistry will alter mood, concentration, and memory (Meyer and Quenzer 2004). Using powerful magnets to suppress the emotion-processing limbic

system changes how people make moral judgments (Knoch et al. 2006). Even some spiritual experiences correlate with neural activities (Vaitl et al. 2005).

Any aspect of the mind that is not transcendental must rely upon the physical processes of the brain. Mental activity, whether conscious or unconscious, maps to neural activity, much like a picture of a sunset on your computer screen maps to a pattern of magnetic charges on your hard drive. Apart from potential transcendental factors, the brain is the necessary and proximally sufficient condition for the mind; it's only proximally sufficient because the brain is nested in a larger network of biological and cultural causes and conditions, and is affected itself by the

mind.

Of course, no one yet knows exactly how the brain makes the mind, or how—as Dan Siegel puts it—the mind uses the brain to make the mind. It's sometimes said that the greatest remaining scientific questions are: What caused the Big Bang? What is the grand unified theory that integrates quantum mechanics and general relativity? And what is the relationship between the mind and the brain, especially regarding conscious experience? The last question is up there with the other two because it is as difficult to answer, and as important.

The history of science is rich in the example of the fruitfulness of bringing two sets of techniques, two sets of ideas, developed in separate contexts for the pursuit of new truth, into touch with one another.

J. Robert Oppenheimer

To use an analogy, after Copernicus, most educated people accepted that the earth revolved around the sun. But no one knew how that actually happened. Roughly 150 years later, Isaac Newton developed the laws of gravity, which began to explain how the earth went about the sun. Then, after 200 more years, Einstein refined Newton's explanation through the theory of general relativity. It could be 350 years, and maybe longer, before we completely understand the relationship between the brain and the mind. But meanwhile, a reasonable working hypothesis is that the mind is what the brain does.

Therefore, an awakening mind means an awakening brain. Throughout history, unsung men and women and great teachers alike have cultivated remarkable mental states by generating remarkable brain states. For instance, when experienced Tibetan practitioners go deep into meditation, they produce uncommonly powerful and pervasive gamma brainwaves of

continued on pg. 5

Your Brain - Basic Facts

- Your brain is three pounds of tofu-like tissue containing 1.1 trillion cells, including 100 billion neurons. On average, each neuron receives about five thousand connections, called synapses, from other neurons (Linden 2007).

- At its receiving synapses, a neuron gets signals—usually as a burst of chemicals called neurotransmitters—from other neurons. Signals tell a neuron either to fire or not; whether it fires depends mainly on the combination of signals it receives each moment. In turn, when a neuron fires, it sends signals to other neurons through its transmitting synapses, telling them to fire or not.

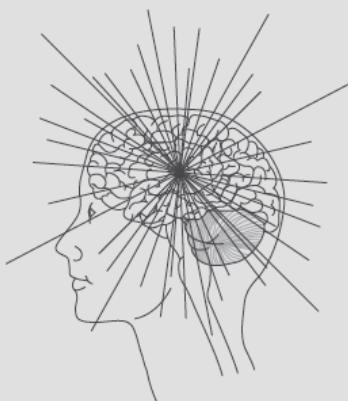
- A typical neuron fires 5–50 times a second. In the time it takes you to read the bullet points in this box, literally quadrillions of signals will travel inside your head.

- Each neural signal is a bit of information; your nervous system moves information around like your heart moves blood around. All that information is what we define broadly as the mind, most of which is forever outside your awareness. In our use of the term, the “mind” includes the signals that regulate the stress response, the knowledge of how to ride a bike, personality tendencies, hopes and dreams, and the meaning of the words you’re reading here.

- The brain is the primary mover and shaper of the mind. It’s so busy that, even though it’s only 2 percent of the body’s weight, it uses 20–25 percent of its oxygen and glucose (Lammert 2008). Like a refrigerator, it’s always humming away, performing its functions;

consequently, it uses about the same amount of energy whether you’re deep asleep or thinking hard (Raichle and Gusnard 2002).

- The number of possible combinations of 100 billion neurons firing or not is approximately 10 to the millionth power, or 1 followed by a million zeros, in principle; this is the number of possible states of your brain. To put this quantity in perspective, the number of atoms in the universe is estimated to be “only” about 10 to the eightieth power.



- Conscious mental events are based on temporary coalitions of synapses that form and disperse—usually within seconds—like eddies in a stream (Rabinovich, Huerta, and Laurent 2008). Neurons can also make lasting circuits, strengthening their connections to each other as a result of mental activity.

- The brain works as a whole system; thus, attributing some function—such as attention or emotion—to just one part of it is usually a simplification.

- Your brain interacts with other systems in your body—which in turn interact with the world—plus it’s shaped by the mind as well. In the largest sense, your mind is made by your brain, body, natural world, and human culture—as well as by the mind itself (Thompson and Varela 2001). We’re simplifying things when we refer to the brain as the basis of the mind.

- The mind and brain interact with each other so profoundly that they’re best understood as a single, co-dependent, mind/brain system.

electrical activity, in which unusually large regions of neural real estate pulse in synchrony 30–80 times a second (Lutz et al. 2004), integrating and unifying large territories of the mind. So, with a deep bow to the transcendental, we will stay within the frame of Western science and see what modern neuropsychology, informed by contemplative practice, offers in the way of effective methods for experiencing greater happiness, love, and wisdom.

To be sure: these methods will not replace traditional spiritual practices. You don't need an EEG or a Ph.D. in neuroscience to observe your experience and the world, and become a happier and kinder person. But understanding how to affect your own brain can be very helpful, especially for people who do not have time for intensive practice, such as the 24/7 grinding and polishing of monastic life.

Although life has many pleasures and joys, it also contains considerable discomfort and sorrow—the unfortunate side effect of three strategies that evolved to help animals, including us, pass on their genes. For sheer survival, these strategies work great, but they also lead to suffering (as we'll explore in depth in the two next chapters). To summarize, whenever a strategy runs into trouble, uncomfortable—sometimes even agonizing—alarm signals pulse through the nervous system to set the animal back on track. But trouble comes all the time, since each strategy contains inherent contradictions, as the animal tries to:

- Separate what is actually connected, in order to create a boundary between itself and the world
- Stabilize what keeps changing, in order to maintain its internal systems within tight ranges
- Hold onto fleeting pleasures and escape inevitable pains, in order to approach opportunities and avoid

The Causes of Suffering



The Wellspring Institute For Neuroscience and Contemplative Wisdom

The Institute is a 501c3 non-profit corporation, and it publishes the Wise Brain Bulletin. The Wellspring Institute gathers, organizes, and freely offers information and methods – supported by brain science and the contemplative disciplines – for greater happiness, love, effectiveness, and wisdom. For more information about the Institute, please go to www.wisebrain.org/wellspring.html.

threats

Most animals don't have nervous systems complex enough to allow these strategies' alarms to grow into significant distress. But our vastly more developed brain is fertile ground for a harvest of suffering. Only we humans worry about the future, regret the past, and blame ourselves for the present. We get frustrated when we can't have what we want, and disappointed when what we like ends. We suffer that we suffer. We get upset about being in pain, angry about dying, sad about waking up sad yet another day. This kind of suffering—which encompasses most of our unhappiness and dissatisfaction—is constructed by the brain. It is made up. Which is ironic, poignant—and supremely hopeful.

For if the brain is the cause of suffering, it can also be its cure.

Virtue, Mindfulness, and Wisdom

More than two thousand years ago, a young man named Siddhartha— not yet enlightened, not yet called the Buddha—spent many years training his mind and thus his brain. On the night of his awakening, he looked deep inside his mind (which reflected and revealed the underlying activities of his brain) and saw there both the causes of suffering and the path to freedom from suffering.

Then, for forty years, he wandered northern India, teaching all who would listen how to:

- Cool the fires of greed and hatred to live with integrity
- Steady and concentrate the mind to see through its confusions
- Develop liberating insight

In short, he taught virtue, mindfulness (also called concentration), and wisdom. These are the three pillars of Buddhist practice, as well as the wellsprings of everyday well-being, psychological growth, and spiritual realization.

Virtue simply involves regulating your actions, words, and thoughts to create benefits rather than harms for yourself and others. In your brain, virtue draws on top-down direction from the prefrontal cortex (PFC); “prefrontal” means the most forward parts of the brain, just behind and above the forehead, and your “cortex” is the outer layer of the brain (its Latin root means “bark”). Virtue also relies on bottom-up calming from the parasympathetic nervous system and positive emotions from the limbic system. You'll learn how to work with the circuitry of these systems in chapter 5. Further on, we'll explore virtue in relationships, since that's where it's often most challenged, and then build on that foundation to nurture the brain states of empathy, kindness, and love (see chapters 8, 9, and 10).

Perspectives on Self-Care

Be careful with all self-help methods (including those presented in this Bulletin), which are no substitute for working with a licensed healthcare practitioner. People vary, and what works for someone else may not be a good fit for you. When you try something, start slowly and carefully, and stop immediately if it feels bad or makes things worse.

Mindfulness involves the skillful use of attention to both your inner and outer worlds. Since your brain learns mainly from what you attend to, mindfulness is the doorway to taking in good experiences and making them a part of yourself (we'll discuss how to do this in chapter 4). We'll explore ways to activate the brain states that promote mindfulness, including to the point of deep meditative absorption, in chapters 11 and 12.

Wisdom is applied common sense, which you acquire in two steps. First, you come to understand what hurts and what helps—in other words, the causes of suffering and the path to its end (the focus of chapters

2 and 3). Then, based on this understanding, you let go of those things that hurt and strengthen those that help (chapters 6 and 7). As a result, over time you'll feel more connected with everything, more serene about how all things change and end, and more able to meet pleasure and pain without grasping after the one and struggling with the other. Finally, chapter 13 addresses what is perhaps the most seductive and subtle challenge to wisdom: the sense of being a self who is separate from and vulnerable to the world.

Regulation, Learning, and Selection

Virtue, mindfulness, and wisdom are supported by the three fundamental functions of the brain: regulation, learning, and selection. Your brain regulates itself—and other bodily systems—through a combination of excitatory and inhibitory activity: green lights and red lights. It learns through forming new circuits and strengthening or weakening existing ones. And it selects whatever experience has taught it to value; for example, even an earthworm can be trained to pick a particular path to avoid an electric shock.

These three functions—regulation, learning, and selection—operate at all levels of the nervous system, from the intricate molecular dance at the tip of a synapse to the whole-brain integration of control, competence, and discernment. All three functions are involved in any important mental activity.

Nonetheless, each pillar of practice corresponds quite closely



to one of the three fundamental neural functions. Virtue relies heavily on regulation, both to excite positive inclinations and to inhibit negative ones. Mindfulness leads to new learning—since attention shapes neural circuits—and draws upon past learning to develop a steadier and more concentrated awareness. Wisdom is a matter of making choices, such as letting go of lesser pleasures for the sake of greater ones. Consequently, developing virtue, mindfulness, and wisdom in your mind depends on improving regulation, learning, and selection in your brain. Strengthening the three neural functions—which you'll learn to do in the pages ahead—thus buttresses the pillars of practice.

Inclining the Mind

When you set out on the path of awakening, you begin wherever you are. Then—with time, effort, and skillful means—virtue, mindfulness, and wisdom gradually strengthen and you feel happier and more loving. Some traditions describe this process as an uncovering of the true nature that was always present; others frame it as a transformation of your mind and body. Of course, these two aspects of the path of awakening support each other.

On the one hand, your true nature is both a refuge and a resource for the sometimes difficult work of psychological growth and spiritual practice. It's a remarkable fact that the people who have gone the

very deepest into the mind—the sages and saints of every religious tradition—all say essentially the same thing: your fundamental nature is pure, conscious, peaceful, radiant, loving, and wise, and it is joined in mysterious ways with the ultimate underpinnings of reality, by whatever name we give That. Although your true nature may be hidden momentarily by stress and worry, anger and unfulfilled longings, it still continues to exist. Knowing this can be a great comfort.

On the other hand, working with the mind and body to encourage the development of what's wholesome—and the uprooting of what's not—is central to every path of psychological and spiritual development. Even if practice is a matter of “removing the obscurations” to true nature—to borrow a phrase from Tibetan Buddhism—the clearing of these is a progressive process of training, purification, and transformation. Paradoxically, it takes time to become what we already are.

In either case, these changes in the mind—uncovering inherent purity and cultivating wholesome qualities—reflect changes in the brain. By understanding better how the brain works and changes—how it gets emotionally hijacked or settles into calm virtue; how it creates distractibility or fosters mindful attention; how it makes harmful choices or wise ones—you can take more control of your brain, and therefore your mind. This will make your development of greater well-being, lovingness, and insight easier and more fruitful, and help you go as far as you possibly can on your own path of awakening.

San Rafael Meditation Group

Open to beginners and experienced practitioners, we meet on Wednesday evenings in downtown San Rafael. “Early-bird” meditation starts at 6:45 with formal instruction at 7:00; meditation ends at 7:30, followed by a brief break, and then a dharma talk and discussion, ending at 8:30. It is led by Rick Hanson, and for more information, check out www.WiseBrain.org/sanrafaelmeditation.html. Newcomers are always welcome!

Being on Your Own Side

It's a general moral principle that the more power you have over someone, the greater your duty is to use that power benevolently. Well, who is the one person in the world you have the greatest power

over? It's your future self. You hold that life in your hands, and what it will be depends on how you care for it.

One of the central experiences of my life occurred one evening around Thanksgiving, when I was about six years old. I remember standing across the street from our house, on the edge of cornfields in Illinois, seeing ruts in the dark soil filled with water from a recent rain. On the distant hills, tiny lights twinkled. I felt quiet and clear inside, and sad about the unhappiness that night in my home. Then it came to me very powerfully: it was up to me, and no one else, to find my way over time toward those faraway lights and the possibility of happiness they represented.

That moment has stayed with me because of what it taught me about what is and isn't within our control. It's impossible to change the past or the present: you can only accept all that as it is. But you can tend to the causes of a better future. Most of the ways you'll do this are small and humble. To use examples from later in this book, you could take a very full inhalation

in a tense meeting to force a long exhalation, thus activating the calming parasympathetic nervous system (PNS). Or, when remembering an upsetting experience, recall the feeling of being with someone who loves you—which will gradually infuse the upsetting memory with a positive feeling. Or, to steady the mind, deliberately prolong feelings of happiness as this will increase levels of the neurotransmitter dopamine, which will help your attention stay focused.

These little actions really add up over time. Every day, ordinary activities—as well as any personal growth or spiritual practices—contain dozens of opportunities to change your brain from the inside out. You really do have that power, which is a wonderful thing in a world full of forces beyond your control. A single raindrop doesn't have much effect, but if you have enough raindrops and enough time, you can carve a Grand Canyon.

But to take these steps, you have to be on your own side. That may not be so easy at first; most people bring less kindness to themselves than to others.



To get on your own side, it can be helpful to make a convincing case for tending to the causes that will change your brain for the better. For example, please consider these facts:

- You were once a young child, just as worthy of care as any other. Can you see yourself as a child? Wouldn't you wish the best for that little person? The same is true today: you are a human being like any other—and just as deserving of happiness, love, and wisdom.
- Progressing along your path of awakening will make you more effective in your work and relationships. Think about the many ways that others

will benefit from you being more good-humored, warm-hearted, and savvy. Nurturing your own development isn't selfish. It's actually a great gift to other people.

The World on the Edge of a Sword

Perhaps most important of all, consider the ripples spreading out from your own growth, imperceptibly but genuinely helping a world full of greed, confusion, fear, and anger. Our world is poised on the edge of a sword, and it could tip either way. Across the planet, slowly but surely, we're seeing increasing

democratization, a growing number of grassroots organizations, and more understanding of our fragile interconnectedness. On the other hand, the world is getting hotter, military technologies are increasingly lethal, and a billion people go to sleep hungry every night.

The tragedy and the opportunity of this moment in history are exactly the same: the natural and technical resources needed to pull us back from the brink already exist. The issue is not a lack of resources. It is a lack of will and restraint, of attention to what's truly happening, and of enlightened self-interest—a shortage, in other words, of virtue, mindfulness, and wisdom.

As you and other people become increasingly skillful with the mind—and thus the brain—that could help tip our world in a better direction.



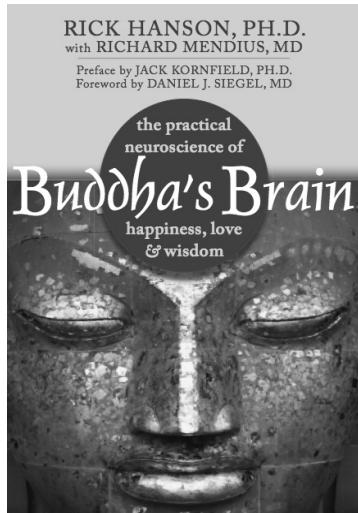
Offerings

Rick Hanson, PhD, and Rick Mendius, MD

1. **Buddha's Brain: The Practical Neuroscience of Happiness, Love, and Wisdom** is now available. You can learn more about it and order it at

[www.rickhanson.net/
writings/buddhas-brain](http://www.rickhanson.net/writings/buddhas-brain).

By Rick Hanson, PhD (with Rick Mendius, MD; preface by Jack Kornfield, PhD and Foreword by Dan Siegel, MD), this book draws on the historically unprecedented integration of modern neuroscience and ancient contemplative wisdom to show you how to use your mind to change your brain to change your life.



2. The “two Ricks” – Mendius and Hanson – have also produced a 3 CD set with Sounds True called **Meditations to Change Your Brain**. This program combines fascinating insights with seven powerful guided practices that you can use routinely to change your own brain for the better. For more info, go to Amazon (www.amazon.com/Meditations-Change-Your-Brain-Hanson/dp/159179711X/ref=sr_1_1?ie=UTF8&s=books&qid=1247945310&sr=8-1) or Sounds True (<http://shop.soundstrue.com/shop.soundstrue.com>SelectProd.do;jsessionid=D684B884BEAF8107013C3B4395A03811?prodId=1979&manufacturer=Sounds%20True&category=Spiritual%20Teachings&name=Meditations%20to%20Change%20Your%20Brain>).

3. The **Just One Thing** newsletter offers one simple practice each week will bring you more joy, more fulfilling relationships, and more peace of mind and heart. It's the law of little things: a

small thing repeated each day adds up over time to produce big results. See www.rickhanson.net/writings/just-one-thing.

4. Through R. Cassidy Seminars, Rick Hanson will be presenting **Taking in the Good** as a continuing education workshop to mental health professionals. Through using the neural machinery of memory in clever ways, you can defeat the negativity bias of the brain, which particularly remembers and then reacts to stressful or painful experiences – even though most of life is positive or neutral. The results include greater self-confidence, better mood, and a gradual healing of upsetting, even traumatic, experiences. The locations and dates are

Friday, October 2: San Francisco, CA
Friday, October 9: Sacramento, CA
Friday, November 13: Los Angeles, CA
Saturday, November 14: Pasadena, CA

See www.academeca.com/Amedco/SeminarInfo.aspx?seminarId=417 for more information.

5. At Spirit Rock, in 2009, these daylongs with Rick Mendius and Rick Hanson and are scheduled:

- **Resting in Emptiness: The Evolution of Awareness and the Transcendence of the Self**, on Saturday, November 7. This workshop will address the thorny and fundamental question of . . . “me, myself, and I.” The self – with its tendencies to grasp after possessions and take things personally – is perhaps the premier engine of suffering. We’ll explore the evolution of the apparent self in the animal kingdom, and the ways in which the self is real and is also not real at all, coming to rest more and more in the underlying spacious awareness in which self appears and disappears. (www.spiritrock.org/calendar/display.asp?id=RR4D09)

- **The Hard Things That Open the Mind and Heart: Practicing with Difficult Conditions**, led with James Baraz, on Sunday, December 13. This is for people grappling with difficult conditions – both internal and external – and for caregivers and friends who support those individuals. These include challenges with the body, mind, and life circumstances. We'll cover Buddhist perspectives and practices for difficult conditions; lovingkindness for oneself and for any being who suffers; brain-savvy ways to strengthen your capacity to be with the hard stuff; and methods from the intersection of the dharma and neuroscience for lifting mood and cultivating joy. (www.spiritrock.org/calendar/display.asp?id=JB3D09)

6. At InsightLA, Rick Hanson will be teaching **The Neurology of Awakening** on Sunday, November 15. This foundational workshop summarizes the practical neuroscience of mindfulness, and deep meditative absorption (including up to the jhanas, which are non-ordinary states of awareness) leading to transformative insight. For more information, go to www.insightla.org/schedule_details.asp?adref=sch&event_ID=458.

7. At Khandro Ling Buddhist Centre in Macclesfield, Cheshire, England on Wednesday, November 18, Rick will be giving a public lecture on **Buddha's Brain: Neuroscience, Meditation, and Well-Being**. For more information, go to www.khandroling.org.

8. At the University of East London, the conference on **Mindfulness and Well-Being: From Spirituality to Cognitive Neuroscience** will be held on November 20 and 21. Rick will be giving several talks and a workshop. Contact Dr. Patrizia Collard at drcollard@stressminus.co.uk for more information.

9. At the London Insight Meditation Center, Rick Hanson will be presenting **The Neurology of Awakening** on Sunday November 22. See www.lon

doninsightmeditation.org.uk/programme/schedule for more information (click on Daylong Retreats).

10. Rick Hanson has a chapter, **7 Facts about the Brain That Incline the Mind to Joy**, in *Measuring the Immeasurable* – which is chock full of essays from luminaries like James Austin, MD, Larry Dossey, MD, Daniel Goleman, PhD., Candace Pert, PhD, Marilyn Schlitz, PhD, Dan Siegel, MD, Charles Tart, PhD, and Cassandra Vieten, PhD. Check it out at <http://www.amazon.com/Measuring-Immeasurable-Scientific-Case-Spirituality/dp/1591796547>.

11. Sounds True offers **Meditations for Happiness** by Rick Hanson, Ph.D. It's 3 CD's worth of talks and brain-savvy exercises for increasing your happiness, with an emphasis on experiential practices and practical tools. It is offered as an inexpensive download to your computer, where you can listen to it or burn it to CD's or transfer it to an iPod.

This program truly turned out to be pretty great, and here's a comment about it from the author, Annie Spiegelman:

On his new "Meditations for Happiness" program, benevolent Rick Hanson guides me to sit down and face my inner critic – and then actually see it as a form and shrink it. Being a Master Gardener, I see the critic as a gnome who tiptoes into my brain when no one is looking, with those tiny pointy shoes, and makes me doubt myself. I shrink him down to the size of a snail and toss him out. He knows nothing. The shoes are a dead giveaway.

Here's the link to this program at Sounds True: <http://shop.soundstrue.com/shop.soundstrue.com>SelectProd.do;jsessionid=91E06512A8A5D4D222A639DA4C1ED2F9?prodId=1715&manufacturer=Sounds%20True&category=Exploring%20the%20Psyche&name=Meditations%20for%20Happiness>

Fare Well.

May you and all beings be happy, loving, and wise.