

Meditation—The Controlled Psychophysical Self-Regulation Process That Works

| By Stephan A. Schwartz |

The SchwartzReport tracks emerging trends that will affect the world, particularly the United States. For EXPLORE, it focuses on matters of health in the broadest sense of that term, including medical issues, changes in the biosphere, technology, and policy considerations, all of which will shape our culture and our lives.

The sense of spiritual consciousness, connecting to something greater than oneself, is one of the most intoxicating realms a human can enter. Across the millennia such experiences have shaped the lives of individuals and, upon occasion, whole cultures. The experiences and their effects are historical fact. The question for science is not to deny them, but to seek to understand the processes by which they occur, and the domain into which they lead us. Central to these true stories is a special state of mindfulness, what the psychologist Charles Tart described in his classic 1972 *Science* paper as a state of consciousness.¹

Whether it is a physicist achieving understanding of a physical principle, a spiritual pilgrim having an epiphany, a great painter or composer creating a masterpiece, or a remote viewer describing a teacup hidden in a closet, all report that when the experience is happening, when they feel that they are “in the zone” they are in a state of nonlocal consciousness. They experience themselves as being in a domain in which space and time are just informational enrichers, not limitations. They all report a timeless spaceless connection to something greater. For each the experience is modulated by their context

and their intention, but regardless of whether they are physicists, painters, or meditators, it is essentially the same.

Although such experiences occur spontaneously only once or a few times in an individual life, almost every human culture has discovered they can be evoked and has developed practices, usually in a spiritual or religious context, for attaining this state. Similarly, all the martial arts have this component of mindful discipline, a practice of focusing intentioned awareness. Collectively, we have come to call these practices meditation.

This ability to open to nonlocal consciousness is a function of coherence, that is, intentioned awareness, and the ability to focus. There are two ways people achieve this state on a regular basis—one negative, the other positive—and the outcomes are quite different. The negative way is through the development of neurotic obsessions that compel us to such focus—this is, the realm of psychiatry. It can cause great pain and dysfunctionality. The positive way is the kind of training that comes from the consistent practice of meditation.

Of all the things that you can do to come to know yourself, nothing will serve you as well as developing the practice of meditation. Although meditation is often associated with Asian cultures, it is not Christian, Jewish, Buddhist, Muslim, Satanic, or any faith at all. It can be done in the name of any of these faiths, or without faith in a religion—as distinct from a spiritual sense. It is a single term defining many practices, some of which have no spiritual component whatever.

The purpose these paths—whether Christian, Muslim, or something else—all

share is they are designed to give practitioners a measure of focused control over mind and body. Inevitably the paths incorporate some model of nonlocal consciousness, because the experience of mind connected to a greater whole is virtually universal among long-time meditators. Empirical observation across millennia has vouchsafed this effect. One ancient source of particular interest is the Patanjali Yoga Sutras, which date at least to the second century BCE. The Sutras speak at length about moving into nonlocal awareness through meditation.

Psychologist William Braud, who has made a particular study of this, notes: “The sixth, seventh, and eight ‘limbs’ of ashtanga Yoga are dharana (concentration), dhyana (meditation), and samadhi (profound absorption), respectively.”²

The Patanjali source refines this further, Braud explains. “The repeated continuation, or uninterrupted stream of that one point of focus is called absorption in meditation (dhyana), and is the seventh of the eight steps (tatra pratyaya ekatanata dhyanam).” When these three are practiced together, the composite process is called samyama.

Samyama might be translated as constraint; thorough, complete, or perfect restraint; or full control; it might also be translated as communion or mind-poise. Samyama conveys a sense of knowing through being or awareness through becoming what is to be known. Through mastery of samyama comes insight (prajna), and through its progressive application, in stages, come knowledge of the Self and of the various principles of reality (tatvas). With increasing yogic practice come a variety of mystical, unitive experiences,

states, conditions, or fulfillments—the various samadhis—along with the attainments or powers (siddhis).²

Although couched in Buddhist terms the Putanjali Sutras describe the same insights and processes concerning nonlocal functioning that modern research has discovered. For the first time in what I believe will be seen as one of history's great confluences, the practices of the spiritual and martial traditions and the practices of science have found common ground, and reached the same conclusions.

THE PHYSICAL EFFECTS OF MEDITATION ON THE BRAIN

Over a 1,000 papers have been published on Meditation in the peer-reviewed literature between 2006 and 2009. There is not one meditation literature, but multiple branches in several disciplines, from physics to pastoral, concentrating on everything from using meditation to end addiction,³ to symptom reduction in Fibromyalgia.⁴ Much of the research particularly focuses on stress reduction, sleep problems, and attention issues. But I want to concentrate in this essay principally on the emerging evidence on the lasting effects meditation has on our neuroanatomy, particularly our brains.

By 2004 it was already well established that electroencephalogram patterns of meditators were different than nonmeditators. But the question was, did this mean there was enduring fundamental change in the brains of meditators? To answer this question a team at the Psychiatric Neuroimaging Research Program, Massachusetts General Hospital in Boston, headed by Sara Lazar used MRI to scan the brains of long-term meditators to see if the physical structure of their brains really were different. In 2005, they reported their findings in *Neuroreport*.⁵

Brain regions associated with attention, interoception and sensory processing were thicker in meditation participants than matched controls, including the prefrontal cortex and right anterior insula. Between-group differences in prefrontal cortical thickness were most pronounced in older participants, suggesting that meditation might offset age-related cortical thinning. Finally, the thickness of two regions correlated with

meditation experience. These data provide the first structural evidence for experience-dependent cortical plasticity associated with meditation practice.

In 2009, at the Center for Functionally Integrative Neuroscience, at Denmark's Aarhus University Peter Vestergaard-Pulsen led a team seeking to explore the effects of long-term meditation on brain structure. They found, as they reported in their paper in *Neuroreport*.⁶

Using magnetic resonance imaging, we observed higher gray matter density in lower brain stem regions of experienced meditators compared with age-matched nonmeditators. Our findings show that long-term practitioners of meditation have structural differences in brainstem regions concerned with cardiorespiratory control. This could account for some of the cardiorespiratory parasympathetic effects and traits, as well as the cognitive, emotional, and immunoreactive impact reported in several studies of different meditation practices.

Half a world away and a few months later that same year a research team at the Laboratory of Neuro Imaging, Department of Neurology, UCLA School of Medicine publishing in *Neuroimage* reported:⁷

... meditation practice has been shown not only to benefit higher-order cognitive functions but also to alter brain activity. Nevertheless, little is known about possible links to brain structure. Using high-resolution MRI data of 44 subjects, we set out to examine the underlying anatomical correlates of long-term meditation with different regional specificity (i.e., global, regional, and local). For this purpose, we applied voxel-based morphometry in association with a recently validated automated parcellation approach. We detected significantly larger gray matter volumes in meditators in the right orbito-frontal cortex (as well as in the right thalamus and left inferior temporal gyrus when co-varying for age and/or lowering applied statistical thresholds). In addition, meditators showed significantly larger volumes of the right hippocampus. Both or-

bito-frontal and hippocampal regions have been implicated in emotional regulation and response control. Thus, larger volumes in these regions might account for meditators' singular abilities and habits to cultivate positive emotions, retain emotional stability, and engage in mindful behavior. We further suggest that these regional alterations in brain structures constitute part of the underlying neurological correlate of long-term meditation independent of a specific style and practice.

The work of Yi-Yuan Tang of Dalian University of Technology in China and Michael Posner of the University of Oregon will end my short survey. Their work confirmed once again that meditation literally changes one's brain. In the *Proceedings of the National Academy of Science* in August 2010 at the University of Oregon 45 volunteers were assigned to either an integrative body-mind training (IBMT) for meditation or a control group that did only a relaxation program.⁸ In scanning the brains of both groups after training they found that the brains of those individuals who engaged in the IBMT form of meditation showed greater change than those who just used a relaxation technique and that.⁸

... 11 h(ours) of IBMT increases fractional anisotropy (FA), an index indicating the integrity and efficiency of white matter in the corona radiata, an important white-matter tract connecting the ACC to other structures. Thus IBMT could provide a means for improving self-regulation and perhaps reducing or preventing various mental disorders.

Note the time for changes in brain structure to occur—only 11 hours.

MEDITATION, PAIN, STRESS REDUCTION, AND MEMORY

In June 2010, writing in *Brain*, Christopher Brown and Arthur Jones of the Human Pain Research Group at the University of Manchester in the United Kingdom, reported the results of a study designed to assess what they called "affective appraisal of pain." They did this by inflicting pain produced by a laser on a control group as well as an experienced meditator group. They found:⁹

More experienced meditators perceived the pain as less unpleasant relative to controls, with meditation experience correlating inversely with unpleasantness ratings. ERP source data for anticipation showed that in meditators, lower activity in mid-cingulate cortex relative to controls was related to the lower unpleasantness ratings, and was predicted by lifetime meditation experience. Meditators also reversed the normal positive correlation between medial prefrontal cortical activity and pain unpleasantness during anticipation. Meditation was also associated with lower activity in S2 and insula during the pain-evoked response, although the experiment could not disambiguate this activity from the preceding anticipation response.

The Human Pain Research Group reflects the sentiment of a growing number of researchers exploring the mind-body relationship when Dr. Brown says, "Meditation is becoming increasingly popular as a way to treat chronic illness such as the pain caused by arthritis. Recently, a mental health charity called for meditation to be routinely available on the NHS to treat depression, which occurs in up to 50% of people with chronic pain. However, scientists have only just started to look into how meditation might reduce the emotional impact of pain."¹⁰

This issue of pain control through psychophysical self-regulation is far from an academic consideration. In the United Kingdom, 40% of the people with chronic pain report they get inadequate support for the management of their pain, and the treatments offered do not work.³ In the United States, it is not so very different. Pain management is a multibillion dollar business with problematic outcomes. Meditation can make a difference.

The role of meditation in stress reduction is so well described that I will do no more than mention the general effect, and focus on what may be meditation's greatest gift to this generation: its effectiveness in helping troops cope with the horrors of modern asymmetrical warfare, and to recover from the posttraumatic stress disorder (PTSD), which afflicts so many thousands of them.

Vanessa Gregory, writing in *Men's Journal*, paints a picture of how meditation has entered the Marine Corps:¹¹

Two summers ago at the Marine Corps Base in Quantico, Virginia, a group of reservists prepared for a tour of duty in Iraq. Twelve-hour days were jammed with rifle qualifications, counterinsurgency training, emergency medical courses, and—last but not least—moments spent in total silence. "You'd see men sitting in the lotus position in their field uniforms with rifles across their backs," recalls Major Jason Spitaletta. The Marines were part of a study, partially funded by the Department of Defense, testing what's best described to the layperson as meditation's potential to increase the mind's performance under the duress of war.

The kind of meditation the Marines are taught, a nonsectarian focusing, has been confirmed in other research to make a significant difference in lowering stress, improving one's capacity for empathy—empathy is much more natural when one has experienced all life as interconnected and interdependent—and to increase the power of one's memory.

Sara Lazar's group at the Massachusetts General Hospital's Psychiatric Neuroimaging Research Program continues to probe the effects of meditation on the brain structure, and they have discovered that "Participating in an eight-week mindfulness meditation program appears to make measurable changes in brain regions associated with memory, sense of self, empathy and stress."¹² Lazar says, "Although the practice of meditation is associated with a sense of peacefulness and physical relaxation, practitioners have long claimed that meditation also provides cognitive and psychological benefits that persist throughout the day. This study demonstrates that changes in brain structure may underlie some of these reported improvements and that people are not just feeling better because they are spending time relaxing."¹²

MEDITATION AND MYSTICISM

Meditation is definitely associated with mysticism, the inner path to experiencing transcendence. It is a foundation of most spiritual paths of Asian origin, and with good reason. The same rational empirical basis by which these cultures developed acupuncture and the martial arts led them also to develop inner-listening practices.

They observed over generations that there is a positive benefit to developing such inward-looking skills. But it is equally true that meditation lies at the heart of the inner-wisdom of both Judaism—particularly the cabalistic practices—and Christianity.

Psalm 19:14: Let the words of my mouth and the meditation of my heart be acceptable in thy sight, O Lord.

Psalm 49:3: My mouth shall speak wisdom; the meditation of my heart shall be understanding.

The practice of meditation is also at the core of the Sufi schools of Islam, to non-Moslems the best known adherents of which are the dervishes. It is part of the traditions of pre-Columbian American cultures as well. The extended awareness of the Vision Quest is one example of it use, and it goes on and on across the rainbow of human culture. It is notable how similar so many of these rituals are: the use of repetition—saying aloud, or in one's mind, sounds or words or phrases. Sometimes it is not even a word, just the sibilant sound of the breath as it moves in and out of one's lungs. It is this focus on a repetitive sound that helps produce the effect.

A decade ago it was already clear to Harvard researcher physician Herbert Benson, MD, who has conducted studies seeking to understand how the mind affects the body during meditation and prayer for over 40 years, that for "For Buddhists, prayer is meditation. For Catholics, it's the rosary. For Jews, it's called dovening. For Protestants, it's centering prayer. Every single religion has its own way of doing it."¹³ Whatever it is called, and however it is done, meditation almost inevitably produces the sense of connection with a greater whole, and often very clear experiences of nonlocal consciousness.

Neurologist Olaf Blanke of the University Hospital of Geneva, Switzerland, for instance, published a paper in *Brain* describing how the brain generates out-of-body experiences.¹⁴

All of it, collectively, presents us with a picture of the complex brain activity associated with meditation. As meditators go deeper and deeper into their discipline, although the body calms, intense activity occurs in the parietal lobe of the brain. This portion of your brain controls your physical orientation in space and is responsible for making the distinction between your sense of "self" and the outer

world, that which is other than “you.” Dr. Blanke argues that all the lobes of the brain play a part in something as complex as religious experience, but that the temporoparietal junction is a prime node of that network.

SYMBOLS, MANTRAS, AND NUMINOSITY

This all-brain experience is stimulated by sense impressions we have, and the meanings we associate with them. Perhaps this explains the widespread use, throughout human history, of the use of symbols and phrases such as mantras or set prayers.

Meditation research over the past four decades has documented a kind of deep “stillness” that affects the entire brain. When this occurs, the frontal and temporal lobe circuits—which track time and create self-awareness—seemingly disengage. The mind-body connection dissolves. The limbic system is responsible for assigning emotional values to persons, places, everything in our total life experience. This assignment is based on a complex set of stimulus responses that collectively give something the quality I call numinous, using it in the sense Swiss psychoanalytical pioneer Carl Jung used it, “We should not be in the least surprised if the empirical manifestations of unconscious contents bear all the marks of something illimitable, something not determined by space time. This quality is numinous . . . numina are psychic entia . . .”¹⁵

Because the limbic system, among other things, regulates relaxation and ultimately controls the autonomic nervous system, heart rate, blood pressure, and metabolism, it produces both emotional and physiological effects when you react to the numinous quality of a specific object, person, or place. These reactions produce real emotional and physiological states. This is why your hair “stands on end,” your skin “crawls,” your stomach “lurches,” or your heart “beats faster.”

Our responses are more complex than they may first appear. For instance, one might react not only to a single example of a category but the category itself, because memory also interacts with the limbic system. For example, if you are an avid baseball fan you might react to the specific baseball you caught at a big league game when you were a child. But you might also

have a reaction, although perhaps not as strong, to any baseball. Or, if you were arrested as a youth, you may react to any picture of any policeman. If you were frightened by a graveyard as a child, a picture of a cemetery could evoke a response. Because meditation affects the limbic system, developing the discipline allows one to become more volitionally in control of these responses. The practice has a calming effect that leaves us relaxed and physiologically more evenly regulated. This, in turn, allows us to be coherently focused because we are less distracted by our inner dialogue and emotions, as well as our physiological responses.

MEDITATION TECHNIQUES

The physical, emotional, and mental benefits reported for those who meditate, in comparison with control populations who do not, make developing the practice an important positive life decision. But how to do it? There are literally hundreds of techniques.

I do have to proffer one warning. People who use any meditation technique tend, over time, to change their world view. They come to feel they are not alone, that all life is interconnected and interdependent, and that this life network, including themselves, is connected to something profoundly good that is greater than themselves. If it is important to you to remain a materialist, and/or an atheist, meditation may be something you do not want to undertake.

I should also say that meditation is at once the simplest and hardest thing you will ever do. It is simple to do it a single time, or even for a week or two, but it is hard to do as a regular practice. Research has shown that most of what we do during our waking hours is unconscious reactive behavior. Presented with a person of a different race, or religion, or ethnic background, or sexual orientation, or social status, or economic group, we immediately have an entire set of programs that kick in to tell us how to react. What passes for thought about this person is really, upon closer examination, little more than running the program until you fit them into the appropriate category so that a judgment can be made as to how to react to them. It is the same with food, or clothes, or music, or pets, or cars. We each have

thousands of these little subroutines, little bots that run our lives down to the smallest detail. The energy they have to do this comes from ourselves, and they are defensive of their prerogatives. When you try to reclaim this delegated autonomy, and to integrate yourself so that your choices are made consciously and not by the bots, they will fiercely resist.

Like the story of the Golem, a creature of legend said to be created by mystical Jewish alchemists to defend their community, the bots live only to serve as programmed. The reality is, however, that there is a price for their service: resistance to reasserting your core autonomy. Meditation focuses you, independent of your religious or spiritual views. It reclaims autonomy and allows you to live in what most spiritual traditions call the “now,” by which is meant you make a decision freed from the drag of biases derived from the past, or in anticipation of a particular future. However you choose to practice it, meditation will subtly but unquestionably change you and make you feel more in control of your life, and will help you make choices that are actually what you want and not what the bots want. On the basis of the evidence accumulated through research to date, the practice of meditation will also make it easier for you to be consciously aware of the nonlocal linkage that lies at the core of your beingness.

Here is the technique that I have developed and personally used for almost four decades. It imposes no beliefs, it offends the tenets of no religion, and one need not be religious to use it. I want to be clear here. This is but one technique of the many available. If you find something else that works better, do it. The important point is to develop the habit of daily meditation.

1. Choose a regular time: Select a time each day when you can sit undisturbed for 20 minutes. No phones. No interruptions. No unnecessary stimulus from radio or television. You will probably find that this becomes the busiest time of the day. After a few weeks you will suddenly have any number of things that your mind tells you must be done only during those 20 minutes. Do not give way. Persevere.

2. Select a spot: Select a spot in your house or office that you use for your meditation session. You are creating your own

sacred space. Doing so in conscious awareness that this is what you are doing, is part of the process.

3. Find a Central Phrase: There is some phrase or sentence you have heard or read that has deeply impressed you, or with which you resonate or wish to align yourself. It might be something from the Bible, or a favorite book. Or a verse in a song, or poem. It should be something that has a strong positive association in your mind, whether or not it would make sense to another person.

4. Keep your phrase a secret: If you tell others about this they will say your word, and share with you their attitude about your choice. When you go to say it their words, their views, may intrude into your mind. Their pronunciation, their intonation may be what you hear. By choosing your phrase you empower it as a goal to which you aspire; keep it a secret.

5. Examine your life: Consider where you are, and where you aspire to be. Consider this from the physical, emotional, mental, and spiritual levels. Look for patterns. In considering the physical, let's say you overeat. It has been a life-long problem. This is the negative. The positive is you wish to eat consciously only foods that are good for you and in appropriate amounts. Reduce the pattern of behavior or response you have identified in yourself, and wish to change, to a word or a phrase. Pick words or phrases fitting each of the levels.

6. Draw a bulls-eye: Draw a bulls-eye with four concentric circles of increasing diameter. Label in the innermost circle "spiritual," the next "emotional," next "mental," and finally, "physical." I have split the emotional and the mental because research suggests, and my own experience confirms, that they are often confused. When people are asked how they feel, they often respond by saying what they think. "How do you feel about what your friend just did?" "I don't think she should have said that to me." That's thinking. "I feel surprised and hurt that she has never told me this before." That's feeling.

7. Choose four words of intentioned purpose: Reduce those patterns to four words or phrases. Words or phrases that embody all the energy you have invested in these patterns, and your aspirations to make their positive aspects the reality of your life. In their appropriate circle write

in the words of intentioned purpose you have chosen. An emotional pattern might be that you feel you allow your partners to disregard your feelings, and then you feel angry. The positive of this might be that you will say what your feelings are, and choose only to be involved with people who will acknowledge them. Your word might be "feelings." Be as honest as you can, and don't tell anyone about it, or you will lie to yourself. A mental pattern might be your sense that you do not think clearly enough about some task you have set yourself, so your word might be "clarity."

A spiritual pattern might be your sense of separation. An existential sense of alienation. In this case your word might be "oneness. When you have carefully chosen your words or phrases expressing your intentioned purpose—and this may take you days, or even weeks to work them all out—keep them secret." For this technique to work you must be absolutely as honest as you can be, and I have found this is hard for most people to do when others know these things about them.

8. Once a day in your chosen place, at your chosen time, be present to meditate for 20 minutes: Sit comfortably. Loosen collars, belts, or shoe laces; anything that constricts.

9. Look at a watch or clock: Visualize the hands as they will be in 20 minutes: you will be surprised at how accurate you become, and this time estimating skill will carry over to other aspects of your life. Many meditators regularly give themselves the suggestion to awaken at a certain time, and need no alarm clock.

10. Say your Central Phrase in your mind: Repeat it. Repeat it again. Wait. For awhile there will be nothing. Then you will find thoughts bubbling up. If the thoughts pertain to your phrase—whether anyone else would think they did or not does not matter—think them. After awhile you will find your thoughts wandering to matters that do not, in your estimation, have anything to do with your Central Phrase. When this happens, stop. Clear your mind. Take a deep breath. Say your Central Phrase again. Then again. Then stop. There will be nothing for awhile. After a bit thoughts will bubble up. If the thoughts pertain to your Central Phrase, think them. After awhile they will wander to other topics. When that happens repeat the process again. In the course of a single

session you may have to do this several times but, over time, you will find you need to do it less and less often.

Your thoughts may give you great insight into something going on in your life, or about which you are thinking. But it is in the periods of "silence" that the really interesting events in meditation occur. It is here that the transcendent experiences that change people's lives take place. When these experiences will happen cannot be predicted, but they will happen. What happens has to be experienced to be understood.

11. Close with your words of intentioned purpose: At the end of your session slowly say in your mind your "physical" word or phrase of power. Pause a moment. Then say your "emotional" word or phrase. Then your "mental" one and, finally, your spiritual word or phrase. It might help to visualize the words going out like arcs of light, or that you are plugging into a greater whole. Whatever works best, do that. Over time you will find that one or the other of your words or phrases will go "flat," as if the energy has gone out of it. Some words and phrases will go flat in weeks, others may take years before they need to be retired. It depends on you and the dance of your life. When this happens examine your life again. You may find that the goal you sought with that word has been attained. The change is usually subtle, and the transformation so gradual you have hardly noticed. But now you are there. When this happens select a new word or phrase in the same way as the earlier one, and begin again. Using this technique you can transform your life.

There will come a time when even your Central Phrase goes "flat." When this happens consider what has changed. Really come to understand it. Make it part of your conscious life. Then select a new Central Phrase, and begin the process again.

CONCLUSION

There are a lot of things one might say about what is happening to you physiologically during meditation, but this can be summed up by saying that your brain changes, your blood chemistry changes, your stress level goes down, your muscles relax, your heart beat slows, your blood pressure decreases, and your sense of well-being increases. Not bad for 20 minutes.

Meditation gives you the ability to focus. Its reward is a kind of mental coherence that is hard to achieve in other ways, and it is this coherence that seems to bestow spiritual, mental, emotional, and physical health on long-time meditators. If you will commit to a daily practice for just 90 days, I believe you will find good reasons for continuing.

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