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Friday, January 10, 2003
By Sharon Begley

IT'S ONLY the second week of the new year and already that whole resolution thing is falling apart for some of you, isn't it? Maybe you haven't aimed high enough. Forget the vows to quit smoking, lose weight and other picayune promises. Start 2003 off right—with a new brain.

Last October, when this column excerpted a book I co-wrote, The Mind and the Brain, many readers asked whether the kinds of alterations in brain wiring described there could be induced by meditation. Practicing the violin, for instance, or exercising a stroke-impaired arm both alter connections among brain neurons, producing exceptional musical skill or a return of mobility. But no one had systematically examined whether meditation can kick-start such “neuroplastic” changes.

For neuroscientist Richard Davidson, the idea of doing so took shape at a meeting with the Dalai Lama in 2000. Over five days in Dharamsala, India, he and other invited scientists and philosophers briefed the Dalai Lama on the latest understanding of destructive emotions. (A book in stores this week, Destructive Emotions: How Can We Overcome Them? by Daniel Goleman, recounts that meeting.) Out of the dialogue in Dharamsala came the idea of exploring how meditation, Buddhist or otherwise, might change the brain and, in particular, its emotional circuitry.

Back in his lab at the University of Wisconsin, Madison, Prof. Davidson and his team recruited employees of a local biotech firm. A randomly selected 23 received meditation training once a week, for two-to-three-hours, for eight weeks. Jon Kabat-Zinn, professor emeritus of the University of Massachusetts Medical School in Worcester, taught them the technique called mindfulness, in which the meditator views passing thoughts as an impartial and nonjudgmental observer. Sixteen employees received no such training.

The resulting brain differences were clear, as the UW researchers will report in an upcoming issue of the journal Psychosomatic Medicine. After the eight weeks, and again 16 weeks later, EEG measurements showed that activity in the frontal cortices of the meditators had shifted: There were now more neuronal firings in left than right regions nestled just behind the forehead. That pattern is associated with positive feelings such as joy, happiness and low levels of anxiety, Prof. Davidson and others had found in earlier studies. The control group showed no such right-to-left shift.

The results are still preliminary, and the number of subjects is relatively small. Earlier claims for the power of mindfulness were called into question last year, when a review by Scott Bishop of the University of Toronto found that many of the studies were “rife with methodological problems.” Although "the available evidence does not support a strong endorsement" of mindfulness, he concluded, “there is some evidence it may hold some promise.”

The UW research avoids the worst of the methodological pitfalls, such as lack of a control group, and also fits with a long line of neuroplasticity studies on animals and people. These show that paying attention is a sine qua non for neuroplastic changes, and that just thinking about repeated movements can in some cases change the brain as extensively as the movements themselves. Focused attention is a hallmark of mindfulness meditation.

EEGs don't have fine enough spatial resolution to reveal what synaptic changes caused the shift in frontal cortex activity from right to left. For that, the UW researchers are using other neuro-gadgets.

Through MRI, they're examining whether meditation strengthens connections between a region of the prefrontal cortex and a brain structure called the amygdala. A little almond-shaped center deep in the brain, the amygdala is involved in such negative emotions as fear, anger, anxiety and depression. Inhibitory signals from the prefrontal cortex appear to rein in the amygdala like a good yank on a kite string. The stronger or more numerous those "stop firing!" signals, the stronger the inhibition.

“It appears that the inhibitory signal reaching the amygdala can be modulated voluntarily,” says Prof. Davidson. A newer technique, called diffusion tensor imaging, will show whether meditation induces actual structural changes in the connections between the frontal lobes and amygdala.

The plasticity of connections between the thinking and feeling regions of the brain casts doubt on the belief that each of us has a “set point” for happiness, and that neither a Powerball win nor a Sept. 11 tragedy budges it for long. If inhibitory connections between the frontal lobes and the amygdala can be strengthened in an enduring way, then perhaps you can voluntarily shift that not-so-set-point.

“I suspect that the set point is more moveable than we think, and that meditation can move it,” says Prof. Davidson. “The idea that our brains are the result of the unfolding of a fixed genetic program is just shattered by the data on neuroplasticity.”

Not a bad thought for the new year.