

Professor
Kathy Sykes
gets into
the Zen zone
at Bristol
University

Changed my mind

TV scientist Kathy Sykes finds that meditation can alter brain structure. Barbara Lantin reports

Kathy Sykes, a Bristol University professor, has long known that if she does not find at least 30 minutes a day in her frantically overcrowded schedule to lie down and listen to music, she is grumpier, more tired and less able to concentrate.

What Professor Sykes, who holds the chair in the Public Engagement of Science and Engineering at Bristol, did not realise until recently is that she was, in effect, practising a fairly crude form of meditation. She also didn't know that there was growing evidence to show that this ancient practice can make people healthier and happier. It may even increase life span, alter brain structure and change personality.

Ancient traditional therapies do not always stand up to close scientific scrutiny. But when Professor Sykes put meditation under the metaphorical microscope for the second series of *Alternative Therapies: The Evidence*, which she is presenting on BBC Two on Monday, she was surprised to find that the saffron-robed monks of Kathmandu and the white-coated scientists of Harvard shared more common ground than might have been expected.

"Several people have told me that meditation can affect your emotions," she says, "and one of the areas of the brain that scientists are finding may be affected by meditation is involved in

processing emotions, among other things. These are early days and we need more trials, but this is potentially very exciting."

There are signs that mainstream medicine has already started to sit up and take notice of meditation. Mindfulness-based cognitive therapy (MBCT), which is about 80 per cent meditation, has been approved by the National Institute for Health and Clinical Excellence (NICE) for use with people who have experienced three or more episodes of depression. And MBCT is now offered by some UK primary care trusts.

Finding a state of calm

About ten million people meditate every day in the West and, while there are many different techniques, the purpose is always to focus the mind — sometimes through the use of a mantra, a sound or the breath — and promote a state of calm.

Although Professor Sykes had always found her own *ad hoc* methods useful, she noticed a change after her visit to Kathmandu for instruction with Matthieu Ricard, a Buddhist monk who has been meditating for more than 30 years. "It would be absurd to say that I have learnt to meditate when people spend a lifetime doing that, but when I try to meditate now it does have a more powerful effect," she says.

"My dad died from cancer about two months before I made the programme, but I had not cried about him for a while because I was just so busy filming. Matthieu had suggested I try to focus on unconditional love so, the next time I was trying to meditate, I thought about that and inevitably about my love for my dad. Within milliseconds I was bawling my eyes out. It was quite an intense experience and I found it comforting in my grief.

"Not long ago, I was on a crowded train where there was standing-room only going from Paddington to Bristol. I sat cross-legged on the floor to meditate and felt like I was transported to a delightful place. It was glorious to feel it was possible to 'escape' like that."

As a scientist, Professor Sykes wanted to know what was happening to her body to make her feel this way, so she checked into the famous Massachusetts General Hospital, where Dr Herbert Benson, a Harvard Medical School professor, put her through a barrage of tests.

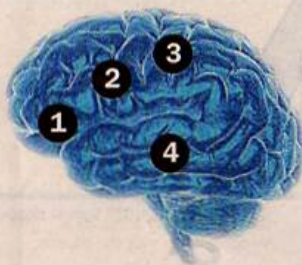
After hooking her up to a range of monitors "like a lab rat", doctors measured her resting pulse, muscle tension, respiration and sweat. They then subjected her to some humiliating mental arithmetic on camera, during which her stress levels and all her readings soared.

But after a short period of meditation, her pulse and breathing dropped below the resting rate. Dr Benson calls this the "relaxation response" and believes it can help with a wide



RICHARD CANNON

Brain meditations



- 1. Prefrontal cortex** Associated with emotion. It was found to be more active in meditators than non-meditators.
- 2. Anterior cingulate cortex** This area is more active in meditators, suggesting that they have greater mental wellbeing.
- 3. Somatosensory cortex** This area is associated with attention span and was also shown to be thicker in meditators.
- 4. Auditory cortex** Processes sound. Was found to be thicker in meditators.

range of conditions, including heart disease, asthma, diabetes and infertility. "To the extent that any disorder is caused or made worse by stress, regular elicitation of the relaxation response will counteract that condition," he says.

Meditation changes the brain

For Professor Sykes, the most exciting part of her investigation took place in the laboratories, where scientists are demonstrating that meditation appears to be associated with changes in the brain. These studies suggest that we could all benefit from regular meditation.

MRI scans of long-term meditators have shown greater activity in brain circuits involved in paying attention. When disturbing noises were played to a group of meditators undergoing an MRI scan, they had relatively little effect on the brain areas involved in emotion and decision-making among those with the most experience of meditation.

"Attention can be trained in a way that is not that different to how physical exercise changes the body," says Richard Davidson, a professor of psychology and psychiatry at the Wisconsin School of Medicine and Public Health.

Long-term meditation seems not only to alter brain-wave patterns: early research suggests that it may also result in changes in the actual structure of the cortex, the outer parts of our brains. "We have found that brain regions asso-

ciated with attention and sensory processing were thicker in meditators than in the controls," says Dr Sara Lazar, an assistant in psychology at Massachusetts General Hospital.

"The data give credence to some of the claims of long-term meditators and suggests that meditation can play a role in reducing stress, improving emotion regulation and perhaps slowing the effects of ageing on brains — slowing the normal decrease in mental agility, ability to learn new things and memory that comes with age."

It is possible, of course, that people with a thicker brain cortex in areas associated with awareness and sensory processing are more likely to meditate. So Dr Lazar is investigating whether changes in brain structure can be detected before and after learning the technique.

All this means that Professor Sykes will be sticking with meditation and thinks the rest of us should try it, too. "I find it incredibly empowering to think that how happy we feel or our ability to focus or concentrate may not be fixed character traits but may be skills that we can train and get better at," she says. "This must be worth investigating. If evidence is found that meditation can help us all to think better, to be happier and to be more compassionate, that would be amazing."

Alternative Therapies: The Evidence starts on BBC Two, Monday, March 17, at 9pm