

2016 U3A Course based on

Dancing With the Unknown

A Book about FEELINGS and the Everyday Experience of MIND and SOUL

Session 6 – May 16, 2016

Previously I've been talking about mind biology and stress and about love and I just hope that your experience of the Course has more to do with love than stress. The main idea is that our minds operate by making connections that are satisfying because they work for us as individuals as well as for the couple, which is essentially what love is – a partnership that strengthens the partners as well. So the business of social engagement – having relationships – is a very high priority in our mind's work.

In the last session I talked about how social engagement helps us to cope with stress, which is life. We humans suffer more from stress than animals do because we have a much more complex mind, but we also have special parts of our nervous system that are designed to deal with it. I want to say more about our brain today, which is the reason for the handout which has three diagrams about nerve and brain function (see last page).

If you recall, we have three basic ways of responding to everything that happens. Our Autonomic Nervous System (ANS), which is the involuntary part of our nervous system, is the key element at the subconscious level. Firstly, there is a shut-down mechanism directed by the dorsal vagus nerve that runs from the back of the brain stem to all our organs (heart, gut, lungs, kidneys, liver etc.). Then there is a fight-or-flight response managed by the arousing ANS and including adrenalin, which we humans utilise in many subtle ways by avoiding issues or getting into arguments. Thirdly, and much the best method for humans, there is the *new soothing ANS* – the vagus nerve from the front of the brain stem to the organs – which is what enables us to have loving social engagement. Every kind of healthy relationship that we have with other people from a casual chat, to hugs and kisses, nursing babies and making love, utilises this physiology.

The reason it is so helpful is that the vagus nerve is our major calming mechanism, slowing down what is happening in our heart, gut, lungs and everywhere and also reporting back to the brain what is happening in those organs. That nice, warm feeling you get sometimes across your chest or in your tummy when something good happens is largely due to the vagus nerve. The brain stem at the very base of the brain controls our vital systems of breathing and our beating heart, but it is closely linked, of course, to the rest of the brain where our emotions are generated and our perception occurs and we get our conscious awareness of what is happening.

Also from the brain stem there are nine other cranial nerves that go to your eyes and ears and affect every tiny muscle in your face. There are 43 sets of muscles in your face that generate facial expression and many of them are completely involuntary – you can't control them. The look on your face and the sound of your voice, the light in your eyes, is a reflection of what is happening inside you at a subconscious level. This is why we can often read in another person's face what he or she is feeling inside and we can connect so strongly with love. The state of your heart, gut, lungs and everything else affects your social engagement and vice versa. We feel better inside when we see kind loving eyes or a warm smile or hear some words of love. We connect strongly through facial expression and this is very important business for our mind.

The vagus nerve fine tunes our heart rate. It is set at a higher level and then modulated by what is called the ‘vagal brake.’ Our heartbeat is very sensitive to social engagement. In our experience of love, sometimes the arousing ANS makes our heart beat faster with excitement. At other times it calms our mind and slows down our heart, our breathing and our gut. What we feel in our heart and our gut is an important aspect of our mind.

The diagrams in this handout come from a book by Rick Hanson and Richard Mendius called *Buddha’s Brain – The Practical Neuroscience of Happiness, Love and Wisdom*. I also brought in Rick Hanson’s later book called *Hardwiring Happiness – The New Brain Science of Contentment, Calm and Confidence*. He has an online newsletter called *Just One Thing* that I know some of you follow, as I do, and a book with that title, too. He talks about a lot of things that have a distinctly Buddhist flavour, which are not part of my Course, although I think they are very good in their own way.

Hanson combines neuroscience and psychology with serious contemplative practice, which has always been part of religious life, but has become more common in everyday life in the Western world, especially in forms that come from Hindu and Buddhist traditions from the East. Mindfulness meditation is the phrase used in our health system where the therapeutic and stress-relieving properties of this contemplative practice are now often included with other treatments. It is effective for steadying and strengthening our minds when the crazy lifestyles of joyless urgency that are so common have brought our minds undone.

I try to be impartial about different kinds of religious practice and I pay tribute to the great Christian tradition of contemplative practice as much as to the Buddhist or Hindu. But the reason that the Tibetan Dalai Lama, whose headquarters are in India, is mentioned so often in neuroscience is that he has contributed significantly to research and dialogue in this field. He and his staff combined with western neuroscientists to form the Mind-Life Institute in 1990. A co-founder was Francisco Varela the former collaborator with Humberto Maturana that I mentioned before. That Institute has sponsored research and held important scientific meetings involving many of the world’s leading neuroscientists – last year was their 30th Conference. You can watch every minute of it online, by the way.

I think it was Jon Kabat-Zinn, an American medical professor who does not identify as Buddhist (and was born Jewish in fact), who first introduced *Mindfulness-Based Stress Reduction* into US medical practice in 1979 and his books such as this one, *Coming to our Senses*, have been influential in this field. Researchers such as Richie Davidson who wrote *The Emotional Life of Your Brain* have done a lot of brain scanning of people who meditate, which show profound effects on brain activity, even after just a few weeks of meditation practice. Rick Hanson brings together leading researchers on meditation and the relationship between the mind and brain and their talks are often on a website called *Sounds True*.

I feel I may have neglected those of you who are doing this Course for the first time in that I have not yet said much about the brain itself. Those who’ve done my previous Courses have already seen diagrams of the brain, but if you haven’t, I want to correct this today and try to put things into perspective a bit more clearly. In this Course I am not ignoring mainstream neuroscience, but I am putting a much greater emphasis on feelings and emotions as the leading edge of our mind than you will find in many standard books on this subject. That’s the whole point of my Course – that the Everyday Experience of Mind and Soul is primarily about our feelings. I’m talking about what the mind feels like as we go about our daily business.

In doing this I mean no disrespect to the power of reason. We couldn’t do this Course or have this conversation if it wasn’t for the rational thinking processes that our mind gives us – they are invaluable. And I’m glad that the latest neuroscience does now incorporate emotions together with reason as partners in what our mind does. The field I work within called *embodied cognition* – that is, mind in the body – has redefined what the mind is in a much more useful way I think. I still don’t

think it does justice to feelings, which are tricky devils, that lie in between our thoughts and our emotions and get swallowed up by both. That's the reason I am writing my book.

A phrase you often see in neuroscience books that I think is misleading is that 'the mind is what the brain does.' Rick Hanson uses it, too, although he qualifies it a few pages later saying that, actually, the mind is more than that because it involves the rest of the body as well. The biggest single contributor to the work of your mind is almost certainly the activity in your brain. Over 20% of the total energy and oxygen that our body requires goes to our brain so it is clearly our most important organ. But, as I've been saying today, what happens in your heart and your gut and everywhere else in your body is involved as well.

My point is that the mind is not any one of our organs – it is a connecting process with our world and every new connection we make also changes our internal state, which in turn affects the next step our mind takes. Our brain activity is as much a result of our series of connections as it is a cause of them so you can't say that your frontal cortex caused you to become a mathematician or a painter or your amygdala made you an anxious person or whatever. It is your history of connections that did that.

The problem with attributing everything to the brain and its role as a master computer is that we underestimate some aspects of the mind that we might say, speaking generally, are less to do with 'the head' and more to do with 'the heart,' that is, they concern our emotions and feelings and our social engagement. Sometimes we could say the mind is what the gut does – or the heart. When you eat food the body's response affects your mind very obviously – it affects how you feel. And I am saying that our loving social engagement is the place to look to see most clearly the mind at work.

In Eastern languages the words heart and mind are combined because it is assumed that they work closely together. Many ancient philosophers intuitively believed the heart to be a more important organ for our mind than the brain, which Aristotle thought was merely a cooling device for the bloodstream. There is a whole field of study outside the mainstream of science that suggests the physiological activity in the heart directly influences brain function, but I'm not going to talk about that here. I have mentioned the way the *new soothing ANS* affects heartrate and feeds back to the brain as it responds to every look we exchange with one another.

It struck me in my dark times just how different understanding one's mind is from knowing how my computer works or my car. Neuroscience can reveal some mechanisms of cause and effect that explain in a mechanical way how something works, but if it gives us the impression that we are even close to understanding how mind arises from our brain and body it I think we have been conned. The science of mind is still quite like the blind man and the elephant, discovering new bits without yet knowing how the thing works as a whole.

In the handout the top left figure shows the structure of a typical nerve cell or neuron. Nowadays we speak about brain function as exclusively the activity in these neurons. One reason I mentioned the blind man and the elephant is that most of the cells in the brain (80-90% of them) are actually not neurons – they are called glia (which means glue) and they come in different shapes and sizes. What they actually do is not known, but some researchers believe their wave-like chemical activity is important for modulating what the neurons do and may underpin all brain processes – hence Andrew Koob's phrase in his book *The Root of Thought – Unlocking Glia* that I brought in to let you know that some researchers question even our most basic assumptions about the brain.

To understand what we think the brain is doing we need to know how the neurons are connected in long chains with criss-crossing linkages to make neural networks. They say there are 100 billion neurons, which is only an estimate, and each one is connected to thousands of others so it sure is a complex network! This brain circuitry is always changing, which is where the term, brain plasticity, comes from. What we call brain activity can be visualised as the amount of 'traffic' along

particular pathways within these networks of connected neurons. The pathways that get a lot of use are like the major highways in our road system. The point to remember about this is that habitual behaviours strengthen the particular brain circuitry involved making it more likely that the habit is repeated, which is why it's hard to change your habits even if you think you would like to do that. But it's heartening to know that the pattern in your brain is changing all the time – even while you have been sitting here today.

This pattern depends upon which neurons are connected with which and how strong and active that connection is. The connecting points are called synapses and it is a type of hormone known as a neurotransmitter that travels from the dendrite of one neuron to the next one in the chain to carry the electrochemical activity along the line. There are dozens of different neurotransmitters – some of them slow down the traffic while some of them speed it up. The amount of hormone that is present and the availability of receptors, which are the connecting points for it, are probably the factors that influence brain function most. The brain pattern that each of us had when we arrived today would have had some very busy synapses and some that weren't doing much. This will have changed just a little by now and it will go on changing.

When we were born we had lots of neurons, but there weren't that many connections. The human baby is the least developed living thing at birth, which is why the love and care that he or she receives is so critical in shaping our mind. Very quickly new synapses are formed and from the age of about three up to 12 or so we have far more connections and far more frequent change in them than we have now. After puberty our brain networks trim down and settle into the patterns that seem to be most important for our particular lifestyle. By our mid-twenties they are fairly settled, but they can still be moulded to optimise our mental wellbeing if we are using our mind in a healthy way. They can also change for the worse. That's the point about brain plasticity – we want it working for us not against us. What is flowing through your mind sculpts your brain and body and this affects the next stage of your mind's journey.

The top right figure is a view of the brain from above showing that it has two distinct halves, called hemispheres, and later we will be considering the interesting fact that they don't both do the same things. They're not exactly the same in their structure, but many of the same parts are found on both sides – in other words we have two frontal lobes and two amygdalas and so on. They are connected by a nerve trunk called the corpus callosum, which you can see in the diagram at the bottom of the page right in the centre. We also have two distinct sides of our body that are always a bit different and most of the nerves from the left of our body go to the right side of our brain and vice versa.

A commonly-used overview of how the brain is constructed comes from considering its evolution. The brain stem at the bottom is pretty well all that a lizard had for a brain. Birds have more cerebellum, which we use today for balance for one thing. All the structures in the middle only really developed in mammals and most of our basic emotions are generated in these parts. And what makes our brain so much larger is all this top part with the folds that is the cortex. This overview is misleading, however, because the lower parts of our brain such as the brain stem have also developed new functions that other animals never had.

The prefrontal cortex is where our highest order thinking processes mostly occur and our rational decision-making stems from. It also has some executive function over other lower parts of the brain. The ACC is labelled here because it affects our all-important attention process and includes some of the pleasure-seeking apparatus involving the neurotransmitter, dopamine. The other brain regions labelled here are the main components of the limbic system, which is the centrepiece of what I am calling our subconscious emotional mind. The pituitary gland is where hormones produced in the brain trigger a cascade of other hormones into the bloodstream including the stress hormones I mentioned before, like cortisol from the adrenal gland. That was the subject area for my PhD research.

In the limbic system our everyday experience leaves its mark on the hippocampus and amygdala (as memories) and the basal ganglia and hypothalamus from which all our strong emotions like fear and grief and lust arise and our mind's emotional state is being generated at all times. Loving social engagement, eye contact and touch activate many areas. What we see with our eyes is relayed as electrical signals to the visual cortex at the very back of the brain – sounds go to a different part – but almost all incoming stimuli pass through the thalamus in the centre which is a kind of sorting area distributing signals to different areas. So there is an enormous interconnectivity, which is the main feature of the brain.

There are many different parts that can do different things, but it's impossible to know much at this stage about how they all work together. Since the advent of brain scanning researchers love to find which parts of the brain light up in different circumstances. When you're happy, for example, it's the left frontal cortex and when you're sad it's more on the right side. You can do an experiment by squeezing a ball repeatedly in either your right hand (which connects to your left brain) or your left hand (which connects to your right brain) and you may feel this effect. All emotional connections we make with one another in our social engagement involve our right brain much more than our left. But these results are not very consistent – for different people or for different tests – so we are cautioned not to read too much into that kind of measurement, which only tells you very indirectly what is happening in the neuron network .

Presumably, the more integrated the whole brain is the better. Unfortunately we have no way of measuring that so it remains largely a mystery. A useful finding from the research on meditation are that the linkages between the prefrontal cortex and these emotion centres in the limbic system are strengthened so that the two functions are better integrated. This is also the theory behind what is known as emotional intelligence where our thinking and our feelings are working harmoniously together. Strong emotions that are unchecked by higher parts of the brain can create problems for our mind. Fear and anger and also shame and guilt can damage our relationships and, although we need all our different emotions, we don't want any of them to be out of control at the expense of the mind as a whole.

Coming back to the big picture, I said in an earlier session that there are three different kinds of relationships that are important to our mind – with the unknown, with ourselves and with other people – and these provide the best opportunities for us to manage our mind, but I didn't explain these three levels at that time. The connection with other people is obvious enough. The connectivity within one's brain that we've talked about today is the next level. In psychology we call this the relationship with oneself. You don't want that egoic self that manifests as a rational know-it-all to be completely dominant and you don't want some deep emotional pain such as a 'heartache' to have taken over your life either – not for too long anyway. Even though we can't know which parts of the brain do what in great detail we do know that they need to be integrated so they are all working together. Those connections are also guided by love as the mind seeks to make that special kind of union in which both the parts and the combination can be strong at the same time. The feelings of compassion and love for oneself that are essential for our wellbeing stem from this.

The third relationship is the one I said was crucial for getting my mind out of the dark place it had taken me earlier in my life – the connection with the unknown. I have come to believe that the connection with the unknown is the most important because it is what shapes the next level down, the relationship with myself. If this relationship is out of order – that is, lacking in love – it is inevitable that my relationships with other people will have difficulties. We are inclined to try to fix our relationships with one another at a superficial level without considering the two higher levels. There is a lot more to say about this, but to begin I want to explain what I mean by the unknown and how we might have a relationship with it – after the break.

BREAK

Chapter 6 of this book is called *Recognising the Unknown*. I said earlier when I was describing my recovery from those dark times that I needed to acknowledge the unknown in a different way, firstly to get my mind to accept that I couldn't work everything out by science alone – that my rational thought process did not have all the answers. Just like I've said about the brain, there is so much we don't know. Then it became something bigger than that. I was saying in the last session that the idea of love is so fundamental that we couldn't do without it and yet we don't know where it comes from. It helps me to think that it comes from the unknown. As I said, that is my belief system – I believe in love. This attitude had far-reaching consequences for my mind because it introduced me to the fact that I also have a soul. I now think of my mind as a process that includes my soul.

We all have to deal with uncertainty and our attitude to this uncertainty makes a big difference to our feelings. It's normal to hope for the best and assume all will be well in the future, but none of us is entirely happy about uncertainty. Some people handle it very badly. I have some friends who find it difficult to make commitments because they're not sure what their circumstances are going to be at that time. The need to know exactly what is going to happen is an unfortunate and unnatural kind of anxiety. I think it is a natural part of the process of mind that we can be comfortable with the idea of not knowing.

I was listening to the talk by Andrew Newberg on *Sounds True* the other day and he was asked about his own personal experience of acknowledging the unknown. He is the American neuroscientist who has researched people's spiritual experiences most thoroughly with brain scans and interviews and so on. He said that he came to a point in his young life where the idea of '*infinite doubt*' became an acceptable part of his thinking and he has found that idea helpful ever since.

Not knowing can be very useful yet it has become less and less popular in this day and age. We amaze ourselves with our ability to think up things to say to questions that probably warranted the simple answer: I don't know. As appointed experts or as parents it doesn't seem right to admit to not knowing. The individualism encouraged by our Western society entitles everyone to have a definite opinion about everything and to want to have a say in how things should be done. Historically there was more reliance on feelings of authority from outside ourselves provided by society or the church. These rules restricted individual freedom, but they made it easier to accept your place in the larger scheme of things. It was dangerous to question this authority as some famous dissenters discovered.

Progressive stages of 'enlightenment,' which meant stronger beliefs in rationality, and a growing enchantment with the scientific way of thinking brought more and more opportunities to question everything and to 'prove' how things work, often based on the simplistic assumption that effects always have a simple linear cause, which they do not. The lure of apparent certainty was driven deep into our psyche and knowing the mechanism took precedence over accepting, or perhaps even admiring, the mystery. But the problem is we don't actually understand things or **know what they mean** simply by knowing how they work. There is always something missing just as there was in my earlier life.

The philosopher Owen Barfield, who was one of 'the Inklings' at Oxford along with C.S. Lewis, J.R.R. Tolkien and others, posed an important question several decades ago: '*How is it that the more able man becomes to manipulate the world to his advantage, the less he can perceive any meaning in it? Exclusive emphasis on physical causes and effects involves a corresponding inattention to their meaning.*'

The word, meaning, can be used in many ways, but I refer to it as a subjective sense of satisfaction such that we feel we understand something. It gets lost when the part of our mind that craves certainty and knowing takes over from the part that sees a broader, more imaginative, perspective.

Barfield echoed Goethe and others when he said that our imagination is required to apprehend the ‘wholeness’ in the specific details that we are observing such that we could obtain some meaning from them. Infusing situations with meaning is an absolute necessity for our mind and it is not possible without a spiritual component, *i.e.* acknowledging the unknown. This is paralleled in my experience by a recognition that there are larger-than-self goals as well as personal goals to consider and that this implies a subtle kind of larger-than-self ‘authority.’ This is a spiritual attitude that leads to some kind of faith, religious or otherwise.

Not knowing is more than the absence of knowing; it is an imaginative leap that recognises the unknown as a crucial component in the function of one’s mind. Our feelings about the unknown are essential parts of our search for meaning and both love and faith are a certain kind of relationship with the unknown. Awareness of the unknown informs the known and enhances the mind, which is likely to become simplistic and narrow without it.

I think it is our responsibility – and the challenge for our mind – in every situation to **understand the context**. Cause-effect explanations tell you nothing about context – the bigger picture within which this situation exists. Every decision, every new thought or action, depends so heavily on context that the logic of cause and effect is only helpful in the most simplistic of circumstances – sometimes it is misleading because, unlike context, it misses the unknown altogether.

The difference between the known and the unknown is like the difference between sound and silence. Another saving grace that helped my mind to cope with the dark times was that I was never afraid of silence. Growing up on a farm I kept to myself quite a lot. Other people I knew seemed to need constant sound; their radios or televisions blared wherever they were, they filled up every space in a conversation with words and they seemed to find silence disturbing. For many people there is no meaning to be found in silence; we speak of a stony silence, an awkward silence or a deathly silence. For a surprising number of people silence does not feel safe – it is a scary void.

Yet we also venerate silence in many ways; obviously in spiritual practices, but also in music, language and in nature. Musicians revere silence because they know that the music is made by the space between the tones as much as by the tones themselves. The experience of a musical performance starts before the first note is played; amateurs are inclined to forget this and start too quickly while some famous maestros have kept their audience waiting for a few minutes before they began to play. The space between words that are spoken or sung is just as important as all good actors, comedians and orators understand very well; a singer such as Frank Sinatra had considerable effect through his phrasing of the words of a song. The silent bits are part of the feeling and whatever is deeply felt is a meaning likely to be shared with others. It takes the greatest skill to play the pauses well.

Our thinking and doing often becomes a rushing torrent in our mind and the ability to pause from time to time is a valuable and underrated asset. As well as providing respite it’s a way of regaining a broader perspective, reconsidering the direction one is taking and tempering the mindless reactivity that can bring us undone. Management consultants such as Stephen Covey recommend leaving a space between the words someone says to you and the response that you make.

We live in a very noisy world, which is perhaps partly symptomatic of the ceaseless striving of our minds to know everything. Along with several other authors, I think of knowledge as an island whose shoreline lengthens as knowledge grows so that our interface with the unknown gets bigger, not smaller, as we think we know more and more.

There is an association, particularly in poetry, between the unknown and the more mysterious aspect of mind that we refer to as our *soul*. In the dark times I never really thought of having a soul and I did not feel loved. When I acknowledge my soul today I regard it as the only part of me that seems to know, without fail, that I am loved, which is why I think of the unknown rather fondly.

That has become my definition of the soul: the place in my mind that can accommodate 'infinite doubt' and that knows I am loved.

In conclusion, the third level of connection that I think is required for the mind to be working well is the connection with the unknown. This could take many different forms of which prayer and meditation are the most common. Whatever meditation practice is adopted there is a letting go of our normal mode of thinking about all the things we know (or would like to know) and an awareness of not needing to know in order to be and belong. Relaxation of the body and awareness of breathing aid this process and some meditation practices also involve concentrated attention on a light or a sound during which the prefrontal cortex is initially highly active. As meditation continues there is a marked decrease in that frontal lobe activity according to brain scanning studies.

The ANS controls breathing and heartrate and those two are closely linked. When you breathe in your heart rate increases slightly and it decreases when you breathe out. Lengthening the out breath calms the whole body as well as the heart. Attending closely to your breathing is a rather special situation for your mind because it is a meeting of the conscious part of your nervous system with the subconscious ANS. It is the most obvious place where these two share responsibility, which is probably why attention to breathing is such a common element of meditation practice.

Finally I must mention a new book just published this year, which will become a best-seller I'm sure, because it is a gripping, true story by a neurosurgeon of the power of mindfulness meditation in the ups and downs of one's life. It's called *Into the Magic Shop* by James Doty. Many of the popular authors in this field including Rick Hanson describe it as an amazing and inspiring story that is hard to put down once you begin reading and that is what I found, too.

