EVERYDAY MIND AND LOVE 2018

Session 4 March 22

A little later today we'll be looking at a very important function of our mind that is our **perception** – the way we **perceive** what is happening around us – external perception.

Last time we looked at the biology of a single-celled organism to illustrate basic principles. We actually have a much closer relationship with these little critters than is immediately obvious. The **bacterial cell** that I was talking about is not some far distant creature, but actually our closest companion whose simple mind interacts with our mind every day, especially in our gut, which you will remember is connected to our brain as part of that Autonomic Nervous System (**ANS**) that involves all our internal organs in the operation of our mind. Trillions of microbes live and work on our skin and within our gut. There are actually far more of them than there are cells in our body. We could not survive without them.

Two of the books I brought in today are about them (*I Contain Multitudes* by Ed Yong and *The Mind-Gut Connection* by Emeran Mayer). It's not really part of this Course, but it's an important subject. I've noticed that some books about how the gut affects the mind are a bit fanciful, but these seemed quite sound to me.

Bacteria were almost certainly the original life form on earth and for a couple of billion years the only one and they are still the most numerous creatures on our planet. When they thrive in our gut we are healthy in our body and our mind. There is far less known about why we need them than there is about computers or brains, but as more is learned the gut keeps going up the scale of importance as a part of our mind, especially for generating emotions. It's not only the nerves of the ANS that connect the gut lining with our brain – many of the important brain hormones are also produced in the gut, particularly *serotonin* that I mentioned as a soothing neurotransmitter – there is far more of it in the gut than in the brain. It is linked to peristaltic contraction, which could be why we need to eat foods that require digestion, not the highly refined ones. I think there will be lots of new research in this area.

The main reason I wanted to draw your attention to the operation of a single cell is that it shows a basic principle of mind. You can think of this cell wall as the complex interface that we have with the world around us that we must manage carefully to keep ourselves fit and well. Mind provides the **connectedness** we need to maintain the **autonomy** that is our individual self. Knowing this principle we can look more clearly at a lot of things to do with our personal relationships, our self-esteem and the quality of our life experience – the good feelings of wellbeing and also the suffering and pain that occurs when connectedness falters and autonomy wanes. The quality of our connectedness is crucial. A very new book that I'll be talking about later in the Course is called *Lost Connections – Uncovering the Real Causes of Depression and the Unexpected Solutions* by Johann Hari (who, incidentally, is coming to the Sydney Writer's Festival next month).

Last time I was talking about that unhappy period earlier in my life. I lost the connections that were most important to me, including my marriage, and in the process I lost my self-confidence as well. A Sydney psychiatrist has written a book called *An Intelligent Life – A*

Practical Guide to Relationships, Intimacy and Self-Esteem that describes my situation. In fact he says that most people who seek help from clinicians have the same twofold problem: they don't like themselves and they don't feel there is much love in their lives – in other words, they have **low self-esteem and problems with relationships**.

I was wrapped up in my scientific work and I thought my rational, logical mind should be able to work out solutions to everything. Eventually my mind was opened up to something bigger – a realisation that the **unknown** and the intuitive, more mysterious, emotional aspects of mind were actually just as important as the known facts for the proper use of my mind. By acknowledging that I came to learn new things about the research I was doing on stress in animals and also about the way we use our mind, which is what this Course is about.

Today I am aware of **three kinds, or three levels, of connectedness** that we need for the proper use of our mind. The obvious one is with other people or something in the world around us. The second one is with ourselves. I will say more about how we develop a personal sense of self because if we are on good terms with ourselves we get on better with others. So that's a higher level of connectedness than the first one. The third is a higher level still. It is our relationship with the unknown. I found that a change in my attitude to and a better relationship with the unknown led to feeling better about myself and this flowed through to my other relationships and led to my learning more about this thing called **love**.

The importance of stress

I want to say a little bit about stress before getting onto the subject of perception. Every change that happens outside us necessitates an internal adjustment and that is what we call stress. We tend to notice it when it becomes severe, but it's actually always there stimulating our system and urging us forward in our lives. So the physiological and behavioural stress responses that one can measure – the release of hormones such as cortisol from the adrenal gland, the rise in heartrate, the shift in your attention and change in your behaviour – these are all actually there for our benefit – at least in the first instance. It is only if we can't relieve the stress or it continues for too long that it actually damages our health. I think there is a somewhat negative attitude towards stress nowadays because people fear that it will damage them and so miss out on some of its benefits. This is partly because we don't really know the best ways to handle it.

There are basically three different mechanisms that we use to handle the stress we encounter in everyday life and they all involve self-regulation, that is, our Autonomic Nervous System. The **ANS** has a neural network that can speed all your systems up and another neural network that can slow them down. These are sometimes called the fight-or-flight system and the rest-and-digest system. The **soothing** network (whose technical name is the parasympathetic system) is so important it has the largest nerve in the body, the **vagus**, running right through our body from the brain stem to all of our organs. It's the only nerve trunk that doesn't go down through the spinal column. The **arousing** network (whose technical name is the sympathetic system) uses adrenalin and other hormones to speed up heartrate and breathing and energise the whole body for action.

As the ANS evolved over thousands of years the response to stress has changed. Cold-blooded animals like lizards use the shut-down network of the ANS to **freeze** when danger is

sensed and to hibernate when cold stress threatens their existence. We still have that primitive network that can shut us down if stress is extreme, but it is definitely only a last resort.

When mammals evolved the oxygen requirement of larger brains necessitated a different stress response so the arousing network of the ANS was beefed up to produce the fight-or-flight response (adrenalin and so on). We still have that system in us too and we often use it, but generally to our detriment because it is based on fear. Our mind suffers when we seek out big arguments or try to run away from issues that we need to face, which is our version of fight or flight.

For humans the stress response had to be changed again so we developed a **new soothing vagus nerve** that other animals don't have to the same extent. This is a more subtle shut-down system that doesn't just immobilise us – it **stills us without fear**. This gives us trust in intimacy and opens the door for mutually respectful or loving relationships. **Connectedness is our antidote to stress**, either through just having someone to talk to about it or comfort us with a hug, or being able to confront other people respectfully and confidently when things need to be changed to relieve the stress. This behaviour is not driven by fear. It is built on a secure relationship – with the unknown firstly, with oneself and with other people. That is what enables us to **love**. We will explore more deeply what that means.

There is more about this in my book and much more in Stephen Porges book *The Polyvagal Theory* if you want delve deeper. Porges described love very aptly as an 'emergent process of our evolving Autonomic Nervous System.' He has been one of the guiding lights for my work in this field.

Why the idea of information is misleading

Last time I glossed over the idea that our mind *regulates the flow of energy and information* even though that is not an unreasonable statement. I did so to shift the emphasis away from the idea of information **flowing in** to our mind towards a more accurate scientific description of the mind as a connecting instrument – a **manager of connections**.

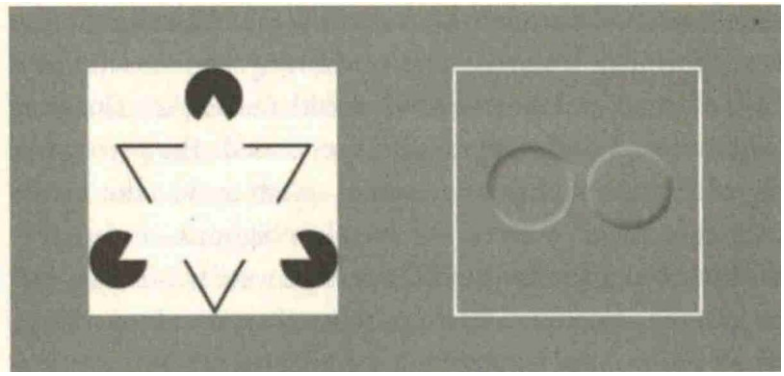
You and I have lived through the **Information** Age, which I think is now waning because we are so flooded with information that more people realise that it alone isn't much help. It is the way we make **meaning** by combining different bits of information that enables our minds to work well. Before Claude Shannon from the Bell Telephone Company published *The Mathematical Theory of Communication* in 1948 the word 'information' had not really been used in relation to the human mind. Then electronic forms of communication took over our lives so dramatically that the brain was being seen as an 'information-processing' machine – a computer, in other words. This is misleading.

Communication technology took another great leap forward with optic fibres. One of the people involved in that development was Richard Epworth who wrote a book called *Bottleneck – Our Human Interface with Reality*. As the transmission of data jumped from kilobits per second to megabits per second and beyond, he said: hang on a minute, there is a huge bottleneck in this system; the human mind can only actually take in a few tens of bits per second at the best, soon forgets most of that anyway, and seems to function without this need for masses of information.

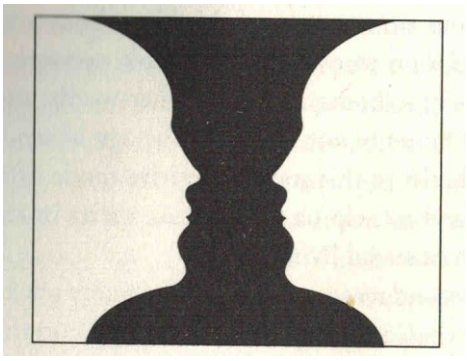
What our mind does instead is use previously built images and patterns to **construct a reality** as we think it probably is and then adjust that accordingly as we go along. Henry Bortoft calls these '**organising ideas**' in his wonderful book *The Wholeness of Nature*. Most of what we experience as happening around us is **a construct based on our previous history**, created by our imagination. This is why we don't need much information because our imagination is so powerful. Our ability to acquire and integrate information from the external world is actually very limited so that is only a small part of what our mind does.

The great complexity of the brain is not primarily needed for us to interface with the world, at least not in the way that a computer would – it is needed for the very complicated business of internal self-regulation. What our brain has done over a period of time is generate **meaning** that provides patterns or organising ideas that enable it to **construct** reality for us very quickly. So perception is not passive – it is a deliberate connecting process guided by pre-existing meaning that predicts and then checks for variations. Perception is **proactive**. The handout for today provides us with some examples that illustrate this point.

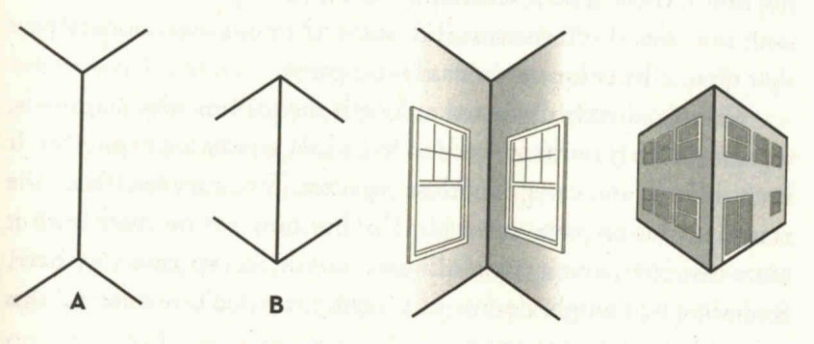
In the image below the well-known Kanisza triangle makes you think there is a second white triangle, but it has not actually been drawn. The two circles are identical except that the shadow has been moved from the top to the bottom to give the illusion of relief. Our built-in meaning is of light coming from on top of things not from below them.



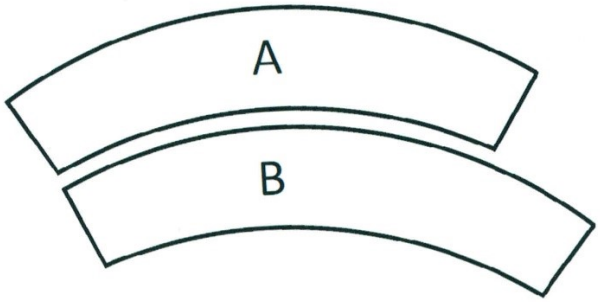
Ambiguous figures like those below allow your imagination to construct two different meanings and shift from one to the other, more or less at will.



The two vertical lines in the picture below are equal in length, but our built-in meaning of them depends on whether you are looking from the outside of a building or the inside of a room so the one on the left appears to be longer.



The two crescents below are of equal length also, but we tend not to allow for circular dimensions.



The diagram below is from Henry Bortoft's book and drawn by his wife. What do you see?

BREAK

Perception and memory

When we explore the way our mind perceives our reality we must be prepared for some big surprises. Our mind deceives us in some ways regarding perception. When you look around the room here it seems that we know about it all – every detail of our surroundings. How amazing to be able to take in so much. There are megabits of information there. But we didn't – in fact we couldn't – take in that much detail. Richard Epworth estimates that we might take in one thousandth of the information available, but that will vary enormously.

You can check to see that the most detail is perceived around quite a small focus near the centre of your field of view by holding up your thumbs and focussing your attention on one of them while moving them apart. When you look closely at one letter in a word you can only make out a few other letters on either side of it.

Perception does indeed imply a flow, but to emphasise information suggests the flow is mainly inwards – like a vacuum cleaner sucking up dust or a movie camera or tape recorder taking note of everything that our senses encounter and arranging it somewhere in our brain where we can access it later. Perception is not like that at all – it is very much a two-way process. Our mind decides what there is to see in the first place and **if we connect well** it can adjust itself to any variations that seem important. So the main flow is outwards. And it is **meaning** not information that dominates the process.

We only see what is meaningful to us. The Nobel Prize winning French philosopher, Henri Bergson, said 'the eye sees only what the mind is prepared to comprehend.' It is the mind that is running the show and its operating system is based around the meaning we make. It has to remake meaning all the time. Its aim is to **hold on to a consistent thread of meaning** that has been working well while continually updating this in a manageable way. A loose or unreliable connection makes this difficult so it is the quality of the connection, not the amount of information, that matters. The quality of the connection is felt in terms of meaning. The experience of **love** is probably the best example of all.

Think of a blind man with a stick. What is crucial is that he places the stick carefully according to the meaning that his mind has made of the imaginary world around him. We need an active imagination to see things clearly. I think it was Mark Twain who said: you can't see clearly if your imagination is out of focus. To check your imagination just close your eyes for a while and recreate this room in your mind.

Too much information can be a handicap. You've probably all struck that when trying to sort out some complicated arrangements. A telling example is when you're doing up a difficult button or putting a small nut onto a thread; you are better off looking away rather than looking straight at it

It would be wonderful to know more about how the brain and body make this meaning for us, but of course much of it remains a mystery. What is clear is that it relies on the process we call **memory** – itself an elusive subject to pin down precisely. To see or perceive anything we need to have some memory of it. We cannot recognise an object if we have no memory of it. One of Oliver Sack's most famous patients even mistook his wife for a hat after he had lost part of his memory as described in the book with that title.

A current researcher in this field, Rodrigo Quian Quiroga, who works at the University of Leicester in England, wrote an interesting book called *The Forgetting Machine – Memory, Perception, and the Jennifer Aniston Neuron*. He discusses the way that perception and memory work together, which we will explore in more detail in the next session.

He is credited with the discovery of '**concept neurons**' in the hippocampus, which provide interesting clues to the way we can **make meaning** rather than just accumulate details. Opportunities to record from electrodes placed into the human brain are rare, but he took advantage of other brain surgery that was being conducted and could measure brain activity in patients as they were shown pictures and asked questions. A certain neuron or group of neurons that was activated by seeing pictures of film stars like Jennifer Aniston was remarkable in that it also responded to hearing or reading that person's name and was not deceived by changes of costume or setting – in other words, it represented the **concept** or **meaning** of Jennifer Aniston, not just the details of her appearance.

There are different kinds of memory that are inextricably linked to our perception process. We will continue with more about memory in the next session.