

**MIND and LOVE**  
**The Human Experience**



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Lloyd Fell

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# INTRODUCTION

## Prelude

Your mind engaged with mine the moment you picked up this book. The words here came from meanings I have made, but what they mean to you will be the work of your own mind. There is no direct transfer of meaning between us – according to cognitive science. Your meaning and mine is self-generated because we are autopoietic (self-producing) systems. Each of us has a mind of his own – or her own, as the case may be.

Yet this same science shows how utterly dependent we are on making connections such as this. Our minds and bodies enjoy this autonomy only as long as we are connected properly to what is around us. To have life we must be an integral part of some larger system, yet remain self-governing. We are like the seeds in a pod, the birds in the air or the fish in the water – individually endowed with a life force which relies upon our relationship with the world in which we live. You probably know the bitter-sweet feeling of having to fit in with your community while trying to be yourself at the same time. This is the central theme of my story about our amazing, life-giving mind.

The engagement of minds makes life interesting; it leads to the idea that perhaps everything is interconnected. Whether your thinking about this comes from the language of quantum physics, the poetry of Native American elders or from ancient Eastern texts, or somewhere else, chances are you have a sense that everything each of us does will affect other people and the environment in which we all live. But how does this work? There are new theories about invisible fields and forces that may connect us, which are interesting, but the real issue in this book is our everyday practical experience of this intriguing and mysterious interconnectedness.

What makes life meaningful, as well as interesting, is the colourful potpourri of feelings that accompanies the engagement of our minds. Sometimes I feel the warm comfort of intimacy and know exactly where

I belong, but at other times I feel so isolated and lonely I would say John Donne was wrong to think that ‘no man is an Island.’ Quite often we feel frustrated about things happening around us that affect our lives yet seem to be beyond our control.

Most of us recognise a need to cooperate to some extent, but our culture tends to worship the individual and emphasise self-interest, particularly in the more affluent societies. This fuels greed and exploitation, which excites us, but it also tears the fabric of our naturally harmonious social nature.

We are concerned about the health of our natural environment and, for that matter, ourselves, despite great technological advances. Ill-health of the mind is certainly not decreasing, nor are modern diseases of the body such as our over-straining hearts, self-harming immune systems and those errant cells called cancer that appear without warning. To a biologist, cancer is an example, at the cellular level, of selfish behaviour overriding the needs of the larger body to which these cells belong. Cancer cells do not know when to stop multiplying and growing as normal cells do.

The balance between self-interest or self-preservation on the one hand and community welfare or survival of the species on the other is an issue both scientific and philosophical. New biological research reveals a lot about how we deal with this. There are also imponderable questions about what makes life meaningful and where real satisfaction might be found. My aim is to bring these two a little closer together in an explanation of mind and love that is set squarely in the context of our everyday experience.

There are two scientific breakthroughs which make this possible today. The first was a paradigm shift in biology that was born over 30 years ago with the idea of autopoiesis. This has influenced the course of cognitive science in a subtle rather than a dramatic way. The second has occurred, sensationally, in the last five years. It is the advent of a ‘social neuroscience’ based on the growing realisation that our brain and nervous system are intrinsically social organs; in Daniel Goleman’s words, we are ‘wired to connect.’

New findings about the emotional basis of all mental engagement go a long way toward explaining human cooperative behaviour, altruism and love. Not only are we a peculiarly care-giving species, but the emotional state that we call love may well have been the secret of our survival as a species up to this point in time. ‘Feelings are what matter most,’ Charles Birch has written, and if we are to speak about human experience, who could argue with that?

It's a fair bet that you and I are the world's greatest experts regarding one matter only – our own individual experience. Whatever you tell me you have experienced, I cannot deny that it happened. This is so even if I have never experienced it myself and don't understand what it would be like. The way you described it to me may not make sense in terms of my experience, but I can't prove that you are wrong. Perhaps I could explain it away as an illusory experience because it does not correspond to the reality that I know. Still, your authority on the matter – or mine if it was me – cannot be negated. On all other matters we cannot be so sure.

We attribute authority to many affairs of the mind and our mind seems to rather enjoy this. One of its abiding pleasures is to make explanations about itself. The bedazzling circularity of this cannot be avoided so we might as well put it right up front. These self-justifying, self-admiring or self-deprecating explanations come in various guises: from science, philosophy and religion, which are three different ways we exercise our individual minds to work together in the world.

Philosophers develop far-reaching concepts or ideas and then talk about how these apply to different situations we encounter in our experience. These are not the truth; they are a particular way of using the mind in which the principle is paramount and the experience either fits or does not fit with the principle.

Scientists do almost the opposite of this. They try to keep a completely open mind about what the principle or law of nature might be and they frame hypotheses, carry out experiments to test the hypotheses, and use this evidence to prove that a certain mechanism is operating in that situation. This is not the truth, either, because science keeps coming up with new hypotheses and new evidence to disprove previous ones and thus yield new explanations. In both cases these ways of using our mind are 'works in progress.'

Whereas scientific and philosophical 'truths' are always provisional, a religious 'truth' is a matter of faith and is not subject to argument using the human mind. There are so many things our mind simply does not know, which we have to deal with somehow. The way we have chosen to do this through the centuries is mostly by religious practice of one sort or another. This is less pronounced today because many people worship science or Capitalism instead of a God in a church, but it is still some outside authority in which we put our faith.

In keeping with my own life experience, the ideas sketched out in this book come predominantly from science, are stroked here and there with philosophy and brushed very lightly with thoughts about religion. But rather than worship religion, philosophy, or science for that matter,

I want our human experience to take centre stage so that it will be the reference point for what I am explaining.

Human experience is the summation of everything we think, feel and do; everything we dream about, sing about, talk about and wonder about or simply enjoy or suffer or disregard, every day of our lives. It's what we are as human beings. Sometimes it's described as everything that happens to us, as if we are merely passive recipients rather than active creators of the process of life. This stems from the fact that we like to observe ourselves thinking, feeling and doing, which is obviously not quite the same as actually experiencing it. Then we have an insatiable desire to explain what we observe as if this will make it a better experience. And somehow it does.

Explaining our personal experience is the subject of this book. In fact its basic premise is: all that we humans ever explain is our experience and we have only our experience with which to explain it. We often say we are explaining something else, but if you boil it down, it is only our experience of that something, which could be what we've heard, read or thought or even imagined about it, if we haven't encountered it directly. The only resource we have to draw on for this explanation is our experience. Whatever we perceive, we can only explain it from our own individual perspective, even when we claim to be all-knowing. We often use our first-person mind in the third-person grammatical sense.

This approach I am taking goes back at least as far as John Locke and echoes the pragmatism that William James applied to studies of the mind over a century ago. Focusing on the way things appear to our mind, it could also imply some elements of phenomenology. But the most appropriate historical root for what I'm writing here is the process philosophy of Alfred North Whitehead, because its development in recent decades has moved us closer to being able to amalgamate first-person and third-person explanations into a meaningful whole.

Whether you want to come with me in this direction will depend on your world view. There are probably as many world views as there are individuals, but to illustrate how powerfully our mind uses language to determine our options, I will give you three from which to choose. The first choice is between modern and post-modern. Modernism began when the scientific method we use today came into being about 200 years ago; it is essentially mechanistic and materialistic. Post-modernism emerged during the last century, in certain fields, to reinstate metaphysical ideas such as purpose, values and subjectivity, even including ironic self-reference and absurdity, which we can hardly avoid when we talk about our mind!



If you choose post-modern, you may consider yourself either a ‘deconstructive,’ like many academics, or constructive and ecological, which is the approach I take in this book. Post-modern ideas can either be deconstructed towards their extinction or constructed into a bigger picture that includes science, but extends beyond its reach, because it draws on the whole human experience.

The 21<sup>st</sup> century genre within which my story might be expected to fit is Integral Philosophy, which deals with the ramifications of an ‘integral consciousness.’ Springing from Hegel and Bergson, through Whitehead and others, this has been developed by Clare Graves, Don Beck and, most volubly, by Ken Wilber, into an academic discipline that describes an evolving consciousness which will eventually transcend the objective/subjective duality to form an integral spirituality.

But my book does not quite fit there because it deals with the practical emotional basis of this evolutionary trend as it plays out in our daily lives. The hierarchical models and academic jargon of this new discipline are not included here because they are not central to our human experience.

\* \* \* \* \*

My field is biological science, in particular animal physiology and behaviour. This book grew out of courses I have taught on mind-body science, half a lifetime spent doing research into the causes and consequences of stress in animals and an abiding interest, which is not unusual for human beings, in the workings of the mind and the experience of love. It owes a great deal to the influence of Humberto Maturana, whose ideas opened a door to a new way of thinking about the biology of cognition and a new understanding of what is special about the human mind.

When Maturana and Francisco Varela published *Autopoiesis and Cognition* in 1980, a new path was created for biological science to explore the human mind. But surprisingly few have taken this path. The somewhat earlier, parallel development of a second-order cybernetics by von Foerster, Bateson, Beer, Pask and others is a similarly inviting track that has not become a major highway. Those of us who know these tracks speak highly of them and I rely heavily on what I’ve found there in this book.

I think ideas take hold according to the culture in which they are born and some of these ideas did not suit the prevailing social systems, which emphasised the principles of control rather more than the principles of cooperation. Nowadays, these various tracks are joining up

with the exciting new pathways of ‘social neuroscience’ and so the biology of cooperative behaviour and human consensuality is coming to the fore again.

The breakthrough I experienced after first hearing and meeting Maturana and starting down this path was that we could at last get to the nitty-gritty of explaining everyday human experience. Science has produced wonderful models such as quantum fields or parallel processing for the brain and mind. Its blending with medicine that is called psychology has a proud record of observing, analysing and classifying human behaviour. Biochemists have discovered ‘molecules of emotion,’ and clever people can make intelligent robots that think like they do. But you and I don’t use much of that science as we get ourselves out of bed, onto a train or up a ladder or into a studio, office or farmyard and live out our normal day – having an argument, wondering why we made that decision not another, why we feel sad or excited and how to tell someone we love them, or we don’t.

Recently, the full weight of scientific materialism has been directed toward explaining the human mind as entirely the product of molecular processes in the brain. If that succeeds, the post-modern world view will have some explaining to do! The main argument science has always had with post-modern biology is that ‘vitalism,’ the idea of a metaphysical life force, conflicts with the scientific principle of mechanism. By following what I loosely call Maturana’s biology, which is scientific therefore mechanistic, I will not need to invoke any ‘*élan vital*.’ Instead, I am simply saying that any scientific explanation of mind will be incomplete. Anyone can add to it according to their own beliefs.

Ways of getting at the mind, scientifically, may be top-down or bottom up. Maturana’s is the latter. Sometimes called the biogenic approach, it starts with the basic facts of biology and works upwards to the particular human case, thereby asking psychological questions as if they were biological questions. Maturana did not begin with the question: what is the human mind? He asked: from the first living things up to today, what must have happened so that we ended up with this marvelous human mind? In other words: what is its biological basis and what are the biological principles by which it operates?

The mind of humans is clearly quite different from that of any other species, but its evolutionary history can be traced right from the roots through all the branches of what we might call the ‘tree of knowledge.’ Our very latest ideas about what mind is and what it does are creations of our own biological process, so we need to understand that process.

The other exciting impetus I gained from the paradigm shift created by Maturana and Varela was the hope that biological mechanisms could now be integrated more closely with the big psycho-philosophical issues such as: what is human will and what is love? What drives us to do what we do as human beings and where do we find satisfaction for our deepest yearnings? The new concept of autopoiesis, as it related to mind, suggested different ways of thinking about love and will and the way we make meaning of our lives – what the Greeks called *logos* – as we trudge the muddy ground of co-existence that is our everyday experience. It seemed we could now close the gap a little between biological science and some age-old questions about the meaning of life.

Several recent books will testify that other neuroscientists have followed a similar path. But it is the way Maturana and Varela equated mind with life ('cognition and the realisation of the living') that I think is crucial in our efforts to integrate bio-logic with *logos*. They made it easier to see how the river of life and the river of mind run together, from an unknown origin as a tiny trickle, through various rapids on to flowing streams, to an ending in some vast ocean. Will and love are the two strongest currents in this flow. They are not opposites, though they can disrupt and block one another, creating the eddies and whirlpools of life. The task of consciousness, as Rollo May put it, is to unite love and will.

\* \* \* \* \*

The first four Chapters of this book deal with the process of perception in our everyday experience. Fritjof Capra said that all our problems are problems of perception and I agree with that. What we perceive ourselves and our world to be is the core business of our mind, obviously. So are the actions we take, the words we think and speak, the decisions we make, the memories we create and our wishes and aspirations. All these are drawn together by the term, cognition, which comes from a Latin word that means: 'to know.' I use the term, knowing, throughout this book as the main descriptor of the process of our mind.

Knowing is not simply the acquisition of knowledge in the conventional sense. There is a difference between knowing about something and knowing something directly, as we do from our experience. Everything we do arises from our knowing, but not necessarily from conscious awareness. There are sub-conscious elements of knowing, which may be labeled intuition or conditioned reflexes or even instinct, in some explanations, but are simply aspects of knowing for me.

It is a feature of our use of language that we cannot consider knowing without being aware of not knowing. Our mind operates at the interface between knowing and not knowing, combining certainty with uncertainty – what we call knowledge with trust and faith. The sequence of ideas in this book is from known facts about sensory perception through to mysterious aspects of our experience connoted by a ‘cloud of unknowing.’ This is a spectrum of mind ranging from the material to the non-material, the physical to the spiritual, or the known to the unknown. There are seven distinct aspects of knowing along this continuum. These early Chapters deal with the first three.

Throughout, I have situated the process of mind in its social context. We do our knowing individually, but we cannot do it unless we interact with other people and our world. Because it is a process, knowing occurs – and our mind exists – through this interaction, not simply within the confines of one’s head. Our mind is to be found in what happens at the interface between one’s self and everything else.

The basic principles of this biology of cognition are outlined in these first four Chapters. The key concept is autopoiesis, which means self-producing. We re-create ourselves in each act of knowing, but we could not do this in isolation. So the work of our mind is to keep us connected to our world without giving up our individual existence; that is its formidable challenge.

We do it by making meaning, which is probably the first thing you would expect your mind to do. We will see that the corollary of autopoiesis is the idea of structural coupling and operational closure, which explains why we have to make our own meaning. As cognitive beings we require our own knowing, not someone else’s, to determine our self-renewing existence.

In Chapters 5 – 7 we look at how language works in this respect and the way our mind is shaped by the metaphors we use. Metaphor is far more than a decorative figure of speech. It creates bridges of meaning, enabling us to understand one kind of thing (or experience) in terms of another. The picture we will create of the nature of our mind depends entirely on the metaphorical structure we choose to employ.

Science, like all the ways we use our mind, is metaphorically constructed. The concepts of space, time and motion are fundamental patterns in our mind that enable us to make meaning and explain our experience. The reality of these constructs is not at issue here. By saying our experience is real we are saying that space, time and motion are real. Facetiously, we might say that our appreciation of time spares us the

experience of everything happening at once and our awareness of space avoids the worry of everything ending up in the same place!

Space, time and movement are the mental manifestation of that sense of separation and togetherness – individuality and belonging – which is our human experience. They enable us to paint a picture of the human mind as a rather incredible connectivity device.

First, our mind locates us in space and time, in relation to everything else. Then it acknowledges that we are moving – and so is everything else. We are here, not there, but we are not stuck here – in fact we can't remain here even if we wanted to. Our mind constructs the delightful paradox that each of us is a significant entity in each moment, yet we drift in the currents of a larger stream over which we have little control. That there is constant motion and continual change is an entrenched idea across all cultures from Blackfoot Indians to Eastern mystics to Greek philosophers who said we could not bathe twice in the same river.

As we change we must remain connected and preserve our identity. We must always be unique because coming to equilibrium would make us one with our surroundings thereby destroying us. So our mind is driven to make the appropriate connections by the experience of difference between ourselves and everything else.

This picture of mind as connectivity helps to explain how our brain and nervous system, with a host of neuropeptides and other molecules, create patterns of connection within our body that will parallel the connections we make with the outside world. The connectivity of mind can be applied from 'neurons to neighbourhoods,' as one brain scientist put it. In Chapters 8 and 9 we see how these physiological patterns affect our daily experience, which reveals some surprising facts about our decision-making process and the nature of free will.

Chapter 10 introduces the emotions, which are the fourth aspect of knowing. All our interpersonal activities involve mutual triggering of emotional changes within each other's brains and bodies. Unlike any other species, humans have an abundance of special 'spindle' cells in the brain that create immediate emotional linkages between us. Other cells called 'mirror neurons' predispose us to mimic the actions of another person, including facial expressions, which are the most emotionally sensitive of all.

Because emotions are not highly acculturated like language, they are much more universal. Our emotional mind is much older in evolutionary terms than our rational mind. In fact, it was from emotional interaction that symbols and language first developed. Emotions provide the meaning and the values we create in our experience; they are our signs of commitment to others and the source of our moral intuition.

We will see how all our feelings are bodily predispositions to our actions. The way they determine our relational space tells us a lot about relationships and interpersonal communication. We will then come to see what is so special about the human mind, compared to other species, when we consider the way emotions and language are intertwined.

In Chapter 11 we look at the later stages of the evolution of our mind from primate ancestors and also its development from babyhood until old age. The recent evolution of our mind is a history of increasing neoteny, vulnerability and intimacy. It was social pressure that contributed most to the enlargement of our brains. Babies cannot develop the human manner of thinking without the emotional connectivity that flows from love. In Chapter 12 we consider the nature of love and to a lesser extent the nature of fear because these two emotions have been the most influential in shaping our mind.

Chapter 13 is about decision-making in the present moment and the tricky business of free will. The folly of self-will and the way in which love and will support one another constitutes the fifth aspect of knowing. In Chapter 14 the difference between knowing and knowledge and the nature of intelligence and wisdom are discussed. The sixth aspect of knowing is the way in which our networks of conversation create the culture in which we live.

Our inquiry becomes more reflective as we move further from the material end of the spectrum of mind to the non-material or spiritual aspects of our life experience. Spirituality is not amenable to scientific explanation, but acknowledging it as part of our experience is the subject of the seventh and final aspect of knowing in Chapter 15.

The remaining three Chapters are about the application of these principles in coping with stress, in personal relationships, and in keeping the human mind alive in the future.

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One of the defining features of this journey is circularity. Autopoiesis, life and mind are essentially self-organising, circular processes. Science had been spooked by this sort of circularity until second-order cybernetics opened a way to honour the inherent circularity of living processes. To embrace this you have to stretch your thinking. A sense of gay abandon helps. And where would the human mind be without its sense of fun!

Think about your mind: that's a whirl for a start! To say the mind is curious is at once an invitation to undertake a circular adventure. Driven

by curiosity, the mind seeks in all directions and what it finds is curious indeed. It gets ‘curiouser and curiouser’ as Lewis Carroll’s Alice remarked during her many adventures in Wonderland.

But this also means some things can’t be explained very well, relying only on visual images and words. The experience of listening to music and singing songs together is one of the best ways I know to learn, experientially, about the human mind. There are many references to music throughout this story and a sprinkling of songs I have composed and written, which I like to perform as an adjunct to teaching. They are included here for their didactic value rather than their musical merit!

Because music exists, we know that the tangible and the visible do not portray the whole nature of our existence. There is a sense of melody and harmony in all our experience. To live is to venture forth into mystery and then return to the familiar with some needs unresolved and others satisfied. Like life, music is often repetitive, but always evokes movement – flowing cycles that may build to a climax and then resolve in one way or another when the cadence brings about a conclusion.

Listening to music, it is not the individual notes that command our attention; it is a sense of the whole experience. In the same way, each recursive moment in the life of our mind is melded into something that we call a whole experience. The meaning lies, not in the individual bits, but in the way we can make them coherent, *i.e.* put them together, with our mind.

This wholeness or unity seems to be a human yearning – perhaps borne out of the sense of separation we necessarily experience. The tension between the individual and the world, which is our mind’s *raison d’être*, is exemplified in all our aesthetic experiences. Humans have developed extraordinary emotions such as wonder and awe which are an appreciation of something other than ourselves.

It is part of the human experience to not only live the reality of our immediate worldly connections, but to transcend this through the power of our imagination and the inherent mystery of the unknown; in other words to invoke, with our mind, a higher order of existence. In doing this we make a special kind of meaning in which we visualise ourselves as a part of something bigger. The alternative in which we see ‘man as the measure of all things’ is to envisage everything revolving around us, just as pre-Copernican astronomers believed the sun and planets revolved around the earth.

Science showed this not to be the case for the solar system, and neuroscience has now gone a long way toward exposing the same folly in our thinking about the mind. Gregory Bateson referred to our inability to see ourselves as part of a larger system as the fundamental

‘epistemological error,’ citing many examples of problems we’ve created in this way. He wrote about alcoholism and other addictions, schizophrenia and ecological disasters. Others have extrapolated his thinking to the obesity epidemic and the war against terror. By creating an ‘us’ and ‘them’ we set ourselves up for conflict rather than cooperation and so the ability to see the bigger picture is lost.

That which drives us as individuals does not always result in peaceful relations among us. There is much conflict and antagonism between people, countries and religions and a lot of ruthless exploitation of our natural world. The desire to know can easily become the desire to control, which has its roots in the desire for certainty. Yet we also know there is no such thing as certainty. Not knowing is as useful to us as knowing, if we accept it, but our desire to control our own destiny compels us, at times, to attack others who appear to threaten our independence.

Our evolutionary history that has trended toward cooperation actually includes a lot of conflict. Most of our primate ancestors wage battles over territory just as we do. The bonobo (known for ‘making love not war’) have a way of turning squabbles into peaceful relations, but chimpanzees and other apes are quite brutal with their enemies. Frans de Waal acknowledged what he called the violence ‘potential’ even though he concluded that interdependence and empathy were the essential characteristics of all primate societies. Behind the violence is that tension between individual sovereignty and community wellbeing.

\* \* \* \* \*

There is one element of our experience that seems to deal directly with this problem. It is what we call love – or at least what I am calling love in this book. In the context of biology, love represents a special attribute of mind that works to preserve human experience when other tendencies would probably destroy it. The connections it creates have the capacity to form a productive union without sacrificing the individual. Its unconditional nature is the antidote to the desire for certainty. Erich Fromm thought that love was no less than the ‘answer to the problem of human existence’ because he saw our sense of separation as the wound most in need of healing.

Our greatest gift and our deepest problem are one and the same. We have the great gift of life by virtue of our autonomy and our ability to connect, but this means we must endure loneliness in our individuality and compromise in our communality, juggling individual identity with total dependence on belonging to something bigger.



Love is a very important word in our vocabulary because it expresses our deepest, unattainable desire and our only hope of ever getting close to achieving it. It is bitter-sweet, but beautiful. To this day, our mind has come up with no other idea that so directly and effectively addresses our basic problem as it also honours our greatest gift – life itself.

But love, to a biologist, can't simply be a passive, romantic ideal. It must have a specific, explainable role to play in human biology. It must take its place alongside the fear and selfishness that produce antisocial behaviours of all kinds including violent and destructive acts of aggression.

Alongside love we recognise a tremendous will that gives us purpose, fashions our intentions and drives our decisions. These two – love and will – bring into effect all our thoughts and actions, all the relationships that make our lives so rich – and yet so difficult at times – and all our feelings, good and bad.

Love and will are completely interdependent and belong together. In the absence of love, will is simply manipulation; and love, without will, is empty and diffuse. The mind of our everyday experience is a fusion of these two.

The fact that love inevitably comes up short, just as will is never entirely satisfied, gives that bitter-sweet quality to life. Yet we are committed to do the best we can in every moment. Understanding the biology of mind helps us to do this.

\* \* \* \* \*

'We human beings presently live a culture that highly values technological development in an ambience of competition, mistrust and control, as if this were the path that would lead us to expand our creativity and wellbeing in family and work life. No doubt we would like to live a professional life that leads to a high quality in our daily living and in the products of our work. Yet this cultural attitude generates pain, suffering and uncertainty in our work space and our family and in our social life.'

'We think that the expansion of our understanding of the kind of beings that we human beings are, and of the biological, cultural and psychic nature of human existence, liberates our intelligence and creativity and gives us a reflective capacity that can free us from the emotional blindness, pain and suffering in which our present cultural living immerses us.'

Ximena Dávila and Humberto Maturana (2009)



## *A CONSIDERABLE SPECK*

A speck that would have been beneath my sight  
On any but a paper sheet so white  
Set off across what I had written there.  
And I had idly poised my pen in air  
To stop it with a period of ink,  
When something strange about it made me think.  
This was no dust speck by my breathing blown,  
But unmistakably a living mite  
With inclinations it could call its own.  
It paused as with suspicion of my pen,  
And then came racing wildly on again  
To where my manuscript was not yet dry;  
Then paused again and either drank or smelt -  
With loathing, for again it turned to fly.  
Plainly with an intelligence I dealt.  
It seemed too tiny to have room for feet,  
Yet must have had a set of them complete  
To express how much it didn't want to die.  
It ran with terror and with cunning crept.  
It faltered: I could see it hesitate;  
Then in the middle of the open sheet  
Cower down in desperation to accept  
Whatever I accorded it of fate.  
I have none of the tenderer than thou  
Collectivistic regimenting love  
With which the modern world is being swept.  
But this poor microscopic item now!  
Since it was nothing I knew evil of  
I let it lie there till I hope it slept.

I have a mind myself and recognize  
Mind when I meet with it in any guise,  
No one can know how glad I am to find  
On any sheet the least display of mind.

Robert Frost



# CHAPTER 1

## Mind, Body and Quality of Life

### *Elusive and extended mind, process philosophy and life experience*

Your life experience and mine will be different in many ways, but in some ways it will be the same. There have been times when my life could be described as joyous and free and I felt very comfortable, at home and pleased with my place in the world. This is the benchmark I use when I think about quality of life. I experienced contentment, satisfaction and peace while still being actively engaged with the excitement of change occurring around me and within me. My body was free to be still or move without distracting pain and my mind played happily with whatever took its fancy. I knew that all of me was alive and I felt very thankful towards everything and everyone. I was connected in all the ways that enabled me to be myself.

How long did it last? Yes, we all know quality of life is ever-changing. It is also a composite of such varied feelings, thoughts, beings and doings that it cannot be captured in a simple phrase. Human experience includes mental and physical pain, anguish and despair as well as joy and happiness. It's interesting that this is not closely correlated with our actual circumstances. Sometimes I know I have just about everything I need, but I'm still not happy. I have also been debilitated by injury and deprived in various ways yet able to find considerable serenity and contentment at that time. I've met people who had no possessions and little food whose faces were always smiling and others who were famous and had everything, but who were unhappy in obvious ways. While there are physical impediments to happiness, it is the mental or non-physical aspect that is the crucial element affecting our quality of life.

This distinction we make in language between physical and non-physical is the first of many distinctions we must make, so this story can be told. Scientific materialism is an attempt to explain human experience in purely physical terms. Something that is non-physical will be much more difficult to explain. Alan Watts said it was like trying to wrap up a parcel of water or shut the wind into a box. But mental phenomena need to be explained because they loom so large in our experience and are so completely different from the physical. They are invisible, intangible, ephemeral and unpredictable. Even though we take them for granted in the most matter of fact way, as if we understood them, our mental processes are shrouded in mystery.

Humans have tried to address this mystery in many different ways. Before the advent of science, people had no choice but to respect and admire or fear all mystery because the option of exploring its mechanism did not exist. Natural philosophers such as Aristotle wrote about how the body and mind might work, but their evidence was extremely scanty by today's standards. The most powerful tradition for understanding mystery was religion or mystical experience and much was written about the mind in relation to the spiritual or non-material realm, which was essentially regarded as another order of reality. This was a belief system, of course. Scientific proof was not required; it was not available.

Much more popular nowadays are materialistic explanations that are suggested by scientific advances, but which also can't be proven on the evidence currently available. The most common is that mind is a by-product of molecular activity, an epiphenomenon arising from the biological processes in our brain. No less a scientist than Francis Crick, who was a Nobel co-laureate for his part in determining the structure of DNA, supported this idea, even though he called it an 'astonishing hypothesis.' Another idea is that mind could be an emergent property of a biological system that has reached such a level of complexity it gives rise to a completely new phenomenon. Thirdly, there are some eminent scientists, including biologists like Charles Birch, who maintain that mind is indeed another order of reality which is inherent in our brain cells and in all matter; in fact it was the force that brought the matter into existence in the first place.

Personally, I choose to honour subjective personal experience, explain as much as I can in objective scientific terms, then respect and enjoy the mystery that remains because I know this explanation will be incomplete. In fact, there is a scientific principle called Gödel's Theorem regarding 'formally undecidable propositions' which states that no logical system can ever be completely decided within the logic of the system

itself. To me, the most poignant aspects of our human mind are those associated with what we do not know.

### *Process philosophy*

My story is situated within the constructive post-modern world view that David Griffin calls pan-experientialism and John Cobb calls pan-subjectivism; these are two leading exponents of the process philosophy of Alfred North Whitehead. Those terms imply that subjective experience is a general principle of all processes; it is not confined to human beings. This challenging philosophy opened the door for what Charles Hartshorne called a 'higher synthesis' of the subjective and objective aspects of human experience.

In describing our reality, processes are at least as important as things. In fact, Whitehead said the real entities of the world are not bits of stuff at all; they are events or processes, which he called 'occasions of experience.' When we distinguish physical from mental or objective from subjective, we are not dividing up a world of discrete entities; we are dividing up a world of processes. We could not distinguish mind from body without thinking in terms of process. We identify different modes of perception as processes. Eastern philosophy has four noble truths, an eight-fold path, five skandhas of humanness and so on, all of which are described as processes. This philosophy counters our preoccupation with the forms – the structures themselves – by directing our attention to the processes which produced these forms. As Birch put it: 'a statue preserves its shape whereas a fountain performs it.' We are much more like fountains than statues.

Yet these distinctions we make using language do serve to divide up our experiential world into meaningful chunks. Having done this our mind re-assembles the pieces into coherent packages that fit together as a story. Several neuroscientists have suggested that our brain is, in essence, a story-making and story-telling organ. Stories are the best vehicle our experience has devised to carry a flow of meaning and hold it together in a satisfying way. They also underpin our autonomy by providing a distinctly personal account of everything that happens in our lives. We need our own story of who we are, where we came from and where we might be going, because it gives us that sense of coherence we call sanity. It's not surprising that we will vigorously defend and protect our own story against disruptive forces that threaten its existence from time to time. In society, we compare our stories with others to get a sense of shared meaning that is crucial for our culture and community.

When I relate my story to you I draw on two kinds of experience, which I will call outer and inner. The first includes all those happenings you could also observe if you were present in my outer world at the same time. The second is everything that happens within my private world, which you could never know, except indirectly. In other words, there are aspects of human experience that we say can be described objectively, but there is a large chunk which could only ever be described in subjective terms. This is an over-simplification because even the so-called objective description is subject to personal interpretation.

The point about pan-subjectivism is that this phenomenon is not necessarily confined to human beings; everything else might have an inner and an outer experience as well. I can empathise with you when I see you stub your toe. I can never really know your inner experience, but I have no difficulty granting that you have one. I can easily grant this also to other higher animals such as my cat or dog, perhaps even to a tree, if I acknowledge that I have some reverence for nature. Whitehead's point is that we cannot prove that some kind of inner experience is not part of every process in every part of our universe.

One of the tenets of process philosophy that can be taken up directly by biological science is that there are two kinds of perception: sensory and non-sensory. The first is the direct connection our sense organs make with the world around us (through sight, sound, smell, taste and touch). The second is that perception which seems to arise internally. It is best known to us as our feelings, but may also be described as intuition. This may also require some kind of connectedness, but it doesn't seem to involve the common sensory connections as they are understood in physical terms. Whitehead's philosophy allows us to explore both these kinds of process: the sensory, which can be explained fairly well in physical terms and the supposedly non-sensory, which probably cannot.

By accepting that not all aspects of process can be explained in purely physical terms, process philosophy accommodates the non-physical (non-material, metaphysical, spiritual) realm as an aspect of our experience. Not to do this would be to leave out a significant part of our recognisable human experience. Nevertheless, many neuroscientists are resigned to doing just that. For the purposes of this book, I am assuming that human experience is both physical and spiritual. The sense of connection we have with the world, when considered as our personal experience, has both a corporeal and a religious component. The word 'religion' comes from the Latin, *ligare*, which means 'to tie, fasten or bind.'



Many explanations which refer to the mind lump all this together under the heading of consciousness. Such a broad term lends itself to a wide range of explanations and also to perplexing questions such as: does a foetus have it? – or a person with brain damage? – or a non-human animal? Science simply cannot answer these questions on such a broad scale. Science works best when applied to more specific topics, though it still has limitations, of course. The constructive, post-modern, world view that is process philosophy can include science in a useful way, but must also reach beyond science to embrace the whole human experience.

Human cognition, for which I use the term ‘knowing’ in this book, is a combination of both sensory and non-sensory perception. The sensory aspects of knowing are explainable in the language of biological science, quite obviously. But biology also has something to offer regarding the non-sensory aspects of knowing, once we acknowledge these as discernible elements of our experience. The description of our feelings is a neglected aspect of biological science, yet feelings are ‘what matter most in life.’ An explanation of the human mind cannot afford to leave them out.

So every aspect of knowing has practical significance in our lives. Seven aspects of knowing are described in this book. These range across a continuum from the purely physical or obviously material, about which we can say a lot, to the purely spiritual or non-material, about which we can say very little, but we do not deny their existence. We will visualise a spectrum of knowing with a solid, material pole at one end and a mysterious, non-material pole at the other. I have found, from my experience, these are seven aspects of knowing that many people don’t know very well.

**MATERIAL → seven aspects of knowing ← SPIRITUAL**

### ***Science in search of the mind***

Advances in scientific thinking during the last century greatly expanded the role of science in explanations of consciousness. There are now several ‘theories of everything’ that attempt to integrate what is known about cosmology, sub-atomic physics, biology and consciousness. A well-developed example is Laszlo’s ‘connectivity hypothesis’ and ‘Akashic Field,’ the Sanskrit term signifying an all-encompassing field of ‘information’ within which we are all part of one big mind. There are

other theories concerning ‘the quantum brain’ and ‘the holographic universe.’ These are interesting and potentially useful, but at their present stage of development, they are neither simple enough to apply in our everyday lives nor complete enough to be entirely satisfying as explanations of the human mind.

An articulate observer of the scientific study of consciousness is the English playwright, Michael Frayn, who wrote *The Human Touch - Our Part in the Creation of the Universe*, which is about the irreducible element of subjectivity in our understanding of everything. He discussed the fundamental laws of science and the disagreements within the field of quantum physics – the famous Copenhagen business of his best-known play included – and came to this conclusion:

‘... we still end up, just as we do in the Copenhagen interpretation, with a reality that is accessible only partly to the observer, and which is expressible only through his participation in the world.’

This brings us back to the need to focus on our own personal experience.

The branch of science that refers most directly to what we experience is biology. For this reason, I suggest that biology, rather than being secondary to mathematics, physics and chemistry – merely the application of scientific laws such as the valence principle of chemical bonding to an interesting phenomenon called life – can be regarded as the primary science of human existence. I know of no biologist who has put this proposition more powerfully than Humberto Maturana from Santiago in Chile.

It was Maturana and his colleagues, notably Francisco Varela, who gave us an explanation of the self-directed nature of living things. To be alive is to have a certain kind of autonomy within the medium in which you live. This is more obvious in living things that move around, but even those that remain fairly still have the ability to control what they do. Their cells are separate enough from the world they live in to be able to carry out completely independent processes such as photosynthesis in plants or the conversion of foodstuffs into heat in warm-blooded animals, as long as they receive the raw materials and energy from outside. Thus they are self-governing, but also dependent on the relationship with their medium. Although this autonomy and relatedness is a fundamental feature of living things, it was not explained in detail until Varela’s *Principles of Biological Autonomy* was published in 1979.

This was a paradigm shift for biology. The relationship between a living organism and its environment had been explained almost entirely in terms of stimulus and response. The environment provided the stimulus and the organism performed the response. In animals with a nervous system, there was the ability to modulate this response, but essentially it was a one-way process. This way of thinking grew stronger as the ‘information age’ took hold. Knowing was said to consist of receiving information and processing it in the brain. Only when biological autonomy was given a new meaning, did neuroscientists begin to explore the two-way nature of perception, whereby the organism also determines which part of the environment it will engage, so the interaction can be visualised as more like a coupling or a connection.

Maturana studied the biology of perception and cognition and tried to relate this to the very nature of living systems, from single-celled bacteria to human beings. To be an autonomous unity is to be knowing, in that the autonomy stems from not being told what to do. To try to understand the mind is to try to understand the nature of life, even though we may only see through the glass dimly. Another biologist aiming in this same direction was Gregory Bateson who published *Mind and Nature – A Necessary Unity* in 1979.

When Fritjof Capra produced *The Web of Life – A New Synthesis of Mind and Matter*, in 1996, he drew heavily on what he called the ‘Santiago Theory’ of Maturana and Varela. He put this within the cultural context of ‘deep ecology,’ a school of thought founded by the Norwegian philosopher, Arne Naess, who professed that the natural sciences were the only valid means of understanding reality. As the scientific field of ecology grew it brought with it a greater awareness of interconnectedness as a hallmark of Nature – a better appreciation of what is known as an organic, rather than a mechanistic, view of the world.

By 2002 another influential biologist, Mary E. Clark, had expanded on this in her book *In Search of Human Nature*. She compared two contrasting world views: the ‘billiard ball’ model in which isolated, individual units move independently and interact by coming into contact with each other *versus* what she called ‘Indra’s Net’ where a Buddhist figure sits atop a jewel-encrusted net in which each jewel is influenced by and reflects every other jewel. The interconnected, organic, world view had gained precedence in the philosophy of biological science.

Much of the contemporary ‘social neuroscience’ stems from these historical trends, which are not representative of all the ways science can help us to understand the mind, but which are the guiding thread for my

particular approach, *i.e.* constructive, post-modern, process-oriented and ecological.

### ***Dealing with circularity***

Emerson Pugh said: 'if the human brain were so simple that we could understand it, we would be so simple that we wouldn't!' In his *Devil's Dictionary*, Ambrose Bierce, referred to the mind as a curious substance that seems to emanate from the brain and has the nonsensical idea that it will one day find out what it is, which is a futile endeavour because it has only itself to know itself with. Could we become lost forever in a circular loop when we use our mind to find out what our mind is and how it works?

Maturana and Varela's delineation of biological autonomy was part of a new scientific stream, which has made it easier to deal with the inherent circularity of self-producing systems. This flowed from cybernetics, which was the study of control mechanisms in both biology and machines and gave us useful concepts such as positive and negative feedback. Coming to consider human behaviour as a control system led to what von Foerster called the 'cybernetics of cybernetics,' or second-order cybernetics, which is the science of observing systems (those that do the observing), rather than the science of the things we observe.

The advent of second-order cybernetics was also an important paradigm shift. It has even been compared to the invention of the wheel and the printing press because its concepts of autonomy, self-regulation and connection provided a new theoretical basis for understanding human experience. Bateson's anthology, *Steps to an Ecology of Mind*, was hailed as a 'revolutionary approach to man's understanding of himself.'

It became possible to analyse essential circularities that are inherent in an observing system's descriptions of itself without resorting to circular reasoning by properly acknowledging the role of the observer – the subjectivity – (see Chapter 5) instead of trying to objectify it.

This is the basis of the connectivity metaphor I am utilising to make a useful description of the human mind. Mary Clark had earlier dismissed the narrow-minded cognitive science that equated mind with brain and, building upon the ecological approach, had written:

'Mind is what connects my individual brain-plus-body to the universe, gives my actions meaning and makes them adaptive.'

### *The extended mind*

Your body is much easier to locate than your mind. Most of it is right under your nose; it goes with you everywhere and seems to weigh more than it should sometimes. You also have a fairly good idea what the various body systems and organs are supposed to do. It is not so with the mind.

Most people think of it as being closely associated with their brain, with good reason, because damage to the brain affects our mental function quite obviously and we know also that the brain (and spinal column) is the 'central nervous system,' being the hub of the networks of communication within our body.

But when you think about what your mind is actually doing, your thoughts will not be predominantly about your brain. The experience of your mind suggests that it extends outside your head and your body because it brings us an awareness of everything we can see, hear, smell and touch in the world that is out there. When you form an image of something with your mind, that image appears to exist out there in front of you, not inside your head. Rupert Sheldrake called this 'the extended mind' by which we reach out beyond ourselves into the world around us. The words, attention and intention, come from the Latin *tendere*, which means 'to stretch.'

An analogy for the process of your mind is your experience of watching television. The images you see come from a studio and a transmitter through your TV antenna, but they may as well not exist until you turn on your television set and tune to that channel. It is only when the connection is made that the phenomenon of the television show comes into existence for you. You would assume it was there all the time, but it was not a part of your experience. Someone might say this experience is a product of the electronic recording, transmission and playback mechanisms involved, but the salient fact is this experience would not occur unless the connection is made by your tuning in.

Similarly we might ask how the experience of music occurs. I play the guitar and the resultant sound comes from the way the instrument and I interact. Neither the guitar nor I could make those sounds except by our interaction. The music is made by our connecting and if you connect with us you will hear it too.

So we come to know the mind (in this story) as a process of interaction between ourselves and our world, characterised by a sense of connectedness. Maturana wrote: 'the mind is not in the head.' He also said we cannot equate phenomena of behaviour with phenomena of

brain activity because they exist in quite different domains. We can look at the relationship between the two, but one cannot be the other. The relationship between behaviour – what we do or what we see happening – and our thoughts and feelings constitutes our personal experience and it is within this relationship that we will find the mind.

### *I feel, I think, I am*

Our personal experience and the process of mind as described here involve our body in such obvious ways that we might ask: is there any real distinction between mind and body after all? Woody Allen said in the film *Getting Even*: ‘is there a split between mind and body, and if so, which is it better to have?’

The person who gets most of the credit, or shoulders most of the blame, when a mind-body split is mentioned is René Descartes who famously wrote: ‘I think therefore I am.’ Descartes was a mathematician, philosopher and experimenter who lived from 1596 to 1650. He was born in France, but lived mostly in Holland. Apparently he liked to spend all morning in bed, thinking, and his thoughts were certainly influential. This habit may have eventually contributed to his death, however, because he contracted pneumonia after being required by the Queen to give her special instruction in the early hours of the morning.

What he claimed was that the essence of our being or the substrate of our existence was a mind (*res cogitans*) that was quite distinct from the body, which was a mere extension of our animal nature (*res extensa*) and essentially mechanical in its operation. This idea distinguished our ‘soul’ from our purely biological form and became the template for much of human thought about mind and body ever since. It led to a way of thinking about the mind which has privileged reason over the emotions.

Nowadays, the important role of feelings in our thinking is so widely recognised that Susanne Langer entitled one of her books: *Mind – An Essay on Human Feeling*. Whitehead, at one time her teacher, also made no bones about this when he wrote:

‘It is never bare thought or bare existence that we are aware of. I find myself rather as essentially a unity of emotions ... my subjective reactions to the environment, as I am active in my nature. My unity which is Descartes’ ‘I am’ is my process of shaping this welter of material into a consistent pattern of feelings.’

We will address in this book what the American neurobiologist, Antonio Damasio, called ‘*Descartes’ Error*.’ Damasio put it: ‘we are and then we think’ and he equated consciousness with ‘a feeling of knowing.’

### ***What is so special about being human?***

For all of us there is something special about that feeling of knowing. As you read my story, or anyone else’s for that matter, you will experience this feeling; in fact, the most common manifestation of it is in our daily conversation. When we consider what might be different about the human species, we generally say it is something to do with our language. From Maturana we get a further crucial insight that it is language as a peculiarly human manner of living together, not simply language as a tool for exchanging information, which distinguishes us from other species. Ordinary conversation is the staple diet in our rich feast of human experience.

Conversation is our most common mode of connecting with one another, which makes it a major part of the operation of our mind. Yet we tend to dismiss it as trivial, even accidental. For example, the chat at the office water cooler is not seen as the main business of the workplace, though it probably influences just as many corporate decisions and outcomes as any of the formal meetings. While we can’t know everything that distinguishes humans from other species, we will get vital clues about this when we consider the mind in everyday conversation.

Imagine you are in a group sitting at small tables, four people to a table, with a blank sheet of paper for a tablecloth, some pens and pencils – this is a ***Conversing Café***. Also called world cafés and other names, these are popular ways of bringing about cultural change across the world today. They are discussed in more detail in Chapter 14.

Maturana answered the question ‘what is a human being?’ in the following way:

‘A human being is living system living in conversations, where a conversation is an entwining of language and emotion ... as the emotion changes, the language changes, as the language changes the emotion changes. I also claim that language is our human manner of living together ... not a communication tool. It is a coordination, or dance, of behaviour that has become more complex. For instance, pointing is an operation in language where we humans look in the direction of the pointing and not at the finger whereas my cat, outside of

language, only looks at my finger. I claim it is a coordinated dance ... that we live in it ... and that love is central to the development of this increased complexity and therefore to what makes us human.'

These are major themes for the rest of the book – language, emotion, love and the dance of conversation.

### *The best life experience*

Basically, we want our mind to provide us with the best life experience possible. Perhaps the simplest way of saying this is to say that we seek happiness. Bertrand Russell was the doyen of all rational thinkers yet he captured the idea of happiness as something that could not be sought directly, but was a by-product of a 'good life.' He wrote:

'A man comes to feel himself part of the stream of life, not a hard separate entity like a billiard ball, which can have no relation with other such entities except that of collision. All unhappiness depends upon some ... lack of integration ... between the conscious and the unconscious mind ... between the self and society. The happy man is the man who does not suffer from either of these failures of unity ... whose personality is neither divided against itself nor pitted against the world. It is in such profound instinctive union with the stream of life that the greatest joy is to be found.'

Russell was Alfred Whitehead's pupil and then collaborator for the monumental treatise of Western philosophy called *Principia Mathematica*, but later their lives took very different paths. Russell remained a leading exponent of materialist philosophy while Whitehead became a pioneering non-materialist, process philosopher. I love the story, recounted by Birch, that Whitehead introduced Russell at a lecture at Harvard, quite late in their lives, with the following words: 'Bertie says that I am muddle-headed, but I think that he is simple minded.'

We live with great uncertainty and a great desire to know. The best life experience seems to be when we can have a sense of security while still remaining open to the unexpected. We are quite equivocal with regard to stability and change. Our need for security and repetition is coupled with a welcome inevitability that we will not always find it. Music is able to fulfill these expectations in terms of its repetitive elements, enriched by the systematic violation of our expectations when the tempo changes or a cadence is unresolved – for the time being at least. Music represents and manifests the idea of ordered yet uncertain movement; it



feels like you are holding onto an essential thread while venturing down an unknown path that twists and turns as it will.

A powerful and frequently met uncertainty in our lives is whether we will find love. Perhaps love is the most basic yearning of our mind; the easiest to excite and the hardest to satisfy. It is rather like a song that you enjoy – there is a lot more to it than the logical meaning of the lyrics. What you hear at a deeper level is the melody and the harmony. You need to know the tune as well as the words. In this book we are listening also for what another biologist, Darryl Reaney, called the ‘music of the mind.’



# CHAPTER 2

## Blind Spots and Not Knowing

*How mind connects us and why meaning is not transferable*

That feeling of knowing is generated primarily from activity in our brain, so we hope that whatever our brain is doing will be reliable and trustworthy, will not distort reality or deceive us in any way. Unfortunately, this is not the case. An honest observer would have to say that your brain (or mine) cannot always be trusted. Experimental psychologists cite hundreds of examples of ways in which our brain has a ‘mind of its own.’

Firstly, there is a self-serving, emotional bias that affects our perception of just about everything. You might deny it like I do, but studies have shown that we judge our own ability to drive a motor vehicle as superior to that of others in most situations, and we take the credit for successes rather more readily than we take the blame for mistakes. Many smokers claim they will not be the ones to contract lung cancer. Most people tested believed this self-serving bias would be more pronounced in others than in themselves! Some people seem to prefer a self-handicapping bias instead.

Another obvious distortion is the pig-headed brain, which will simply not change its view in the face of new evidence. Then there is the weak-willed brain that will let you think you must not eat another chocolate or take another drink, but a moment later cause you to gobble the chocolate or swig down the drink. Trying to make yourself go to sleep when you are wide awake is an all-too-familiar example of a mind that won’t do as it’s told.

It’s an undeniable fact that the decisions we make can be affected by the mood we are in at the time. Aristotle noted long ago that ‘feelings are conditions that cause us to change and alter our judgments.’ There is also evidence that individual preferences are often based on nothing

more than familiarity, or previous exposure to the same situation, which is probably why David Hume wrote: ‘it is not reason which is the guide of life, but custom.’

Nevertheless, our knowing still works remarkably well. The fact that my subjective experience does not always tally with someone else’s supposedly objective viewpoint is a biological fact, but it does not have to be a problem. It is more like the spice of life rather than its poison. Being aware of these little tricks our mind plays is helpful in many ways, not least because it reminds us that what we think we know might be only a drop in the ocean of all there is to know.

There was a Professor I knew who started every new class by drawing a huge circle on the blackboard – as large a circle as the blackboard would allow. Then he made a tiny dot with the chalk in one corner of the board and said: that dot is the sum total of human knowledge; the circle represents all there is to know. We tend to assume that our beliefs are always well-founded, but Ludwig Wittgenstein, sounded this warning: ‘At the core of all well-founded belief, lies belief that is unfounded.’

Does anyone know all there is to know? There have been some famous statements made by scientists throughout history to the effect that we were on the brink of knowing everything about the mechanisms of the universe, so we would shortly be able to predict and control what happens. A most eminent scientist, Lord Kelvin, advised students, at the end of the 19<sup>th</sup> century, not to study physics, because he believed that almost everything in that field had already been worked out. Soon after came the revolutionary new concepts of quantum mechanics and relativity theory!

Being overly proud of what we know is an intellectual hubris that is widespread. You have probably found from experience, as I have, that letting go of what we think we know is a necessary prerequisite for learning something new. To be human is to acknowledge uncertainty reluctantly. Maturana and Varela chose to illustrate the opening paragraph of their classic book, *The Tree of Knowledge*, with a famous European painting depicting the human temptations, in particular ‘the temptation of certainty,’ which is the principal pitfall of the mind.

### ***The inevitable blind spots***

The basic difficulty about knowing is that you don’t know what it is you don’t know! Mark Twain put it like this: ‘It ain’t what you don’t know that gets you into trouble. It’s what you know for sure that just ain’t so.’

Something you thought you knew perfectly well may suddenly turn out to be quite different. Your rear vision mirror on the car may show

most of the road behind, but if there is a small area which you can't see, you could be in for an unpleasant surprise.

As you probably do know, each of us has a physiological blind spot as a normal part of our visual system. There is a small area, about 30 cm in front of your face, which each eye individually cannot see, because those light rays entering the eye happen to fall on a place where there are no sensory nerve endings to detect the light. It is the point on the retina where the optic nerve is attached. Because we have two eyes that can move freely and a clever brain this doesn't cause us any problems. To locate your own blind spot right now, try the first experiment outlined below (Figure 1).

What is most interesting about this blind spot is that our brain is so ready to fill in the missing bit for us. In the second experiment below (Figure 2), with a line through the spot, the line appears to be still there after the spot has disappeared. That line was not physically visible to your eye, but your brain filled it in anyway, because it decided the line should be there. Similarly, the background shading was filled in as if it existed in place of the missing symbol. This happens because your brain is in the business of making a story. Its process is to preserve the wholeness of the story as it encounters new experiences and to do this it often has to make things up in order to fill in the gaps.

In the third experiment below, it is obvious that your brain has the ability to recognise a whole word even when many of the letters are incorrect. It only needed a clue from the first and last letters and was able to make up the rest. Filling in the gaps to maintain the coherent wholeness of the story is the normal way of operating for our brain and mind.

### Three Experiments for you to try:

**Experiment 1.** In Figure 1 below you can find your own blind spot. To do this you cover your left eye and look directly at the + with your right eye while moving your head back and forth in front of this picture. When the picture is a certain distance away the black spot will disappear from view. It will reappear when you move closer or further away.



Figure 1. The black spot will disappear when it is in your blind spot.

**Experiment 2.** The second experiment (Figure 2) is the same as the first except there is a line through the black spot and grey shading. See what happens to the line and the shading when you make the spot disappear. Try reversing the process to make the + disappear instead of the spot and see what happens to the shading.



Figure 2. See what happens to the line and the shading when the black spot or the + is made to disappear.

### Experiment 3. Try reading the following passage:

Aoccdnrig to a rscheearch at Cmabrigde Uinervtisy, it deosn't mtttaer inwaht oredr the ltteers in a wrod are, the olny iprmoatnt tihng is taht the frist and lsat ltteer be in the rghit pclae. The rset can be a taotl mses and you can sitll raed it wouthit a porbelm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe.

This is the point about blind spots. You don't know they are there because the mind's process compensates for the deficiency without you realising it.

Heinz von Foerster used to tell an interesting story about a medical case from World War II. A soldier who was shot through the head sustained what seemed like minor damage to the back of his brain near the visual cortex. After returning to normal life, he found that he stumbled a lot and dropped things. This became worse, yet his tests showed all motor systems functioning normally. It took some detective work to find that the problem was due to his restricted visual field. He had a greatly enlarged blind spot without realising it. His sensory-motor coordination gradually broke down because he was relying on visual clues that were no longer there, yet his brain was behaving as if they were. After realising this he could retrain his behaviour accordingly.

There is a parallel here with any form of psychotherapy which consists of uncoupling people from relying on clues that are no longer there. Viktor Frankl, who wrote *Man's Search for Meaning*, treated a man with severe depression after his wife died by conversing about a new, identical wife until the man realised he was living in an imaginary relationship, now she was no longer there. In von Foerster's inimitable words: 'when he could see that he was blind, then he could see!'

One of the most pervasive kinds of blind spot that we all experience is when we miss things because they are too close at hand and too obvious. Wittgenstein made the telling point that: 'the aspects of things that are most important for us are hidden because of their simplicity and familiarity.'

### ***To know and not to know***

Even the knowing we can rely on comes in several different kinds. Knowing how to do something, which could be called a procedural kind of knowing, makes up a large part of our mental activity. Knowing how something works is somewhat different in that it is more theoretical, yet it also plays a large part in our thinking and decision-making. John Shotter spoke about 'knowing of the third kind' (to distinguish it from theoretical or practical knowledge), which he said was knowing how to interact and relate to others. We are also aware of knowing as our inner experience, *e.g.* to know pain, to know freedom, to know love or fear.

Then there is the ancient injunction: 'know yourself.' Who am I? This is perhaps the most basic question of all. What about knowing someone else? Are you what I think you are? That seems unlikely. And

are you what you think you are? It has been said in many ways that I am not my thoughts. They come and go and I'm still here.

Thinking as a biologist, it's obvious that we are not the only living things that are capable of knowing. I have stood in the forest and wondered how the trees knew to grow upwards even though a seedling had started out from the side of a rocky ledge; how the largest trees knew to grow straight and tall so their leaves will get enough sunlight; how plant roots know where to head towards water; how all creatures know how to find their food, avoid danger, build their nests and so on. There are names for all these things – geotropy, hydrotropy, phototropy, *etc*; and they are also called instincts where animals are concerned. My point is they are all examples of knowing. Knowing is not just an attribute of the human brain.

Because words make distinctions, we can't consider knowing without acknowledging the phenomenon of not knowing. Not knowing has rather a hard time of it in the world today. It's not at all popular and understandably so. Few of us are willing to admit to not knowing and even fewer actually practice admitting it often enough to enjoy the benefits of doing that.

The age of specialisation has contributed to this. We have come to rely on the expert in each field to know more than the rest of us about that particular subject. For anyone bearing the label of expert, to say 'I don't know' is tantamount to handing in one's badge, unless you can argue that the question doesn't belong in your field. Most of us will make a valiant attempt at a partial answer, at least, to any question that could possibly fall within our area of expertise. I am painfully aware of this myself, having been known as an expert on the biology of cognition!

The problem is not confined to that large body of people who are experts on something. Most of us are quite ready to say that, although the question is way beyond our experience, we think and feel such and such about it, and the more we have to say on the matter, the greater our knowledge of the subject appears to us to be. Then there are the administrators, managers and politicians who have to act as if they know something in order to keep their jobs. As parents, too, we seem to have a moral obligation to be knowing, even in the face of momentous questions such as where did I come from and the like.

I would like to say I know nothing about knowing, but that would make it too difficult for me to write this book. But what I have discovered is, the more I tell people everything I know about knowing, the more they seem to appreciate the importance of not knowing!

In this book, we will consider seven aspects of knowing that range from the purely physical coupling of a living being with its environment



to a mysterious spiritual notion of belonging to some larger system. These are the two ends of the complete spectrum of mind.

### *The first two aspects of knowing*

The first two of the seven aspects of knowing have been mentioned already. They are *autonomy* and *connectedness*. Both depend on there being a boundary that distinguishes one's self from everything else, at the same time as it links us with the environment in which we are embedded. Our body surface serves the dual purpose of separating us from, and connecting us to, everything else.

The basic physical arrangement that makes life possible is most easily seen by visualising a single-celled organism such as a bacterium, which is the simplest type of cell. This little creature does not live at the mercy of the elements around it. It does what all living things do. It eats, digests, breathes and excretes by virtue of an operating system that we can describe as autopoietic. It also senses where there is food and may be able to move towards it and also move away from a toxic substance it detects nearby. In other words, the simplest kind of living cell displays a kind of intelligence, as Bruce Lipton put it. It has a mind, albeit in the most primitive form.

The biological view of mind is that it is synonymous with life. Living things could not exist without it. The process of knowing is the fundamental process of living. That is the common element in the two basic questions that Maturana posed in his research: (1) what is the nature of a living system? (2) what is the process of perception/cognition? He summed up many years of complex research with the very simple conclusion that living systems are cognitive systems and cognition is what a living system does.

Cognition is the process of knowing in its broadest biological sense. It does not require a brain or nervous system to know, although these obviously add greatly to the scope and flexibility of the mental process. The biological approach to the study of mind is to acknowledge that every living cell has an ability, by virtue of its autopoietic function, to know what to do.

This deceptively simple, but far-reaching, abstraction of the living process is the idea for which Maturana coined the term, autopoiesis, which literally means self-producing. Apparently, he was discussing with a friend the dilemma Don Quixote de la Mancha faced as he had to choose either the path of arms (praxis, action) or the path of letters (poiesis, creation). Maturana recognised that the autonomous nature of

the living organism signified a continuous process of re-creation (through doing) and could be captured by the term, self-creation, or autopoiesis.

The Fontana Dictionary of Modern Thought now defines autopoiesis thus:

‘In cybernetics, a term coined by Humberto Maturana for a special case of homeostasis in which the critical variable of the system that is held constant is that system's own organisation.’

The concept of an autopoietic organisation draws together the biochemical activity of a living cell in a new way by putting a conceptual boundary around the system. This property of the system as a whole is called its *organisation* as distinct from the interacting components that make it up which are its *structure*. The living system, bounded in this way, is open to matter and energy from outside, but it essentially runs itself and maintains itself by replacing its molecular components through the activity of its molecular components. To do this, it is absolutely dependent on its connection with the medium in which it lives to provide the flow-through of its source material.

The autopoietic organisation is crucial for life, so this must be kept constant – it is not negotiable – but the structure can change in whatever way is necessary to maintain this organisation. That structural change occurs according to the ever-changing connections it makes with its surrounding medium – a process Maturana and Varela called ‘structural coupling.’

The diagram below (Figure 3) shows an autonomous unity at the top, a representation of its environment in the wavy line on the bottom and the essential connectivity between them as a two-way arrow.

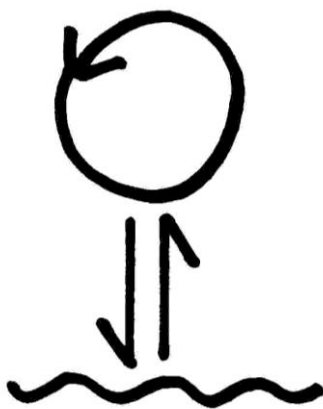


Figure 3. Diagram representing an autonomous unity, structurally coupled to its environment to maintain its autopoietic organisation.

As long as we have our mind, we can keep on being autopoietic by reconnecting with our world at every moment, according to the flow of external change that we encounter and the flow of internal changes we must make to keep our organisation intact. Any description of our mind must include the interconnectedness that is involved in its operation.

Think of a blind man walking with a stick. His vision is the connection that the stick makes between his brain and the objects of the outside world. Think of how you and I exist for one another. We exist not only in our respective places, but you exist in my mind also and I exist in your mind; unless, of course, you are not paying any attention to me! We are connected by our minds.

The term, autopoiesis, is not only a brilliant abstraction of the living system process. It is also a concept of great philosophical importance, because it underpins the holonomic way of thinking which will be crucial if we are to understand and solve the huge ecological problems we have in the world today.

Mary Clark's way of summarising the basic nature of a living system matches nicely with Maturana's. She said there are only three necessities of life for a human being (or any living thing) and these are also the three basic propensities of life. These are a propensity for *bonding*, for *autonomy* and for *meaning*; firstly, to be bonded – to belong or connect – secondly, to have a personal identity and autonomy, and thirdly, to have a meaningful purpose and be able to make meaning.

Elaborating on this (recognising that the order of 1 and 2 is interchangeable): a human being must have (1) autonomy – being oneself; (2) connection (belonging to and being part of something bigger), and (3) the ability to make meaning. The third one depends on the first two. Maturana and Varela said, in corresponding fashion, a living system is autopoietic (autonomous) and structurally coupled (connected) so as to have the ability to know (cognition).

So the first two aspects of knowing are the most basic biological requirements for survival. All the other aspects of knowing we will consider have to do with the ability to make meaning.

We now have a more complete working definition of mind, which will shape our way of thinking about it: *Mind is that property of our being which connects us to one another and our world in such a way that we can maintain our autonomous existence and create the meaning we need.*

To successfully manage this inevitable tension referred to earlier – to be oneself, but also belong to the wide world – is the poignantly tricky task of the human mind.

*Distinguishing ourselves*

It is autopoiesis that gives us our selfhood. A living system is often referred to as self-organising, though it is, more strictly, spontaneously organising by means of a self-referring process. Its task is to create and maintain this sense of one's self as distinguished from everything else. But, here's the rub. This can only be achieved by keeping its boundary closed so far as knowing is concerned. An autopoietic system keeps its organisation intact in the midst of the changes all around it by a property known as *operational closure*. This means that what happens within your brain and body is not directly controlled by what happens outside it. Your being will respond to many nudges from outside, but it will decide for itself what response to make.

The idea is that one's own knowing should be the knowing that controls one's own process. Our mind must engage with the outside world in such a way that our being remains self-governing. It will feed off the connections it makes, but must then manage this energy to run its own unit – not be directly driven by outside forces.

Therefore we say that living things are both closed systems and open systems at the same time. They are open with respect to the intake of oxygen and nutrients and the excretion of waste products. They are closed in a semantic or operational sense in that what happens outside the boundary of the living system does not instruct or determine what happens within it. Outside stimuli are not unambiguous signals that have a predetermined result upon reaching our body. They are non-specific triggers so far as our body is concerned and it will not necessarily react according to the way the signal reads.

For a rough analogy of this process, think of the commander of a submarine under the water or a pilot landing his aircraft in a thick fog. He watches the panel of instruments in the cockpit and makes decisions according to their configuration, which is internally generated from signals passing to and fro between his vehicle and its surroundings. This configuration of cockpit instruments is all he needs to know to do his job. If you complimented the pilot on landing in the fog he might say: 'what fog?' He was just using his instruments. They provided the meaning that ensured his survival.

We are always in the driver's seat and we use our instruments of knowing to tell us about our relationship with the medium in which we operate.

When you think about it, a self-organising system could not be told what to do or be controlled by some external instructions and still be

running itself. It has to have this peculiar characteristic we refer to as knowing or, to put it another way, it has to have a mind of its own. Another way of saying this is that it forms its own meaning; it does not receive this meaning from elsewhere in a preformed state. We tend to look for meaning outside of ourselves without realising that we are creating our own all the time; that this is the essential nature of a cognitive system.

### *The first two blind spots*

The reason I said these seven aspects of knowing were not well understood is that each one has a number of blind spots associated with it. In our normal manner of living we are generally unaware of these, which is why we find it difficult to overcome some of our most pressing problems, as individuals and as a society. The most fundamental and therefore least obvious blind spots are associated with the first two aspects of knowing.

Firstly, we don't fully appreciate our autonomy and think of ourselves as being steered by outside influences, which is only partly true. This means we are inclined to look outside of ourselves for security and authority, particularly in the direction of institutions and experts. We generally feel rather alone and see around us fragmentation rather than wholeness. We often try to promote a false togetherness by various forms of monoculture such as wearing the same clothes or making our houses and shops all look the same and, in doing this, we forget to honour and respect the diversity on which our connectedness depends. This is a subtle and insidious blind spot, but its implications are profound.

The second blind spot concerns our sense of connectedness. Taking our connections for granted, we often forget about them altogether and do not honour them as they occur. This is especially true of long-term family or institutional affiliations, which seem to be fixed or imposed on us rather than freely chosen. On the whole, we treat relationships quite casually rather than sincerely. This is reflected, not only in sexual promiscuity, but in our attitudes to the people who serve us in shops or join us in queues or on buses. To a biologist who studies the mind, every connection is precious no matter how fleeting it is or how institutionalised it has become.

The biggest difficulty we face in communicating with one another arises because we assume that meaning is totally transferable between us and then deplore the misunderstanding that plagues our lives. We are generally blind to the operational closure of our cognitive process and

the need to create our own individual meaning at all times. You and I have lived through the information age, which by its very nature demeaned the business of connecting by overvaluing the bits of information we are always trying to obtain. We have been worshipping the content when it is the process that is fundamentally important.

When we recognise a blind spot, we see something differently, and this new meaning can be very helpful; it can even lull us into a false sense of security because we now know something we didn't know before. But we are still faced with so much more we don't know. It is the human condition to have to deal at all times with what we don't know alongside what we do know. This is the source of both our fear and our excitement.

At the interface between the known and the unknown is where our mind is most alive; where it does its best work. We live with uncertainty and today's world is said to be more uncertain than ever before, which makes us anxious. But the human mind is perfectly equipped to deal with uncertainty. It is our attitude to the unknown that brings out the very best of human qualities. The way we use our mind to relate to the unknown will continue as a major theme of this book.

# CHAPTER 3

## Seeing and Hearing

*illusion or perception, the organising idea, music and the voice*

The five remaining aspects of knowing all concern the way we make meaning, which would not be possible without the twin foundations of the mind: autonomy and connectedness. It's a sweet paradox that we all make meaning by the same process of 'connecting the dots,' as it were – by putting together our story, based on each moment of our experience – yet each of our stories is uniquely our own. Even though our brains provide for an extraordinary degree of emotional correspondence between us and there are brain cells that mimic the activity in another person's brain (see Chapter 8), our mind is essentially autonomous and operationally closed, so that one's knowing and meaning is one's own.

Earlier we distinguished between sensory and non-sensory modes of perception. The journey from what is most clearly known, which we called the material end of the spectrum of knowing, to the more mysterious kinds of experience at the spiritual end, begins with the obvious sensory aspects of knowing. These involve our eyes, ears, mouth, nose and skin and our incredible senses of sight, hearing, smell, taste and touch. I will describe the process of perception mainly in terms of our visual and auditory systems.

What role do we expect our eyes and ears to play in our knowing? The pervasive culture of 60 years of the 'information age' leads most of us to say we expect our eyes and ears to receive, or at best gather, information from our environment. This suggests a rather passive, one-way process in which the more information you collect the better it will be. But we have become quite disillusioned with this idea in recent decades, due to feelings of stress from so-called 'information overload'

and futility because our appetite for information seems to be insatiable. In this regard the Internet has had an important influence.

On the one hand, the World Wide Web gives us a sense of the impossibility of ever obtaining even a tiny fraction of the total amount of information available; on the other hand, it makes it easier than ever to grab any bit of information we like. The problem is the reliability of this information for our meaning-making process. That is because some of it comes from within a coherent meaning structure that will be fit with our own, but some of it does not; it could be what we call wrong or it could be misleading, even deliberately so.

An illustration of this is the developing culture in which so-called 'information exchange' is a game of virtual reality played by people pretending to be someone else such as the Tweeps on the social networking site, Twitter, or people living fantasy lives in an imaginary world such as Second Life. You don't have to be on the Internet to be exposed to a barrage of so-called facts and figures that trigger the meanings you make in one way or another. In these declining days of the information age, one of the most commonly used terms is 'misinformation.'

Perhaps we should be grateful that neurobiologists have now brought to our attention the closed nature of our cognitive system and the fact that the information is not the meaning. Every number, word or symbol we read or hear is merely a trigger for our knowing process; it is not an unambiguous message we receive in our brain like you get a letter in the mailbox. Each bit of information has no real value until we combine it with something else to form meaning, which we do within the closed domain of our autonomous selves.

### ***Seeing and hearing are different connectors***

Visual and aural perception will be considered here, not as means for acquiring information, but as connective mechanisms that are vitally important to the operation of one's mind. The senses of seeing and hearing are very different and this difference enriches our highly integrated sensory experience.

The physical medium we use for seeing is light, of course – the super-fast-moving rays (or electromagnetic radiation) that travel through space, even totally empty space, at about 300 million metres/second. We normally think of these as travelling in straight lines unless they pass through a transparent material such as a glass prism; and they can be blocked by any opaque material.



The substance of hearing is the much slower-moving vibration that we call sound. This must travel through an elastic material such as air or water to produce a series of minute pressure fluctuations. Unlike light, sound can go through walls and around corners to a certain extent, but it travels at only 350 metres/second in air. Its speed varies according to the medium that carries it; it's much faster in sea water, for example. The sound waves spread out like ripples on a pond to form a field, which can interact with other fields and be reflected or altered, *e.g.* by resonance. It's a form of motion known as wave propagation, meaning that something is conveyed from one place to another, but the air itself does not go there; it just goes up and down.

These sound waves can be felt by many parts of our body, but it is the ear that is exquisitely designed to use them. They are channeled by the outer ear onto your ear drum, which is incredibly sensitive to pressure fluctuations. The vibrations pass on through a spiral amplifying mechanism into a fluid-filled chamber in which several thousand tiny hair cells are bent to and fro by the movement of the fluid, sending nerve impulses directly into the middle of the brain. For sensitivity and ability to discriminate, it is perhaps our most amazing organ.

In the eye there is an adjustable lens enabling us to focus the light rays reflecting from a particular object. Where this light meets the lining at the back of the eye (the retina) there are two types of receptor cells that will detect it. These connect via the optic nerve directly with the back of the brain. The image created in this way would be upside down and back to front, but our brain has no difficulty coping with that. Our two eyes, side by side, provide a stereoscopic view, making it easier to judge distance and depth of field, but the width of our visual field is more limited than many other animals, meaning we have to turn our head to see behind our back.

Our aural field is 360 degrees and hearing can't be turned off and on as easily as sight can; we don't have earlids. It is the first sense to develop; the ear begins to form at eight weeks of pregnancy and is anatomically complete by 20 weeks or midterm. It is the last sense to shut down when we go to sleep and the first to resume when we awaken. Hearing voices in our imagination is nowadays regarded with suspicion, but has not always been viewed so negatively. The idea of the muse in mythology gave our sense of hearing a more mystical connotation.

But we live in a world where vision is the predominant sense. Visual perception is described as the premier channel by those who say we obtain 75% of our information through our eyes. Blind people have to substitute other senses and there are remarkable examples of how this

can be done. Helen Keller, who was both deaf and blind, could know a lot about people and places from her unusually keen sense of smell and her sensitive hands. The blind use touch to read Braille, of course, or a stick to locate parts of their world that are close by. Deaf people have developed wonderful ways of communicating by sign, gesture and facial expression.

For most of us, in our quest for meaning, there is something primary about seeing. We tend to say 'I see' to denote our understanding of something. When we feel the need to know something, our first impulse is usually to look for it, rather than listen for it or smell, taste or touch it, though all of those may soon follow. We give considerable prominence to the visual arts in the form of paintings and photographs and the moving images of cinema, television and theatre – which also incorporate sound, of course.

Not that anyone would deny the importance of listening to one another and to voices on the radio and detecting unusual noises. We are always monitoring the sounds around us, but in a less overt way. The sounds of our city environments are harsh, so the use of headphones and ear buds for private listening has increased, and we are less exposed to the natural sounds of our environment than humans have ever been. The widespread use of garish, flashing lights to catch our attention puts emphasis on the visual sense, but an unexpected sound like a thunder clap or rifle shot is an even more potent trigger for our mind.

In my own experience, awareness of the non-sensory aspects of perception seems more closely related to the sense of hearing than to seeing. Although bright light has been associated with some dramatic experiences that people refer to as spiritual, the everyday appreciation of the more subtle meanings in life is more often associated with hearing. There is a saying that sight takes you into the world whereas hearing brings the world into you. Hearing is less intrusive and less probing than seeing; and it detects more subtle qualities of our connecting process.

Amongst all our listening experiences, the appreciation of music deserves a special place and we will consider it in more detail. Anthropologists have various theories about the origins of music and language (see Chapter 11), but most agree we have been making some kind of music for at least the 100,000 years or so that our species (*Homo sapiens*) has existed. We all experience music in some form or other and this experience reveals important features of our mind.

The most outstanding feature of our visual perception is our ability to recognise faces and notice subtle changes in facial expression. A large proportion of the total activity within our brain is directed towards this because interpreting facial expression is more important than anything else in the making of our story of meaning. Even though we're not looking directly at one another, we use our peripheral vision to connect at all times. This is of the utmost importance in the relationship between a mother and her baby; in fact the development of the baby's mind depends upon it.

We see things, and may also hear things, in our imagination, which is a constant stream of patterns or images that may be quite unrelated to our actual surroundings and may or may not have words associated with them. This means our brain spends much of its time dealing with images that are generated internally, mostly from previous experience, but perhaps also from some unknown creative source.

I can look at my wife or my grandchild when I am with them and I can also see them now, if I want to, in my imagination. To my brain, there is no difference between these two. It is almost entirely the same parts of my brain that light up when I imagine my child's face as when I look at that face. If I have an amorous thought regarding my absent lover, my brain will be behaving almost as if she was right there in front of me. Surprising as it may seem, our brain is not designed to immediately tell the difference between what is real and what is imaginary.

### ***Perception and illusion are the same process***

Consider the simple visual illusions below (Figure 4). There is actually no white-line triangle, but it looks as if there is, in the illusion called the Kanizsa Triangle. There are just three black line shapes of an incomplete black-line triangle and bits cut out of the circles which together suggest another triangle. Your brain is using its powers of imagination and preexisting patterns – it knows about triangles – to create the shapes in your mind. In the Ponzo illusion, is one horizontal line longer than the other? You suspect it's an illusion, but you have to measure them to be sure they are exactly the same length. Like the blind spot experience in the previous Chapter, this is a reminder that the mind can tell us things that, on later inspection, are not really true.

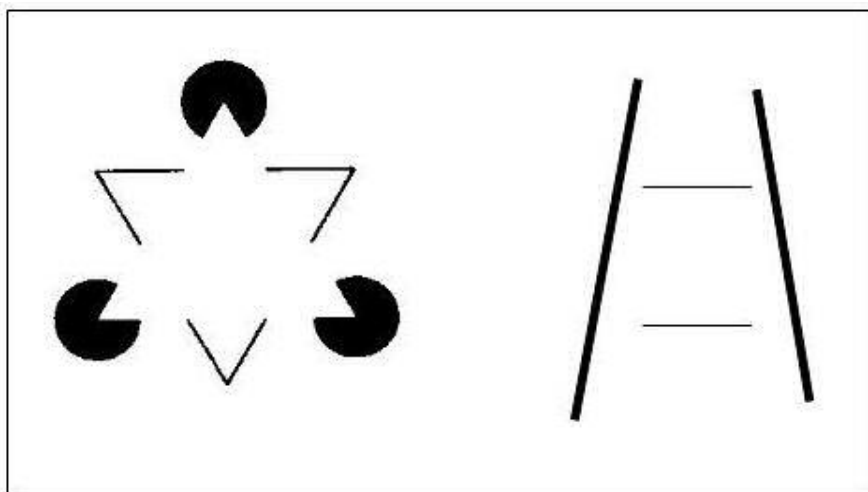


Figure 4. Kanizsa Triangle (left) and Ponzo Illusion (right).

Here is another example of an illusory visual experience. You are sitting in a train at the railway station when the train next to you pulls out in the other direction and you could swear, for a moment, it was your train that was moving. The perception is as real as if you were moving yourself, but by checking against some other markers, on the platform perhaps, you can soon determine that it was not real. You do this after the event. Your brain could not determine the reality of the situation in the act of perception. It has to make a subsequent reference to another source. There is no certainty we will know what is real just by looking at it because the process involved in an illusion is exactly the same as the process of perception.

One can easily think of illusions affecting our auditory system, too. Making the sound that resembles a fart (and, for some strange reason, is known as a raspberry) is a universally favourite trick in the minds of children. The sound effects technician has a huge array of noises that will represent clear images in our minds although the sound may not be the real thing.

Look at the Figure below (Figure 5) with the dark blobs on it until you can see a clear picture of something. It was created by Jackie Bortoft for Henri Bortoft's monograph entitled *Goethe's Scientific Consciousness* and I use it with their permission.



Figure 5. What do you see in this picture?

### *The organising idea*

What has happened to turn a jumble of dark blobs into a meaningful picture? You might have needed a clue that it is the head of a tall animal commonly seen in a zoo. Once you see it, there is not the slightest doubt what it is. The blobs themselves did not change, so it must be something performed by your brain or your mind. It is an extension of what we experienced before with the line through the blind spot and the triangle illusion and so on. It can be explained by the fact that your brain has a preexisting pattern or image that it uses to make meaning – to make sense of what you are looking at.

Henri Bortoft called this the ‘organising idea.’ In *The Wholeness of Nature*, he explained the difference between the empirical explanation that the giraffe is already on the page and the biological explanation that the giraffe arises in your mind from your way of seeing it. In other words, seeing is an active, not a passive process. The eyes see according to what the brain is doing, even as the brain is doing its work according to what the eyes see.

You may also like to explore the well-known ambiguous figures in Figure 7 at the end of this Chapter. The switching of one's mind from one figure to the other occurs more easily for some people than others and more easily with some figures. This ability does not have any practical significance for the everyday working of your mind.

There is also clear anatomical evidence that the process of visual perception involves a two-way connection between our brain and the objects we are seeing. As well as the sensory (or receptor) nerve fibres that enable light rays reaching the eye to also reach the brain, there are motor (or effector) nerve fibres that control the operation of the eye and the perception process so as to influence what it is the eye detects. Thus the brain can control where we put our attention, what we bring into focus, which light rays are to be given emphasis, and therefore what we see.

We don't see everything that is out there to see. We see what our brain wants us to see – what it knows. Henry David Thoreau put it beautifully when he said: 'It's not what you look at that matters, it's what you see.' Mark Twain, in his inimitable fashion, said: 'You can't depend on your eyes when your imagination is out of focus.'

### *Images we hear*

The process is essentially the same for hearing. As with sight, auditory perception involves an active input from our brain that plays a large part in determining what we actually hear. It's the same kind of two-way connection. We don't necessarily hear what is there; we hear what we think is there because we know about it from our history. Sometimes, our children don't hear what they have been told, if it's new to them, which is why repetition is so essential for learning and tolerance so necessary in parents!

Many years ago, Hudson Hawkland used microprobes placed in the auditory neural pathways of a cat to 'listen in' to its hearing. The cat had a lever-operated box containing food (fish), but the lever only worked when a tone was sounded. Sounding a tone that the cat had never heard before at first produced no detectable response in the auditory pathways. As the cat learned about the meaning of the tone, its physiological hearing response began to fire. Our brain is open to new sounds or sights, but until a meaningful pattern in the form of an organising idea can be applied to them, they will probably not register. Of course, there were some strong patterns established long ago for the alarm response, which we do not need to learn.

Visual images are easy to describe because they are pictures, but tonal imagery is almost certainly just as important. With our visual perception, we detect patterns of light distributed across space and also across time if they are moving. The clarity and unambiguous nature of these images dominates our perception in many cases; less so in good works of art which leave room for our imagination to play. Images of sound tend to be less directive and less obvious.

Our world is described mainly in visible and tangible terms, which our senses of sight and touch provide, but our hearing, in particular, along with smell and taste, deals with the invisible and intangible elements of our experience. This blurs the distinction between an outer world that you can see and touch and an inner world of thoughts and feelings. Thus it has a special role to play in our experience of connecting our inner and outer worlds. It is through an appreciation of hearing that we come to know about the non-material aspects as well as the material aspects of our experience.

Try listening to the rich ringing tone of a Tibetan ‘singing bowl’ or a tingshaw and try to determine the exact time at which the sound disappears. After a while you can’t tell whether the sound is still ‘out there’ or just playing on ‘in here.’ The sound is obviously out there in the air, but it is also inside us when our mind makes that connection. We are hearing tones and overtones, which are subsidiary sounds at higher frequency – so what is the meaning of a tone? Tonal images also signify time and space, like pictures do, but in a more subtle way, which can be explained by considering our experience of music.

### ***The perception of music***

Tones are physical events occurring in the external world as wave patterns, which also exist in our imaginal world as distinct patterns of sound. We tend to associate meaning with words, even though they are only triggers that propel our mind to make meaning. The words are often said to point to the meaning. In the case of music, the meaning is not generally associated with particular sounds; it arises from the dynamic experience of the melody and harmony. It is not a perception of objects that are being pointed out; it is an experience of the process of pointing.

A sequence of tones that forms a melody is more than just a collection of sounds when perceived by a listener who is not entirely naïve with regard to that music. A melody has a flow of meaning which is very like the meaning stream of a story. From the beginning, it appears to be heading somewhere, may emphasise certain matters along the way,

often builds to a climax and usually resolves itself in a satisfying manner such that the listener knows the end has been reached.

This dynamic quality of melody, which stems from the relations between the tones rather than the individual tones, gives music its sense of time; it is a flowing pattern, a moving image. Someone familiar with musical scales and cadence can describe this in terms of relationships between phrases and between certain intervals on the musical scale in any particular key, *e.g.* in the most common diatonic scale, the seventh or leading note has the effect of leaning towards a return to the tonic or base note (the first or eighth tone). You don't need any musical training to hear this quite clearly.

Schopenhauer wrote of melody as 'having significant and intentional connections from beginning to end' and also as 'one thought from beginning to end.' Attentive listening to music is not a passive process; it is intensely active, involving a stream of inferences, hypotheses, expectations and anticipations. Of course, it is possible to listen to music without paying much attention, but the sense of flow is still there in the background because of the way the tones are bound together as an organic whole. Every bar and every phrase arises from what preceded it and invites what will follow.

Several notes sounding together constitute a chord, which evokes the spatial component of the imagery of tones. Different chords may be experienced by the listener as very different sensations or feelings, *e.g.* a major chord compared to a minor chord, the latter being more constrained, melancholy, or even fearful. Composers use the structure of chords to enrich the meaning of their music in a way that corresponds to an artist's use of space. Victor Zuckerkandl, who explained this in much more detail, said it was an aspect of our imagination that invites a deeper appreciation of the workings of our mind.



Figure 6. The theme melody (Ode to Joy) from the choral movement of Beethoven's Ninth Symphony.

Music also helps us to understand the elusive concept of wholeness. The individual notes in a fine piece of music need one another to become a meaningful whole, just as the blobs on the page needed one another to make a giraffe. Consider the apparent simplicity of the above passage of



music (Figure 6), which is mostly one type of note (crotchets), uses only a few lines of the staff and can easily be played by even such an amateur musician as me. But when you hear it, if you recognise the tune, your imagination may be filled as mine is with the sound of an orchestra and choir in full voice because it is one of the most powerful melodic themes in the history of Western music. What is most remarkable is that Beethoven was almost totally deaf when he composed this for his last Symphony. These tones, arranged like this, came from his imagination and they come to life and sing in our imagination when we connect with them through the imagery of sound.

When we remember a melody it is re-created and lives again in our mind. It is not a process of re-assembling the components, but is like other very familiar aspects of our experience such as walking or swimming in that we encounter each step or stroke as an integral part of the whole process; we do not dwell on each bit separately. There is a kinetic melody in all our experience.

Because music exists we know that the tangible and the visible do not make up the whole nature of the world. Yehudi Menuhin wrote:

‘The magic of listening brings us closer to the central core of the universe. To begin to comprehend the mystery of life it is not sufficient to touch and to see – we need to hear, to listen, and thus to unite heart and mind and soul.’

Menuhin’s friend and colleague, Ravi Shankar, also said: ‘the highest aim of music is to reveal the essence of the universe it reflects.’

Music brings enormous enjoyment to human beings especially as it becomes familiar and our imagination starts to anticipate and remember its flow – the shape of its imagery. Pop music and rock concerts send young people into a frenzy; certain moments in opera trigger explosions of applause and shouting (bravo!); advertising jingles oil the wheels of commerce every day; and the slow movement of a Mozart piano concerto, for example, can bring a feeling of complete rapture to an otherwise quiet moment.

### *Hearing the voice*

Humans excel, not only in certain aspects of hearing, but in producing the most complex and influential of all sounds: the voice. Anne Karpf found it remarkable that such a sublime ability as human vocalisation is so little studied and so readily taken for granted. She said it ‘lies at the heart of what it is to be human.’ It is crucial for the mother-

baby relationship that is the birthplace of each new human mind and it is our most expressive and revealing instrument of communication.

The subtlety of frequencies and resonances in the human voice has defied even the best digital technology to synthesize it exactly. The average person hears over a range from 16 to 16,000 vibrations per second (Hz) although youngsters who haven't been deafened by loud music can hear higher frequencies – up to 20,000 Hz. Hearing is most efficient in the range 1000 – 3000 Hz, which is the typical sound of human speech. There is also some evidence that these relatively low-frequency vibrations can influence biochemical reactions within the living cell (see Chapter 9).

You can tell a lot about how a person is feeling from listening to his or her voice and we are often affected quite strongly by the sound of other people's voices. Listening to one's own voice played back, rather than from within your body, is an interesting experience for getting to know yourself as you are heard by others. Because it is produced initially by vocal folds constricting the flow of air from our lungs and then amplified in resonating cavities, our speaking (and singing) is integrated with the very basic physiology of our breathing. The sound is made from breath and comes and goes with the breath. We even starve ourselves of oxygen, sometimes, to say something we need to say.

Finding one's voice has become a metaphor for expressing one's autonomy in a satisfying way. It's as if our voice gives birth to our thoughts. There are specific programs that use the voice to heal, enrich and liberate the mind and body. Chris James' *Discover Your Natural Voice* and Jill Purce's *The Healing Voice* are two examples. The Tomatis Method uses voice and hearing for psychotherapy and to overcome learning difficulties in children. A 'life of transformation through listening' is described by Alfred Tomatis in his book, *The Conscious Ear*. More than anyone, he appreciated the profound relationship between what our ears can hear and the sounds we produce through our mouth.

Some people are concerned that we are becoming increasingly deaf – not just industrial deafness from so many machines – but a profound lack of attention to the small sounds around us. This manifests itself as insensitivity to the degradation of our physical world and the cries for help of our fellow human beings. We are bombarded with visual images of starving children and bomb-ravaged streets, but it seems that no one is listening.

Both seeing and hearing are vital functions of our mind in which there is more to it than meets the eye – or the ear. At the interface between knowing and not knowing, we can learn something from

hearing that would not be obvious were we relying only on the visual sense. And likewise for the senses of smell, taste and touch, for which the same two-way process that occurs with seeing and hearing is operating at all times.

In the next Chapter we will consider the broader implications of this proactive perception that is such a key ingredient for creating all the rich flavours of the human mind.

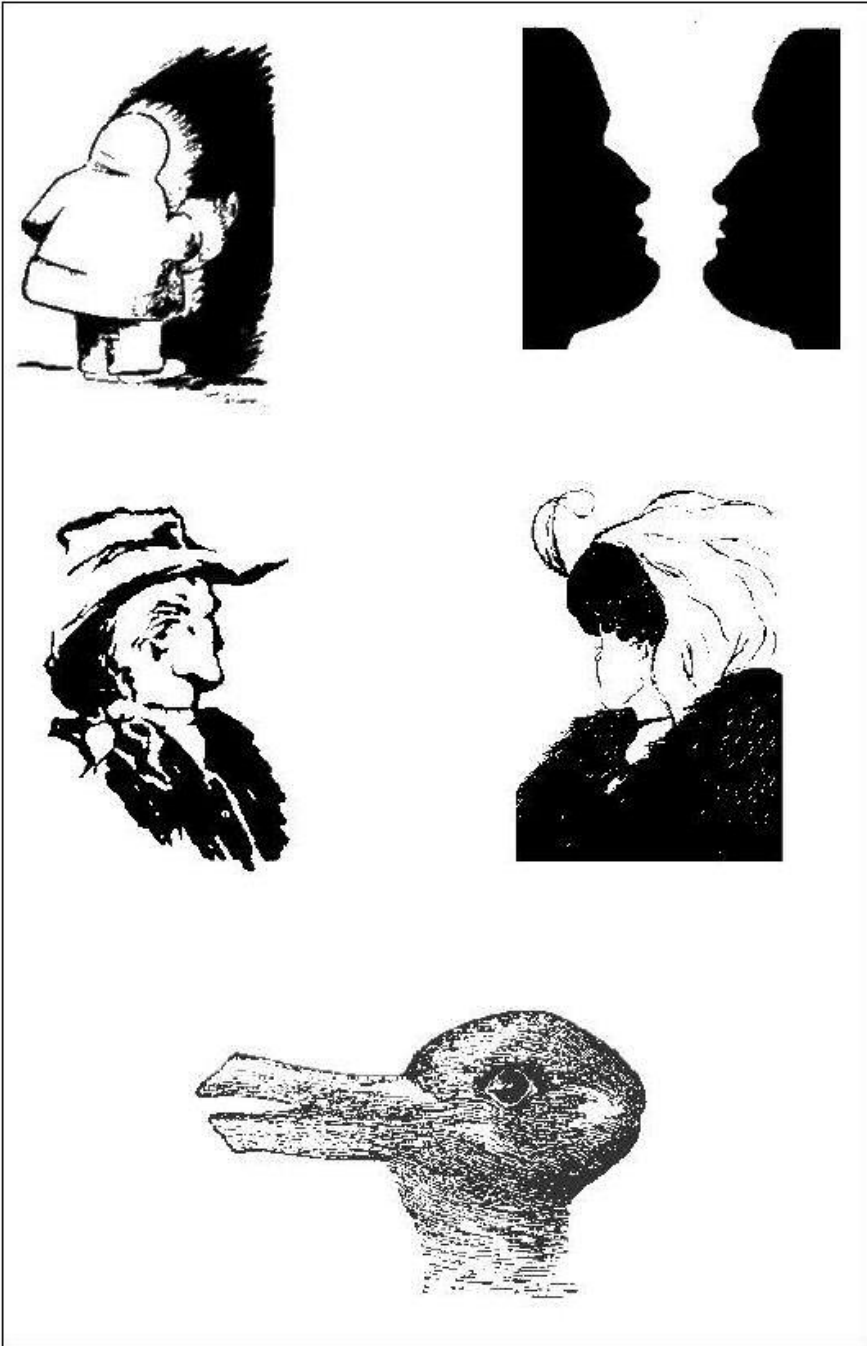


Figure 7. Some well-known ambiguous figures (from top left: Eskimo or Indian chief; vase or faces; old man or young man; old woman or young girl; duck or rabbit).

# CHAPTER 4

## Proactive Perception

### *Circular sensing, perceiving colours and bringing forth worlds*

The third aspect of knowing is the proactive nature of our process of perception. This is also the point where Maturana and Varela departed from the main stream of cognitive science. They were not the only ones, but they were the principal architects of this new paradigm that is not yet commonplace, but deserves to be, for the reasons outlined in this book.

Humberto Maturana Romesin, or H. R. Maturana as he is known in the scientific literature, was born in Santiago, Chile, on the 14<sup>th</sup> of September, 1928. At the University of Chile he began to study medicine, but then transferred to study biology. In 1954 he went to study anatomy and physiology at University College, London, and then obtained a PhD from Harvard University in 1958, after which he returned to the relative isolation of research and teaching in neurobiology at the University of Chile. Others took up his work elsewhere (*e.g.* the Ontological Coaching program developed by Fernando Flores in California), but Maturana said he preferred the academic freedom he experienced outside the main stream of international cognitive science.

The history of this new paradigm stems from a paper called *What the Frog's Eye Tells the Frog's Brain* which was the work of Lettvin and Maturana at Harvard. That they worked in the MIT Research Laboratory of Electronics is indicative of the fact that cognitive science was becoming the province of engineers rather than biologists. This trend started with the arrival of 'information theory' which dates roughly from Shannon's publication of *A Mathematical Theory of Communication* in 1948. Before that biology texts made no mention of information as an aspect of cognition, but from then on the idea of information came to occupy a central place in the explanations of neurobiology.

The 'Frog's Eye' paper attracted much attention from people developing artificial intelligence and computer models of the brain, but back in Chile, Maturana was reflecting on it very differently. He began to question the basic assumption of the Harvard research, which was that the eye passed on information to the brain to give it an accurate representation of an objective reality. He had noted that:

'The eye speaks to the brain in a language already highly organised and interpreted, instead of transmitting some more or less accurate copy of the distribution of light on the receptors.'

Much of his subsequent research concerned the processes of avian colour vision. The perception of colour was a prime example of the limitations of cognitive science because colour is one of the so-called qualia – a quality that could not be described scientifically except by reducing it to quantitative dimensions such as the wavelength of the light. Maturana asked himself:

'What if, instead of attempting to correlate the activity of the retina with the physical stimuli external to the organism, we did otherwise and tried to correlate the activity in the retina with the colour experience of the subject?'

Eventually, Maturana and his colleagues showed that the subject's previous experience of colour produced organising ideas that affected the pattern of its visual system's responses to what it was seeing. They also experimented with salamanders whose eye connections to the brain could be surgically altered without disturbing their subsequent ability to see. When tricked in this way, the salamanders flicked their tongue in the direction suggested by their brain, not where the food actually was, even though they could 'see' it. This is how the biological principles of proactive perception were first established.

Francisco Javier Varela Garcia, or F.J. Varela in the scientific literature, was born on September the 7<sup>th</sup>, 1946, and grew up in a mountain village in the Andes before moving to Santiago to become the first of his family to attend a University. Cultural historian, William Irwin Thompson, wrote in 1989 that he would hail Varela as 'the Einstein of the consciousness movement' except that this kind of hype was already over used and Varela did not work alone. He told the story that Francisco came to Maturana's office at the University of Chile in 1965 seeking to study 'the role of the mind in the universe' and Humberto said: 'My boy, you've come to the right place.'

Varela's PhD was also from Harvard, in 1970, after which he returned to Santiago to work with Maturana, and together they re-shaped cognitive science. *Autopoiesis and Cognition: The Realization of the Living* was published in 1980 and a more popular account of their work, *The Tree of Knowledge: The Biological Roots of Human Understanding*, appeared in 1987. Varela worked in the USA during the Pinochet regime in Chile, returned home for several years and then continued this work in France from 1986 until his untimely death in 2001 at the age of 54.

What had previously been understood as an allopoietic system now became understandable as an autopoietic system. The difference can be explained by comparing a car factory with a living organism. Both utilise raw materials from outside themselves, but the car factory builds them into a motor car, which is clearly something other than the factory and which will exist independently of the place it was made. In a living organism the raw materials are used to rebuild the very structure that is doing the building.

Every cell in your body lives for a short time only. When it dies, its work is taken over by a new cell of the same kind. For some kinds of cell, this happens every few days – for others only every few weeks or months. The basic structural units of the body are proteins that are made up from smaller molecules called amino acids. The construction process is regulated by other small molecules such as enzymes according to a blueprint set out by the very basic molecule called DNA (deoxyribose nucleic acid). These cell structures use the flow of molecules and energy that come in from the outside to produce, within the system, all the same components that are needed to maintain the existing structures.

In a more general sense, autopoiesis refers to the dynamics of any system that is organised in its own right and therefore not in equilibrium with its surroundings. Maturana proposed that, before life began on earth, there were many molecules interacting with other molecules, but they had not formed into an autonomous, self-producing arrangement in which the results of their molecular interaction would be a re-creation of the same molecular configuration. This may have happened in a haphazard fashion for a long time before these operationally closed entities eventually became stable units capable of reproducing themselves in a reliable way. Life forms have been evolving ever since.

### ***Our nervous system is closed***

This operational closure that created an autonomous unity set in place the fundamental structure of our nervous system today, so it is fair to say the proactive nature of our perception is as old as life itself. It

manifests in a special way for humans, but the point is we can learn about our own mind by noting the biological principles on which it is based.

Consider the example of a single-celled organism called an amoeba having its dinner, as it were, by engulfing a protozoan. Molecules released from the protozoan trigger membrane changes in the amoeba which enable it to spread itself in the direction of its prey until it eventually wraps itself completely around the protozoan. This is achieved by the amoeba maintaining an internal correlation between its sensory surface, which detects the chemical triggers, and its motor surface, which brings about the engulfing movement. This correlation is maintained through processes inside the cell that have developed over time for this particular organism.

In more complex organisms the principle is the same. The sensory surface may be connected to the motor apparatus by a complex network of nerves, but it is still a sensory-motor coordination that is occurring – a cyclic process of detecting and acting, which we call knowing and doing. The action is not dictated by external instructions; it results from the internal correlation at each moment in time. Through operational closure and autopoiesis, the organism is able to operate ‘with relevance to the maintenance of itself’ in any situation.

Many cognitive scientists still hold to the precept that cognition is a type of computation and there can be no computation without representation. But Varela explained perception quite differently:

‘It is not a process of representation of an independently existing world, it is a continual bringing forth of a world which is defined by oneself and defines oneself at the same time.’

The process of knowing appears to an observer, superficially, to be a computation of data that has been supplied – until we come to appreciate the idea of autonomy. Biological autonomy means that the way an organism specifies itself through its interaction is also the way it performs cognitively. We are talking about a process of construction rather than instruction – internal coherence rather than representation.

Instead of information being that which represents the external world and corresponds to it, we say that the information has been constructed and the correspondence is simply the pattern by which the two are connected. Rather than ‘mapping’ its surroundings, the nervous system is forming certain patterns according to its domain of interactions. Thus the information is only specified during its operation; it is not to be found ‘out there.’ It is formed within – as suggested by its Latin roots: *in formare*.



### *Our blind spots regarding this process*

Understood in this way, cognition does not primarily mean knowing something about the rest of the world; rather it means knowing one's self through one's interactions with the rest of the world. This explains why we are not able to see exactly what is there; we see what our brain thinks is there, from its previous experience. To the old saying 'seeing is believing' we could add that 'believing is seeing.' Your imagination shapes the world you encounter into patterns that are meaningful in terms of your previous experience.

It was suggested that when the tall ships of European invaders first arrived to set up colonies in remote places, the indigenous people could not determine what the strange object was on the horizon because they had never seen a boat of that size before. In their imagination it might have come from the sky or the sea or wherever the thunder and lightning or wind and rain came from.

The most important implication of operational closure is that we form our own meaning at all times and cannot receive it already formed from anywhere else. We often assume that others have acquired from us the same meaning we have formed and we get by with that because it works reasonably well amongst people with very similar histories and cultural context.. But it also often leads to misunderstandings.

Because we misunderstand the proactive and personal nature of our perception, we tend to blame the world for how we see it. This is a constant source of difficulty for almost every human being, yet we all know that people can be happy living in a shack and unhappy living in a castle. We also waste much of our lives arguing about the nature of an external reality that, in the end, can only be validated either by our own knowing or by some authority or institution. In doing this, we value ideas about objectivity and so-called 'truth' above the quality of our personal relationships, which in a biological sense, is not life-sustaining.

The process of learning is often misunderstood because it is thought to be an accumulation of information or knowledge when it is, more precisely, an updating of our organising ideas. Students are all presented with the same 'facts' yet some fail to learn and others achieve high distinction. Teachers strive to make large quantities of the best information available to their students, but it is the quality of the connection between mentor and pupil that most affects the outcome.

It is actually our saving grace that we cannot have another person's meaning imposed upon us as the story of King Midas reminds us. He asked the Gods to grant him the gift of turning everything he touched

into gold. When his daughters ran up to give him a hug, he touched them and they became frozen gold statues. That gift would be a disaster in any form.

### ***The sensory circuit***

This process of perception involves a two-way connection between the brain and the objects we perceive. As well as the inwards connection from sensory nerves in the eyes, ears, skin, nose and mouth to the brain, we have effector or motor nerves carrying instructions from the brain to those organs and guiding their physiological behaviour. That guidance stems from whatever meaning our brain is making from the sensing of the object – by the continual reformulation of the brain pattern which is our organising idea. Unless the organising idea becomes stuck or fixed in our neural network, which happens if the system is not exercised, it will be constantly rearranged to be ready for the next stage of our perception experience. This new or modified organising idea will then impose itself again upon the sensing operation – and so on, in a circular process.

This two-way circuitry of our nervous system is known as a sensory-motor loop. Not only does each sense organ connect up with the object it senses, but the various senses work together to create the whole picture that our brain seems to require. In *The Spell of the Sensuous*, David Abram wrote:

‘My senses connect up with each other in the things I perceive, or rather each perceived thing gathers my senses together in a coherent way, and it is this that enables me to experience the thing itself as a centre of forces, as another means of experience, as an Other. The relative divergence of my bodily senses ... ensures that my body is a sort of open circuit that completes itself only in things, in others, in the encompassing earth.

Our senses form part of an open circuit that completes itself with whatever it is we sense (thus becoming, in that moment, closed).

In physiological terms the sensory-motor loop is internal in that the sensory nerve endings on the edge of our bodies are correlating their activities with the brain and central nervous system from which the motor nerve activity is directed. But in terms of the operation of the mind it is a larger circuit that extends to the object itself. When Sheldrake wrote about the ‘extended mind’ he suggested that a special sense could be involved, but my point is that it is a perfectly normal operation of our regular sense organs to complete the circuit in this way.

The great German poet and scientist, Wolfgang von Goethe wrote: ‘every object, well contemplated, creates an organ for its perception.’ Bortoft’s book, *The Wholeness of Nature*, is subtitled: ‘Goethe’s way toward a science of conscious participation in nature.’ This attempt to unite the subjective and objective aspects of our mind is precisely the direction in which process philosophy is leading us and to which the biological science outlined here applies.

The circularity of sensing is a subtle idea that conventional science, which is an analytical mode of consciousness, cannot entirely embrace. In a more holistic mode of consciousness we see that our sensory perception does not operate separately from our non-sensory perception. The experience of seeing the giraffe was a case of a non-sensory factor acting as the organiser of the sensory perception. In objective science we are blind to the fact that the answers we get arise from the nature of questions we, ourselves, have put.

In a post-modern, constructive explanation such as I am offering here, it is necessary to explain secondary qualities in their own right rather than simply reduce them to primary, quantitative properties as conventional science does. This entails some of the insights that have come from phenomenology, such as the idea that consciousness has intentionality built into it. Phenomenology sits uneasily with science because its founding philosophers such as Husserl tried to establish the validity of the ‘first-person approach’ to the study of consciousness. This biological science helps to bridge the gap.

Francisco Varela deserves special mention in this respect. He was also a poet, musician and philosopher who was fluent in five languages and he became a Buddhist teacher and associate of the Dalai Lama. His later book (with Thompson and Rosch) was called *The Embodied Mind – Cognitive Science and Human Experience*. As its title suggests, this book draws from the rich wellspring of Merleau-Ponty’s pioneering work in phenomenology. Its relevance to my story here is shown in the following quote:

‘This book begins and ends with the conviction that the new sciences of mind need to enlarge their horizon to encompass both lived human experience and the possibilities for transformation inherent in human experience. Ordinary, everyday experience, on the other hand, must enlarge its horizon to benefit from the insights and analyses that are distinctly wrought by the sciences of mind. It is this possibility for circulation between the sciences of mind (cognitive science) and human experience that we explore in this book.’

*The perception of colour*

Goethe was an important earlier pioneer in this regard. He lived from 1749 to 1832 and the large number of books written about him attests to his extraordinary versatility as an author, poet, philosopher and artist. His beloved science, which occupied a large part of his life, was largely ignored, however, until the new insights about wholeness and process began to emerge from physicists like David Bohm and the cyberneticians I have already mentioned.

Goethe developed a way of seeing that he called ‘dwelling in the phenomenon’ or ‘making the phenomenon visible,’ which Bortoft refers to as ‘exact sensorial imagination.’ One of the best examples of this was his comprehensive research on the perception of colour.

Newton had shown previously that a beam of light passed through a prism onto a wall produced the spectrum of colour as we know it (red, orange, yellow, green, blue, indigo, violet) and thus each colour could be assigned a different wavelength. This was classical science, reducing a secondary quality to a number. Its great value lay in being able to explain colour in a physical sense and we use wavelength measurement as an analytical tool to identify and investigate unknown substances.

Goethe’s experience as a painter gave him a more subjective interest in colour. He observed what happened when you hold a prism up to your eye and look at an edge – the boundary between dark and light. You can explore this for yourself by careful observation. The first thing you will notice is that colours arise near the edge. Depending on how you hold the prism and card (see Figure 8) you will see red, orange, yellow extending from the boundary line into the white area, or blue, indigo, violet extending from the boundary line into the black.

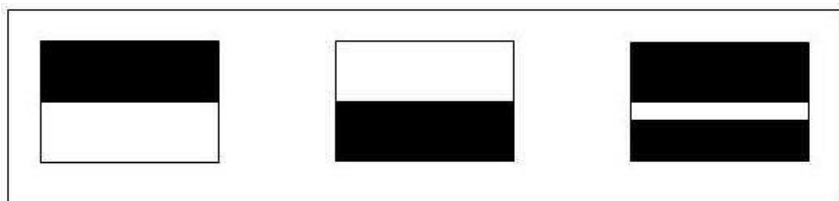


Figure 8. The edge between black and white is where the colours arise when viewed through a prism in the manner of Goethe’s experiments on colour perception.

If you continue that experiment, very carefully, using a narrow band of white between two dark patches you will be able to join up those two

ends of the spectrum and see that green is produced in the middle where the blue meets the yellow.

Whereas Newton had wanted to take the colours apart, Goethe wanted to know how they went together – how they related to one another in our experience of perception. He found that, firstly, you need both light and dark to perceive colour. Secondly, the progressive lightening of dark (seeing dark through light) produces the ‘red, orange, yellow’ end of the spectrum while the progressive darkening of light (seeing light through dark) produces the ‘violet, indigo, blue’ end of the spectrum. This research took 20 years, not just the few minutes I am taking to describe it.

Then he could see the colours of his world more meaningfully. The sky straight overhead is bright blue on a clear day, becoming lighter in shade as you look more towards the horizon (as every landscape painter knows). The higher you go above sea level into the sky the blacker it becomes. This makes sense because the atmosphere is filled with light by the sun and the space beyond it is black, so you are looking at dark through light. The horizon view takes in more atmosphere – the view straight overhead is more direct so it encounters less atmosphere – hence the difference in colour. Similarly, the sun overhead is yellow, but it is redder the closer to sunrise and sunset you see it because you are looking at a very bright light through the relatively darker atmosphere.

The point is that Goethe wanted to understand things as a whole, which is what our mind strives to do even when we have divided something into parts. We can’t make meaning unless there is a coherent whole within which the details can be accommodated. This is why it’s difficult to understand detailed scientific evidence until we can see its connectedness – its meaning. Our ability to form meaning tells us there cannot be parts without a whole.

The whole is not simply the totality of the parts; nor can it be broken up into the parts, because it is not made by adding them together – it is a special quality in its own right that arises due to the proactive nature of our perception. This is the same principle as a laser hologram where each part also contains the whole. As explained in quantum physics, the properties of a single particle are determined by the interaction of all the other particles.

In any case, we couldn’t possibly attend to every single detail of our world. We are able to select meaningfully because of our mind’s appreciation of this subtle, but profoundly important, quality called wholeness. Goethe’s research on colour perception stands as one of the cornerstones of this meaning structure.

*Paying attention*

Our attention system has to be highly selective because we could not take in everything at once. We have the ability to concentrate on one set of things while relegating all the rest to the background where they may be missed altogether or may float around the periphery of our attention.

An interesting experiment by psychologists at Harvard showed what they called ‘change blindness’ in which the subjects did not notice a huge change that occurred right before their eyes and were incredulous when told later what they had missed. In this experiment one person behind a desk handed the volunteers a consent form to sign and then ducked down out of sight while another person stood up and received the form when it was handed back. Most volunteers didn’t realise it was not the same person although they were quite different in appearance.

A powerful quotation from the radical Scottish psychiatrist, R. D. Laing, sums it up:

‘The range of what we think and do is limited by what we fail to notice. And because we fail to notice that we fail to notice there is little we can do to change until we notice how failing to notice shapes our thoughts and deeds.’

There is a popular picture book called *Animalia* in which a small figure of the author, Graeme Base, is partly hidden on each page, but it is hard to find because of the intricate detail in all the pictures. We can only attend to a small portion of what is going on out there in our world. We attend to what our brain thinks is important for us to connect with at that time. There is a saying: ‘show me what you attend to and I will tell you who you are.’

In the BBC TV series, *Brain Story*, Susan Greenfield described medical case histories in which localised brain damage interfered with the normal perception process. One extreme case where a woman had lost the ability to perceive whether objects were moving or not shows how difficult it is to explain movement to someone else and how important it is to be able to create this meaning for yourself.

Some people with brain damage can see the details of faces, but can’t put it all together into a recognisable whole, which has a devastating effect on their lives. To lose the ability to form meaning when you look at another person’s face would be a crucial blow to the mind. You may have noticed it’s much harder to recognise pictures of famous faces, or your friends, if they are upside down. The details are still there, but the wholeness does not form in the same way. Other brain-damaged patients could not distinguish between common objects even though they could describe in detail each

part of the object. They also had a difficult time because, when you tell them what something is, the meaning does not stick.

### ***Bringing forth our own worlds***

It is a consequence of the physiological processes involved in being human that the world I see before me and experience will not be exactly the same as anyone else's world. Wittgenstein observed that happy people seem to live in a different world from unhappy people.

But for practical purposes we are quite content to assume that we are living in the same world as everyone else. This is because those of us with similar backgrounds of education and experience, within a well-defined culture, tend to have very similar organising ideas and stories, so we bring forth a very similar world. The small differences can be easily accommodated without upsetting our communication, particularly by those who are aware of this biological process. The real problems arise between people from contrasting cultures with very different mental histories and, unless we acknowledge the very prevalent blind spots about this aspect of our mind, we will never overcome these problems.

The way in which each of us brings forth a slightly different world has an emotional basis as we shall see in more detail later. Robert Zajonc showed how even the decision-making function of the mind operates within an emotional context. When subjects were presented with tones they had unwittingly heard recently, they showed a distinct preference for them over tones they had not just heard, although they did not give this as the reason for the decision. In other words what is familiar feels better even when we think we are judging rationally. In another study subjects responded quite differently to a drug or a drink depending on whether they were told beforehand it was a narcotic or an alcoholic drink or a sugar pill or water. What we experience in the world depends upon how our mind thinks and feels about that world.

Maturana coined the term 'multiverse' because there are as many different worlds as there are people perceiving them. There is a very ancient saying from the *Talmud*: 'we don't see the world as it is; we see the world as we are.'

This brings us to acknowledge two different sides of our perception process; we are not only experiencing, we are also observing. The world we bring forth is the world we see. Seeing is done by an observer whereas knowing about it includes having the experience.

In the next Chapter we will consider what a difference it makes whether we acknowledge the role of the observer or not.





# CHAPTER 5

## Explaining

*objectivity, self-consciousness and what happens when we ignore the observer*

We do a lot of explaining. We seem to have a need to explain things, firstly to ourselves so they fit comfortably into our story and also to others so we can bond with them. Maturana used to say, with a mischievous twinkle in his eye, that explaining is to humans what a pacifier is to a baby – it soothes us, sets our mind at rest and brings us feelings of comfort and satisfaction.

We cannot explain anything without using a form of language – if not words, then images or movements that could have words attached to them. This language enables us to distinguish between this and that and those basic distinctions we make dictate the structure of our explanation. Often without realising it, we shape our view of the world and our way of operating according to the distinctions we make.

An example of this is the distinction between subjectivity and objectivity. The former has much less credibility when it comes to describing the reality of our world. But how does that fit with the biological fact that we bring forth our own worlds? There is a different distinction we can make that is much more important for the mind in our daily experience and it gives rise to two completely different ways of explaining.

Firstly, consider what it is we are explaining? There is a blind spot here that is quite subtle. We usually say we are explaining something separate from us, *e.g.* Maturana's biology or the structure of the eye, but it would be more accurate to say we are explaining our experience of that something – what we have read about it or done with it before. We

address certain aspects of the subject one at a time as we bring each aspect into view for the purpose of explaining it.

### *The observer*

Maturana wrote, ‘everything said is said by an observer.’ In the act of explaining something we are able to separate it from our immediate experience and view it from the standpoint of an onlooker so we can make a better description of it and establish the meaning of it for ourselves. All our explanations are made in our capacity as observers and they are frequently shared with or passed on to others who are also acting as observers. So what we are explaining is a combination of our experience and our observing of that experience. The resources we draw on to do the explaining also come from our experience – from previous encounters with something similar.

We live our lives experiencing, observing and explaining, but obviously, the explanation is not the same as the experience, just as the menu – though its words may stimulate your senses when you read it – is not the same as the taste and texture of the food you eat. Explanations exist in a different domain from that which is being explained.

Often, we can forget about this because we want to explain something separately from our experience of it, anyway, so we can ignore the role of the observer. In other situations, there are compelling reasons why we should acknowledge that we bring forth our own world. This is not to say we created it. We are saying nothing about its existence ‘in reality’ – only that we brought it forth in our experience at this time.

### *Objectivity and subjectivity*

As a scientist I have a high regard for what is known as objectivity. This is a particular way of observing and explaining in which the personal bias of the observer is prevented, as far as possible, from influencing the description of what is being observed. In other words, it’s meant to be a value-free, emotion-free, totally impersonal account, which reveals exactly what is happening – what is there or what the world is really like – in its own right. Even though we can’t entirely forget that everything we say is a comment or a reflection about what has happened rather than the happening itself, this notion of objectivity has served us well for scientific investigation and for conducting much of the business we do together. It is usually contrasted with what is known as subjectivity, that being merely one’s personal impression of a world that should preferably be known to us in its own right, but at the moment is not.

Much is made of the distinction between objectivity and subjectivity in our society. The former is more highly regarded in most of our serious social and professional intercourse because the removal of personal bias is usually seen as leading to better decisions and more sound judgments, even though this is not necessarily so. Subjectivity is tolerated – even welcomed – with regard to artistic or aesthetic opinions and also in communicating our deepest feelings to one another, but is considered suspect where more pragmatic interactions are concerned.

The difference between the two is often exaggerated, particularly in scientific or quasi-scientific activities. When I was researching animal behaviour, I spent days and nights simply watching what animals did. The question arose: were my results more subjective than those of my colleague whose data were delivered by a laboratory instrument? The answer is not simple, because the machine could be influenced to favour one reading over another, depending on the way it was set up. An archeologist friend told me his largely intuitive ability to recognise various stone artifacts would sometimes be questioned, whereas the carbon dating results from the laboratory would not, although they could be wildly inaccurate in some circumstances.

We trust technology blindly by relying so heavily on the data output from recording and measuring instruments. As well as the obvious possibility of a mechanical or electrical defect producing an error, it is too easy to forget that the machine is just an extension of the human mind that designed it or is using it. When I look through a telescope or a microscope, it is still my human eye that sees – albeit with much finer resolution – and my human mind that does the knowing about what is there. Watching a heart monitor draw its flowing graph can tell a nurse much more about the patient than she could know directly from her senses, but it is still her human monitoring that interprets what is happening.

### *Two different ways of explaining*

The distinction between objectivity and subjectivity is not as crucial in real life as people often claim and there is a more important distinction based on whether we acknowledge the role of the observer or not. Each time we set out to explain we must choose between two quite different paths.

One option is to have regard for the apparent similarity between the world I bring forth and the world everyone else brings forth, and consider this to be a given reality that is endowed to us and already exists, regardless of my perceiving of it. The problem is that validation of this

reality must be done independently of our existence. This path we will call *objective reality* or option [1].

The other option is to have regard for the constructed nature of what each of us brings forth, through our individual perception process, without making assumptions about any other reality that may exist independently of us. The problem is that this view of reality cannot be validated independently of our existence. We will call this path *personal reality* or option [2].

The terms Maturana used to describe these two ways of explaining were ‘objectivity without parentheses’ for the first and ‘objectivity in parentheses’ for the second. Although the phrase is awkward, the idea of simply putting objectivity in brackets when taking personal responsibility is very useful. Maturana also used the terms ‘transcendental’ for option [1] and ‘constitutive’ for option [2].

So, in summary, the two ways of explaining our experience in language, which are two different views of reality, are:

- [1] **Objective:** reality is given, preexisting, transcendental, *i.e.* objectivity without parentheses.
- [2] **Personal:** reality is arising, constitutive, individual, *i.e.* objectivity in parentheses.

There is a subtle difference between this personal reality and what we were calling subjectivity. The idea of subjectivity belongs to the path of objectivity (option [1]) because it is a personal assessment that is made with reference to a supposedly objective reality. When we are being subjective we imply that there is only one true version of reality and our personal version has no validity compared to that – it is an inferior and more or less private indulgence. What we are calling personal reality or option [2], however, is not an inferior version of objectivity. It is a perfectly valid way of knowing and a different way of regarding knowledge. It is not merely an individual’s interpretation of an otherwise objective world.

In daily life, we use both these alternatives and move between them according to our preference at the time. It’s not that one is right and one is wrong – we need both. Our preference will depend on the situation we are in and, most importantly, our emotional state. The point to note here is that these two paths have very different consequences, for our society and for our individual lives. Which one we choose has a profound effect on the delicate work of our life-giving mind.

### ***Two different sets of consequences***

The most obvious virtue of objective reality is its technological convenience because it provides us with a reference point outside of

ourselves. There is no need to negotiate with someone else about what is what because the common ground we need to be able to work together is given to us all in the form of objective reality. If you and I have to move a table into the next room, we will need to work with the 'same' table and the 'same' doorway, whatever our personal perception might be. If I am to learn the mechanism of an internal combustion engine from your diagrams, I will need to accept them as a 'true' representation of the parts of the engine.

Even granting the idea from physics that the observer influences what is observed, it is often necessary, and certainly convenient, to behave as if there is an external reality which is independent of us. We are very accustomed to doing this and we are generally blind to any problems associated with it.

The main problem is that it necessitates a belief in a validation mechanism that is independent of the observer. The criteria for validating this reality are outside of human knowing; hence the term, transcendental. For practical purposes, this requires us to establish some form of authority, which may be religious, scientific or philosophical, that can represent the truth about what is so in the world. This authority's ability to know what is true is considered to be an endowment; it is taken as given.

This carries with it the following consequences:

- (1) This knowledge may be appropriated by individuals or institutions, and hierarchies of knowledge may be established accordingly;
- (2) There has to be either agreement with this authority or negation of it in the form of disagreement;
- (3) Individuals become dependent on this authority, no longer exercising responsibility for their own knowing.

This makes a stark contrast with the personally constructed, or constitutive, reality, where the ability to know anything is very much a personal responsibility. Whether what we know individually is the truth or not is not the issue. In this case, all our realities will automatically be somewhat different and, strictly speaking, there will be no such thing as disagreement. Instead, there will only be individual preferences, which are simply differences in culture that have been constituted through the operation of the observer.

This different kind of awareness is sometimes called a second-order operation, i.e. knowing we are doing what we're doing and taking responsibility for it. The notion (from mathematics) of second order means, in a very general sense, observing from a higher level. For example, when I look at a tree, that is a first-order operation, but when

I come to consider myself looking at the tree, that is a second-order operation.

The first option of objectivity effectively does away with the role of the observer. In that option, we simply take for granted the abilities of the observer, assuming there is no need to explain them, whereas in the second option, the idea of the observer is part of the explanation. Put another way, if we ignore the role of the observer, we are confined to descriptions of the brain and our behaviour at the first-order level. The advent of second-order cybernetics opened the door to studying observing systems (those doing the observing), not just those being observed.

A key difference between these two ways of explaining is that, in the first one, we justify our actions by whatever we say is the truth, whereas in the second, we try to act according to the needs of our human relationships. We then have the possibility of respecting one another's different views of the world and trying to work things out between us, instead of relying on the authority of any particular dogma. This can be a more difficult and arduous path to take at times, but it can also help to avoid the arbitrary decision-making that predisposes to all kinds of conflict from workplace disagreements to global war.

There are compelling reasons why people may not want to negotiate in that way. Some are commonsense, but the more sinister reasons are to do with the power structures in our society and a widespread belief in the force of reason. If I know what is true about the world and you do not agree with that, then I will have to persuade you that I am right and you are wrong. Maturana wrote about the huge amount of human effort we put into 'the search for a compelling argument' with which we can get our own way. We human beings use our minds extensively to exert influence on others – to try to force others to do as we say. Much of our personal distress is due to the fact that other people do not seem to know the world exactly as we do and we believe they should.

This notion of personal reality is not intended to be what philosophers call solipsism. Whereas realism is the idea that reality exists quite independently of the observer, solipsism is the claim that such a reality does not exist – it is created by the observer. In this mode of personal explaining, we are not saying anything about whether an independent reality exists, nor do we claim to have created one for anybody else.

### *Self-consciousness and personal responsibility*

Much of the time we will rely on the practical convenience of an objective reality. But the work of the mind is grounded in the first two

aspects of knowing: autonomy and connectedness. These require appropriate use of the second option of taking responsibility for bringing forth our own world without demanding that it corresponds to some absolute reality. If we have to argue that our fit with reality is the correct one, then the other people must be wrong and we will have to convince them to change their thinking. As long as people believe it is the other's distorted view of reality that is the problem, it will always be difficult to find solutions other than one side capitulating altogether.

Putting objectivity in parentheses does not mean we discredit it; rather, we choose to leave it aside for the purposes of our present interaction. The second aspect of knowing is to honour the connections that our mind makes with others because this mutual respect preserves and nourishes our mind. Being aware of others' worlds helps to keep us 'on the level' – it restrains our imagination from wild flights of fancy that could be seriously anti-social. We try to appreciate the particular world in which the other person's experience was valid for them at that time. This puts the emphasis on our role in a relationship rather than our so-called knowledge of the world.

The way we make mistakes is an interesting corollary to this. Making mistakes is a normal part of the operation of our mind because the process of perception cannot distinguish what is real while doing the perceiving – it requires a subsequent act of perception using another point of reference, *e.g.* when you thought the train next to you was moving or you mistake a person coming towards you for a friend and call out her name only to find a moment later it was not her.

What we later call a mistake was perfectly valid at the time of committing it. Mistakes are not of themselves; they do not occur in the present – they are a later reflection. This makes a difference to how we answer the question: what is it to know? What we know at any point in time is subject to revision and, if we acknowledge the blind spots, we know there will always be much we do not know.

Maturana's basic idea is that we can only bring forth our realities by what we do, so strictly speaking, we can make no definitive statement about a reality that exists independently of our doing. What is external to us cannot reliably tell us what we need to know about it. This is a reminder that we need to know ourselves to know about anything external to us and we do this through our successive interactions with it.

So what we call reality is an explanatory proposition arising from the way of living of the observer. An external reality might not be created by our doing, but its existence is known to us only through what we do. Therefore nothing we do as human beings is trivial. Every single thing we

say and do becomes a part of our known world. What an awesome responsibility this is!

Heinz von Foerster wryly observed:

‘Objectivity is a subject’s delusion that observing can be done without him. Invoking objectivity is abrogating responsibility; hence its popularity!’

What von Foerster called the ‘Pontius Pilate Syndrome’ – otherwise known as ‘they made me do it’ – is quite a common occurrence. Pilate washed his hands of a very crucial decision in the history of Christianity by asking a crowd of people to settle the matter for him. Nowadays, people often wash their hands of any responsibility because the system in which they work apparently compels them to make certain decisions even if they don’t agree with them. We become accustomed to doing what some authority requires us to do even when we think it is probably wrong.

Our saving grace is a coherent explanation of self-consciousness. Maturana is saying that self-consciousness can’t be explained adequately (or scientifically) using the pathway of objectivity (option [1]) because the self arises in language when we bring forth the observer as an entity, distinct from other entities, in the explanation of our experience. He wrote: ‘understanding the ontological primacy of observing is basic for understanding the phenomenon of cognition.’ He puts the observer first, *i.e.* our experience.

In option [1] it’s assumed the observer can make reference to something entirely independent of himself or herself and therefore outside the scope of a scientific explanation. The experiential (*i.e.* biological) indistinguishability between perception and illusion is not recognised in option [1], whereas in option [2] it is the starting point. Hence we come to know self-consciousness through option [2] – the personal mode of explaining.

Life has this property of circularity built into it, but it need not be our downfall; on the contrary, appreciating the circularity gives us our strength. Because we are self-conscious – acknowledging the observer – we can explain how self-consciousness arises and thereby take responsibility for every bit of our experience.

### ***What makes a good explanation?***

An explanation is always an answer to a question, which may be implied or posed by you or someone else. Its acceptability as an explanation depends on whatever criteria the questioner wants to



apply to it. If another scientist is explaining to me a principle of thermodynamics, I will be listening for certain regularities in his or her language that satisfy my criteria for us doing science together. If I am listening to a sports commentator on the radio, I expect to hear passionate, probably exaggerated, descriptions of each player's movements as they alter the score in the game. If I am trying to explain to my wife why I'm late for dinner, I will draw not so much on science, but on my knowledge of human nature, particularly hers. She may not accept my explanation, in which case it is not valid as an explanation.

There are as many different explanations as there are different criteria for acceptability of that explanation. In the end, the acceptability to the listener (who may be oneself) determines the validity of the explanation. That acceptance may be based on validation by an appointed authority or it may be based on validation in terms of the integrity of the ongoing human relationships involved. An explanation that is valid in one domain might not be valid in another.

The kind of explanation I employ in this book is not what something *is* (an ontological question), but how do I know what something is (an epistemological question). My story is about the process of knowing/not knowing. If my story is not useful and satisfying to you, it is not a valid answer to whatever is your question. In that case, you need to ask someone else for a different kind of explanation!

### ***The fun of explaining***

One of the worst side effects of too much explaining, as you probably realise by now, is taking ourselves too seriously. Fortunately, most of the great explainers were aware of this and have given us a wealth of entertaining literature so we can enjoy the sheer fun of explaining. Some nice examples are the *Just So* stories by Rudyard Kipling, which are delightfully fantastic accounts of how various natural phenomena were supposed to have come about – how the camel got its hump; how the leopard got its spots, *etc.* Written as if for children, these have been widely translated, read and enjoyed by people of all ages, suggesting that they help us to see ourselves more clearly by not taking ourselves too seriously. Kipling's *Jungle Books* and many other tales featuring feral human children raised by animals, *e.g.* Romulus and Remus who founded Rome, Tarzan, Mowgli, *etc.*, are further examples of the delight we take in speculating rather wildly about our humanness and the human mind.

Every cultural group of humans has produced creation myths in the form of elaborate stories about the origin and the creation of the world in which they live. The Australian Aboriginal Dreamtime stories are just one example. A modern scientific version is *The Universe is a Green Dragon* by Brian Swimme, which is not only fun to read, but contains much wisdom – as they all do.

Most of the written work of humankind is called fiction, anyway. Its various forms – romance, adventure, crime, *etc.* – are all based on human experience. The genres of science fiction and fantasy also give vent to the incredible human imagination, which has been remarkably prescient regarding future scientific developments, *e.g.* H.G Wells' stories about journeys to the moon.

Explanations, no matter how wonderful or how precise and scientific, are stories about our experience that pacify our mind. They are seen more clearly when we think of them in terms of their role in human relationships rather than as something separate from our experience.

In the next Chapter we will ask more questions about language and how we use it to express the meaning that we form and to form the meaning that we express.

A child's game that illustrates a loving way of hearing explanations is called 'What's in my Hand?'

Your partner uses her imagination freely to guess what is in your closed hand and you keep the conversation going by joining in her story – thus looking for the world in which her story is valid.

The practical experience I have found most useful for learning about the mind is to sing songs together.

The theme song for this book is below. For the melody of this and other songs in this book, visit [www.biosong.org](http://www.biosong.org) - or you can make up your own.

I created this – as a bit of fun – to help in forming meaning around these ideas. It is another kind of didactic experience, especially if you actually sing along.

***THE SONG OF AUTONOMOUS  
UNITIES***

I am an autonomous unity  
My structure is very profound  
While everything else is a line to me  
To me I am perfectly round  
My history mystery I will unveil  
Believing I know as I do  
This world I bring forth is my own –  
And I love  
Your autopoietical you  
Not hypothetical, just parenthetical,  
Autopoietical you  
Not hypothetical, just parenthetical,  
Autopoietical you

This song is about the way we use words to create a stable reality – inventing objects and ideas – but not always realising that we invented them!

***THE SECOND-ORDER SONG***

If I'm doing something to it, it's an object  
 To objectify existence is a must  
 By discovering the objects all around me  
 I know my world is something I can trust

( 'Trust!!            'Trust?? )

But what if it is doing something to me?  
 Have I become a victim of its way?  
 Could it be I've given it my power?  
 How come I don't seem to have a say?

**Second order, second order,  
 Second order singing is a song, song, song,  
 Second order, second order,  
 Second order singing is a song.**

What is this that I am doing to it?  
 Giving it its objectivity  
 As if it was completely independent  
 Of little, old, good-for-nothing me

I do believe that I was its inventor  
 Perhaps I only have myself to blame  
 What I do and what it does are not different  
 The action and the object are the same

**Repeat Chorus**

# CHAPTER 6

## What Language Does

*riddles, self-reference and dividing up our world*

What fun we can have with words – and yet what importance we have attached to our use of language in explaining the mind. The emphasis Maturana puts on the way in which our selves and our worlds are brought forth in our language is echoed by Wittgenstein who wrote:

‘The limits of my language are the limits of my mind. All I know is what I have words for. If we spoke a different language, we would perceive a somewhat different world.’

Even in the 19<sup>th</sup> century, Max Müller had been saying:

‘Let anyone try the experiment and he will see that we can as little think without words as we can breathe without lungs.’

There is a sense in which no one doubts the existence of an objective world, but the minute we start talking about this world – even thinking of talking about this world – it becomes an interpreted world – a world that exists in our language. The German philosopher, Martin Heidegger, put it more poetically when he wrote: ‘language is the house of being.’ The language we use tells us the kind of world we can expect to find. What counts as a fact is determined by our language, not by the world.

The importance of language to the operation of the human mind is so obvious it goes without saying! But how could it! Riddles can be fun or they can be annoying. The point is we can learn more about the autopoietical nature of our mind by considering how we use language to express the meaning that we form and to form the meaning that we express.

We use words to talk about identifiable things that seem to exist in their own right, but the things of which we speak were brought forth in our minds in the first place by the use of the word (see *The Second-Order Song* at the end of Chapter 5).

Perhaps the preeminent example of this is found in the writing of the New Testament in the Christian Bible. The Gospel according to John begins with the words: 'In the beginning was the word and the word was with God and the word was God.' The story of Genesis, the creation of the world, is told as if these things came to be when God said the word. The first thing he said was: 'let there be light' and there was – and so on – let there be 'water' - and 'beasts of the earth' – and 'man in his own likeness.' The Bible was written by people, of course, about what they believe happened, but it's a good example of the way we use words to make things come into existence and assume great importance in our minds.

We are so steeped in language we don't notice the effect it has on our knowing. Once again, it is the most obvious that is hardest to see. We are not the only species of living things that makes noises to communicate, but we are the 'linguaging' species.

### ***Living with self-reference***

The way in which language is self-referring provides an instructive parallel for the self-referring nature of our autopoietical selves. Circularity and the observer's role can either be ignored or included in the explanation; when it is included, some aspects of the mind are revealed that had been previously overlooked.

A paradox is an apparently true statement that also seems to point to a contradiction. It is one of those mysteriously important ideas that the human mind has delighted in developing – not to drive ourselves mad, but to increase the breadth of our knowing. The statement: 'this statement is false' is an example of a self-referential paradox. Another example is to say: 'disobey this command' or to write on one side of a piece of paper: 'the sentence on the other side of this piece of paper is true' and on the other side write: 'the sentence on the other side of this piece of paper is false.' This principle is known as the 'liar paradox' because, a long time ago, Epimenides, from the island of Crete, apparently said: 'all Cretans are liars.'

You might think that science always follows simple logic, but in fact, paradox occupies an important place in scientific explanations, most obviously in physics, but also in relation to the mind. The deeper we go into explaining aspects of our lived experience, the more likely it is we

will find apparent opposites that also seem to be the same. This is an inescapable part of the mysterious nature of our mind.

Variations on this self-referential theme have provided more of the literary fun that we enjoy. One of my favourites is: 'Due to circumstances beyond my control, I am master of my fate and captain of my soul.' Oscar Wilde said: 'The only way to get rid of temptation is to yield to it' and 'one should not carry moderation to extremes.' The Queen in Lewis Carroll's *Alice in Wonderland* recommended that Alice get more practice at believing impossible things. When she admonished Alice to think carefully before speaking, Alice indignantly replied: 'How can I know what I think till I see what I say?' And we hear it said that change is the only constant or that constant change is here to stay.

The internal consistency associated with self-referral is illustrated by a statement such as: 'this sentence contains three error.'

But there is more to self-reference than mere enjoyment. It has an important role to play in our lives because, when it becomes recursive, it produces stability and cohesion – it works to hold the story of our world together in a meaningful way. There is a mathematical formalism for this kind of stability. The term, eigenvalue, means 'proper value' or the characteristic value peculiar to a situation that is undergoing change through a self-referring process. Our use of language exhibits what is known as eigenbehaviour, thus providing the stability we need to make sense of our world and our existence in it.

You can demonstrate eigenbehaviour by this experiment. Take an urn containing one white and one black ball. Draw one ball from the urn at random and, whatever its colour, replace it, and add another ball of the same colour to the urn. You will observe that the percentage of, say, black balls in the urn will reach a particular value and stay there. After an initial period of fluctuation, the ratio will settle to a stable value; another time you do it, it will arrive at a different stable value. That is an example of stability being achieved by self-referring behaviour. As we apply words to our experience in a reasonably repeatable manner and they begin to take on a life of their own, we obtain a mental stability that could not be achieved in a system that was not self-referring.

Accepting and living with self-reference invites us to become more aware of just how we use language in the operation of our mind. It also

Here is a little problem for you: Can you complete the following sentence so it is an accurate statement, writing out the number in full (e.g. thirteen): **This sentence has \_\_\_\_ letters.** There are two correct answers and one of them is thirty-three.

indicates how we might take more responsibility for what we are doing as we utilise language together.

### *Dividing up our world*

Human language is obviously very different from the utterances of our prehuman ancestors, so it is of considerable interest to know how our language evolved into its present form. In Chapter 11 we will consider the two main schools of thought about the origins of language.

One is that language developed along compositional lines in which individual sounds and words and eventually grammatical structures with meaning attached to them gradually became more complex. The Chomsky school, for example, focuses on the component parts of language and the symbols themselves, primarily as the mechanism for transmitting meaning rather than forming it.

The other approach is that the holistic nature of human interactions between individuals who were generating their own meaning led to an increasingly sophisticated ‘dance’ in which the language used both constructs and reflects what is happening. In this scenario, the role of body language and voice intonation is given more emphasis and the association between emotions and language becomes more obvious.

In either case, the first effect a word has when we use it is to make a distinction – between it and something else. When I mention the top of the whiteboard you know it’s not the bottom of the whiteboard. Each word creates something else from which it is being distinguished; language is our epistemological knife. It divides up our world into chunks for the purpose of knowing about them. The way in which word meanings contain their opposites is illustrated in two of my poems at the end of this Chapter.

There is a limit to how many separate chunks we can handle so at some point we need to start grouping them together into categories where one word covers a whole lot of things that have some common characteristics, but are not exactly the same. This is a crucial aspect of the way we construct our own individual world.

These categories – or ways of dividing up our world – are not universally ordained by some outside authority, even though we do learn some standard classification systems during our education. Nor can we say they derive from the inherent structure of language itself unless you adhere very strictly to the compositional theory of language development. They arise from the organising idea that each of us imposes on the world



as we perceive it. In other words, they are part of our individual generation of meaning – our own story – by which we attempt to organise our world in what seems the most appropriate way.

So it is obvious that no two people will divide up the world in exactly the same way. This is a major blind spot we generally don't take into account as we strive to share our meaning with others. When we are attempting to understand in what domain another person's explanation would be valid (see Chapter 5), we need to take into account the way in which their world is divided up – what distinctions they are making. Many of the most common misunderstandings between people can be circumvented if we are aware of this.

George Lakoff pointed out that the meaning associated with a particular word has all the cultural preconceptions about that world already built into it – and this is a self-reinforcing phenomenon. In other words, 'the language embodies that particular culture's framework of reality,' as Mary Clark put it. The culture comes before the categories and creates them in its language. It's not surprising, then, that cultural differences account for so many of our communication problems. We will not solve these problems until we acknowledge the fact that people from different cultures have different ways of dividing up the world in their mind.

Another experiment you might like to try with a partner is to sit and watch him or her sort a very diverse collection of small objects (buttons, screws, seeds, marbles, stones, etc.) into a small number of categories that you specify (say 3 or 4). You try to guess the criteria by which your partner sorts – then check later to see if you were right.

### ***Different ways of thinking about the world***

Australian Aboriginal languages provide interesting examples of how a different language comes from, and results in, a different way of thinking about the world. This was explained by Michael Christie, a linguist working in Yolgnu communities of Northeast Arnhemland. The names of things in their language are impossible for us to classify because they have several different names for the same thing depending on a person's relationship with that thing at the time. Groupings that we call tribes or clans, implying clear boundaries between people, mean virtually nothing to them. Their nearest word would be 'mala,' commonly translated in Aboriginal English as 'mob,' which means a freely reconstituting entity that changes with the context. Even the Yolgnu

people's names, now imposed on them by the bureaucracy, seem problematic to us because each person has several names, again, according to context. This naming is not haphazard; each name describes that person's exact place in the web of connectedness and his or her relationship with whatever is happening at the time.

Christie described how he struggled to arrange the relatively small number of Yolgnu nouns into any sort of hierarchical classification that would be meaningful to us. He assumed that the distinction between 'plant' and 'animal' was a natural biological distinction that would be clear to human beings everywhere, but found there was no Yolgnu word for either plant or animal and, in fact, very few words that divide up the world in this segmentary way. They did have words for various kinds of food provided by the plant and animal species. We know the species by name, but might not know which ones are fit to eat.

Their language reflected a more practical day-to-day reality described by story and song in a more metaphorical way. Rather than having an inherent structure to it, their knowing flowed from the ancestor's experience of it, carefully passed on to preserve functionality rather than form; relationships rather than bits and pieces. It's not easy for us to come to grips with such different ways of thinking about the world unless we understand how the mind uses language.

In his book, *The Aboriginal Gift*, Eugene Stockton gave examples of an Australian Aboriginal's view of the world compared to Europeans. The language that flowed from industrialisation and modernity was based on (1) the use of machines, (2) the capability for long term storage of food and (3) the use of money for a form of trading based on ownership and accumulation of goods. Aboriginal people not only had no words, they had no concepts or meaning, for any of these experiences. Little wonder then they seemed slow to understand how the world works in the European sense.

The Semitic languages are also quite different from English in the way they make distinctions and denote relationships. In Ancient Hebrew and Arabic, the meaning of a word is quite dependent on context and the verb is more basic than the noun. Most words have a root consisting of three consonants, which is generally a verb in its root form, and letters are added at either end to produce more words for different parts of speech. David Bohm drew attention to this when writing a critique of the English language in his book *Wholeness and the Implicate Order*. He referred to the limitations of the subject-object language structure and the advantages of a language built on verbs that made the doing aspect of our lives more explicit. Buckminster Fuller apparently said, 'I seem to be a verb.'

Immersed in the flow of our language, we don't realise we create the differences and the similarities in our world, and so we refer to those differences and similarities as if they were not made by us. Objects, events and issues appear in the world as we name them and, although we hardly notice it, the issues go away as we stop talking about them. Unsuspecting, we fall into the trap of mistaking the content of our thought for the structure of the world. Alan Watts wrote:

'We suffer from the delusion that the entire universe is held in order by the categories of human thought, fearing that if we do not hold to them with the utmost tenacity, everything will vanish into chaos.'

### *The flow of languaging*

What we do in language is tied to everything else we do because knowing flows into doing just as the doing of language flows into our knowing. Our everyday actions are shaped by our language. But it is not simply the words we use which create this moving structure for our world, as every connoisseur of 'body language' knows. Gesture, facial expression, posture, movement and other sounds are all included in what Maturana called 'languaging.'

There is a story about three mothers meeting up for their regular coffee morning. As the first one sat down she gave a little moan, the second woman sat down heavily and sighed, and the third one, as she sat down, said: 'I thought we weren't going to talk about the children today.' You don't always need words to trigger lots of meaning.

Languaging is not a recognised word in English, but its invention is not entirely surprising. In Maturana's native Spanish, this neologism is apparently much more striking. It's an important term for our purposes because it conveys a sense of the flowing nature of our mind. It also puts the way we use language into context as a recurrent triggering process – like balls of individually-formed meanings bouncing back and forth between us.

The first function of our language is to create the individual parts of our world. In the next Chapter we will consider how we also use it to put the world together again in a very satisfying way.

***LIFE AND DEATH***

Nothing is the other half of something  
Black is just the other half of white  
Nowhere is the converse side of somewhere  
Dark is just the other half of light

Personal is the flip of universal  
Cocky is the other half of coy  
Thinking is the reasoned half of feeling  
Sorrow the unwelcome half of joy

Going is the other half of staying  
Planning's the preceding half of done  
Working is the other half of playing  
Moping is the nether half of fun

Singleness goes back to back with many  
Plenty is reciprocal to none  
Particular is like and not like any  
Zero is the other half of one

Taking is the other half of giving  
Despair is the other half of hope  
Dying is the other half of living  
Copes well who dares to say I cannot cope

Dependency is just not living freely  
Control is the flip side of submitting  
Limpid is the other half of steely  
Given up is linked to unremitting

Asking is the other half of telling  
Saying shares a thought with 'keeping Mum'  
Sulking is the other half of yelling  
Gone is the antithesis of come

Doing is the other half of being  
Spoken co-exists with nothing said  
Blindness is the other half of seeing  
Living cannot be unlinked from dead

***EVERY END IS A NEW BEGINNING***

Every end is a new beginning  
Every failure is something learned  
Every loss gives a chance at winning  
Unrequited means truly yearned

Every tumble leads to rising  
Every hurt has need to heal  
Every grief yields sympathising  
Every pain shows that you feel

Difficulties are debentures  
Problems are a challenge really  
Even mishaps are adventures  
Setbacks show the path more clearly

Every wrong is a cause worth righting  
Each mistake is a chance success  
Every miss improves the sighting  
And every more is also less



# CHAPTER 7

## Shaped by Metaphor

### *imagination, wholeness and the seven aspects of knowing*

The brain is a story-making organ, but the way we use words to divide up our world tends to produce fragments of a story, so we need a way to combine these into a satisfying whole. This whole is sometimes called a 'gestalt' from the German word, *gestalten*, which means to form or shape. Some of the experiments in this book, *e.g.* recognising the giraffe amongst a jumble of black blobs, may be explained in terms of the gestalt theory of perception. Our mind enables us to create coherent wholes at almost any moment in the history of our connections. This big picture, sometimes referred to as our world view, is triggered by the connections we make, but it is a product of our imagination.

Consider again the two different world views described by Mary Clark. The first is what she called the 'Billiard Ball' gestalt: an individualistic universe in which isolated objects move independently and may collide with one another according to linear, cause-effect, relationships and sequences of events. It is an atomistic world view and the 'self' is discrete and separate from the whole. The other she named the 'Indra's Net' gestalt after a Buddhist story about a God seated on a jeweled net in which each jewel in the net is connected to and hence reflects upon all the others. This is a connected universe where no one entity can exist independently of its connectedness to the whole of reality.

The contrast between standard European or Western language and the Yolgnu (Australian Aboriginal) language as explained by Michael Christie provides a good illustration of these two world views. The Western culture has developed an atomistic reality in which boundaries and segmentation are fundamental. Society consists of individuals,

language consists of words that mainly stand for things, everything is reducible to smaller parts and it is as if that is the way the world was originally made and is meant to be.

To Yolgnu people, whose ancestors created the world by their actions of singing and talking their way across the land, there are no fixed boundaries enclosing any discrete entities; there are only extendable webs of connectedness. To them the English phrase, ‘the cat on the mat,’ makes no sense because they have no such distinct entities. Surprising as it may seem, a phrase such as ‘familiarity breeds contempt’ or ‘necessity is the mother of invention’ is more meaningful to Yolgnu people because those are ways of talking about experience and they can identify with that.

In both cases, it is the explaining of human experience that has developed the language and, in turn, the language that will continue to shape that experience. As we form meaning in our process of knowing we become able to do what we do. What we do seems right and logical if it is coherent with the world our knowing has created.

But in order to create this world we have to employ our imagination, because it’s not all set out in front of us at any point in time. We construct these worlds on the basis of relationships in language that are generally referred to as metaphors. The contrasting world views just described are two completely different metaphorical structures. The point is we live our lives according to the metaphorical structure of our knowing, *i.e.* according to the way we envisage the world in our imagination.

### ***Putting our world together***

Wittgenstein said: ‘uttering a word is like striking a note on the keyboard of the imagination.’ As we use language, particularly in conversation, we rely heavily on our imagination because many of the things we are talking about are not actually happening at the time. The rich nature of our languaging experience comes from these deeper resources of our mind. It doesn’t come directly from meanings attached to particular words, though those are influential triggers. It has more to do with the way our brain creates a story that is coherent and whole. The mind uses language, not only to divide up our world, but to put it together again in a satisfying, and often very beautiful, way.

The biology outlined here informs us that the meaning does not come neatly packaged in the words we hear. It comes from a combination of the words we hear and our own story. So in exploring the way we make meaning, we need to look beyond the literal meaning of a word as it appears in the dictionary.



This is amusingly illustrated in another of the insights of Charles Dodgson (alias Lewis Carroll) from *Through the Looking Glass*:

‘When I use a word,’ Humpty Dumpty said, in a rather scornful tone, ‘it means just what I choose it to mean – neither more nor less.’

‘The question is,’ said Alice, ‘whether you *can* make words mean so many different things.’

‘The question is,” said Humpty Dumpty, ‘which is to be master – that’s all.’

As the creator of our own story, our mind’s most masterful characteristic is its ability to build bridges of meaning. This is the metaphorical nature of our mind – the word, metaphor, having come from words depicting a transfer from one place to another or the carrying of something across a divide. A metaphor is typically thought of as a poetic embellishment of language – a literary device in which something is described by another word that is quite different in meaning, but brings out some nice similarity between the two, *e.g.* ‘a sea of trouble’ or ‘all the world’s a stage.’ This aesthetic value, which we enjoy, disguises a deeper significance that metaphor has in our practical experience.

George Lakoff and Mark Johnson have shown us that: ‘the essence of metaphor is understanding and experiencing one kind of thing in terms of another.’ In other words we can think of one thing in terms of another and utilise this meaning bridge to jump our train of thought onto another track; to change the direction of our thinking and thereby change what we are experiencing. Metaphors are essentially paradoxical in that ‘all the world’ is not really ‘a stage,’ but it can be thought of as that because of an underlying similarity – a pattern the two have in common.

So metaphors are not merely to beautify our language; they actually define our reality, shape our thoughts, our plans and our expectations, and form the basis for our actions. We will see later that meaning forms first in our body at an unconscious level, before it becomes conceptual, and the bridge between these unconscious patterns of knowing and our conscious mind is metaphor. Everyday opinions and decisions emanate from this patterned story that we live. This affects our wellbeing at all levels, *e.g.* health workers have been able to utilise metaphorical conceptualizing in the healing process.

Lakoff explained that:

‘a large proportion of our most commonplace thoughts make use of an extensive, but unconscious, system of metaphorical concepts, that is, concepts from a typically concrete realm of thought that are used to comprehend another, completely different domain.’

Our mind works across a spectrum from knowing to not knowing and metaphorical imagination is the way we connect up fairly concrete and familiar patterns with the more elusive concepts that are too rich and nebulous to grasp easily. As Vladimir Dimitrov put it, ‘logic is the torch of rationality, but it is metaphor that illuminates the edges of the unknown.’ He said its inherent paradox and flexibility can be compared to the way ‘fuzzy logic’ works in modern technology. Fuzzy logic can tolerate the conceptual twilight in which we find ourselves as we thread our knowing story through the depths of a jungle of unknowing.

The phrase ‘a can of worms’ or ‘Pandora’s box’ evokes more meaning than a fairly detailed description of one’s complicated and difficult circumstances. Often metaphors come from archetypal stories passed down over time, *e.g.* the sword of Damocles was suspended by a single hair over a courtier’s head as he feasted and now it expresses any real life situation that is impregnated with danger.

In the derivation of words from much earlier times we can often see how the metaphorical structure has been retained and modified along the way. An example is the English word, ‘window,’ deriving from an Old Norse word, *vindauga*, or eye of the wind, which was the name for the hole in the roof that let the smoke out – the smoke being visible wind in a metaphorical sense. Window now stands not only for openings in walls, but also for windows of opportunity or frames in which you work with your computer.

The Yolgnu language has more in common with ours when metaphors are considered. Mountains and rivers, for example, can have heads and arms and feet like our body. Constellations of stars in the sky are called Baiame or Orion’s Belt. Ritual dance, like corroboree, or our theatre and ballet, creates rich metaphors of the more subtle aspects of human experience that cannot be spoken about directly with the same force or clarity.

It’s hardly surprising that our body is a rich source of metaphor. We talk about the heart of the matter, losing heart and also broken hearts. A table has a leg and a foot and we talk about attitudes such as standing

on your own feet, being tight-lipped or holding your head high, not to mention keeping your chin up and your feet on the ground. Also significant in our everyday lives is the idea of being in touch and having a voice, rather than having either no say or no standing in the world.

The logic of imagery is seen in the great mythological stories in which the myth is fictional yet deeply true to experience. In *The Aboriginal Gift*, Eugene Stockton characterised the Western world view as a triangle image, depicting hierarchies, compared to the Aboriginal world view as a circle of people around a camp fire. The imagery of concentric circles is important in Aboriginal art and has many layers of meaning.

### ***Metaphors about communication***

Consider the different ways we might describe having an argument with someone. A common metaphor in our society is the image of combat or war. Thus you can attack the weakest point of your adversary's position or shoot down his argument, especially if your words pack a punch and are right on target. But you could also think of an argument as a building that, if not properly constructed or supported, might be a bit shaky or easily torn down. It could also be framed as a journey – wandering around, covering little ground – or it could be a vessel that has lots of holes in it and does not hold water.

How often do we think of our mind as a machine? We have to get the wheels turning to grind out a solution; we can be a little rusty or even run out of gas. We get annoyed if someone is not on the right wavelength or something doesn't compute.

The advent of scientific methodology accelerated research into mind and body, but it also sponsored a more mechanical imagery and dimmed our view of the organic wholeness of the human being. This changed our manner of relating to one another. In particular, the information revolution was spawned by new technology for communication, which meant that cognition came to be seen in terms of information-processing mechanisms. In many popular books about the brain you will find computer metaphors such as firmware, parallel processing, *etc.*

Krippendorff identified six metaphors that apply to interpersonal communication. The first is the idea of conveying something in a container, facetiously known as the 'bucket theory' of communication. This puts the emphasis on content – the words – which must be transported correctly and delivered undamaged. Part of the message could be lost. Related to that is the conduit metaphor in which

information may encounter bottlenecks or not go through proper channels. Then there is the control metaphor in which the message takes over its recipient in a compelling way. The transmission metaphor comes from signal encoding where it is crucial to decipher the code correctly. The pervasive war metaphor has already been described with respect to an argument, where the communication has to have a winner and a loser. Finally, there is the metaphor of a dance that I alluded to earlier, which is a delightfully cooperative and communal activity.

The important point to notice is that these metaphors have 'entailments' that 'organise their users' perceptions' and thereby shape our experience of living. One metaphor on which I have based this story is the mind as a connectivity device, linking us to one another and to our world. What we see in this view differs in subtle, yet important, ways from the picture painted by the old information-processing school of cognitive science. That is how significant the choice of metaphor can be.

### ***The basic metaphors of science and experience***

There are some basic patterns we take so much for granted we think of them as fundamental aspects of reality itself. These are the notions of space and time and the related concepts of movement and causation.

We use a variety of metaphors to do with spatial orientation – up, down, in, out, rising, falling, *etc.* For example, happy is up and sad is down; your spirits can soar or sink. More is up and less is down. Things come into view or go out of sight; you go in a race; or you fall in love. We speak about water turning into ice or an idea coming out of a discussion.

The concept of time is also used metaphorically. Time is money and can be wasted or saved; we never seem to have enough. What does this kind of language have to do with the physical science on which it seems to be constructed?

Bruce Gregory's delightful book about 'physics as language' affirmed that, for all practical purposes, the world is what we say it is or, as I've described here, we invent our own particular reality as we bring it forth with our mind (see the lines from a Metalogue by Gregory Bateson at the end of this Chapter). Another book in a similar vein is *Physics as Metaphor* by Roger Jones.

We tend to think of science, metaphorically, as drawing back the veil that hides the secrets of the universe, whereas the history of science

is the evolution of a particular language with which we attempt to explain and understand our experience. Sir Arthur Eddington put it beautifully when he wrote: ‘the footprints we have discovered on the shores of the unknown are our own.’

So the most common everyday metaphors we use are built upon foundational concepts that are the deepest expressions of our consciousness – the cardinal metaphors of space and time. Immanuel Kant considered space, time and causality to be essential conceptual and intuitive categories arising from the interplay between our mind and the world itself. Without them we would never be able to construct our personal story because our experience would be too chaotic and tangled. I suggest that space and time are the mental manifestations, expressed in physical terms, of the deep sense of separateness and individuality and possibilities for union that we experience.

We simply can’t imagine living without the reality of space to keep things separate and time to distinguish one event from the next. But our actual experience of time and space is not so clear-cut. We can feel distant from someone who is standing beside us and close to someone who is far away. And our sense of the passing of time is notoriously elastic. An hour can seem like a few minutes or it can drag interminably depending on our state of mind.

The scientific concept of space and time is more elastic than you might think, too, because these changed from being straight-line parameters to having curvature when Einstein first surmised about relativity. He maintained that ‘the human mind has first to construct forms independently before it can find them in things.’

Our modern notion of causality is closely tied to the concepts of space and time, but this was not always the case. Thinking changes over the centuries as our metaphorical stories change. Hundreds of years ago people did not feel as separate from their natural world as we do today. They saw something of themselves in their fellow creatures and in the stars, the sun and the moon; they believed their lives were linked to everything else they observed.

They had no need to distinguish between an objective assessment of planetary orbits and their subjective experience of celestial cycles in their mind and body. In some ways they were able to respond to natural events more meaningfully than we can because of their awareness of these connections. We have developed, through science, much cleverer ways of interacting with our environment that enable us to respond more efficiently today, but in doing this we’ve lost much of our connectedness with nature.

A simplistic and more 'scientific,' way of thinking about causality has actually hindered our understanding of mind. We put most emphasis on only one of Aristotle's four different types of causality – the one he called the 'efficient' cause, which is the agency that appears to be the immediate driving force. He also distinguished a 'material' cause (the original constituents), a 'formal' cause (the planning process) and a 'final' cause, which is the purpose behind what has happened. None of these can be ignored in explaining our mind because causation is essentially a construct of the human mind as Kant explained. Neuroscientist, Walter Freeman, wrote: 'causality is in the minds of humans, not in the malevolence of nature.'

Carl Jung gave us a term to describe the coincidence of two events that have no apparent causal connection between them, but which have a common symbolic or metaphorical content. He called it synchronicity. Astrology is a classic example of a supposed relationship between what we experience in our lives and what we see in phases of the moon and the movement of planets. We would call it an acausal correspondence today; some of us believe in it, many of us do not.

Science has always been primarily concerned with causal connections that are directly linked. But in an extraordinary transformation, rather like cutting its own throat, science produced the new theory of quantum mechanics in which probability rules and information does not need to travel across time and space; it is shared and omnipresent. Quantum theory has spawned new metaphorical descriptions of the brain and mind. The evolution of our knowing will continue as new metaphors are created.

The notions of space and time lead to the idea of movement or animation – the opposite of being still – and to thoughts about what makes this happen. The concepts of force and energy are huge elements of human experience in that we often wonder what motivates us – where did that impulse come from or what provided the impetus to act or speak in a particular way? We want to honour the sense of vitality and energy we experience, without which we could do nothing, but we also know the definitions from physics could not possibly do justice to the mystery that is entailed in our incredible life force.

Then there is the indispensable concept of fields about which Einstein remarked that it required a courageous scientific imagination to realise it was something existing between the bodies rather than the bodies themselves that was responsible for the activity being observed. James Clerk Maxwell is sometimes regarded as the greatest of all physicists for his

conceptualisation of the electromagnetic field; although his work was based on the observations of a relative layman, Michael Faraday.

Fields as invisible regions of influence are the basis of Rupert Sheldrake's radical explanations about living systems that he called a 'new science of life.' His idea is that every cell and organism, including human beings, creates an invisible morphogenetic field that shapes its existence and defines its connection with its world. Plenty of evidence has been gathered that would support this metaphorical picture, but its practical application has not yet been realised.

### *The metaphor of wholeness*

One of the most important new metaphors created in the latter part of the last century – during which huge advances in mind science were occurring – came from the physicist David Bohm. As a research scientist during the development of both relativity theory and quantum mechanics he was in a position to think about what these two revolutionary ways of thinking about reality had in common. The two approaches seemed irreconcilable to many people, but what Bohm said they had in common was they both invoked the idea of an 'undivided wholeness in flowing movement.'

Bohm expressed concern about the fragmentation of the world as it manifested in our thinking and doing. He saw this as a root cause of our problems and, partly through dialogue with Krishnamurti, he argued passionately for an awareness of the whole. He proposed the fundamental idea of two orders of reality: implicate and explicate. Thus, all the manifest details we recognise in the world of our experience, which is the explicate order of reality, are also enfolded into an unbroken wholeness in a corresponding implicate order of reality. This allows fragmentation and unity to coexist naturally, flowing from one to the other according to our perception of them.

The value of this can be seen by comparing what Bortoft called an authentic whole and a counterfeit whole. Wholeness is a special property in its own right; it is quite different from totality. The counterfeit whole is a totality that is formed by adding together the parts – it is really just another larger part. Wholeness, on the other hand, may be illustrated by one's experience of a hologram.

A hologram is a photographic plate made with laser light, which differs from natural light in that it's said to be coherent. When you shine laser light on this plate again, it shows up as a three dimensional optical image that is a complete reconstruction of the original object. The

amazing thing is, when you light up any part of the plate, that part also displays the complete image, only at a lower resolution. The whole is contained in each of the parts as Goethe had been saying long before. This also tallies with the perception from modern physics that the properties of a single particle are determined by all the other particles acting together.

Another example of wholeness is what is known as the hermeneutic circle, which is the way meaning arises in our mind as we read the words in a book. If the book is well written the meaning seems to unfold progressively as if the essence of the whole story is somehow immanent in each line or paragraph. If you want to know beforehand what a book is about you could read a summary on the dust jacket, but that is usually an overview which at best only hints at the true essence. If you want to understand the book better you will not get that knowing by standing back for a broader view; you will find it by examining more closely certain passages which convey the wholeness of its meaning.

A true science of wholeness that Goethe foreshadowed will differ from materialistic science as we know it today. The authentic whole is almost invisible to that science because the scientific method is like the judge who compels the witness to answer the questions he himself has formulated – so it isn't open to seeing a bigger picture. The authentic whole cannot be reduced to its parts because it's not an integration of the parts (*i.e.* it is not secondary). Like the parts, it was always there.

This is why my story of the mind, grounded in process philosophy, must embrace the whole spectrum of knowing, which is a continuum from knowing to not knowing, from the physical to the spiritual – the material to the non-material – using whatever means are available to make an acceptable explanation. It acknowledges the wholeness that exists in each part of our story.

### ***Seven aspects of knowing***

The one remaining metaphor I required to explain the spectrum of mind came from the Eastern tradition of knowing and was triggered by Caroline Myss and her book *Anatomy of the Spirit*. It also grew from my personal fascination for the seven tones of the most common musical scale, the seven colours of the rainbow and all the other ways in which the number seven has been given significance by human minds throughout history. The final trigger was when my physiotherapist told me he was using acupuncture to heal my aching arm even though he



thought that energy meridians and chakras in Chinese medicine were only metaphorical, not scientific, descriptions of the body!

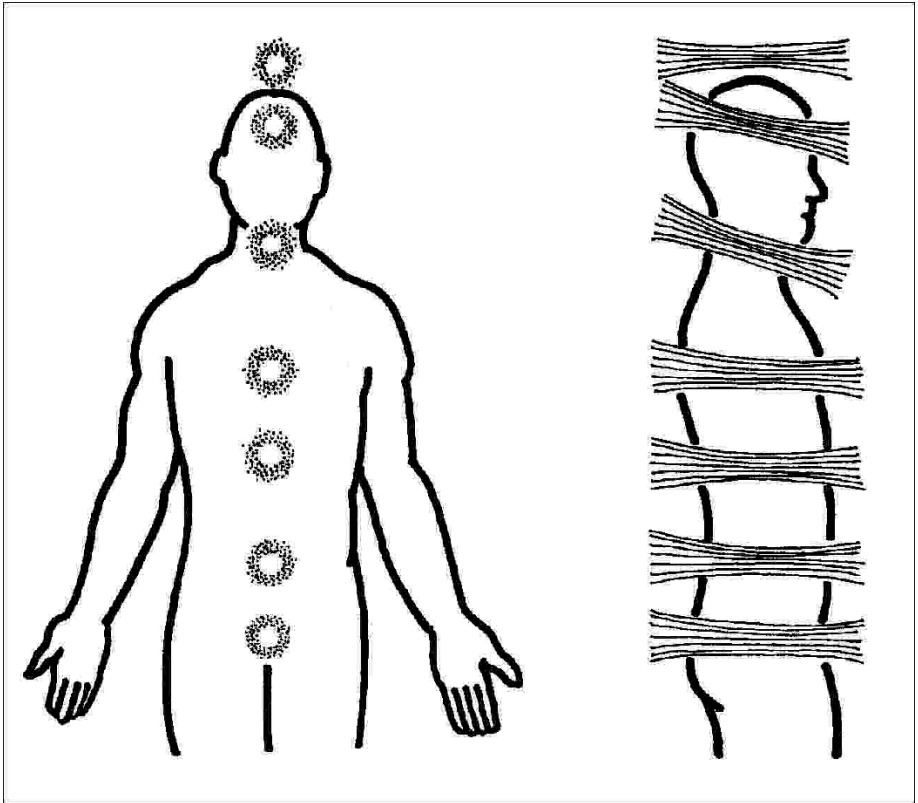


Figure 9. Diagram representing the seven chakras.

The seven chakras described in Yoga (see Figure 9) have been associated with levels of consciousness in ways that are outside the scope of this book and I do not claim to understand those deeper meanings. But their continuity from the base chakra to the crown chakra is said to represent the transition from the physical to the spiritual planes of existence, from the known to the unknown, or the material to the non-material poles of reality. The Eastern tradition of knowing is very different from the tradition of Western physiology, but here is a way it could contribute to a more holistic explanation than science alone can provide.

Caroline Myss had already used this sevenfold structure to draw parallels between the chakras, the seven Christian sacraments, seven levels of the ten sephirot from the Jewish Tree of Life and what she called 'seven stages of power and healing.' At the end of this Chapter is a Table of Correspondences in which I adapted some of her seven stages

and aligned these with the seven aspects of knowing I identified from modern cognitive science. The colours and elements that are traditionally associated with the chakras are also included in this Table.

A chakra is defined by Anodea Judith as a centre of activity that receives, assimilates and expresses the life force energy. She also referred to it as a 'spinning vortex of energy created within ourselves by the interpenetration of consciousness and the physical body.' The word, chakra, is a Sanskrit term meaning wheel, so this may be visualised as a spinning sphere of bio-energetic activity. Seven of these wheels are apparently stacked horizontally in a column of energy that spans from the base of the spine to the top of the head. The meaning of these concepts has been derived, like all meaning, from practical experience, so it cannot be denied. Inevitably, though, if you have not experienced it yourself, the meaning could be rather unclear.

The life-force energy or prana (Sanskrit meaning breath) is said to be a property of the whole universe and the chakra is described as the nexus of the metaphysical and the biophysical energy, so the nature of this energy can't be explained in scientific terms. That doesn't mean it does not exist – just that, as scientists, it is not known to us. Some researchers suggest that the bio-energetic activity emanates from the major nerve junctions or endocrine glands situated nearby, but neither of those has known properties that would account for the chakra's effect as an influential biological field.

Some Western medical scientists have studied closely these patterns of energy in what they call the electromagnetic body to contrast it from the dense chemical body of which we normally speak. The metaphor of the biological field is potentially of great importance for our understanding of many physiological phenomena, but acceptable explanations of these fields have yet to be established. They are difficult to study because cause and effect can be instantaneous and extremely subtle, *e.g.* altered by a mere touch. Practitioners of body energy therapies are obviously aware of these fields in an experiential sense, but their knowing has not yet been translated into scientific explanations that are widely accepted.

In the sense that metaphors create bridges of meaning, what is written about the seven chakras helps to clarify and serves to enrich what we know as the seven aspects of knowing.

The first aspect of knowing, autonomy, corresponds with the Christian sacrament of baptism, the physical kind of power and learning about the physical world. It also corresponds with the base chakra, which is said to

represent our purely physical connection to the world – our ‘survival consciousness,’ our grounding, the element, earth, and the colour, red.

Connectedness, the second aspect of knowing, corresponds with the sacrament of communion and the power of relationship. It implies lessons about sexuality and physical activity and carries with it the sacred truth: to honour one another. With the element, water, and the colour, orange, the sacral chakra refers to creativity, sexuality and wellbeing through joining together with others. In Yoga it’s said that our singleness becomes aware of duality and difference and hence the movement between polarities and the desire to connect are introduced into our knowing. The solid earth has become flowing water in this aspect of knowing.

The proactive nature of our perception, expressed as the way we bring forth our world, is the third aspect of knowing and the first that deals directly with the way we make meaning. It corresponds with personal power and is where we find our self-esteem and our personality and come to the truth of honouring one’s self. It is worth noting that this follows after we honour one another because it depends on that connection having already been made. The solar plexus chakra represents self will and assertion as they are coupled with vitality, laughter and joy. Its element is fire and it’s said to radiate; its colour is yellow. It draws on a desire to transform energy into action. It is sometimes a ‘gut feeling’ about something. The sacrament of confirmation is regarded as an important milestone in establishing one’s spiritual identity and commitment.

The remaining aspects of knowing are yet to come in this book. As they arise a few details about each corresponding chakra will be included to enrich the meaning that can be formed about them. I don’t think of them as levels like steps in a staircase, even though one may build upon the next. To me they are like a drawing by Escher that flows up and down at the same time. Each one is like a particular colour in the rainbow or note on the musical scale and they may be joined or mixed together in whatever way appeals to you. At the end of the book I will offer them to you as a seven-pointed star.

Aspects are particular vantage points from which something may be viewed – certain ways of looking at something. I like to visualise the human mind as a gigantic crystal in which most of the facets twinkle with mystery and are not known to me, but in which I can discern seven particular aspects that have meaning from which I gain satisfaction.

The particular shapes we prefer to employ in our imagination are very personal choices. We will see how these arise from the emotional patterns that form in our minds and how they influence what we do every day. It is to the processes of doing that we now turn in the next Chapter.

**WHAT IS AN INSTINCT?** A Metalogue by Gregory Bateson (from *Steps to an Ecology of Mind*, 1971)

**Daughter:** Daddy, what is an instinct?

**Father:** An instinct, my dear, is an explanatory principle.

**D:** But what does it explain?

**F:** Anything – almost anything at all. Anything you want it to explain.

**D:** Don't be silly. It doesn't explain gravity.

**F:** No. But that is because nobody wants 'instinct' to explain gravity. If they did, it would explain it. We could simply say that the moon has an instinct whose strength varies inversely as the square of the distance ...

**D:** But that's nonsense, Daddy.

**F:** Yes, surely. But it was you who mentioned 'instinct,' not I.

**D:** All right – but then what does explain gravity?

**F:** Nothing, my dear, because gravity is an explanatory principle.

**D:** Oh.

**D:** Do you mean that you cannot use one explanatory principle to explain another? Never?

**F:** Hmmm ... hardly ever. That is what Newton meant when he said, "*hypotheses non fingo*."

**D:** And what does that mean? Please.

**F:** Well, you know what 'hypotheses' are. Any statement linking together two descriptive statements is an hypothesis. If you say there was a full moon on February 1<sup>st</sup> and another on March 1<sup>st</sup>; and then you link those two observations together in any way, the statement which links them is an hypothesis.

**D:** Yes – and I know what *non* means. But what's *fingo*.

**F:** Well –*fingo* is a late Latin word for 'make.' It forms a verbal noun *factio* from which we get the word 'fiction.'

**D:** Daddy, do you mean that Sir Isaac Newton thought that all hypotheses were made up like stories?

**F:** Yes – precisely that.

**D:** But didn't he discover gravity? With the apple?

**F:** No, dear. He invented it.

**D:** Oh.

**D:** Daddy, who invented instinct?

CONTINUES

CHAKRA	COLOUR	ELEMENT	SACRAMENT*	SACRED TRUTH*	KINDS OF POWER*	LESSONS ABOUT*	ASPECTS OF KNOWING
base	red	earth	baptism	all is one	physical power	material world	<sup>1</sup> <b>AUTONOMY</b> autopoietic unities
belly	orange	water	communion	honour one another	relationship	sexuality, movement	<sup>2</sup> <b>CONNECTEDNESS</b> operational closure
solar plexus	yellow	fire	confirmation	honour oneself	personal power	personality, self-esteem	<sup>3</sup> <b>PERCEPTION</b> bringing forth own world
heart	green	air	marriage	love is divine	emotional power	love, compassion	<sup>4</sup> <b>EMOTION</b> feelings shaping mind
throat	blue	sound	confession	follow divine will	the power of will	self-expression	<sup>5</sup> <b>ACCEPTANCE</b> being our history of connections
brow	indigo	light	ordination	seek only the truth	the power of mind	mind, wisdom	<sup>6</sup> <b>KNOWLEDGE</b> knowing as we do, in conversing
crown	violet	thought	extreme unction	live in the present	the power of spirit	spirituality	<sup>7</sup> <b>UNITY</b> imagining all is one

Table 1. Table of Correspondences. \*Adapted from Myss (1997)



# CHAPTER 8

## Doing Our Best

*subconscious decisions, the enigmatic brain, building neural nets*

The mental processes we've explored so far - sensory perception and languaging – are ways we connect with our world and other people. These connections constitute our knowing, but they are equally descriptive of our doing because of the proactive nature of perception, *i.e.* we see what we know to see because of the organising idea within us. Knowing and doing are inseparable aspects of the mind.

What we do is what we know to do at that point in time. Of course, we often have a sense that we choose between different actions or words, but that isn't as clear-cut as you might think, because much of our knowing is subconscious, *i.e.* it involves our mind, but is not part of our conscious awareness. Have you ever said something and then wondered: where did that come from? Even our language may arise from aspects of our mind that are below the level of our conscious thought.

The pattern of connections our mind makes with the world outside our bodies is based on and shaped by our body's internal state at the time, yet much of that internal state is beyond our conscious awareness or control. If we understand these internal processes also as patterns of connection, we can explore the crucial part they play in the work of our mind.

There is a flow of structural change occurring within our bodies that must remain congruent with the changes occurring in the immediate environment around us. To envisage this kind of congruent change, think of your foot in a shoe over a period of time. The fit becomes more comfortable through wear until, after a while, a new pair of the same shoes would not fit quite so well. The shoe has probably changed more than your foot, but both are adjusting to successive interactions in the same way your body does in relation to its world. Most of the time this

adjustment is slight and goes unnoticed, but each change influences what happens next. Each small change predisposes the system to its next experience, sometimes dramatically, but usually in quite an insidious way.

So the history of connection that constitutes our mind depends not just on what shapes are out there, but on what shapes we form within. And it works both ways of course. Changes in our external connections not only derive from, they also contribute to, the changes in our internal state. This means the flowing shapes of our body networks will be reflected in the everyday flow of our doing while, at the same time, our experiences are making us who we are.

### ***Deciding what to do***

The fact that we do what we know to do in each moment means our system is always doing its best with what is at hand at that time. In this noble endeavour our thoughts and our conscious intentions are not nearly as influential as we would probably like to believe.

As we develop habitual patterns of behaviour we don't necessarily think about what we're doing at all. Driving a car on a familiar road, for example, we often seem to be on automatic pilot while our brains attend to all sorts of worries or pleasures from the future or the past. We develop habitual verbal responses to oft-repeated nagging from our children or the daily grind of predictable work situations. We might doodle or daydream while doing routine operations so our thoughts are not about what we are doing.

Then there are all the body processes that happen without any conscious help from us such as digestion, respiration, blood circulation, and so on. We can influence these systems at a superficial level, but the knowing that drives them is much deeper than our thought can take us.

Another interesting disparity between our sense impressions and our actions is illustrated by the following experiment. Subjects are asked to pick up a small metal bar with their thumb and forefinger when the bar is placed on an illusory grid that makes it look longer or shorter depending on where it is placed. The action of their fingers – their actual doing – is never deceived by the visual illusion. Even though to the eyes it appears that the bar is either longer or shorter, the fingers, driven by the motor nerves from the brain, know exactly how long it really is. There is no conscious awareness of how this was achieved.

There is a condition known as blindsight in which people will make a response every time a visual stimulus appears on a screen, but they are not aware of seeing anything. This is generally due to brain damage, but



is another example of knowing that is not associated with conscious awareness.

If you think about professional sportsmen, particularly those who use racquets or bats such as tennis or baseball players, you realise that their actions are often so quick they could not have had time to think about what they were doing before they hit the ball; it was more like a reflex reaction. Their training has prepared them to react in an effective way purely through subconscious knowing.

This idea that our actions can be controlled subconsciously led Benjamin Libet and others, half a century ago, to pose a very basic question about the mind: where does the process of doing begin? Does it begin with my conscious thought or with a change in the brain itself or do these two occur simultaneously? In other words, when I decide to do something and then do it, does my brain start first or do I start the brain? I would assume that my conscious decision to move my finger tells my brain to prepare for that movement. But, on the contrary, it was found that all our actions are initiated subconsciously – our brain is preparing for an action slightly before we become aware that we decided to take that action.

Libet worked with patients who were undergoing brain surgery while they were fully conscious. This was a requirement for certain operations that cured severe epilepsy. First, he showed that a conscious person did not become aware of an electrical stimulus applied directly to his brain until about half a second after the stimulus was first applied. It seems that conscious awareness is not localised in any small area of the brain so it probably requires a huge number of brain cells, perhaps the whole brain, and to get so many cells working together takes a little time. Libet called this ‘neuronal adequacy for awareness.’

Further research showed that the electrical activity in the brain required to carry out a particular decision started about half a second earlier than our awareness of making that decision. The conscious thought did not initiate the brain activity – it had started already at a subconscious level. Very recent research suggests that telltale brain precursors for any decision may be seen several seconds before the decision is ‘made.’ So there is a time lag in our experience of the world because our conscious awareness is at least half a second behind the work of the subconscious mind. This means that awareness, although it’s one of the tools our mind may use, is not the agency that initiates the action.

So we might ask: who is in charge of what we do? Are we being guided deterministically by some unknown forces or do we possess a genuine free will? We will answer that question a little later in the book.

A useful metaphor for the relationship between the subconscious and the conscious mind is the interaction between an elephant and its rider. A clever rider can guide the elephant's actions quite successfully because he understands the elephant well. The rider also knows that, should the elephant decide to do something of its own accord, he is powerless to change its course. Such is the power of the subconscious patterns of our mind that the superficial thinking part cannot rely on brute strength to control them – it must employ more subtle measures to get what it wants.

### ***Networks within the body***

There are at least three connective systems within the body that work together to create the patterns that will shape the operation of our mind. These are: (1) the *nervous system*, which consists of electrochemical linkages, (2) what I shall call the *hormone system*, which covers all biochemical substances that travel around the body to affect cells other than the ones that produced them, by direct molecular interaction, and (3) *biological fields*, which act by some other mechanism that may be intuited from observation, probably involves vibration and wave effects such as resonance, but is not yet measurable within conventional science.

These three are closely interrelated, but differ in the mechanism of connectivity and the time scale of their operation. The biological fields may connect different parts of the body almost instantaneously, but they are the least understood. What I am calling the hormone system embraces many subsystems and substances that are not normally referred to as hormones, but I lump them together here because their function as part of the mind stems from the connectivity patterns they provide. This is the slowest of the three networks having its effect over several seconds, minutes or even hours. Fields and hormone networks will be the subject of the following Chapter.

### ***The nervous system***

The most obvious instruments of doing are the motor nerves that make things happen throughout your body and form the circuit with the sensory nerves to implement the proactive process of perception (see Chapter 4).

The hub of all nerve circuitry is the brain, of course, and the spinal column on which it rests. These are known as the central nervous system to distinguish them from the peripheral nerves throughout the rest of the body. Both networks are branching structures of connected nerve cells called neurons. The much greater density and complexity of the network within the brain gives it special properties which are described in the next section.

The brain is not only the hub of the nervous system; it is also the interface with the hormone system in that certain nerve cells produce hormones that trigger a cascade of other hormones throughout the body. This engages the hormone system with the process of perception. The hormone system also involves the gut so it can interact with the body's 'outside' by contact with the food we eat as well. Some hormones produced elsewhere in the body affect brain cells directly, although there is a blood-brain barrier that insulates the brain from unwanted chemical activity occurring elsewhere in the body.

As well as this voluntary nervous system that makes up the sensory-motor loops, there is an involuntary nervous system, which regulates the operation of our viscera – heart, lungs and gut. This consists of two distinct networks of nerve cells known as the sympathetic and the parasympathetic systems. Broadly speaking, these two work in opposite directions. The sympathetic stimulates or excites other body systems, while the parasympathetic has a slowing or calming effect. The balance between them is an indicator of stress, *i.e.* how successfully we are using our mind to cope with the changing circumstances of our world.

The way we handle stress is an important issue for the mind and is described in Chapter 16. A fear response, for example, activates the sympathetic 'fight or flight' mechanism, increasing heart rate, respiration rate, *etc.*, while diverting physiological activity away from less urgent priorities such as the digestion of food. Conversely, meditation practices activate the parasympathetic side of the involuntary nervous system.

Neurons come in different shapes and sizes; the most common form has a main shaft or axon and branching ends called dendrites through which it can connect with other cells. In the periphery they form into dense tracts of many strands running through the limbs and to and from the various organs. The shaft may be covered by an insulating myelin sheath which makes its operation faster and more efficient. Deeper parts of the brain are called white matter because of this white sheath whereas the outer part of the brain is called grey matter, being neurons without this covering. The axons vary in length because some

neurons connect locally while others connect with neurons in a completely different part of the brain.

The basic operation of each neuron depends on a very slightly different electrochemical charge across its cell membrane, *i.e.* between the inside and the outside of the cell. This difference is regulated by the passage across the membrane of chemical ions that have a small positive electrical charge. Thus there are tiny pulses of electrical activity occurring in each neuron that can be transmitted from one to another. This is called a nerve impulse and it goes wherever the branching network of the nervous system takes it with an end result such as the twitching of a muscle in your leg, if it is a motor nerve.

For the impulse to get from one neuron to the next requires another crucial biochemical step because the endings of the individual nerve cells do not quite touch one another. They are separated by tiny gaps called synapses. Small molecules known as neurotransmitters are released into this synaptic space. They are like the hormones elsewhere in the body in that they require receptor sites to attach to on the other side of the synaptic space. The function and connectivity of the whole nervous system depends very much on which neurotransmitters are involved and how effectively they are working. This is particularly true within the much more concentrated and complex network that is the brain.

### ***Our enigmatic brain***

The brain is an enigma because we know so much about the structure and function of its parts yet the way it works as a whole still puzzles us in many ways. Some one hundred billion nerve cells, an even larger number of infra-structural (glial) cells in support, each neuron having many thousands of connections with others – is it any wonder we get excited talking about our human brain, especially those of us who think of connectivity as the crucial feature of mind? As we look more closely, we see that this connectivity is not a rigid hard wiring; in fact its resilient plasticity is perhaps the most remarkable of all its remarkable features.

Descriptions of the brain are an interesting example of the way we distinguish many different parts of something and then speak as if those distinctions were not created by us but were its ordained design features.

From the outside view, for example, we say it is divided into cerebrum, brain stem and cerebellum and the cerebrum consists of various lobes: parietal, frontal, occipital and temporal. These are broad anatomical

distinctions which have enabled us to recognise different functions associated with different regions. But the neurons and the networks within each region all look much the same. It must be the way those cells work together – the nature of their connectedness – that distinguishes, say, the fusiform gyrus, which you use to recognise your friend's face in a crowd, from the motor cortex, which you use to twiddle your thumbs.

The broad functional arrangement is already established at birth, but it can still be drastically altered if necessary because a huge number of the synaptic connections the brain will use have yet to be established. This has been shown in children who needed to have large areas of brain removed, yet could still develop the normal range of brain functions as they grew up. The human brain is the least differentiated organ in the body at birth so it has the most potential to develop according to the way it is used. It's not an exaggeration to say: you build your own brain; what an awesome responsibility that is.

The eventual specialisation of different parts and the patterns of connection that underpin the human mind are primarily the result of the activity of the brain cells themselves. Evidence for this comes from animal experiments in which brain cells from one specialised area, *e.g.* the visual cortex, were transplanted to another specialised area, *e.g.* the motor cortex, where they soon took on the new function of sensory-motor coordination of muscles instead of their original function of detecting visual inputs.

Another enigmatic feature of the brain is that, even with these localised functional areas, it also has the ability to distribute many of its functions very widely across all areas of the brain. For example, Broca's area and Wernicke's area were identified long ago as the primary areas responsible for speech, but it has since been found that normal speech involves many other parts of the brain and these vary considerably between individuals. When Broca's area had to be surgically removed from children, they still learned to speak normally.

A telling indication that the brain is still largely a mystery is the fact that some infants with hydrocephalus (water on the brain) who possess only a fraction of the normal amount of brain cells are quite normal or even exceptionally bright. Other babies in the same situation, however, will die. Einstein's comparatively small brain (87% of the average weight) is often cited as evidence that intelligence is not related to brain size.

Nevertheless a lot is known about the relative contribution different regions make to brain function so there are quite a few pieces in place in the unfinished jigsaw puzzle of brain and mind. Figure 11 shows the general arrangement of the inside of the brain in a very simplified form.

The bottom part, known as hind brain and brain stem and including the cerebellum, has been termed the reptilian brain because it is the oldest part in an evolutionary sense. The much larger cerebrum on the top, particularly its cortex (which means outer section), is the peculiarly human part which developed most recently. In between, sometimes called the mammalian brain, are structures we have in common with all mammals which play a huge role in shaping our mind. This arbitrary division can be misleading, because those parts do not work independently of one another – they are thoroughly interconnected and the older parts, in evolutionary terms, are just as essential to us now as any other part.

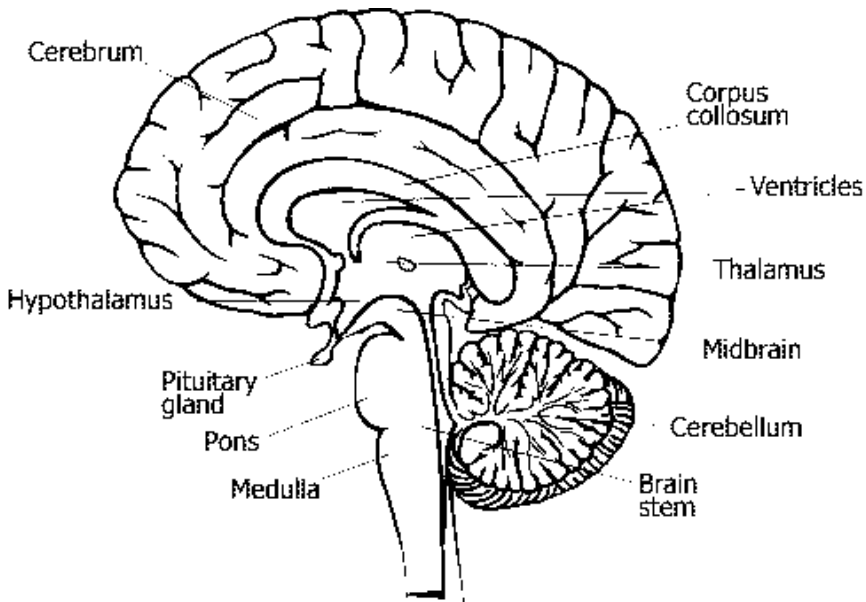


Figure 10: Diagram showing parts of the human brain in cross-section.

The cerebellum (whose name means little brain) was once thought to be only concerned with physical posture and spatial orientation, but it is now known to be vitally involved in higher cognitive activity as well. The brain stem takes charge of very basic involuntary functions such as breathing and the beating of your heart.

The cerebrum or forebrain that sits on top and almost surrounds the whole thing is by far the largest part and it is the reason our brains are much larger, in relation to body size, than any other animal. Two cerebral hemispheres form two sides of the brain with a deep cleft between them. They are joined at their central region by a thick trunk of at least a hundred million nerve fibres called the corpus callosum. Remarkably, it is possible

to cut this connection (as a treatment for epilepsy) without upsetting the person's subsequent behaviour very much.

Famous experiments with patients whose right and left cerebral hemispheres had been separated in this way gave rise to the idea that the left side specialises in verbal language skills while the right side was mainly concerned with non-verbal, more artistic skills. While this is a reasonable approximation, again, it should not be taken too literally, because some people have rather different lateralisation; also, verbal skills involve many different parts of the brain including the right hemisphere. No two brains are exactly the same. There are gender differences and a lot of variation between individuals in the way in which different regions of the brain are associated with particular functions.

The asymmetry between right and left cerebral hemispheres may have a deeper significance according to very recent research. In an important new book, *The Master and His Emissary – The Divided Brain and the Making of the Western World*, Iain McGilchrist explains that our left hemisphere, which has usurped control to some extent, is specialised for repetitive, procedural, utilitarian functions whereas we need the right hemisphere for understanding metaphor and wholeness and being receptive to the unknown. When musicians are learning new music or creating it their right brain is most active, but when they come to perform it the left brain takes over and could be thought of as claiming all the credit.

In the region between the hindbrain and the forebrain there are several structures that are vital for all our emotions. They include the hypothalamus where several hormones are produced and passed to the pituitary gland which is attached here by a short stalk. Many basic drives and feelings originate in the hypothalamus including those around hunger, thirst and sex.

The engine room of our emotions is around here in what is known as the limbic system, which is a band of structures including the amygdala and hippocampus that are associated with memory and whose connection with the forebrain is a crucial aspect of the way our mind functions. In the lower parts of the midbrain there is a reticular activating system which has a filtering and distributing function for connections entering and leaving the brain.

Two specialised neuron types, only recently recognised, play vital roles in the social bonding that is so crucial to our mind. One of these is the spindle cell which has a bulb-shaped axon and thick dendrites for rapid synaptic transmission. We have a thousand times more of these

particular cells than our nearest primate ancestors so they clearly contribute to what is special about the human mind.

When you are with someone and your eyes meet theirs, these cells, concentrated in the orbito-frontal part of the cerebral cortex, with strong links to the upper part of the limbic system, apparently make a snap determination of the warmth or otherwise of that interpersonal connection. They are also active when you look at a photo of a loved one.

The other brain cells of paramount importance, socially, because they make emotions contagious, are the mirror neurons. They enable us to copy, in our brain, the facial expressions and any other movements of another person into which we can read some intentions – so they provide the mechanism for what we call empathy. They are widespread throughout our sensory-motor cortex, frontal and central areas of our brain.

There are spaces within the brain containing cerebrospinal fluid which also fills the spinal column and acts as cushion for the brain as a whole. By floating like this its effective weight is reduced by 80%, thus lessening the chance of injury within the bony casing of the skull. This means that your posture and the way you hold your body can influence brain function also. Body therapists are acutely aware of the importance of this.

As neurons connect in the brain their activity can become synchronized thus exciting a whole region of the brain, which produces electrical activity that can be measured by an electroencephalograph or EEG machine. Different types of ‘brain waves’ have been distinguished with different frequencies that are associated with the degree of arousal of your mind.

Alpha waves of 8 – 12 cycles per second are associated with a relaxed, but alert state, whereas beta waves at slightly higher frequencies signify more intense concentration and mental activity. Frequencies below 8 cycles per second are the theta and delta waves associated with drowsiness and deep meditation. There is interest nowadays in a much higher frequency activity, around 40 cycles per second, which some people think could be involved in a higher consciousness of some form.

Not only has this electrical activity proved difficult to relate to either cognitive processes or emotions, but more sophisticated brain mapping using magnetic resonance imaging (MRI) has not yet shown really clear correspondence between brain activity and mental function. It measures changes in blood flow which are certainly related to the cellular activity, but not in a very specific way. The very latest fMRI (functional MRI) brain mapping produces beautifully coloured images in yellow,



orange, red and blue, but the data require very detailed statistical processing to be interpreted and different algorithms used for this purpose can give quite different results.

We know that doing arises in the brain, but not from an easily defined, hard wired circuitry. Instead it is a highly plastic, ever-changing 'neural net' that enables us to know what we know and, therefore, to do what we do. This uniquely personal web of connections develops in a particular way as a human being grows from a tiny embryo into an adult person. Its development follows a course that is congruent with the connections that the person's mind is making with everything he or she encounters along the way.

Fred Genesee compared the brain to a computer that comes with basic circuitry, but no software – that must be added by experience. This analogy may be useful, but it certainly does not do justice to the extraordinary plasticity of the circuitry itself in the human brain.

### ***Shaping the neural net***

Genesee described the process of learning in the light of very recent brain research:

'Learning by the brain is about making connections within the brain and between the brain and the outside world. What does this mean? Until recently, the idea that the neural basis for learning resided in connections between neurons remained speculation. Now, there is direct evidence that when learning occurs, neurochemical communication between neurons is facilitated and less input is required to activate established connections over time. New evidence also indicates that learning creates connections between not only adjacent neurons but also between distant neurons and that connections are made from simple circuits to complex ones and from complex circuits to simple ones.'

An example he gave was exposure to unfamiliar speech sounds which are initially registered by the brain as rather diffuse and undifferentiated neural activity, but as exposure continues, both simple and complex circuits in the auditory cortex of the left hemisphere are seen to be activated repeatably and easily. These then join with other brain regions to incorporate visual, tactile and olfactory aspects and to include the emotional memory related to the sound of the word, which all combine to give the sound of the word some meaning. The connections spread far and wide, including the right hemisphere, to form

a complex neural net. The meaning that was at first like a blurry photograph becomes clearer and more detailed.

Circuitry that is actively utilised works more rapidly and efficiently than is the case when it was first being formed. This means that, for learning to be effective, some time is needed to establish the circuitry. And it's quite true that the more you use your brain the more effective your brain will be for that task.

Every connection our minds make with the world in which we live helps to shape our neural net. Thus knowing affects doing and *vice versa* in a recursive connecting process that is the everyday experience of our mind.

All the shapes in our brain and, particularly, the shapes in our body as a whole are also determined by the hormone system to which we will now turn our attention.

# CHAPTER 9

## Mind in the Body

### *peptides, neuromodulators and cell membranes that dance*

The chemical communication systems within the body are even more extensive than the manifold branches of the peripheral nervous system. Many trillions of individual cells communicate with each other by some kind of chemical interaction. It is a gross oversimplification to call all this the hormone system, but I do so to draw attention to the broad principles involved.

Strictly speaking, hormones are the chemicals that travel in the blood stream from their site of production – endocrine glands such as the thyroid or adrenal glands – to their site of action, elsewhere in the body. It is now known that many organs and tissues other than these endocrine glands produce such chemicals, *e.g.* the lining of the gut, the brain, the heart and the white blood cells of our immune system. These mobile molecular ‘connectors’ can also drift through fluid-filled spaces between cells in many parts of the body.

These molecules are often described as chemical messengers, conveying information from one place to another. This is quite an apt metaphor even though it puts more emphasis on the content than the connection. What it obscures is the fact that there has to be both a cell mechanism producing the ‘message’ and a timely, corresponding, cell mechanism receiving it and without that molecular connectivity the ‘message’ would have no value.

### *The molecules of emotion*

Mind scientists became very interested in these chemical networks from the moment they realised that hormones from other parts of the body

could directly influence brain function. This meant the flow of emotional change could no longer be attributed solely to networks within the brain.

One of the pioneers in this research, Candace Pert, who later turned to popularising this field, coined the phrase: 'molecules of emotion.' Her discovery of the opiate receptor in the brain in 1973 was one of the early breakthroughs that boosted this research. The opiate drugs had been well known for their effect on the human brain and someone else had worked out how hormones attach to receptors on the edge of a cell. Then, to find specific opiate receptors on brain cells was a very exciting development. Pert said it started a 'receptor revolution.'

Receptors are specialised molecules embedded in the outer membrane of every cell that act as connecting points for specific hormones that come by in the blood stream or the surrounding fluid. Their specificity is crucial and has to do with the shape of the molecule. When a hormone molecule that is shaped like the 'key' for that particular receptor molecule's 'lock' arrives at the surface of the cell, the two become bound. This connection triggers a further chemical process within the cell that is specific to that particular hormone at that time. Many hormones stimulate certain cell processes; some inhibit them.

On each cell there are thousands of these receptors of every different type that the cell may need, but their numbers are not constant. As the demand changes, so the number of receptors is increased or reduced. If there is a lot of stressful activity occurring, for example, certain stress hormones will be circulating in larger amounts and those particular receptors will become more numerous while some other receptors needed for the healthy digestion of food, for example, or for relaxing, will become fewer through lack of use. This is an incredibly responsive, internal connectivity system that is related to the way your mind is connecting with the outside world.

While the vast majority of chemical changes occurring in your body may not be immediately recognisable in your feelings, the flow of underlying emotional change plays a subtle and powerful role in the operation of your mind. Even some of the smaller effects are quite obvious. The gut's reaction to food we eat and the subsequent metabolic changes such as a slight rise or fall in blood sugar levels lead to changes in mood. The skin's reaction to a certain touch can have strong emotional ramifications. Even slight dehydration affects cognitive ability. It is reasonable to assume that all chemical activity in the body could influence our knowing, albeit at a subconscious as well as a conscious level.

### *Hormones and the brain*

Aristotle, being more of a naturalist than his teacher, Plato, was the first to explain the different temperaments and behaviour of people in terms of bodily substances. He described four ‘humours’ or chemical states of the body, which he called blood, phlegm, black bile and yellow bile. An imbalance or a change in temperature of these was thought to predispose to different behaviours, *e.g.* too much hot black bile would make you wild and garrulous while excess yellow bile would make you melancholic.

The names have changed and the scientific explanation is vastly more detailed today, but we still think of chemical balances and interactions within the brain as the principal determinants of how we feel and how we behave. More is known about those neurotransmitters that have the greatest effect on our mood and wellbeing because that is where the research is concentrated. The knowing and doing of our pharmaceutical industry and medical profession are driven by – and also drive – the moods and feelings of our population.

Today it is serotonin, one of the neurotransmitters that bridge the gap between neurons, that receives a lot of the attention. The most commonly used antidepressant drugs such as Prozac are selective serotonin reuptake inhibitors (SSRI’s) that boost the activity of this hormone. This alters mood and produces better feelings because it affects the synaptic strength and thus the connectivity in crucial brain regions where emotions are shaped. Giving these drugs to children whose brains are still forming new neural networks is considered highly problematic by some researchers.

Dopamine has been known for a long time to be one of the most influential neurotransmitters because it affects cognitive functions such as memory and problem solving and also produces feelings of wellbeing and motivation. Its precursor hormone, L-dopa, is used to treat Parkinson’s disease. Dopamine is implicated in addiction problems because it mediates what has been called the ‘reward pathway’ in the brain. It also works, with noradrenaline, on the mind’s capacity for focus and attention. Boosting these hormones is a way of treating attention deficit disorders (ADD’s) and hyperactivity that seem to be increasing as our society becomes more complex.

Noradrenaline and adrenaline are hormones of the sympathetic nervous system mentioned earlier as the ‘fight-or-flight’ response that arouses the body to cope with stress. Like all the hormones mentioned here they operate as neurotransmitters at the nerve junctions, but are also

released into the bloodstream from various places in the body, in this case from the central part of the adrenal gland. The parasympathetic arm of the involuntary nervous system is much less researched, its complementary or balancing role having less obvious effects. Its principal neurotransmitter is acetylcholine which has recently been implicated in the social bonding aspects of brain function that are so vital for the healthy mind.

Some of the most exciting new findings concern social bonding. Oxytocin is another very small molecule (just nine amino acids in a string called a peptide) that has a long evolutionary history – it is found even in primitive fish. Produced in a lower part of the mammalian brain called the hypothalamus, it is stored in the pituitary gland. Intermittent release into the blood stream causes uterine contractions during childbirth and milk letdown during suckling.

Now, oxytocin is being referred to as the ‘hormone of love’ because it increases feelings of trust and promotes a sense of commitment between mother and baby and in adult relationships. It is a neuromodulator rather than a neurotransmitter because it affects synaptic strength across whole groups of neurons. This seems to loosen internal connections that are more personal and self-centred and promote mutuality of intentions and perception between people who have formed a loving attachment.

The social motivation system is a delicate balance now known to include the hormones: oxytocin, vasopressin and endorphins, which are active in parts of the brain that are involved in facial recognition, attention, mothering behaviour and also fear in social situations. Playing peek-a-boo with a child is an example in that it activates noradrenaline and endorphins, thus producing elation and excitement in both parent and child. There is that element of uncertainty that our mind may either enjoy, or be frightened by, in an outburst of tears.

There are two distinct neural pathways involved in the fear response. There is a ‘low road’ that goes into the limbic system and produces an immediate emotional response in the amygdala and a ‘high road’ that goes straight to the higher cortex so that what we think about the fearful stimulus can be taken into account. This ability to rationalise the fear will often override the direct emotional response.

An extension of this idea is the principle that Daniel Goleman called ‘emotional intelligence’ or EQ. He said that EQ went beyond IQ and was ‘a different way of being smart.’ His best-selling books on business management were based on the likely advantage of cultivating better connectivity between the amygdala and the cortex so you can be

more aware of your emotioning and integrate it with rationality more successfully.

Goleman went on to write *Social Intelligence*, explaining how the ability to read one another's feelings underpins all our relationships. In this regard, the spindle cells in the brain are rich in receptors for serotonin, dopamine and vasopressin. This connectivity across the social bonding regions of the brain is a good example of the way that hormones work in conjunction with the neural nets.

Other hormones are not necessarily less important simply because they are less well understood. Melatonin is another small molecule, widely distributed in nature, with a long evolutionary history, that in humans is secreted from the pineal gland to control the diurnal rhythm we experience in our physiology due to the passage of day and night. This basic and natural cycling of the mind is usually damaged in people suffering from Alzheimer's disease.

Nor are the hormones to which the brain is most sensitive all produced in that organ. In fact, larger quantities of serotonin come from the gut than anywhere else. Almost all of the many peptide hormones produced by the gut are also found in the brain. Our knowing about this important relationship between the food we eat and the state of our mind is still in its infancy.

The major neurotransmitters such as dopamine also act as neuromodulators to regulate brain function more globally. Histamine affects our state of arousal and our ability to sleep. Melatonin is also a neuromodulator. Cholecystokinin, produced in the small intestine and once thought to be primarily for the digestion of food, is closely associated with the natural opiates (endorphins) in the brain and feelings of reward or satiety.

Another important source of hormones, which go by other names, is the set of white blood cells that make up a large part of our immune system. These 'interleukins' cause cognitive changes when we are sick. Conversely, they make our immune system quite sensitive to psychological and physical stress which weakens the body's resistance to infection. The immune system has been described as a cognitive system in itself because its cells can recognise foreign cells that enter our body which is, undeniably, a crucial aspect of our knowing.

The interaction between the mind, brain and immune system is an exciting new field of medical research known as psychoneuroimmunology. There is a class of diseases, seemingly on the increase in recent times, in which the immune system attacks itself. This includes various kinds of rheumatism, polymyalgia, lupus and chronic fatigue syndrome.

Although the brain plays the central role by handling most of the sensory perception and initiating many of the emotional responses, the work of our mind, in a biochemical sense, is distributed right throughout the rest of the body as well.

### *The mind of a cell*

The ‘receptor revolution’ has helped to explain the chemical networking system throughout the body, but we also need to look at what happens inside the cells as a result of being connected in this way. To do so we need to revisit the basic principles of this biogenic explanation of the mind.

We began with the idea that a single-celled organism must have a mind in its most basic form because it can sense what is happening outside of itself, form some meaning about this and perform simple life-preserving actions. You will recall that autonomy, connection with the world and the ability to form meaning are the essential requirements for life.

Living things are cognitive beings and cognition is what living things do. The advent of life and mind created an operationally closed system which was no longer controlled by outside forces, energies and information. The cell itself became responsible for the intracellular events that result from what is merely a triggering effect of all the outside changes.

The constituents biologists regard as essential in the minimal living cell are the cell membrane (or cell wall) and the DNA (deoxyribonucleic acid). The DNA is crucial for reproduction because it provides the templates for the production of all the structural and functional materials of the cell. The role of DNA in determining what happens inside cells was misunderstood and exaggerated in the latter part of the 20th century. It is now known that the genes are influenced by a cell’s interaction with the outside, at least in their expression, and therefore hopes of controlling much of human experience simply by manipulating DNA have not been realised.

Our set of genes does not determine our experience. It is more like the written constitution of a country that has a reasonably stable government. It provides operational blueprints that will not be lightly changed through successive generations, but these are a product of the mind of the people, not the mind itself. Genes are not the primary controllers of cellular activity; they are the blueprint used in its construction. What the cell needs to function properly is awareness – to know what is happening in its environment and what to do about it – and that awareness is provided via its cell membrane.



The chemical structure that first formed our mind was the cell membrane. It provided the operational closure the cell needed to be autopoietic while at the same time providing the connection it needed with the outside world. Since the triggers from outside set in motion unspecified internal processes, the membrane is also the starting point for its mechanism of operation. In short, the cell membrane is the essential cognitive component – the mind of the cell.

### ***The human cell membrane***

A bacterium has a very simple cell membrane made of peptides and sugar molecules. Ours are much more complex three-layered structures based on an array of phospholipid molecules within which protein molecules known as IMP's (integral membrane proteins) play the vital connecting role (see Figure 11).

The human cell membrane is typically only about seven millionths of a millimeter thick, so it can't be seen except under an electron microscope, a technology that has only been available in the last 50 years or so. Bruce Lipton has a neat way of illustrating its three-layered structure. He employed the analogy of a sandwich made from two slices of bread with a generous layer of butter in the middle. A liquid such as water dropped on one side of the sandwich will easily permeate the bread, but will be stopped by the butter. This enables us to visualise the role of the phospholipid molecules that make up the supporting structure of the cell membrane.

Each molecule has a phosphate head and a lipid body or tail. The heads are polar which means they have a small electrical charge, as do all water-soluble substances in the body. The lipid is non-polar like all oils and fats. These molecules are arranged side by side and tail to tail to form a wall with polar heads on the outside and the inside of the cell wall and the lipid layer in between – just like the butter sandwich. In the same way that water and oil do not mix, the lipid centre blocks any polar or water-soluble molecules from getting through, giving the cell the autonomy it needs.

Embedded in the cell wall 'sandwich' are the IMP's – quite extraordinary protein molecules which are the working components of the membrane in that they connect the inside to the outside of the cell. Some of these are the receptors I have already described that bind with hormones that come by. Linked to these, other IMP's are effector proteins in that their actions change something within the cell. Some IMP's are transport vehicles that channel substances such as oxygen and carbon dioxide into and out of the cell. One particular channel protein is

responsible for the energetics of the cell's operation. It creates a small electrical 'membrane potential' that works as a kind of self-charging battery to power the cell.

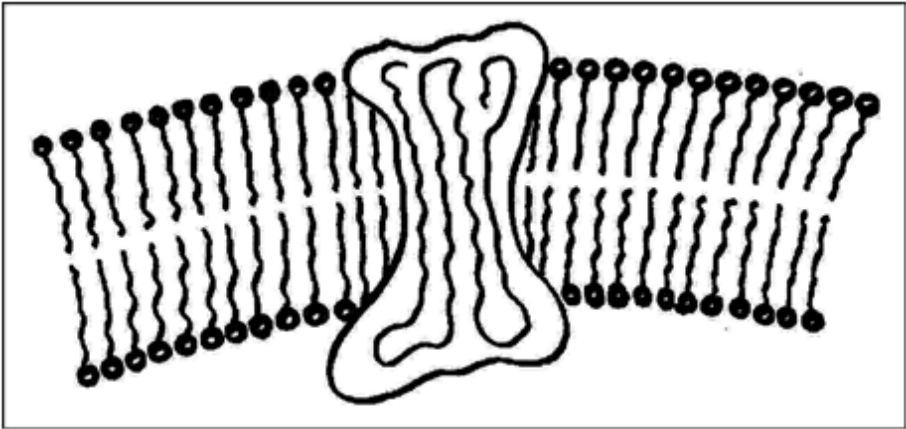


Figure 11. Depiction of an Integral Membrane Protein in the human cell wall.

What is most fascinating about the IMP's is that protein molecules such as these can change their shape and also recognise the shapes of other proteins. They are long chains of small amino acid molecules linked together so the protein can wiggle like a string bead. Their ends carry small electrical charges that affect the shape by attracting or repelling one another. Vibrational energy fields can also alter the protein's electrical charge and therefore its shape. This shape-shifting behaviour is three dimensional; and some protein backbones are so long they require helper proteins to assist in the folding. The important point is: what a protein does depends on how it is folded. The operation of the network depends very much on the physico-chemical properties of these integral membrane proteins.

Bruce Lipton drew other analogies from modern technology, comparing the cell membrane to a liquid crystal screen that allows a certain pattern to show through or to silicon chips which are semiconductors with programmable gates and channels that change their connectedness. Our metaphorical mind likes to see itself in the technology we produce, but this doesn't do justice to the kind of knowing that a human cell must have. It has to be affected both by the hormones connecting to the outside of the cell wall and also by what is going on within. It has its own individual knowing, but in a multicellular organism, it must be able to subjugate this to the knowing of the person as a whole.

### *Cells working together*

The social aspect of mind was the key to our evolutionary progress right from the beginning. The long history of multicellular beings (about 750 million years) is a fascinating story of cooperation and communication in which the ability of cells to couple effectively while still retaining individual autonomy – in other words, the operation of the mind – continued to be the guiding principle. At critical times cells had to amalgamate to survive. There are separate structures inside our human cells that once were single-celled organisms in their own right.

An example of cells working together is the slime mould. When a number of these single-celled animals find they are running out of food, they release into their environment a chemical that causes them all to clump together in a large multicellular ‘slug.’ Then they hibernate as an inactive, but still living organism, only reproducing again when there is another chemical trigger to indicate that food is now available. This is often referred to as the working of an elementary mind. The chemical messaging is the same basic process that coordinates the activity of all multicellular animals.

As cells learned to work together in more complicated ways they began to specialise into distinct organs so that similar functions could be concentrated in one place. The best example of this is the brain which in a primitive form was just a cluster of several nerve cells but is now the most complex structure known. Increasing complexity also led to the great diversification of cell types. The essential requirement for connectivity and communication between cells remained the central theme so, eventually, an autonomous unity that began as a cell could successfully incorporate itself as just one part of the larger autonomous unity that is a human being.

Probably the best name for this principle is Arthur Koestler’s term ‘holon’ – something which has autonomy, but is also dependent on a larger whole for its existence. It accounts for both the self-assertive and the integrative tendencies at the same time. Ken Wilber used this concept in his work.

Mind, by definition, is the phenomenon that makes possible such holonomic relationships in the world of living things. David Bohm’s term ‘holomovement’ invokes an image of its dynamic process.

### *Biological fields*

Very little is known about the physiological effects of vibrational energy fields. They can influence the shape, position and activity of

proteins in the cell wall, but the implications of this are not clear. Authors such as Candace Pert and Bruce Lipton like to describe the proteins on cell surfaces as the dancers in a grand choreography of intercellular connection, swaying to and fro to form the shapes and patterns that help to orchestrate our mind. This is an imaginative metaphor which also has some scientific basis and it could point toward our future knowing about the mind in the body.

The predominant world view of biologists is that molecules could not connect or influence anything except through direct contact with one another. Applying the principles of quantum physics to biology has raised other possibilities, but these do not have an immediate practical application. The controversial research of Jacques Benveniste suggested that energy fields associated with certain molecules could be the principal cause of the biochemical effects of that molecule.

He diluted some proteins of the immune system so much that only water molecules remained in the solution yet it still had a biological effect. This was called the 'memory' of the water and was used as evidence for the therapeutic effects of highly dilute solutions used in homeopathic medicine. He also 'recorded' the vibrations from the neurotransmitter, acetylcholine, and delivered them to another solution which then had the specific effects of this hormone. Later, these experiments could not be replicated by his critics and he died without having received much support from the scientific community.

Recent research on the electromagnetic field around our heart also raises fascinating possibilities. These fields have been shown by magnetic imagery to extend well outside the body. They are related to the swirling vortex of blood flow within the heart and there are new techniques, described under the name of HeartMath, for 'head-heart entrainment' by which brain waves and heart beats can be more or less aligned with supposed benefits for coping with stress.

A relationship has been inferred between the heart's electromagnetic field and similar fields across the brain produced by the still-mysterious glial cells. A supposed interaction between these fields and vibrational fields in our environment could be a crucial element in the connecting process of our mind if it does exist.

No doubt there is much more to learn about biological fields, as there is about neural nets and hormone interactions. The broad overview I have given of networks within the body provides the background for us now to consider how emotional patterns frame the everyday experience of our mind.

# CHAPTER 10

## Emotioning

*the source of meaning and what is special about human beings*

If the engagement of minds is what makes life interesting, it is the emotional connection that makes life meaningful. It's true we bring forth individual worlds and cannot transfer meaning to one another, but life is not nearly as lonely as that makes it sound. How is it we can feel we know the meaning that another person makes and seem to share that meaning with them in an empathic and understanding way?

The answer lies in the emotional component of our mind's operation. Though often maligned and misunderstood, the experience of emotioning, as Maturana called it, flows through our lives so unmistakably that it could never be entirely ignored by those who studied the human mind. It has been portrayed as both villain and heroine at various times. In the stories of modern cognitive science it has become one of the principal characters.

Plato argued that our emotions arose from a lower part of the brain and perverted reason. Some 18<sup>th</sup> century philosophers, David Hume and Adam Smith, for example, wrote much more kindly about emotions, even as the 'age of reason' gathered strength. Adam Smith wrote *The Theory of Moral Sentiments* before he wrote his *Wealth of Nations* so he could be said to have founded the 'sentimental science' as well as the so-called 'dismal science,' economics. He wrote about an 'invisible hand,' which is still mentioned in economics today, to describe an emotional thread that weaves the fabric of society together.

The beginning of the scientific revolution was accompanied by a much reduced awareness of emotions as elements of the mind. Charles Darwin, however, used emotions to illustrate the evolutionary continuity of humans with other animals and did a wonderful job of recording how

emotions were expressed. His second last book, *The Expression of the Emotions in Man and Animals*, was a best-seller at first, but then largely ignored for a century until its revival in social neuroscience today. Darwin maintained that the strongest emotions were the social, particularly the maternal, instincts and that these were the basis of our human morality and our capacity for good.

Through the information age emotionality has often been regarded disdainfully, but it takes centre stage again now as ‘the root of all intelligent action,’ no less. In this book, we will see the emotional mind as the force that created human societies and the glue that holds them together.

### ***The universal nature of emotions***

In the period when Darwin’s *Expression of Emotions* . . . and such sentiments as Adam Smith expressed had fallen out of favour there was a wave of colonisation by European powers of countries occupied by more primitive, or at least, less industrialised, people. The thinking developed that human emotions were essentially cultural and learned, as is language; therefore the indigenous people would not have the same feelings as the more ‘cultured’ Europeans.

It was the famous work of Paul Ekman, less than half a century ago, which showed how wrong this was. He identified six basic human emotions that were felt and expressed in exactly the same way by New Guinea tribesman who had rarely seen white people before as by the American people he used in his study. The facial expressions associated with these emotions were almost identical in the two different human populations and Ekman described these expressions as a universal and innate human ‘language’ because they had not changed as the society had become more complex.

The six primary emotions, as they came to be called, are fear, anger, surprise, disgust, joy (also called happiness) and distress (also called sadness). In fact, Darwin had identified all these long before in animals and humans and described many variations such as rage, astonishment, disdain, contempt, anxiety, grief, *etc.*, as evidence of evolutionary continuity.

It can be confusing that so many different words are used to describe emotions, but it illustrates the diversity we recognise in ourselves and others so far as our feelings are concerned. Although the basic emotions are now regarded as universal, there is an overlay of cultural variations in the way they are expressed, *e.g.* in some cultures people smile much more; in some there is a distinctive way of expressing anger or disdain.

Nowadays it's common to speak of 'higher cognitive emotions' such as pride, shame, envy or jealousy and love is usually included here, although there has been debate about whether romantic love is innate or highly acculturated; an 'invention of medieval poets,' perhaps. Like Maturana, I have come to regard the state of mind called love as a very basic thread running through our evolutionary development.

### *Emotions as aspects of knowing*

That the expression of emotion is an important aspect of our mind is obvious. It enables us to know quite clearly what another person is feeling which is the closest we can get to a mechanism for knowing the meaning that someone else has in mind. Wittgenstein wrote: 'we understand other's minds through perceiving and responding to expressions of feeling.'

This is not a transfer of meaning from one to another; it is a special form of connecting by which we can interpret the emotions we detect in others. Our brain has specialised neurons for this purpose, including the spindle cells described earlier. It also has mirror neurons that enable us to copy others' expressions, gestures and movements.

As Darwin had recorded, the expression of emotions may involve sounds, body movements and postural changes, hairs standing up, ears drawing back and many muscle changes particularly around the mouth and eyes. The human face has a very complex musculature enabling a great variety of facial expressions. The importance our brain attaches to reading faces was mentioned earlier. Clearly emotions play a large part in the business of knowing and being known.

What we are observing, however, is not the emotion itself; it is the physical action that accompanies the emotion. There may be a whole series of other behaviours that follow the initial expression, particularly with strong emotions such as rage or despair. Maturana gave us a way of thinking about the emotions themselves that helps to explain their role in the operation of our mind. He defined emotions as 'bodily predispositions to action' and went on to say they determine our 'relational space' (see Chapter 12). In the presence of a particular emotion certain actions are far more likely to occur and some other actions would be very unlikely.

It is interesting that Darwin had a similar idea. His first principle regarding the expression of emotions was that particular actions were consistently associated with each emotion or 'state of mind.' A simple analogy is that a car in reverse gear is not predisposed to move forwards at that time. A person in a state of abject fear is more likely to freeze or

run away than be whispering sweet nothings in your ear. Unlike the car analogy, however, the behaviour that flows from the emotion then feeds back to alter the emotional state in that endless loop of knowing-doing-knowing described earlier.

Our awareness of just how important this is owes a lot to the work of Antonio Damasio. He showed it is not just strong recognisable emotions that predispose to what we do; it is the largely unrecognised undercurrent of constantly shifting emotions that constitutes our knowing at all times and this is always influencing the way we will behave. He called these physiological changes, which are only detected by sensitive recording instruments, 'somatic markers.'

We simply do not realise that even the most subtle emotional changes within us are influencing our knowing and therefore our mental judgments, thoughts and actions. Damasio devised a card game (known as the Iowa Gambling Task) in which the player chooses between different packs to either win or lose 'money.' There was no logic to winning except that certain packs gave more consistent and moderate results than others. After a time most players stick to these packs without realising why they are doing that. In real life, logic is often insufficient to make decisions, so we are guided by the knowing that is our emotional state.

Mary Clark wrote:

'It is perhaps the quintessential error of the modern Western world view to suppose that thought can occur without feeling.'

Assuming that thought and feeling are separate in any way or that thoughts are superior because they come from a higher part of the brain, whereas feelings come from the parts that are older in evolutionary terms, is completely wrong. Brain surgeons point out that consciousness is not destroyed by removing the higher parts of the brain, but it is if you interfere with the older parts such as the top of the brain stem. The essential basis of thought lies in the brain's inner realm of basic emotions.

Feelings are a crucial part of our experience, but it's useful to make a distinction between feelings and emotions. Maturana pointed out that the feelings we describe are a commentary made about the emotioning, not the emotioning itself. In other words, we put into language our impression of our emotional experience when we describe how we feel. The problem is we are often inaccurate in doing this, for various reasons, such as the need to impress someone with the severity of our woes or the need to deny we have been hurt. Our emotioning is a largely subconscious form of knowing that cannot be represented precisely in terms of the feelings we express.



### *The braiding of languaging and emotioning*

The brain creates stories so we need to look at how the language in which the story comes to be realised is related to the emotional state within which the story is framed. The metaphorical shapes of our unconscious, emotional meaning continually interact with the mental processes used in our language to generate what we come to understand to be the meaning of each moment of our lives.

It is the hallmark of the human mind that languaging and emotioning are intertwined in their flow rather like the strands of a girl's hair are interwoven into a braid. As Maturana put it: we actually live in a conversation in which language and emotion are entwined; as one changes, so does the other. They lead each other in a recursive, interacting flow.

Languaging is the outward manifestation of the operation of our mind, *i.e.* all our body language and tonality as well as the words we use. It is our mind in overt action. Emotioning is the vast realm of internal processes that predisposes to our actions and is in turn affected by them. The flowing nature of our mind is an endless intertwining of these two streams.

This is happening right now. These words I write trigger non-specific physiological changes in you. When you respond to my words with a thought or statement of your own, or even a look of dismay or joyful insight, you are languaging according to the shape your emotional state is in at this point in time.

If I should hear your response it will register in me by changing my internal state, but not necessarily in the way you intended, because I am autopoietic just as you are. I may then react from my altered emotional state in a way that triggers a strong feeling in you that I did not intend. How easily we could get into a fight if we were not such nice people! On the other hand, how enjoyable it is to flow together in a mutually agreeable way in the course of our conversation.

This is not an exact mechanical correspondence between us, of course, where we could predict the reaction precisely. In fact, there are very few simple causal relationships in the world of our experience. Causation is multifactorial, better explained by the distinction between constraint and possibility than by the classic distinction between chance and necessity. It is more like an 'invisible hand' that guides our mind in its journey because we are living systems, not bits of machinery. It was Bateson who compared kicking a stone to kicking a dog. You could expect to know roughly what the

stone would do, but not so for the dog! The croquet game that Alice played in Wonderland was exceedingly difficult because the croquet balls were live hedgehogs, the mallets were flamingos and the hoops were made by soldiers bending over.

Dealing with uncertainty is the growing point of the human mind. Meeting this challenge has developed it into the wondrous process we experience today. We know that logic and rationality alone are not sufficient to deal with situations as uncertain as we face all the time so we need a mind that combines languaging with emotioning.

Languaging structures our perception, as described earlier, and we humans have evolved into a state of ‘living in language,’ but that’s only half the process that connects us to one another and to our world. That is why our conversation is not primarily for the purpose of transferring information or meaning. It is more like a dance we do together that enables us to live our lives in the best possible way. At its best it’s a highly satisfying dance of mutual understanding and shared meaning.

This biogenic explanation gives us a slightly different world view – a different window onto the mind. Through this window we can see aspects of the mind that were previously hidden. The idea is to use this awareness in a practical way in our lives and appreciate its value for attaining the best quality of life.

There are many dramatic examples from research and case studies of the emotional framing of meaning. Paul Rozen studied the relationship between thoughts and feelings of disgust at different stages of a child’s development. This is a particularly strong emotion for influencing our behaviour and also one of the clearest examples of the connection between brains made by the mirror neurons. Brain scans show that our mind identifies strongly with the disgust shown by another person; the same parts of our brain are activated as if we were experiencing disgust ourselves.

Paul Bremner treated Vietnam War veterans suffering from post-traumatic stress disorders in which the patients’ ability to connect with the world had been severely impaired. The emotional networks and centres in their brains had shrunk. Their relational space was profoundly altered and also their ability to live in the present reality rather than in past fantasies. These are extreme cases, but the way in which emotional experience altered their perception, *i.e.* their conscious awareness of the time and space in which they live, serves as a good illustration of the workings of the emotional mind in all of us.

### *The heart chakra*

The heart chakra lies midway between the base and the crown. Below it are the first three chakras which have a strong physical and external element to them while above it are the three chakras that draw on the spiritual realm and concern our internal experience more than the external. Anodea Judith described the understanding from yoga that the heart chakra is the balance point between these two extremes, 'the integrator of mind and body, the central home of the spirit.' The heart chakra introduces emotional power and the power of love. The corresponding Christian sacrament is marriage and in yoga this chakra represents the marriage of body and soul.

This meeting point between the physical and the spiritual is the interface between the known and the unknown. We are now dealing in our knowing with the influence of the unknown. You might compare this to the influence on our conscious actions of subconscious imagery such as the archetypes described by Jung. These psychic images are said to point to the unknown; they are a 'bridge to the sublime.'

The corresponding element, air, brings a more ethereal quality to our knowing. The association with the breath in yoga shows the prime importance of this chakra as a life force. In the way that air is formless and expansive, yet soft and gentle, the quality of love associated with this chakra begins to assume its subtle power and primary place in our knowing. The Sanskrit name for this chakra means 'sound that is made without any two things striking' and it's said to represent a state without conflict where the movement, the desire and the will (from the first three chakras) can be brought together in graceful harmony.

In Goethe's explanation of colour perception, the colour of this chakra, green, has a special central place. Whereas red, orange and yellow arise from the progressive lightening of dark and violet, indigo and blue arise from the progressive darkening of light (see Chapter 4), green only comes into view when these two ends of the perceived spectrum are joined; at the point where the blue meets the yellow.

Knowing from the heart is a familiar idea to most of us even if it isn't 'scientific.' We are innately aware that emotioning is indispensable to our human intelligence. Dylan Evans explained that Spock, the pointy-eared, super-rational, half-alien character in *Star Trek*, could probably never have evolved. The idea of Spock fascinates us because we know, intuitively, that his pronounced rationality and lack of emotion would have rendered him so unintelligent in a practical sense that he could not have survived the rigours of our evolution into human beings. In our

recent evolution many things happened that rendered us more vulnerable, more dependent on one another, and more sophisticated in the use of our mind. This increasing complexity of our mind, brain and behaviour produced the braiding of languaging and emotioning that is the most distinguishable trademark to the human species.

### *The social imperative*

The extraordinary increase in brain size that accompanied our recent evolution was closely associated with the formation of larger social groups and more complex societies. We seemed to need one another more as we became more human. In Maturana's phrase, the dance of conversation became more complex as we generated more and more subtle nuances of meaning and then used these to engage with one another in more sophisticated ways.

Emotioning became a critical component of rational thought as the environment with which we had to connect consisted more and more of other people. The social world became the cognitive challenge that demanded more complex emotions. Leading anthropologists have said it was coping with the demands of living in larger groups that contributed most to the origin of human intelligence.

Louis Cozolino described the brain as a 'social organ built through experience' and to emphasise this he said 'there are no single brains.' There are separate brains, of course, and separate minds, but each is influenced by the connection with the others. We will see later that the evolution of our mind and the development of a baby's mind were both dependent on this social activity.

Our peculiar languaging-emotioning braid developed to enhance the quality of our interpersonal connections in line with the requirements of our increasingly social existence. It was the quality of our connecting that led in turn to the generation of more subtle meanings. We developed an aesthetic sense with a love of beauty through our pursuit of music and art. We became the species that can speak of a sense of wonder and awe. Eugene Stockton said it poignantly when he wrote: 'Of all the things in nature which amaze me, the most amazing thing is that they amaze me.'

This is where the emotional predisposition we call love has been crucial. Maturana defined love as the kind of interaction between us which allows the other to be the legitimate other. It is a way of seeing other people – and everything else, for that matter – with a regard and an appreciation, but not a selfish expectation. It does not mean fulfilling one

another's emotional needs. It means being aware of and respecting the authenticity of the other person.

It is the most unconditional attitude, the least manipulative kind of interaction, and the most inclusive connection we can make. I'm not talking about love as a feeling, which would be merely a commentary on the emotion. Love is the most expansive emotional state enabling the utmost openness to the possibilities of the world, in sharp contrast to fear, for example, which is much less open or inclusive.

It is perhaps Maturana's most significant contribution of all to show that, without love, we humans would not have survived to this point in our evolution. Love made possible the social evolution on which our particular species relied for the development of the human mind.

We have said that all other living things have a mind and are knowing entities. Many other animals have thinking minds that can solve elaborate problems using logic and memory. Other animals also use a form of language, from grunts or whistles to the symbolic representations that chimps can learn from humans. Even though the development of our language is closely tied to the expansion of our brain, it is not what distinguishes us from other animals.

Other animals also certainly have emotions. These are most obvious in the mammals that are closest to us in evolutionary terms, but the biochemistry required for emotion also exists in much more primitive species. So it is neither emotioning nor languaging *per se* that distinguishes us from other species. All other living things, in principle at least, have both feelings and thoughts.

What is special about the human mind is the way in which languaging and emotioning are braided together. Although we didn't notice it happening, this biologically unique thinking/feeling flow that we developed has given rise to an unprecedented quality of interpersonal relationships, the unmatched creativity of our human imagination and an awesome and humbling capacity to know ourselves.

Recognising the importance of love as a social necessity for human beings, neuroscientist, Gerald Hüther, entitled a recent book *The Compassionate Brain (how empathy creates intelligence)*. He said that humans have developed this special capability of our brain through long practice and our survival will depend on continuing to do that.

Loving one another implies each of the previous aspects of knowing – recognising our autonomous unity, honouring one another and honouring ourselves. And it adds to them another kind of knowing that is more mysterious, but which we know empowers us and through which we can empower one another. Thus we find ourselves able to

demonstrate compassion and acts of forgiveness that have great social benefit. Extraordinary examples of healing become possible due to such powerful emotional connections.

Even though our basic biology of love has brought us to this time and place together, we must also acknowledge the pain and suffering and constant struggle that confronts so many of our species every day. The reality of our social imperative is that we do not all live together in harmony, we do not express love and tolerance in a large part of our doing, and we do not feel as joyous and free as we would like to be. There is war and poverty and mistreatment of one human being by another before our eyes almost all of the time. Our quality of life as a species seems to be far less than it could be. This must also be explained within our story of the mind and there is much practical value in understanding it.

### ***The everyday emotional mind***

Although this fourth aspect of knowing signifies the love that is our birthright, it also stands for all the other emotions that constitute our everyday knowing. In particular, the emotional state of fear has a strong predisposing influence on the way we behave. There are many other more subtle emotions affecting our doing all the time. We often speak of our moods, which we distinguish from our emotions because they are more generalised and longer-lasting states of mind that may persist for hours or even days. It's well known that the mood we are in will affect our behaviour.

A common manifestation of this is the way emotions and moods affect our attention. Strong emotions tend to focus our attention more sharply, particularly fear which make it difficult to think of anything other than the perceived threat. Love in the romantic sense, or anger or surprise, also distract our attention. The more subtle effects of this are revealed in psychological tests such as the Stroop test in which the time it takes people to name the colour in which a particular word was written depends on whether the word is a strong emotional trigger or not. If the word is 'rape,' for example, a rape victim probably can't attend to the colour of the ink without much difficulty.

Emotion also affects memory in that different people recall past events very differently, according to their emotional involvement in the event. When you evaluate a proposal or an argument put to you or assess the suitability of a candidate for employment, whether you are in a good mood or a bad mood will have an effect. Recall the quote from Aristotle: 'feelings are conditions that cause us to change and alter our judgments.'

And also the fact that individual preferences are often based on familiarity, which caused David Hume to write: 'it is not reason which is the guide of life, but custom.'

Although two heads may be better than one in some situations, the combination of individual minds is not always beneficial. Collective emotion in the form of a 'group mind' may lead to antisocial or violent behaviour that the individuals involved would not engage in if they were alone. The idea of a 'herd mentality' is also implicated in unquestioning allegiance to a 'Hitler' or a self-appointed 'saviour' of some kind.

The perceived need for objectivity arises from our desire to conduct what we call business and this has its basis in ownership or appropriation of objects such as land, buildings, food, weapons, even people and, nowadays, information. In our culture, we perceive the object as something separate from us whereas, in Australian Aboriginal culture, for example, the focus of perception is the relationship with that particular thing.

Therefore our system of trading is not simply for the purpose of living together; it creates the possibility of acquiring 'wealth' by appropriating more things. So it is we find the attitude of human beings toward one another to be often motivated by greed. For this to work so pervasively in our society we need to deny, to some extent, the emotional basis of our behaviour and conduct our business in a purely rational way, which is not quite according to our fundamental human nature.

Ironically, the best salesman will be the person who has the best feel for the emotioning involved in the transaction. A good Real Estate agent will not concern herself with the objective details of the house or the prospective buyer as much as with the feelings she detects as she helps you search for your dream home. What she seeks is an emotional match between a house and a human being, even though the languaging about the deal will mostly be about the objective details such as the size, location and the price.

It is essentially the same with any business. The rise and fall of the stock market is a good example of the unacknowledged influence of emotion on business decisions. People take pride in their clever thinking when buying and selling shares, but the slightest suggestion of panic by anyone spreads like wildfire.

The price we pay for this partial denial of the true nature of our mind is a degree of strain on our living system. Whatever separates us from our true selves or from one another and the world acts as a stressor. It interferes with our consciousness of time and space and can even cripple our ability to be in the present moment as seen in the previously-mentioned Vietnam veterans with post-traumatic stress disorder.

The complexity of our business world requires us to exercise our mind in planning and evaluating past experiences and future possibilities all the time, which we can certainly do, but not without some cost. This challenge has some benefits as well in that it equips us to meet similar demands in the future. Ways of dealing with stress are discussed in Chapter 16.

On the positive side, much of our human interaction does match the biology of our marvelous mind. To connect really well with someone, try laughing with them, or crying. When we laugh or sing or say wheel, because it is spontaneous and happening in the present moment, we get a brief respite from the straining of our mind in the business negotiations of life. Love and laughter and tears are happening now and have nothing to do with who owns what. Maturana once described laughter as a momentary respite from the burden of appropriation.

Laughter is a uniquely human symbol of cooperative play, signifying the social development that characterises our evolution and it is extraordinary in its diversity and character. It is highly contagious – activating mirror neurons – and also pleasurable, of course, rewarding any social activity that is mutually beneficial.

Humour can be understood as a trick that is played with your organising idea. A well-told joke leads it one way and then gives it an unexpected twist. For adults, this twist needs to make a coherent story, but for young children, the surprise alone will make them laugh, as in playing peek-a-boo. Animals, too, play by tricking one another in a thoroughly benign way.

The smile is perhaps the most distinctive symbol of human social life because it is the clearest signal of equality and trust rather than hostility. With our focus on facial expression, we can recognise a smile at a distance of 50 metres or more, which is about the distance you can throw a spear. Smiles involving the tiny muscles around the eye are called D-smiles (after Duchenne) to distinguish them from the more artificial kind of smile that shopkeepers sometimes give you as you enter their shop. All emotional expressions are signs of our degree of commitment; none more so than the authentic, natural smile.

These kinds of behaviour puts us in the present moment, here and now, where the connections due to our emotional mind flourish, not in the past or future – the places and times outside biological reality where business is mostly conducted. The best way to travel together with others is to be living freely in the present, but our appropriations often hinder us in this respect because the business they entail compromises the emotional aspect of our mind.



The success of a conversation or a lecture depends mostly on the emotional authenticity of the participants. If you compare a conversation that is open, honest, loving and respectful with a controlling, fearful one, you will have no doubt which is the more creative and life-affirming. When I regurgitate appropriated knowledge that belongs in a book, but not to me personally, I am bound to be less interesting, less passionate and less convincing. When we feel good about what we're saying and speak from our heart we are more warmly disposed towards ourselves and others. If we like one another we will connect better and understand one another better because understanding depends to a large extent on the emotional mind.

The principal blind spot associated with this aspect of knowing is that men, far more than women, have come to value the rational above the emotional, to worship reason and put down feelings, thus disconnecting ourselves from one another and their environment. Our society tends to put more resources into science and technology than into the arts or the natural environment. As teachers, parents, bosses and mentors, we forget it is not the 'facts' we espouse or the clever nature of our advice that enriches our social world; it is the quality of the connection itself that promotes learning or helpful change. Friendship and caring are the most powerful healing forces and the most influential agents of change. The greatest virtue is love because it makes the best connection.

### *The myth of irrationality*

Because we worship rationality we also promote the idea of irrationality. In a book whose title I borrowed for the heading above, John McCrone claimed that this distinction between rational and irrational has impeded progress in psychology for a long time. He believed a more useful distinction would be between the part that is animal – which I would call the basic biological mind – and the part that is a product of human culture. He deplored the fact that psychology has largely ignored the social and historical nature of mind development, two aspects I am emphasising here.

That the mind develops its particular characteristics through conversation over a period of time is one of Maturana's themes. It takes the spotlight off reasoning power alone as the defining feature of the human mind and provides space for the emotions to be included. This emotional mind, however, is not to be confused with the irrational mind.

The idea of irrationality can be traced back to Plato, but the main force of its popular meaning today stems from the Romantic period when the idea of human nature as the ‘noble savage’ was developed by Rousseau and others. Romanticism spawned great poetry about special human qualities, but it also entrenched a belief in the power of irrationality in its new guise of unbridled self-will through philosophers such as Schopenhauer and Nietzsche.

Then Freud’s great influence on psychology gave more credence to subconscious drives. Whatever is not rational has come to be regarded as either an especially noble feeling or a terribly base desire. The simplistic imagery of the human mind as half God and half beast does not do justice to the biology.

Mr Spock in *Star Trek* exhorted the humans to govern their passions and rely on logic, but being half human himself, he also displayed a grudging admiration for human irrationality and creativity, especially that of his impulsive commander, Captain Kirk. This is the allure of the idea of irrationality. The so-called logical impenetrability of the mind fascinates us. I also advocate respect the unknown, but not because it’s irrational.

McCrone’s point is we know that the higher mental abilities of humans have their basis in our use of language and that our human mental ability is socially derived. He said: ‘the human mind is a social creation based on the organising power of language.’ His thinking extended the ideas of two Russian pioneers, Vygotsky and Luria, who showed that the guiding hand of culture could be seen behind the full range of human mental abilities from self-awareness through to various forms of madness. What was often labeled as irrational was simply a different way of constructing one’s world through language.

When I acknowledge the importance of not knowing in this book, I’m not thinking of the opposite of rationality; nor do I wish to provide a rational explanation of everything about the mind. McCrone was concerned that the explanation of mind was unnecessarily shrouded in mystery, whereas I want to embrace the mystery and respect not knowing in its own right. The business of knowing is not confined to rationality. I don’t say, as Hume did, that ‘reason is, and ought only to be, the slave of the passions.’ But I do find satisfying meaning in the famous words of Blaise Pascal: ‘the heart has its reasons of which reason knows nothing.’

The third essential propensity of life – the ability to make meaning – depends on the emotional component of our mind. We make meaning emotionally and then express ourselves accordingly in language. The

rational component of our mind is an overlay of the biological connecting process even though it often seems to us to be the part that creates the meaning because we can only explain the meaning in that way.

In the next Chapter we will trace the evolutionary development of mind in more detail and see how this is related to the way a human infant's mind forms and develops.



# CHAPTER 11

## Evolution of Mind

### *Musical language, intimacy and how a baby's mind develops human thought*

If mind began with the first living cells it has been around a long time. It took several billion years for multicellular beings to evolve and another 500 million years before such complex autonomous unities as chimpanzees and other primates appeared on earth. Just a few million years later we find ourselves experiencing the wondrous human mind that seems to us so special.

To know something about the way mind has changed, just in this most recent, tiny fragment of our evolution, helps us to appreciate the exquisite braid of language and emotion that is the hallmark of our humanness. This evolutionary story helps us to appreciate, also, the similar pattern of change occurring in an individual's mind as he or she develops from babyhood to adulthood.

This knowing is laced with uncertainty because the evidence from archaeology and anthropology is fragmentary and subject to different interpretations. In the context of today's social neurobiology the key element is the way in which thinking and feeling have become interwoven. It has been more common to focus on tool use and increasing technological cleverness as the driving force in our evolution. The biology described here suggests that those forces were just as likely to contribute to our extinction as to our survival.

### *The human manner of thinking*

Even though other animals can perform quite complex thinking tasks there is no doubt our kind of thinking is special. A human infant at only two years of age has already entered that mysterious realm we call

our imagination and established subtle social relations utilising language and self-awareness.

We usually refer to thinking as something we do on our own, though we recognise that our thoughts are affected by other people. In fact, it goes much further than that. The human manner of thinking can only arise in the first place from social engagement and it operates almost entirely within a social environment.

Just as the brain was said to be a social organ built through experience, the human mind is created and maintained by our process of connecting. Dan Siegel's book, *The Developing Mind*, begins with the premise that 'human relationships shape the development of the brain and thus the mind.'

How do we know we cannot acquire the ability to think all by ourselves? The answer comes firstly from detailed studies of feral children who had been raised by animals or with almost no human care. They did not develop a recognisable human way of thinking. There have even been some cruel experiments in centuries past where infants and children were kept alive, but deliberately deprived of proper human contact, to see what would happen to them.

Sadly, there is also evidence from contemporary society which shows that children who have only limited interaction with adults and other children will not develop the normal human ability to think. Rousseau had speculated that we are born with all wisdom and virtue and in a spiritual sense this may be true, but in a physiological sense it is not.

Just a few years ago, Stanley Greenspan and Stuart Shanker wrote:

'We have found that the capacity to create symbols and to think stems from what was often thought of by philosophers as the 'enemy' of reason and logic: our passions or emotions.'

Their book, *The First Idea (How Symbols, Language and Intelligence Evolved from our Primate Ancestors to Modern Humans)*, explains how the emotional connections between us, not only influence our thoughts, but actually gave birth to our ability to think. This happened in our recent evolution and is repeated in the early development of a human infant's mind.

Peter Hobson wrote: 'the tools of thought are constructed on the basis of the infant's emotional engagement with other people.' I mentioned earlier that the emotion of love has been crucial for our survival as a species. We will now look at the quintessential example of the expression of love – the relationship between a mother and her baby – and the role it plays in forming human minds.

### *The cradle of thought*

Our mind starts to form long before we are born, particularly with regard to its auditory connection with the world. The sense of hearing is fully developed, anatomically and physiologically, by four and a half months of pregnancy and there is plenty of evidence that certain sounds are already familiar to the baby when it arrives in the outside world. We can't say much else about the embryonic mind. But we do know that a baby is not born with a thinking human mind; only with the potential for that to develop.

This begins immediately the baby's eyes connect with the world around it. Careful research has shown that babies start social interaction very soon after they are born. In one study, the caregiver's overt facial expressions such as a mouth wide open or tongue sticking out were observed along with the baby's response, if any. At one hour old, while many babies did not connect with the facial expression at that stage, there were 170 out of 412 babies observed that appeared to imitate the movement made by the caregiver. The engagement with people that grows the human mind is already under way on the very first day of our being in this world.

In the first few weeks and months of life it becomes obvious that the baby relates quite differently to people than to objects; and the connection with people's faces has the highest priority. The interaction with facial expressions is not fixed like early attention to objects; it flows and cycles through all sorts of fleeting exchanges. The mother's way of speaking is an important influence. She speaks quite differently to her baby, with more rhythm and prosody, in a sing-song style known as infant-directed speech or 'mothertalk.'

Just as a two-month old baby is obviously striving hard to communicate, so the mother's special brand of attentiveness and gentle repetition is establishing a framework for the baby's mind. Colwyn Trevarthen referred to 'the two in complete concert as if dancing together.' He emphasised the importance of this intersubjectivity between infant and mother in which the experiences of one are linked to the experiences of the other.

This is an intense and highly emotional bond. Babies are born with the ability to perceive and react to what they see, hear and feel in the behaviour and expressions of other people. But they do more than just show coordinated patterns of behaviour with other people; they are emotionally connected with them. To be emotionally connected is to experience the other as a person. It is through emotional connectedness

that a baby discovers the kind of thing a person is – that with which feelings are shared; with which one can communicate.

The active involvement of the infant in this process is shown clearly in experiments with the ‘still face procedure.’ When the mother’s face is unresponsive the baby will try all sorts of ways to reestablish the connection. The importance of reciprocity between mother and baby is obvious when you watch the effects of mistiming. It’s like musicians missing the beat or dancers treading on one another’s toes or the joke that begins: ‘what is the essence of comedy?’ Just as someone is about to reply you say: ‘it’s timing!’

By about six to eight months of age this kind of interaction has become attuned to the regularities of simple games such as peek-a-boo or playful feeding routines which embody more advanced features of human communication. The baby’s smile or laughter has become a sort of comment on what has happened even though this is not yet in the form of language. It is a natural continuation of the emotional coordination that links our subjective experience.

The baby has developed a perception of feelings in others that produce feelings in oneself, which is the nature of the mind bridge between one human being and another. Recall the quote from Wittgenstein: ‘We understand other’s minds through perceiving and responding to expressions of feeling.’ The interpersonal engagement of emotion involves not only voice and facial expression, but all the subtleties of body movement and posture as well.

Studies of early childhood autism have shown that, whether the disease is genetic in origin or has environmental contributing factors, it manifests as an inability to establish the normal emotional connection between the infant and caregiver. These studies have helped to explain how thought develops from the early emotional experience of the baby and why successful interpersonal engagement throughout life depends on this ability to form an emotional connection.

In the first few months it is with the person or the object that the babies are relating, but by 12 months or so they are beginning to relate to the other person’s relations with something else. The earliest experience of shared meaning is when they can read their mother’s face regarding the appropriate response to an object or a situation. At first a toy might be alluring in its own right; then it becomes more or less alluring, or frightening, if the mother finds it so. The meaning has changed because of what it means to someone else. Trevarthen’s term for this is ‘secondary intersubjectivity.’ An object or an event has become a focus



between people and can be communicated about. The human process of thinking is getting under way.

Following the first step, where the infant is engaging with another person, and the second step, in which he or she begins to relate to another person's relationship with things and events, there is a third major step, which becomes obvious during the second year of life. It has three elements to it: (1) the appearance of symbolic play, (2) the growth of a new awareness of self and others and (3) the emergence of language. An example of symbolic play is to pretend the spoon is a motor car or to play with a doll in an imagined world. Children with autism do much less imaginative play, probably because they lack the subtleties of emotional connectedness.

The second element, self-awareness, is exemplified by looking at yourself in a mirror and touching a red spot on your forehead instead of on the mirror. There is a sense of coyness about this as your feelings about yourself become separate from, but also entwined with, the feelings of others towards you. This harks back to my earlier point (in Chapter 5) about whether you can acknowledge another person's way of looking at something as well as your own. It is our emotional capacity to do this that makes possible the thought processes involved.

Those two elements of play and awareness of others and self introduce the use of symbols and metaphorical language, processes I described earlier (in Chapters 6 and 7). Symbols stand for something else and their use can greatly simplify our communication. Thoughts are about things, but are obviously not the same as the things themselves. By using symbols, first in play and later as words which have a meaning attached to them, we incorporate symbolism as a basic element of thought.

The third advance for the two-year-old – expanding vocabulary and learning grammar, also from the structure of the human interactions – becomes a social necessity of rapidly increasing urgency. The child simply has to develop language to explore and enrich the social interaction – to be able to react to others and to affect the minds and actions of others.

In summary, you get an idea of the progressive development of thinking if you start by imagining blowing bubbles for a six month old baby who will watch them disappear and might give a little sigh. By 12 or 14 months old, she or he will also be pointing things out and drawing your attention to them, actions that are precursors of the languaging that is to come. The making of meaning is not in an intellectual sense at this stage; it is a discovery in action and feeling rather than in thought. Those

actions and feelings are the emotional framework that will soon become the child's thoughts and explanations about what is happening.

The foundations of our languaging-emotioning braid are laid in this way. We have a basic human response to the feelings we perceive in others and out of this response comes our ability to think and to speak. This subtle, but pervasive, rocking to and fro of feeling and action between the baby and parent is what Peter Hobson called the 'cradle of thought.' The cover of his book bearing that title has a painting by William Blake of a mother drawing her child forward in a flowing movement. The caption reads: 'Teach these souls to fly.'

Social engagement is what transports human mentality into the boundless realm of the imagination within which thought will never stop weaving patterns to enrich our lives. The fabric of thinking is a braid of languaging and emotioning – the warp and weft of our interpersonal connections. Its consequence is making meaning; and there are so many meanings to be made.

### *The evolution of intimacy*

The story of our recent evolution is a history of increasing neoteny, vulnerability and intimacy. Neoteny is a biological term that connotes staying young for longer throughout life – the retention of juvenile characteristics into adulthood. Humans are quite different from any other species in that we do not grow a thick hide or a complete hair covering as we develop and we retain the soft skin and many of the facial features of a child, even as a mature adult. Our temperament changes as we grow, but we do not seem to lose completely the ability to feel like a child. For other mammals that play, this is mostly confined to the juveniles, whereas human adults still enjoy play throughout their lives. We like to say we are always children at heart!

Humans at birth are less developed in physiological terms than any other species and, unlike many other species, we could not possibly survive without outside help so we begin our lives from a very vulnerable position. This helplessness at birth and characteristic neoteny have evolved gradually, probably at least since the first Hominids appeared on earth about two million years ago. Their skull shape had a slightly enlarged area where we know today the social bonding components of the brain are to be found.

Prior to that there were three species of African apes – gorilla, bonobo and chimpanzee – with whom we shared a common ancestor seven or eight million years ago. At that point the gorillas diverged and then, five or six million years ago, the *Homo* group diverged from chimps

and bonobos. The more intense socialisation that grew our brain may have started about that time. There is little doubt that other changes leading towards greater vulnerability followed soon after.

The Hominids known as *Homo ergaster* (beginning 1.8 million years ago) were completely bipedal, *i.e.* they walked upright on two legs. This would have had many consequences, particularly greater flexibility in foraging, eating and moving together, but one that is remarkable is that it exposed their sensitive underbelly and even to some extent their genitals to frontal observation or attack. This introduced a new dimension in vulnerability and new requirements for social relations that almost certainly included an increasing need for mutual respect, trust and intimacy.

*Homo ergaster* was around for a long time, but it was not until about 600,000 years ago that the increase in brain size really accelerated through *Homo erectus* and *Homo heidelbergensis* to what is known as modern man in the form of *Homo sapiens* (which is us) and *Homo neanderthalensis*. Neanderthal man developed in parallel to us and had the same sized brain, but became extinct about 30,000 years ago.

Although we don't know precisely when they occurred, we can recognise the most significant developments in this inexorable journey towards closer interpersonal bonds and greater intimacy. Expansion of the cortex in the brain of primates was associated with the increasing size of social groups; the fact that other primates became a larger and larger component of the world in which each one had to live. Anthropologists say that human intelligence developed to cope with the demands of living in larger groups.

It was a new kind of uncertainty that was challenging these ancestors of ours. The increasing social uncertainty meant they had to learn to trust one another more and act towards one another with some kind of unconditional love.

This new intelligence involved other remarkable developments, firstly in the shape of our hands. At the same time as our opposable thumbs and more delicate fingers were enhancing our ability to manipulate objects and use tools and weapons, we were developing the ultimate organ of caress, which is the human hand. No other organ can shape itself to every part of the body with such subtle or powerful effects as our hand. The need to do more than simply groom one another, which many mammals do, led to the caress as an intimate expression of a loving and caring attitude towards one another.

Having grown so vulnerable we could only survive by helping and supporting one another in more sophisticated social ways. During this

time we refined sexual intercourse for pleasure as well as procreation so its primary biological purpose of producing offspring became secondary to its importance as a way of expressing our deepest love for another human being.

Mary Clark described this as a neotenous extension of the mother-infant kind of physical affection into adult interpersonal behaviours including sexual intercourse. As the period of sexual receptivity of females became extended, males kept company with females for more of the time and simple acts of affection and feelings of being wanted for the sake of one's physical presence gradually developed.

As babies were becoming more and more vulnerable at birth, the demands of parenthood were increasing and a larger family support system became necessary. Female breasts became larger, which provided more direct eye contact between the mother and the suckling baby and eventually these breasts became a part of the sexual association between adults too. The need for intimacy and affection became a lifelong need for human beings, extending far beyond the basic mammalian attribute of suckling young that it had been for millions of years.

Of course there were also many technological innovations during this period such as the development of tools and the use of fire to protect humans from predators and cold weather and to refine the business of acquiring food and preparing it for human consumption. This increasing cleverness and ability to manipulate our environment, which contributes greatly to our wellbeing, continues to this day. It is inextricably related to the increase in social complexity and in brain size.

The tools and technology also became weapons for use against other humans. It has been the case for a long time that the human species' greatest enemy – and the greatest threat to its survival – is other humans. The social imperative became our challenge as well as our basic need. This is why my story puts greater emphasis on the refinement of our social skills and the evolution of intimacy and love than it does on cleverness in a technological sense and the use of tools.

The language-emotioning braid was the most crucial attribute of our developing intelligence in that it enabled us to cope with the increasing social demands. As we became more vulnerable in a physical sense, we needed one another's mutual support to grow stronger in a psychological or spiritual sense. Our basic task of making meaning became more sophisticated.

It was the interplay of language and emotioning that produced more subtle and more profound shades of meaning such as our aesthetic

sense and our feelings of awe and wonder. Our respect for the unknown progressed along with the increasing challenge of uncertainty that came with self-consciousness and the ability of our imagination to relive the past and dream of the future.

The richness of our language today reflects this history of increasing intimacy and vulnerability. It was the cultural practices built around our social imperative that made possible the evolution of our characteristically human, symbolic and reflective thinking.

### ***The social brain***

At birth, our brain and that of a chimpanzee has a volume of about 350 cc. In the chimp it will grow to about 450 cc at adulthood whereas the human brain will grow fourfold to about 1400 cc, reaching 90% of its adult size by the age of three. For the chimp, many of the neural connections are already in place at birth such that it can hold its head steady and extend its arms within two weeks whereas, in a human baby, the brain will take 20 weeks or so before it has sufficient connections in place to enable that to happen.

The human brain at birth is the most undifferentiated organ in the body, which means it has the most potential to develop in different ways according to its genetic baseline and the influence of the baby's history of connections with its world. What an awesome responsibility this is, that the human species has inherited!

The brain neurons are more or less all there at birth so the differentiation occurs through the formation of connective circuits, which happens in four different ways. Firstly, the nerve axons lengthen to reach different regions. At the same time a host of new synaptic connections are formed between neurons as required. Also, the myelin sheath grows along some nerves to enhance their function. Fourthly, the receptors increase in density and sensitivity as required. The synaptic connections and the receptor activity are reversible processes, so circuits are being broken as well as being established, to meet the changing requirements of the developing mind.

There is much individual variation in the pattern of development and researchers do not agree about the timing of different events, but the following scenario gives a picture of the major steps along the way.

By the age of three, each neuron could have something like 15000 synapses with other cells, which is six times as many as at birth and many more than we have as adults. This makes the child almost an instant learner with huge scope for new patterns of connection, but

many of these are only short lived. Patterns are made and remade every day. This highly plastic state continues until about age 10 or so when rigorous pruning begins that continues throughout puberty and adolescence.

Like the first three years, this is a critical period because of the rate of change in brain connections, when emotional support and plenty of sleep are essential. This sorting out of brain circuits according to what seems to be most needed has settled down by about the age of 18 with a reduction in connections to about two thirds or one half of the number present in the young child. These connections are more firmly established so the reduced plasticity of the brain serves to stabilise the mind and the person's place in the world, with definite social benefits. The brain is not regarded as 'complete' in its development until a person is well into the 20's, however, and some further change continues throughout our adult life.

The idea of the 'social brain' is based on the fact that the changing patterns of connection within the brain are linked to the changing patterns of connection between one brain and another as we relate to other people. The term 'social synapse' was coined by Cozolino to show the correspondence between the brain connections and the interpersonal ones and he 'zooms from neurons to neighbourhoods' in describing the way our brain is shaped simply by being with other people.

Of particular interest in this regard are the mirror neurons that are situated alongside motor neurons and fire in close correspondence to another person's brain when you are watching that person perform certain actions. It seems we can participate in other people's actions without even trying to imitate them such is the sensitive connectivity of our brain. This system is especially responsive to obvious goal-directed actions where we become aware of the intention associated with those actions. We may still misunderstand their meaning, but it is in our nature to try to read other's intentions by feeling what they feel. As the discoverer of mirror neurons, Giacomo Rizzolatti, put it: 'we grasp the minds of others ... by feeling, not by thinking.'

Accomplished musicians playing together provide an excellent example of entrainment and synchronisation of neural nets and hormonal connections within the brain. The spindle cells and the hormones associated with them – serotonin, dopamine and vasopressin – help to create a correspondence between brains that leads to a sense of mutual understanding. We know that our feelings correspond quite well with what another person is feeling.

This kind of emotional connection or empathy is also called 'affect attunement.' The term was first used to explain a mother's attunement to her baby, which is the earliest example of what Daniel Stern called the 'intersubjective matrix,' but it has a wider application. This is not simply imitation; it is an innate ability to enter into the experience of another person and participate in it through emotional correspondence. Autistic children or adults are not so immersed in this intersubjective matrix.

Stern maintained that intersubjectivity is an 'innate motivational system' that is essential for the survival of our species because it facilitates group formation, enhances group function and assures group cohesion. Unless we participate in this intersubjective matrix, our human identity will begin to dissolve or veer off in a different direction. To be fully ourselves it seems we must be part of some communal activity. This includes many forms of ritual, some of which are solemn, but many of which have that essential element of play. Perhaps the best example is our experience of dancing and singing together.

### *The origins of language and music*

It's fairly certain that humans have been singing and dancing together for a very long time. Steven Mithen made the point that the change to standing upright on two legs made possible a completely different kind of movement. Instead of simply swaying to a rhythm, Hominids would now have been able to dance, because of the greater independence of torso, arms and legs.

The range of movement human bodies possess, which we take very much for granted, was described by Rudolph Laban as one of the greatest miracles of our existence. He enthused about this, saying: '... every simple transference of weight, every single gesture of any part of the body reveals some feature of our inner life.' Body language and movement were an important part of our connecting long before we developed any spoken language.

In the early stages of language development there must have been a long period of what is called, proto-language, and there are two quite different schools of thought about the nature of this. One holds that it was 'compositional' in that it was built up from a few words, arranged in a meaningful way, into a great many words, each with individual meanings. The other holds that it was 'holistic,' being a gradual refinement of generalised utterances and gestures that served as emotional messages and were only later segmented into modern language.

Persuasive agreement with the holistic scenario comes from Mithen's book, *The Singing Neanderthal (The Origins of Music, Language, Mind and Body)*. Like most anthropologists, he felt that the African apes, who communicated by gesture and vocalisation, had none of the thought processes and language that could be called a human mind. The evidence he compiled suggested that critical changes in skull shape (enlargement of the area where mirror neurons are found) and accompanying changes in social life and foraging behaviour, beginning less than two million years ago, signified the emergence of a new communication system that he called 'Hmmm.' This is an acronym for holistic, multi-modal, manipulative, musical and mimetic. These were the basic elements the proto-language needed if it was to develop into the manner of thinking and languaging that exists today.

Mithen's explanation dovetails beautifully with the biology of a baby's development of mind through interpersonal exchanges in which the response to expressions of feelings in others, which is more basic than thought, eventually leads to thought. The point is that humans did not suddenly become unique by developing language *per se*. Before that there was something else that propelled us into language and it had to be something that could evolve in tiny steps. That something else was social engagement with each other.

Peter Hobson was quite clear that the foundations of thinking were laid when ancestral primates began to connect with each other emotionally in the same way that human babies do with their mother.

He went on to say:

'It was a change in the nature of primate social engagement that led to the kinds of thinking and language that are the hallmark of human beings. Thinking does not arise from something less than thinking; it arises from something different from thinking. Our human *pre-sapiens* ancestors differed from their chimp-like peers in the primate world by virtue of their deeper connectedness with each other. It was this that gave them thought and the leg-up into language. And, startling though it may sound, it was through minute changes in emotional interchanges and relationships that the wonderful transformation took place.'

Some anthropologists think there was a musical phase during the evolution of language – a non-verbal, pre-linguistic, musical mode of thought and action. Iain McGilchrist's recent book on brain asymmetry also gives priority to the role played by musical perception in the development of language through metaphor. Mithen suggested that



bipedalism initiated a musical revolution whereby rhythm, movement and vocalisation combined to develop the proto-language he called Hmmm. Thus language developed within the framework of the dance.

This would have included mimicking animal movements in both ritual and play. Some sound patterns that are obvious in indigenous languages today could have developed in this way. If you were told there is something in the bush called a *chunchuikit* and something else called a *mauts*, you would have no difficulty guessing which was a bird and which was a fish.

There is also archeological evidence that early humans gathered together periodically in large groups for purposes other than the basic necessities of life, suggesting that one of their activities was ritual and play such as singing and dancing.

There are many biological reasons that making music together would be a useful way of fostering cooperation and improving social bonding. It helps to relieve that inevitable tension between being an individual and belonging to a group because good feelings arise from the combination of your individual expression and your enjoyment of group outcomes. Walter Freeman commented that the release of oxytocin that occurs in the brain during group music-making is very beneficial in this respect. He referred to music as 'the biotechnology of group formation.'

Infant-directed speech must have developed to meet the increasing demands of parenthood as evolution made babies more helpless. They could no longer hang on around their mother's necks for comfort and warmth and she couldn't carry them all the time, so they had to be wrapped up and put down somewhere or held by others. This could have been the start of more sophisticated crying sounds and the corresponding human response that is the singing of a lullaby or crooning. Singing may well have contributed to the increasing subtlety of the mother-infant relationship.

Around the compositional school of language development there is a belief that music is a secondary 'technology,' it has been called 'auditory cheesecake.' On the other hand, the holistic school generally has music as an integral part of the development of language, highlighting for example the importance of tonality in early language and in infant-directed speech. The most recent synthesis by Steven Mithen concluded that language and music probably did not develop as one stream, but as two from a long way back, but the two strands of development influenced one another a great deal.

Language and music share three modes of expression: they can be vocal, as in speech and song; they can be gestural as in sign language and dance; and they can be written down. Language is primarily for expressing thoughts while music is associated more with emotion. We

know from the previous Chapters how closely these two aspects of our mind are intertwined.

Music has great power to express emotional states and induce them in yourself and others. Research has shown that listeners can reliably identify the emotions intended by the musical performer. Listening to music has been shown to improve short term learning, perceptual and motor skills and creative ability. Music therapy has been found to affect many physiological parameters in a beneficial way.

Mithen also made interesting observations about Neanderthal man with respect to music. They had a similar vocal capacity and the same sized brain as us, but it seems they never developed the same kind of thinking and language as we did and they became extinct about 30,000 years ago. They did survive for more than 200,000 years through periods of extreme climate change so they must have had considerable social capacities and cultural stability.

What is strange is there are virtually no signs of cultural change over this period. They left no symbolic artifacts such as wall paintings. It seems their languaging must have been domain-specific, *i.e.* it could not form the bridges of meaning between domains that are characteristic of our metaphorical mind. This meant they were essentially imitative and could not be creative.

Mithen felt they must have relied on their social security to survive and, in this respect, might have done a lot of singing. He speculated that modern humans are quite limited in our musical ability compared to Neanderthals as we have become increasingly desensitised to sound. The melodies and rhythms of nature have become muffled to the human ear by the evolution of a new kind of language.

### ***The final step in language***

*Homo sapiens* developed in Africa and only spread to Europe about 40,000 years ago. Recent evidence suggests we may not have spread to other places a great deal earlier than that, *e.g.* Australian Aboriginal remains have been dated from about 60,000 years ago. The earliest known symbolic art is in the form of cave paintings in Africa from about 70,000 years ago.

Symbols enabled the bridging of meaning across different domains. With increasing complexity we had to develop minds that were not domain-specific to promote creativity and develop the imagination. Symbols are the tools of play and of the imagination. After about 50,000 years ago, there was a great increase in the diversity of symbolic artifacts

and the dispersal of humans over the earth, which led to the more complex referential and imaginative kind of language that we use today.

The critical issue in this final step in the development of language was how it became less holistic and more segmented. Segmentation refers to the breaking of holistic phrases into separate units that are referential and can be combined in a variety of ways, which led to the compositional kind of language we have today. This enabled more specialisation of individuals and groups within society and the development of more intricate technologies, which are the kinds of cultural change that were noticeably absent in the Neanderthal communities. Whatever was different about the experience of *Homo sapiens* out of Africa and the 'singing Neanderthal' in Europe apparently took the human mind in a different direction.

Any explanation of this must include the different state of emotioning that went hand in hand with the more clever language and thought that we developed. Our ancestors lived in a warmer climate and travelled much more widely than the Neanderthals who would have spent a lot of their time huddled together in caves in their very stable social groups. Therefore we would have encountered a greater variety of threats and more danger in our daily lives including the fearful uncertainty of meeting more strangers. We are more likely to have had to fight others in order to survive and we needed to become cleverer at this.

Whereas love has been the enabling force of human evolution, it is likely that the contrasting emotion of fear has been the driving force for this final stage in the evolution of our mind. We may well have contributed to the extinction of the Neanderthals as we became more combative and clever. History shows that whenever societies have become too comfortable and insular they have collapsed.

The refinement and segmentation of our languaging may well have come from the stress that our species created for itself during the most recent stages of our evolution. Stress is a double-edged sword in that it can have negative biological consequences, but it also paves the way for meeting new challenges in life.

There is more to be said about fear in the next Chapter, but it is useful to note here that it has been described as 'the condition for the experience of thought ... the trigger for our evolved capacity ... and the manner in which we begin to make meaning.' Giambattista Vico (1668-1744), a significant pioneer in the science and philosophy of mind, suggested that thought eventually grows weary when it is disconnected from fear.

He also argued that religion originated in the formative passion of fear; not so much a fear of other humans, but a fear from within. Many of the symbolic artifacts found today have been interpreted by anthropologists as having religious significance.

The way our mind has to operate at the interface between the known and the unknown is the cutting edge for its development and the sophisticated language that we use today has emerged out of the crucible of this fundamental uncertainty of human existence.

In the next Chapter we will consider in more detail the nature of love, fear and other emotions.

# CHAPTER 12

## Love and Fear

*what emotions do for our relational space and the power of our will*

Love and fear are central themes of our literature, poetry, theatre, art and conversation because they are so well known in our experience. Science chose to leave love to the poets until recently. Philosophy and religion tend to generalise about love in realms beyond everyday human experience. But in the practical business of knowing and doing, there can be no more important subject than love.

Paracelsus, one of the grandfathers of medical science, wrote in the 15th century:

‘He who knows nothing, loves nothing ... But he who understands also loves, notices, sees ... The more knowledge is inherent in a thing, the greater the love.’

With this fourth aspect of knowing, which is, metaphorically, our heart chakra, we are looking at the place where the known meets the unknown and our emotions determine the way our mind will address the interface between the two.

Love and fear are fundamentally different attitudes toward the unknown – sharply contrasting ways of dealing with uncertainty. We can open ourselves to it and embrace it unconditionally or we can withdraw from it, focus more narrowly and protect ourselves by limiting the possibilities, so we feel we have more control over the situation.

The fearful and controlling option goes along with the semantic language structure and clever mind we have developed. It is the core of our manipulative thinking and behaviour. At the same time, the limitless bounds of our imagination and the joyful experience of reverence for the unknown have remained the most essential features of our peculiarly

human mind. As we saw with a baby playing peek-a-boo, uncertainty sometimes triggers a fear of danger, but more often triggers the joy of surprise and wonder.

### ***Is love an art?***

This is the question Erich Fromm posed at the beginning of his classic book, *The Art of Loving*. Because it is an art, he says love requires much effort and considerable learning to be able to practice it well. Yet many people regard it as something that will happen incidentally or accidentally; that we might ‘fall into’ if we are lucky.

This attitude stems from several misconceptions about love. It is common to think first of the experience of being loved rather than of our capacity to love, which implies that waiting and hoping are the best we could do. Secondly, we tend to think much more about the object of our love than we do about the act of loving. In this respect, to be attractive means to have qualities that increase your desirability in the love ‘market,’ so to speak. Thirdly, because the sudden onset of romantic feelings happens so easily, we tend to think that remaining in love will follow automatically without any special effort. Finally, if love only ‘profits the soul,’ as it were, we may be inclined to learn a more ‘useful’ art that guarantees some return; until we realise that love could be the most valuable art of all.

Fromm maintained that love is ‘the answer to the problem of human existence.’ His thesis was that love is the true and proper antidote to the basic human awareness of being separated from everyone and everything. When humans became fully self-conscious, we experienced the uncertainty of being isolated and small in relation to everything else and our ability to think about the future and the past brought into play our consciousness of time. Space and time are the elements of our separateness.

Fromm thought this feeling of separateness was the source of all anxiety. The Biblical account of Adam and Eve is the most commonly cited story depicting our ‘loss of innocence’ or the price we pay for knowing as much as we do. It also highlights the primal need for love because Adam and Eve became painfully aware of their differences and their separateness, and he blamed her and she blamed the snake, and they left the Garden of Eden covering their shame and revealing their fundamental human inadequacy. Fromm wrote: ‘The awareness of human separation, without reunion by love, is the source of shame ... guilt and anxiety.’ He went on to say that the deepest human need is to overcome our separateness; in other words, to connect.

Human beings are often trying to connect in ways that are not very effective. One way is an 'orgiastic' union through addiction to sex, drugs and alcohol. A very common way is to seek union through conformity with the group in behaviours and beliefs. I mentioned earlier the blind spot that leads to monoculture and a false sense of togetherness as we try to look and act the same as everybody else. It seems the Enlightenment ideal of 'equality' has taken on the much inferior quality of sameness. Another common – and perhaps more effective – way of attaining some sort of union is through creative activity. Strong engagement with what you are doing, whether you are an artist or an artisan, provides some sense of the connection that we seem to crave.

None of these is entirely satisfactory because productive work is not necessarily interpersonal, orgiastic union is very short-lived and social conformity creates only an illusion of union. Even a more symbiotic form of union can be inadequate if it involves dominating and exploiting someone else or seeking to be controlled and used by another person; situations that are all too often described as loving relationships when they are certainly not.

Jung wrote: 'Where love rules, there is no will to power; and where power predominates, there love is lacking.' Fromm's definition of love as a 'union under the condition of preserving one's integrity' dovetails beautifully with Maturana's idea that love is a state of mind that allows the other to be the legitimate other at all times.

If the essence of love is that it's active, not passive, then the kind of doing that characterises it most clearly is the act of giving. This is not the same as giving up something. In fact the joy of giving lies in it being an outward manifestation of our capacity to give and our vitality. 'Not he who has much is rich, but he who gives much,' as Fromm put it. To give of one's time, for example, is the best indication that one has plenty of time to live life to the fullest extent.

Attitudes of love imply that we care for the life and growth of something else and show it respect through our ability to know about it; to know what it means for us. In this respect, love and knowing are inseparable. They are crucial elements in the life-giving function of our mind. Fromm wrote:

'The only way of full knowledge lies in the act of love; this act transcends thought, it transcends words. It is the daring plunge into the experience of union.'

He was a psychologist, but also believed the dependence on psychology in contemporary society betrayed the fundamental lack of love in human relations because psychological explanations could be substituted so readily for a more complete knowing in the act of love.

In Buddhism, there are four aspects of love, which are generally translated as (1) loving-kindness towards everything, (2) compassion, (3) joy and (4) equanimity or freedom; when you love, you bring freedom to yourself and the one you love. Therefore love is not the same as the desire for attachment, from which Buddhists so earnestly seek relief. Instead it is grounded in mindfulness, which will be discussed in Chapter 15. The widely read Vietnamese Buddhist monk, Thich Nhat Hanh, wrote that 'without love, life is impossible.'

There are four different kinds of love in the Western tradition. One is the sexual attraction that we call lust or libido. The second, which the Greeks called Eros, is an even deeper biological drive – the desire to create higher forms of being. The third is filial (brotherly) love or friendship, and the fourth is *agape* or *caritas* – a love devoted to the welfare of the other in an unconditional way such as God is said to love mankind. The human experience of love is usually a combination of these, in varying proportions.

The love we express through knowing, giving, respecting and caring, applies just as much to our attitude to ourselves. The idea of self-love is often confused with selfishness and has even been decried as a sin when it is purely narcissistic. Rollo May pointed out there is no basic contradiction between love of others and love of yourself and he criticised self-contempt as a quick and arrogant substitute for a sense of worth.

In fact, selfishness stems from a lack of self-love. If I do not already know myself to be rich and blessed, I will not be able to spare some of my time and effort to think of and attend to others. To allow myself to be the authentic me at all times is an essential prerequisite to my being able to allow others to be the legitimate others in coexistence with me.

The way we learn to love is by being loved unconditionally in the arms of our mother. This maternal-infant bond is the model for the genuine expression of love, but this ideal is impossible to maintain in all the circumstances of our lives. The slightly more remote, but more widely applicable, kind of love we call fatherly love is an equally important guide for us. For people practicing a religion, the love of a father is often the model for a relationship with God, along with the idea of church as mother, or the earth as mother, in the case of indigenous spirituality.



I referred earlier to the strain our mind encounters as it deals with the business of our appropriative and materialistic society. There is a fundamental tension between the biological necessity of love and many of the pragmatic circumstances of our lives. This ensures that our mind will experience many other emotions as well as love; in particular, it will experience fear. Love and fear are very different means of dealing with uncertainty, but they are bound together. We are keenly aware that we fear not being loved, but not so aware that we are often afraid to love because of the risks involved.

### *The inevitability of fear*

The awareness of danger must go back a long way in our evolution. Even lizards in the garden seem to startle at a movement or a sound. I mentioned earlier that, as well as the enabling force of love, there must have been a driving force of fear contributing to the refinement of our language and our cleverness. Societies enjoying too good a time are vulnerable to collapse because they lack an appropriate awareness of danger. It seems the Neanderthals did not experience the same kind of emotional development as our species did, which probably contributed to their extinction.

Fear was unavoidable for us because we were generally at the mercy of other more powerful elements. Our evolutionary story is a history of increasing vulnerability and intimacy and increasing subtlety in our languaging-emotioning braid. The development of our imagination and the fine tuning of our thinking and language were shaped by our experience of fear.

Modern psychology, with its more empirical approach, has generally not looked at the emotional roots of our imagination, so David Russell drew on the ideas of Giambattista Vico from centuries ago to explain the part fear played. Vico considered the emotion of fright or fear, *spavento* or *timore*, to be the existential condition for thought to occur and the origin of all human experience that is 'over and against the world of nature.' Thus it triggered our evolving capacity to make meaning as a way of combating the fearful experience.

Vico associated the origin of religion with fear – not of other humans, but fear of the unknown and what it might mean. In Russell's words, he suggested:

'It was the fear of thunder that began to assume a meaning that eventually assumed the idea of a 'god.' Unlike the fear of a competitor or aggressor, or even a natural event such as fire

and flood, there is no practical response to thunder. When confronted by this god there is nothing specific to do ... thus it can accumulate progressive meaning of mystery and awe ...'

In this way fear provided the impetus for thought in general as it helped to shape the human mind in relation to powers greater than ourselves (gods) and then towards all forms of authority in human social relations. Vico said that thought needs fear to avoid becoming weary.

It follows from this that the solution to the fatigue of thought at any point is not rest, but the re-emergence of fear. Re-engaging with fear reminds us we are the makers of consciousness. We have no way of escaping the life experience that happens at the interface between the known and the unknown.

When dread becomes mixed with veneration, a kind of respectful fear arises in our emotioning. This would have helped self-interest to become subordinated to the social imperative in our evolution. It led to new dimensions of the emotioning-languaging braid that included awe and reverence with regard to the unknown. The peculiarly human emotion of awe evolved to meet the special needs of human sociality and it enabled us to find our place in the greater scheme of things at a spiritual level as well.

This does not mean that fear on its own is a positive force for the long-term wellbeing of our species. Rather, it suggests the inevitability of fear and the fact that the human mind can never become complacent and rest on its laurels; it must always be drawing on imagination in a creative way to cope with the inevitable stresses of life. Fear is our most frequently used – and most useful – motivator of mental effort.

But if we were driven only by fear, we would eventually close down and lose the imagination and the creativity that comes from that more naive sense of wonder and the open-mindedness of love. In society today, vague and unfounded fears haunt us often, shutting down some of our opportunities for life and love. On the other hand, love is the emotion that opens and enriches our relational space.

### ***Relational space***

This is a way of describing our experience of the quality of the connections we make with other people. Because I am an operationally closed, autonomous unit, my experience tells me there is always a gap between myself and others, no matter how hard I may strive to get closer to them. The social bonding mechanisms of my nervous and hormone

systems give me the precious experience of emotional correspondence with others, but not always to the same degree.

There are times when I seem to be exactly in tune with my friend – we are ‘on the same wavelength’ and strongly connected. Then, something will happen, often unexpectedly, to disrupt this intersubjective experience and we will not feel so close. We spend most of our time in the presence of others whether this is real or imagined. We have the ability to enter into the experience of another person and participate in it – sometimes feeling what they feel, but this comes and goes.

Emotional correspondence is not the same as a transfer of meaning between us. Our social brain is still impervious to the precise transfer of meaning even when our feelings are very nicely aligned. In fact, quite a lot of misunderstanding arises from a misinterpretation of the meaning or the intentionality behind what we have experienced through an emotional connection. If I smile at a girl across the barroom because I was amused by something she did, she may interpret this quite differently from what I intended.

These emotional experiences of connecting are referred to in a general way as ‘vitality affects.’ You have probably felt your mind and body come alive at a certain moment in a musical performance or the first glimpse of a painting or a beautiful sunset unfolding. But very often it is meeting another person or noticing some change in his or her expression that has this effect. ‘Affect’ is an apt technical term for emotioning, because it is not only happening to us – it is affecting others as well.

Daniel Stern described vitality affects as a ‘lived story’ – as distinct from a told story – and it is the story aspect that best captures what we experience. When someone smiles at you there is a story unfolding, which has the elements of a plot and a ‘temporal contour’ or storyline. There is a line of dramatic tension running through even the briefest encounters. We will consider these present moment experiences more thoroughly in the next Chapter. The point is your story and mine interact across our relational space.

I think of relational space in a metaphorical sense as an invisible field – something like a magnetic field or the lines on a weather map. Emotions like love and fear influence our relational space. The composite of all our emotions, as it meets the field of other people’s emotions, determines what our relational space will be at any moment. If we are feeling confident and aware of our autonomy we will be responsible for a larger proportion of our relational space, whereas we may be swamped by another person’s emotional field if we are feeling inadequate.

Another way of thinking about it is the way we pay attention to what is around us. Gerald Hüther pointed out that our brain must be open enough to attend to the flow between it and the world, but sufficiently closed to prevent external disturbances from upsetting its inner order. He proposed that brains have the ability to open or close their 'attentional apertures.'

So relational space can be visualised either as attentional apertures through which something to do with feelings flows between us (in both directions) or as attentional tentacles with which we grasp onto another person to experience something of their emotional experience.

In either case it has certain properties that are entirely determined by our emotional state. The degree of openness or closure with regard to the other's feelings is one of the parameters of relational space. Others are the breadth or scope of the linkages, the intensity of the mutual influence or flow, whether it is focused or diffuse and its resilience or resistance to disconnection.

So our emotional state – as well as being the bodily predisposition to our actions – is what determines the breadth, intensity, openness, focus and resilience of the connections we make with others.

Love in its pure, unconditional form has the greatest openness to possibilities and usually would have the greatest breadth. It also has the property of optimising intensity and focus according to the situation. Therefore, with love, we are likely to see most clearly, obtain the maximum meaning and understand in the greatest depth. In his wonderful allegorical story, *The Little Prince*, Antoine de Saint-Exupéry wrote: 'It is with the heart that one sees rightly; what is essential is invisible to the eye.'

The resilience of this connection depends on the commitment we make. Even a trace of love in our emotional disposition improves openness and tends toward optimising the intensity and focus of the connection, which in turn promotes a more life-preserving situation; hence its great biological significance.

There is a special role in social bonding for the so-called hormone of love, oxytocin. As mentioned earlier, oxytocin is a neuromodulator that loosens neural connections associated with self-centred behaviour, thus allowing trust and mutuality of intentions to develop between us. This role in unlearning has great practical significance because we are all prone to developing unhealthy 'addictions' that adversely affect the quality of our lives. These are very resistant to change even when we think we know how to do something differently. Love loosens the addictive patterns of our mind and it is the only emotion that can do this.

However, pure love, in isolation, would not be biologically sound. The emotions do not occur separately; they work as a composite entity. It's quite true that 'love is blind' unless it is mixed with the other life-preserving emotional states. We will consider, firstly, the six primary emotions, which are the ones most obviously associated with facial expressions.

Fear sharpens focus, but usually reduces breadth and drastically reduces openness because it limits the number of possibilities. It may increase the intensity and resilience. With this type of connection, mental concentration is enhanced leading to more productive intellectual activity. The attendant loss of breadth diminishes relationships generally, often producing a vicious cycle of relationship problems leading to more fear. A very narrow focus coupled with increased intensity leads to aggression and violence. Even traces of fear in our emotional disposition reduce openness and tend to diminish life-preserving connections, except for mental acuity. This double-edged sword has been a pivotal issue, both beneficial and dangerous, in the evolution of our mind and the survival of our species.

Anger arises from fear, particularly against a backdrop of love, and has the same attendant problems (and possible short-term survival benefits) as described for fear. Surprise is a bitter-sweet combination of fear and pleasure that initially sharpens focus, reduces openness and enhances mental activity, as does fear, but may then dissolve into loving openness and joy. Disgust is a potent combination of fear and displeasure that disconnects us from something when that is necessary; as such, it has been very helpful for our long-term survival.

Sadness and happiness are probably the emotions we talk most about and, when shared with others against a background of love, they produce strong, empathic, connections. Like all emotions, they do not stay the same for very long. Both can trend towards broad, loving, open, connectivity or they can become rather self-indulgent states that actually close down the relational space.

These primary emotions wax and wane, of course. When the emotional intensity drops off and our relational space becomes less well defined, another emotional state can develop that we refer to as indifference, which warrants a special mention in the context of our naturally proactive human mind. Indifference could be described as the complete absence of love and fear. It produces weak and diffuse connections that also lack breadth and openness so it has hardly any life-preserving value. For this reason it is probably the biggest threat of all to the survival of our species.

The emotional opposite of love is not really hatred; it is apathy. This saps all life-preserving energy and studies have shown that apathy predisposes to anarchy, violence and the breakdown of social structures. Apathy is also the opposite of will. The more overwhelming aspects of contemporary society – and also some of the methods used to manage and treat mental illness – seem to foster indifference, which is a cause for concern in a biological sense. It will help to be aware of the insidious effects of apathy in our lives.

Relational space is changing in the modern world with more people listening to headsets or watching screens rather than relating directly to the people around them. This might benefit us by cultivating inner strength or harm us by fostering indifference towards the outside world. Interpersonal activity will surely remain the core business of our mind. It will find different ways to manifest itself as the relational space changes with our culture.

In the broader context of our relationship with the unknown, the transcendent emotions such as awe, wonder and reverence have a special significance because they help us find our place in the larger scheme of things. Evolution has produced a mind that enables us to appreciate something bigger than ourselves and this has played – and will continue to play – a vital role in our experience of life.

Love is critical in this respect. When we fear, doubt or deny the unknown we give up the opportunity to ever make meaning of it. The knowing that love provides, in its deepest sense, addresses the paradox that we yearn to find meaning even in the unknown. The attitude towards the unknown that brings the most satisfying life experience is an attitude of love and respect through which we come to trust deeply in something bigger than ourselves. This is the fifth aspect of knowing and the subject of the next Chapter.

Giving meaning to the unknown is indeed paradoxical and will be considered in Chapter 15. The best word for it is spirituality, which is the seventh and last aspect of knowing.

### ***Attention and selfishness***

Another aspect of attention that affects our relational space was brought forth by Trigant Burrow more than 50 years ago. His work is continued by a small group, but is rarely mentioned in the psychology literature today – an exception being Steven Rosen writing about the ‘evolution of attentional processes.’

Burrow was a pioneer of group therapy and apparently liked to regard himself as a member of the group, making his work an

experiential kind of research that was ahead of its time. He saw the limitations of two-dimensional research done by a detached observer who denied the fact of his own subjectivity. Burrow acknowledged the role of the observer before second-order cybernetics had been invented. He studied the 'biology of human conflict' in its many guises including the kind of neuroses that arise when we blame or dislike other people by making them responsible for our feelings – as in 'she makes me mad' or 'he thinks I'm stupid.'

He described two contrasting modes of attention for which he coined the terms, *cotention* and *ditation*. Cotention referred to the natural biological union of minds, which we call the intersubjective matrix today. Ditation, he described as a common form of divided attention in which our interest does not flow directly to the other person, but is diverted back upon the self-image in the form of 'how am I doing?' 'do these people like me?' or 'what is expected of me in this situation?'

Cotention is the kind of emotional connection I've been describing. In Rosen's words 'it embodies the felt experience ... that unites the human species.' Burrow emphasised the 'groupness' of human beings, preempting to some extent the social neuroscience of today. Ditation, he said, works against this group cohesion because it is essentially self-seeking. He found it was also stressful and that the strain associated with ditation was particularly evident around the eyes. His idea was that the eyes are our principal means of knowing the world in relation to ourselves, but when that objective knowing becomes confounded with a self-centred interpretation of our feelings, there is a problem.

This 'encroachment of cognition upon the organism's empathic mode,' as he called it, is quite a common misfit between feeling and thinking that affects our relational space. You experience this when you are doing something because you have to do it rather than because you want to do it. If you ask a child to clean up his room and he does so in a sulky and surly fashion, your relational space – and his – is disturbed by the selfishness displayed, even if this isn't acknowledged. If I say 'I love you' when I really mean 'I want you to love me,' I am being selfish and dishonest. This is quite a common example of ditation or divided attention.

The problem with ditation is that it gives one's self priority, rather than the bigger world to which we belong. In a biological sense, autonomy – the first aspect of knowing – is achieved only as long as you honour the connection, which is the second aspect of knowing. Then you can honour yourself, which is the third aspect of knowing, and from this biological state the possibility of love arises. If self-centred will

usurps the position naturally occupied by honouring the connection it becomes a hindrance to the biological union of contention and love.

Earlier I said sadness and happiness could become self-indulgent. To allow overt sadness or happiness to persist to the point where they overwhelm subsequent interactions leads to ditention. It is useful to acknowledge another's sorrow or joy, but to dwell in it with them for a long period does not help. In Goethe's *Faust*, the one thing that would enable the Devil to win the contest with God over the soul of Dr Faustus would be for Faustus to say: 'linger for thou art so fair' indicating that he was stuck and did not know how to move on.

### *The necessary yearning*

Just as life experience can never stand still, the work of our mind can never be entirely satisfied. Our life is built around a mind that has this limitation. If our mind was unlimited there would be no unknown. And if we knew everything there would be no need for love or fear or any of the struggles that characterise life. Our living process and our mind depend on our having to deal with the unknown and cope with uncertainty.

So the last thing to say about love as the 'answer to the problem of human existence,' or the cure for our separateness, or the antidote for our uncertainty, is that it never quite achieves its purpose. If it did there would be no life as we understand it – no separateness, no autonomy and no playground for the mind at the interface between the known and the unknown. The source of all meaning in life would have been removed.

David Russell explained that, at the very heart of human experience, there is a gap – an inherent incompleteness in our knowledge and our affection. He cited Jung's position that, if we trust that this experiential 'unknowing' has a purpose, our daily activities will become more meaningful. The fact that love is always unrequited to some extent – and fearful control never succeeds in blocking all the possibilities – is the source of our strength, not a weakness. To love possessively, or to become one with something else, would destroy the possibility of love. There must always be the yearning to love and to know. Giving in to temptation kills off the desire because desire by its nature must never be fulfilled.

In Russell's words:

'The experience of consciousness, like all experience, is fashioned by desire; by body states that we have named 'emotions.' In early Greek literature this embodied experience



was attributed to Eros... denoting 'want,' 'lack,' 'desire for what is missing.' The experience of Eros, as a dynamic of ambivalent emotions, is always a bitter-sweet experience.'

### ***Will and meaning***

There is always a want to do something and sometimes this is a compelling desire or intention to act in a certain way. Motivation, desire and intentionality are matters of the mind that stem from our emotional state and form an integral part of the way we make meaning. As I said earlier, will and love are designed to work together, but this does not always happen.

Intent is the directing of an action towards some future goal that is consciously defined and chosen by the actor. Motive is the reason and explanation for the action; and desire is the awareness and experience associated with it. There is an important difference, as we saw earlier, between this conscious awareness of intent and the subconscious knowing that directs our actions, which we will call intentionality.

Walter Freeman wrote extensively about how the brain makes meaning. He warned against simplistic notions of linear cause and effect which cannot explain this process because it involves the circular loop of perception and action described earlier (Chapter 4). He said meaning is created by the process of intentionality. It arises when our knowing connects us to our world in the way it intended to connect us and then continually adjusts this connection according to new intentions (*i.e.* new meanings) that arise from our doing.

Similarly, Rollo May explained that intentionality is the structure in our mind that gives meaning to all our experience. It manifests as our organising idea and it is shaped by our emotional state. Because there is no knowing without doing and no doing without knowing, what we call our will arises conjunctively with the making of meaning.

The emotions that determine our relational space are bound up with our want to do something and our sense of what everything means at that time. As described earlier (in Chapter 8), awareness is one of the tools that accompany our decision-making process, but it is not the agency that initiates the action. The action results from a deeper level of knowing that we call intentionality.

Its relation to free will is the subject of the next Chapter, which concerns the fifth aspect of knowing where acceptance and trust are the critical elements together with our consciousness of time.



# CHAPTER 13

## Acceptance

*decision-making, present moments, trusting and free will*

During a Maturana workshop years ago I heard a cameraman who was filming the proceedings ask Humberto if he had ever been a football player because he did not stand still while lecturing and was quite deft in his movements from side to side. He was highly amused by this suggestion and followed up by saying the sporting metaphor that suited us best was the image of a surfboard rider cruising on the crest of a wave. It was part of his biological explanation that our being is always in motion, but at the same time is always experiencing just this moment. We are balancing in the here and now; our living occurs only at the wave front of our life. From the start we have maintained our connection with that wave front and our present position is the result of all the connections we made along the way.

Similarly, a tightrope walker is physically connected only with her feet on the rope, but she must use all her senses to maintain exactly the right orientation towards everything around her if she is to keep her balance and proceed along the rope. Halfway through her journey, she can say that where she is right now is purely the result of all the delicate connections she has made since she began; it is not due to anything else.

Autonomous unities such as we are must also remain connected to carry on living and what we are at any moment is solely the result of our history of connections. This undeniable relationship between what we have become and our history of connections is essentially deterministic when explained scientifically, but it is also inherently indeterminable because of the sheer complexity of all the interactions involved. There is

no way we could be aware of all the tiny connections we make, yet each of them plays a part in moving us forward.

Generally speaking, we do not accept this idea very well. Because we didn't notice every connection along the way, we often desire to be something different from what we actually are. If we are in trouble, we try to avoid this reality by saying there has been some mistake or, if we are suddenly successful, we think this could be an aberration and so we often behave inappropriately. These stories in our head are our fantasies, whereas reality is simply whatever is actually happening right now.

The combination of our desire and our imagination is an emotional powerhouse for pretending to be something other than what we really are. The ancient admonition to 'know thyself' must surely have been triggered by an awareness of this very human capacity for self-deception and self-denial.

### *The throat chakra*

For the fifth aspect of knowing, the challenge is to know ourselves within the context of a much larger unknown. We become more aware of the unknown and of a power – or powers – greater than ourselves. In acknowledging that we belong to some bigger system that is too vast to be known by our individual analysis or controlled by our individual will, we encounter the reality of acceptance and surrender, which are represented, metaphorically, by the throat chakra.

The throat chakra lies midway between the head and the heart, balancing and uniting those two great forces of life – intellect and emotion. Having moved further towards the unknown end of the spectrum, we feel the impact of doubt and fear more strongly, which heralds in another stage of cognitive maturity – the ability to trust. At the same time, we have moved towards the brow chakra, the centre of deeper intellectual knowing, so there is another paradox to be confronted.

This has been described as the inevitable tension between self-satisfaction and self-transcendence. If there is an uncontrollable unknown that is bigger and more powerful than the part I know and think I can control, then to what extent should I surrender my will to this unknown will? To what extent must I accept the situation I find myself in or how should I be trying to change this situation through my own efforts? If the unknown is not bigger than the known or is less powerful, then I won't need to ask these questions.

Thinking only of personal satisfaction is selfish, but the idea of surrender to a divine will, for example, need not be a denial of self; in

fact it's more likely to be the antidote to this kind of self-deception. A prideful or self-centred attitude of presumed knowing about the world is referred to as hubris, the Greek roots of which meant 'presumption towards the gods.' And hubris is the precursor of self-deception.

The element associated with this chakra is sound and its colour is turquoise blue, blending the green of the heart with the deep indigo of the brow. In the Eastern tradition, the throat chakra is referred to as the centre of communication and creativity. In Hindu and other mythologies – also in the *Narnia* books by C.S. Lewis – the world was created through sound, so the sound we make in our throat is said to be a microcosm of all creation. Science employs the cruder, sound-based metaphor of the Big Bang for the origin of our world.

It is in finding one's voice as it flows from the vibrations within that we come to know ourselves as we really are, yet it is here that our anxiety and nervousness reveals itself most obviously. Interpreters of body language say that covering your throat with your hand while speaking reveals your inability to trust in the process or the outcome. It's not that our will and our voice are necessarily opposed to a larger will. It's the lack of authenticity of our will and our voice that produces the tension between the two. Believing in ourselves, but as part of some larger system, we can find a transcendent level of satisfaction that is a distinctive expression of our humanness.

It is our imagination that points to the unknown and there is no biological precedent for this creative realm, as far as we know. It is the most distinctive aspect of the human mind through which new meanings arise and our sense of wonder and awe develops. The essence of this aspect of knowing is called faith, which includes the Christian sacrament of confession and the ability to trust in ourselves as we really are (see Table 1). The idea of faith need not necessarily have any religious connotation. We demonstrate our faith in something almost every moment of our lives. This faith underpins the true power of our will and our authentic self-expression.

### ***Memories and wishes***

In a book called *Waterland*, Graham Swift wrote:

'Only animals live entirely in the here and now. Only nature knows neither memory nor history. But man – let me offer you a definition – is the story-telling animal. Wherever he goes he wants to leave behind not a chaotic wake, not an empty space, but the comforting maker buoys and trail signs of stories.'

Memories occupy a huge part of our conscious mental activity and it helps us to feel more secure to think of them as indelible marks left along the path our mind has travelled or images filed away in the great database of one's brain. But your brain does not store items of memory *per se* and there are no specific biochemical remnants of our past experience to be found there.

It retains the evidence of your experience in the established patterns of its neural networks. Networks that often fire together tend to wire together more strongly, to paraphrase what is known as Hebb's axiom. Networks that have been connected before will connect more easily next time, so the increased probability of firing in a familiar pattern is how the network 'remembers.'

That history of brain connections is a reflection of all the connections our mind has made as we have lived our lives; and it also contains our phylogenetic history, *i.e.* the development of our mind through generations. Not all connections are the same in this respect because they vary in emotional intensity. Experiences at either end of the scale of emotional intensity – those that are very slight and those that are overwhelming – have the least effect on the wiring of our brain, while all those in between show a U-shaped relationship between intensity of the emotion and effect on the brain. Neurobiologists emphasise the narrative quality of memories, both in the forming of the networks and the relating of past experiences. We know and tell what happened as a story.

This history arises according to the flow of possibilities created by our changing organising ideas and emotional state and the changing external world. We are not actually accumulating knowledge of the world as something separate from us; we are acquiring a history of connections with the world we have encountered. What we are at this moment is the product of our history of connections. That is how we have defined ourselves.

So it happens that what we attend to we become more like, in some way. Recall the quote: 'Show me what you attend to and I will tell you who you are.' Every moment of connection steers us into the realm of possibility of the next. No step is trivial; little things do count a lot. This is why we must focus on the history, not the memories *per se*, to understand the process of our mind.

The conventional stimulus-response theory is unhelpful here, as Timo Järvilheto pointed out, because it wrongly attributes a cause and effect to every interaction. It is true we see repeatable patterns of response to a defined stimulus, but to explain this as a linear cause and effect is to ignore the historical nature of autopoietic beings. What we

call a stimulus exists only because there has been a history that defined it as a stimulus and it does not have a simple causal relationship with subsequent behaviour because it is only one of many elements involved. To say otherwise is like saying the last piece in a jigsaw caused the picture to happen whereas it merely completed a long process that eventually realised the picture and it was, by then, the only piece that could do so.

As well as the ability to reflect on the past, we have a great need to project our mind ahead of the present time and envision our desires, hopes and aspirations – our wishes for the future. This is another special feature of the human mind that brings both the tantalising joy, and the heartbreak, of yearning and hoping. At the same time, it is of great assistance to us in planning future activities cooperatively with other people. Someone said that ‘expectations are premeditated resentments,’ which is often true, but the ability to think ahead has obviously been an indispensable component of our mind.

We have come to rely heavily on the pleasure we get from happy wishes and memories, but the problem is this consciousness of time past and yet to come is also the source of much of our pain. Alan Watts wrote about pain and time, saying humans are different from other animals in not being satisfied that the present time is enjoyable; we demand to have enjoyable memories and expectations as well and will even tolerate a miserable present if it helps to make the past or future seem better. We have a great ability to spoil the present with the emotional threads of our story about what might happen or has happened, which is a constructed fantasy, even when it’s reasonably accurate. What this Chapter is about is the need to live in the present moment if we are to be real.

### ***The present moment***

Many philosophers – and more recently, psychologists – have contemplated the question: what is the present moment? In the objective sense of time, which the Greeks called *chronos*, the present is a moving point that heads only to the future. By its conception it defies our attempt to grasp hold of it, as implied in the book by Sheldon Kopp called *Here I am, Wasn’t I*.

Our subjective experience of time is not like that, however, because we are aware of something happening right now that contains its past as it heralds its future. This is a real experience even if we can’t quite capture it as an event. Our sense of time is not fixed; you can experience a ‘long’ or a ‘short’ present moment. Perhaps the experience is best conceived as a musical phrase within a familiar melody that not only

contains the past and the future, but relates them to one another. This is also like the narrative sense we have of everything held together in our mind as a story.

The Greeks also had a term, *kairos*, for this subjective experience of time. It was described in the following words by Daniel Stern:

*'Kairos is the passing moment in which something happens as the time unfolds. It is the coming into being of a new state of things and it happens in a moment of awareness. It ... escapes or transcends the passage of linear time. Yet it also contains a past. Kairos is a moment of opportunity ... A small window of becoming ...'*

Stern's method of psychoanalysis, described in his book, *The Present Moment in Psychotherapy and Everyday Life*, is unusual in that he asks patients to describe just a few moments of their day in great detail, rather than their whole life story. He said these episodes of present moment experience can be more revealing indicators of a person's psyche than the larger story they have learned to tell; partly to cover up some aspects of themselves they didn't want to accept.

While our physiological perception might discriminate individual units of 20-150 milliseconds, this is not an experience during which we could say we have formed any meaning. That may take several seconds, which is typically the length of a breath cycle or a recognisable musical phrase, a spoken greeting or a packet of playful expression with a baby.

Whatever the duration of the present moment might be, the essential elements of it are encapsulated in Stern's phrase, 'lived story' that I mentioned in the previous Chapter. This lived story is not the same as a told story or spoken narrative because it is lived as it happens as an unfolding of feelings. It is more like an untold emotional narrative, which harks back to the kind of mind that infants develop, before they learn language. It is the fundamental act of making meaning.

As Stern described them, stories start with a trigger, which is a novelty requiring some resolution. This is how stories captivate us if we relate to this apparent 'need to get something back on track.' Secondly, stories are structured around a plot – who, why, what, when, where and how – which is their attention-holding backbone. Thirdly, stories must have a line of dramatic tension – the temporal dynamic I mentioned before. This narrative format is our basic way of perceiving (as well as telling about) our lives, for the smallest coherent units of experience as well as the larger ones.



These moments in story are where the present meets with the past and the future. The present experience must be able to alter our view of the past because we are remembering in the present. So the past plays a constant role in influencing what we experience from moment to moment, while the present moment constantly reorders our memory of the past. It has been shown in animal experiments that a present experience can permanently rewrite neural connections created in the past. In the same way, the present moment is also where our future aspirations blend with what is happening now and they, too, are re-shaped in the process.

In this book, I first referred to knowing in terms of language and then progressed to speak of subconscious knowing in terms of emotional states. Stern distinguished between explicit and implicit knowing. He said, because the present moment is mentally grasped as it is still unfolding, knowing about it cannot be verbal, symbolic and explicit. It is an implicit, ‘marvelous mess,’ – much less clear than it will be when explicated later.

In our intersubjective engagement, the sloppiness of implicit knowing is very useful for co-creation for the same reason that fuzzy logic and metaphor help us to share meaning. Our entire social experience is a series of these present moments – a sentence, a facial expression, a gesture, a feeling or a thought. The world is indeed our ‘stage’ – a rich theatre of story-telling, social, human minds, playing together to create our individual meanings, moment by moment.

### *The meaning of free will*

In Chapter 8, we considered the conundrum that our brain seems to decide what to do before we are conscious of making the decision. I raised the question: who is in charge of what we do? Do we have free will or is this chain of connection created by our mind a deterministic yoke from which we can never escape? Our conscious thought tells us that it precedes action, whereas the brain measurements show that the intentional process is already happening even as the thought arises in our awareness. Now is the time to resolve that issue.

The drawing in Figure 12 represents you or me about to take our next step in life. Behind us is the path we have trodden, *i.e.* our history of connections; up ahead is our vision or goal. We like to think that where we will step next is a rational choice we make by distinguishing all the alternatives, but in fact it arises organically from our whole being. It is simply what we know to do at that point in time.

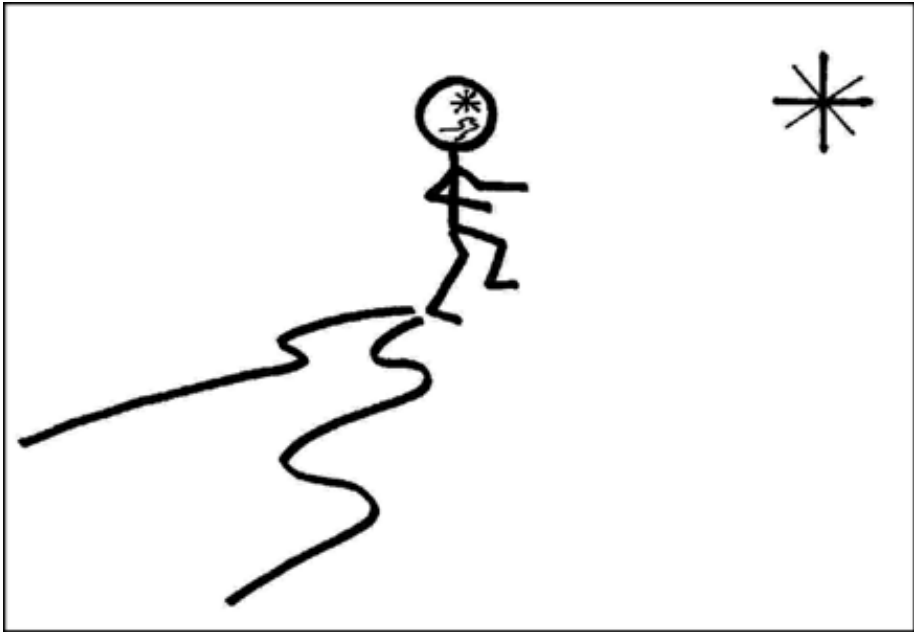


Figure 12. How do we decide on our next step when there is a path behind us and a goal out in front, but no path laid down ahead?

We tend to think there is a path out in front to guide our footsteps, but as you can see in the diagram there is not. In the words of the poet, Antonio Machado, made famous in this context by Francisco Varela: ‘we lay down the path in walking.’ We create imaginary paths at ‘planning meetings’ – both private or public – but they are never quite the same as the path we will subsequently lay down.

The decision about what to do next is based on our actual knowing, which includes both the history and the vision as they are manifest within us. The result of our history and the effects of our vision are combined to constitute our knowing at that time. This is our intentionality – the structure in our mind that gives meaning to our experience – in that particular situation. As explained earlier, this is not the same as our conscious intentions.

Each decision we make generates constraints and possibilities, but it does not, by itself, determine the outcome; that will depend on the connections we make from then on. It does something else, which is important. It determines our orientation – the direction we will head towards, which will have an important bearing on our next connection. It is that ability to orientate ourselves that provides us with genuine options.

We only have that ability if we are experiencing the present moment. We lose it if we are thinking only of the past and the future. If the thoughts about our future goal or past experience are allowed to dominate our mind and exclude the present moment experience, our orientation is already determined and our freedom of choice is limited.

We like to think we use our mind to choose outcomes, but that is simply not possible, except in a very general way. Our fresh path of connections will determine the outcome. What we can choose is our orientation. And this will define the range of opportunities available for the connections that follow.

Being in the present moment in this way is barely possible if we don't trust the unknown. Earlier I mentioned the yearning we have to make meaning, even of the unknown, which is a paradoxical aspect of knowing that I refer to as spiritual. Our mind has evolved this capability, but our individual hubris and reliance on self-will – for example, dition (see Chapter 12) – often deprives our minds of their full potential. We are biologically endowed with free will, but only when we can experience present moments in the context of a larger whole in which we place our trust. Love makes this possible.

The crux of the matter is: we have free will when we accept completely – with unconditional love – where we are and who we are at this moment. This is reality. It includes being an individual speck in a very large world. If we love that world we can trust it and our minds will revel in this freedom.

If our minds are preoccupied with fantasies about the future and the past, which they so often are – in various states of fear, uncertainty and selfish desire – we have denied ourselves the freedom of choice that is our biological endowment. In other words, acceptance of – or surrender to – the reality of one's highly personal here and now is what gives us free will.

Thinking about our goal in relation to our past is the work of our conscious intentions. As described earlier, meaning is created by the process of intentionality, which is essentially an emotional state and largely subconscious. The conscious intention to achieve a certain goal is an added awareness about one's behaviour, but it is not the driving force of that behaviour. Samuel Johnson commented that 'the road to Hell is paved with good intentions.' Intentional action is directed by internally-generated goals, many of which are at the subconscious level of our knowing.

Charles Birch's book, *On Purpose*, is an eloquent example of a biologist's description of a sense of purpose in human life, in nature and

in the universe. He is quite explicit that this comes directly from a certain kind of God; whereas I have left it open by referring to a higher power that is essentially unknown. But I also make a personal decision to relate to this higher power in a loving and trusting way. The ‘spiritual’ meaning I choose to give it implies that it has a purpose, but what that is remains a mystery to me, in all respects but one, which is the subject of Chapter 15 – essentially that I can trust it to take care of me.

The obvious force of our will to live and our increasing reliance on love to show us how to belong to something bigger than ourselves can’t coexist in my mind with the idea of a totally meaningless existence in an aimlessly drifting world.

Our minds are simply not capable of ignoring the unknown. It won’t go away. We experience connections with it that each of us has to interpret somehow. By calling the unknown a spiritual dimension, I can relate my human spirit – that intentionality which makes meaning of everything I do – to some larger spirit, whatever that might be. My spirit – this spirit – motivates me to use my mind responsibly to preserve what I call life and love. It invites me to bring my attention to the here and now so as to exercise free will. In other words, whatever higher will might stem from the unknown seems to be there to help me use my authentic free will for some larger good that includes me as well.

We tend to mistake free will for self-will. Our minds attend by connecting and they can do this narrowly or broadly. Attention is the totality of our connections at any point in time. The mind’s preoccupation with future and past severely narrows and limits its connectivity in the present so our attention will not be here and now. This unfortunate situation stems from our obsession with cause and effect and our desire to control and manipulate by focusing on outcomes rather than simply being in the present moment. Because we have not realised that every tiny connection and its emotional state leads towards the next one, we often find ourselves in a situation where we say: how did I end up here?

At that point we often call on willpower to reverse this trend. What we usually call willpower is the intensification of self-will, which is basically in opposition to what has happened. It says: I should not find myself in this position. Rather than adjust myself I will change the world around me to better suit my needs. Sometimes that seems to be working, thus deluding us further, but generally it fails, for obvious reasons.

The authentic power of will has unconditional love alongside it. Exercising the power of will begins with the realisation that who we are and where we are at this moment is exactly where we are meant to be.

This is what empowers us to move forward, decisively and effectively, in the direction we have chosen. By initially surrendering to the unknown, we gain the ability to trust, which gives us the freedom to choose and the strength to move forward.

These are not choices based on guessing outcomes, but choices based on trust that all we need to do – and all we can do – is the ‘next right thing’ in any situation. Appreciating the true power of will reveals the folly of simplistic cause and effect. Our awareness of possible outcomes and the results of previous experience serve as an ‘invisible hand’ to guide us, but it is our attention to the present moment that provides us with free will.

### *Appreciating the flow*

For more than three decades, Mihaly Csikszentmihalyi has studied those states in which people report feelings of blissful concentration and deep enjoyment that he calls an autotelic experience. Derived from *telos*, meaning goal, and *auto*, meaning self, this term describes:

‘A self-contained activity ... done, not with the expectation of some future benefit, but simply because the doing itself is the reward.’

He wrote about reclaiming present experience, citing Ralph Waldo Emerson’s words: ‘we are always getting to live, but never living.’ He said that consciousness becomes disordered as we spoil the present and it is strengthened and ordered by close attention to what he called the ‘flow,’ which is the ever-moving, present moment of our lives.

Attending to the flow and keeping our mind in the here and now is a function of our emotional state. The emotions that limit our connectedness hamper our present moment experience. Fear is the most obvious example, and chronic sadness, and any other self-centred state – they make it more difficult for us to accept and be present. Knowing what the next step is to be does come from our history and our vision, but not, primarily, from a rational analysis of them; rather from an attitude of love toward them.

This relates to the authentic self-love discussed in the previous Chapter. Any criticism of ourselves and what we have done, or an inflated view of what we have achieved, is an aspect of pride as it was portrayed in the Seven Deadly Sins. This false pride is the most common manifestation of self-will in defiance of the larger will of the universe in which we live. With that attitude, our mind presumes to judge rather than just to be. Humility, on the other hand, comes with honest acceptance.

Attending to the flow in an accepting way does not mean giving away our freedom of choice. In fact, it is our best opportunity to exercise free will. We become trapped in our own thought process when we analyse our situation too much. Such analysis does have a useful role to play in our mind's work, but it is more effective when combined with an attitude of acceptance. Only then can we see in all directions instead of staring down the tunnel of our existence that we made by only looking forward and back.

In the Temple of the Goddess of Love, Aphrodite, one had to decide which direction to face; it was this choice that made it beautiful. If we accept our present position lovingly we can face in any direction and our next step will be the next right thing to do. We will not be tied to the railway track of our fears and desires, nor stuck in the rut formed by our habitual ways of doing things. This is a spiritual act requiring trust and surrender and appreciation of the flow. Every instance is a beginning and we got to where we are by starting off exactly where we were. By appreciating this, we can step forward with confidence.

### ***Travelling the unmade path***

A workshop given by Pille Bunnell and Humberto Maturana at a world business conference in Vienna was the inspiration for my drawings in this Chapter and for one of my songs, *The Unmade Path* (see the lyrics at the end of this Chapter). Its essence is that we orientate ourselves according to the way we feel, but then we walk on, or do whatever we do, in exact accordance with our knowing at that point in time. Thus it says: we do not see the seed of our becoming; we cannot watch the choices grow. We don't choose an outcome, but we know what we attend to and we do what we know.

We often have an inflated sense of our knowing and our influence in the world, especially if it seems we have been very successful in some way. Similarly, we blame ourselves for bad things that happened, attributing far too much importance to our personal influence on that situation. The alternative is a humble acceptance of our mind's limitations as well as its possibilities.

In Figure 13, the circle represents a living system; one of us. The two-way arrow refers to our ability to make a connection. The wavy line represents the medium with which we must remain connected as we move through life. We encounter only a very tiny portion of this medium at any one time, which Maturana called our niche, indicated by the small curved bracket. The large curved bracket is to remind us that most of

what is happening in the world is beyond our awareness. We move in continuous blindness with regard to a much larger whole.

It's as if we are walking through a pitch-dark world carrying a small torch. What we see is what we attend to with the light of our torch. Fortunately, what we see in one another and in our world can be changed at any time, if we stop to reflect. Often this doesn't happen because we tend to cultivate our blindness through ready answers and quick judgments, by not stopping to see. It is in acceptance and surrender that we reflect and what we see will then change.

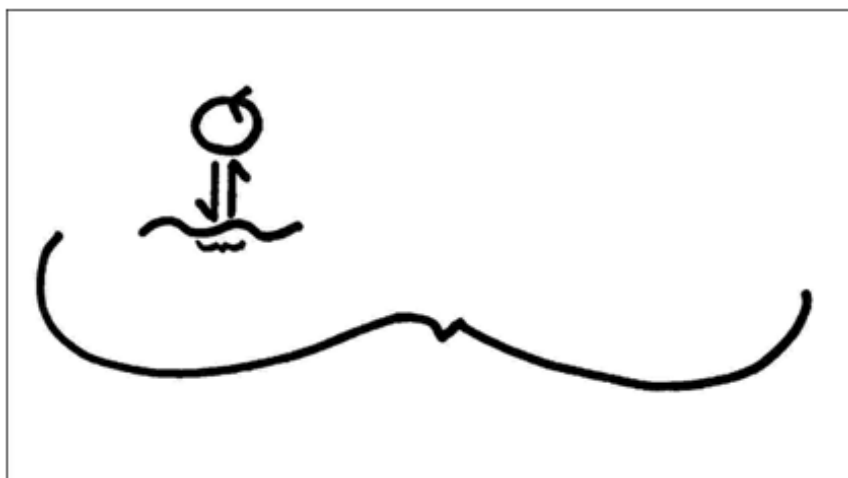


Figure 13. We connect with only a very tiny portion of all the happenings in the world.

A world authority on leadership, Debashis Chatterjee, wrote about *Leading Consciously*, which he said requires self-mastery as a first step. Personal mastery is 'a function of our quality of seeing.' In our ordinary state of consciousness, we are 'visual ragpickers.' He recommended three ways of improving conscious leadership: (1) the discipline of concentration to sharpen focus, (2) detached or choiceless awareness (less thinking, more attention) and (3) transcendence, which is the transformation of energy from one form to another.

This is quite a stark reality for us to accept: that the path is unmade, it is pitch-dark, we have only a very small torch, and we need to stay here and now. But there are two facts about our niche that are our saving grace. Firstly, the size of our niche is not fixed; it can be expanded at any time by seeing something we did not see before. This is a function of our emotional state. Secondly, our niche is social. It's a fundamental attribute of our mind that we live in social relations, so we can be part of the niche of each other and we never have to stumble in the dark alone.

The expansion of our niche is brought about by seeing our situation more clearly and the emotion that makes this possible, as explained in the previous Chapter, is love. It is ‘with the heart that one sees rightly.’ Seeing clearly with love legitimates what we see.

### *The value of reflection*

If we don’t cultivate our own blindness by jumping to conclusions and judging too hastily, we can enjoy one of the finest experiences of the human mind – our capacity for reflection. We can take a good look at ourselves, in our circumstances, simply by choosing to do so. The process involves both languaging and emotioning. We need the language to objectify our view of the situation and then our emotional state will determine how clearly and how broadly we will see it. It’s often said: if you want to do something differently, you have to change where you are ‘coming from,’ which means you have to change the way you are looking at it.

If we simply think about everything in a purely analytical way, we will become trapped. The idea behind meditation and mindfulness is to create an internal disposition (an emotional state) in which we are not trapped by our thinking, *i.e.* our mind is unfettered. Such mindful attention to the present is described in Eastern philosophy as the release of all attachments. Paradoxically, the letting go of attachment to our mental constructs of past and future enables the genuine biological ‘union’ of our organism with its surroundings.

Our ability to expand or contract our niche is fundamentally emotional; an attitude of love will expand it and a sense of fear will constrict it. In reflection we can become loving towards ourselves, thus accepting the legitimacy of all our emotions, *e.g.* I am fearful, that’s OK. Then we are freed to move on to see the bigger picture.

When you actually see the situation, or the other person, there cannot be judging, because seeing is accepting legitimacy. If I accept, I see; I may not like, but that’s another matter. Your emotional disposition determines your relational space. What you accept and love becomes meaningful to you. To love yourself is to accept the legitimacy of yourself and then you see yourself as you really are. As you are, you will take the next step positively, whereas not seeing yourself clearly, your next step will be uncertain.

The need to reflect often arises because we recognise some kind of problem. The interesting thing about problems is that they really belong to the emotional domain, whereas we often treat them as questions of



rationality and try to solve them purely by thinking. We employ technological or scientific 'solutions' to situations that are actually causing us trouble, emotionally.

All problems are essentially conflicting desires and they are never solved until there is an emotional change with regard to them by all the parties concerned. This will not happen without reflection. It explains why wars can't solve problems, nor can imprisonment or punishment or any authoritarian control – they can only help to manage the problems in the short term.

Authority of one person over another is a necessary part of our workplace arrangements even though it distorts the natural biology of social relations and causes stress. If we appreciate what is different about our work situation, it's easier to accommodate our social expectations to the daily grind of work.

The business of our workplace is a designed system, not a social system, even though we exhibit our biological need to socialise as we go about our work. The essential difference is that work relations are entirely outcome-based and therefore need to have controlling and limiting rules of operation to be successful.

There is a parallel here with the difference between humans and robots. The difference is that a robot will always do exactly the right thing in a certain set of circumstances, but it has a very limited ability to adapt itself to change. Its history is quite different from that of a living system. It was designed to operate that way from the start of its existence, whereas human design has never been fixed. We are upgrading our design according to each changing situation – we always have and always will be. The social imperative has kept this process going by virtue of the emotions of love and trust.

So our systems of work have peculiarities that can be stressful, even though love and trust guide the intentionality of the human beings who are doing the work. The most enjoyable workplaces are those where space has been left for social interaction as well as the work itself.

Artificial control systems invariably undermine trust and heavy-handed authority tends to foster irresponsibility. We live in a highly distrustful society and creating more and more laws and restrictions only perpetuates this situation. By living in an attitude of mistrust, we bring forth a world based on mistrust. Rules limit our space for reflection.

People subject to this artificial control have difficulty reflecting and seeing properly and are therefore not acting out of their awareness, which would normally enable them to redirect their flow as they reflect. Personal responsibility arises only when we can reflect and thus look

honestly at all the consequences of our actions. Most harm is done in the world as a result of people following orders or instructions in a controlled system instead of acting out of their awareness.

### ***Summing up the blind spots***

This fifth aspect of knowing is linked to some obvious blind spots. The most basic is that we often think simplistically in terms of cause and effect. Then we find we can't impose our will on the world because there is no simple cause and effect. We try to link complex outcomes to our good or bad decisions, not realising that our life generally follows a channel created by millions of tiny connections and we cannot know the effect of every one.

Nevertheless, by stopping to reflect, we can choose a new direction at any moment, which is something we often forget to do. We can choose to head in a positive direction in any situation as long as we don't become obsessed with deterministic calculations. The trick is not to be overwhelmed by our own intellectual analysis and to trust in ourselves in the context of the great unknown.

The famous Serenity Prayer links our acceptance of all the things we cannot change with the courage to change the things we can and the wisdom to know the difference. Paradoxically, only surrender brings genuine freedom. What we accept no longer binds and controls us. What we embrace moves with us, whereas what we deny or resist will oppose us with a strength proportional to the strength of our opposition. In the Biblical phrase: 'only the truth can set you free.'

Finally, we tend to think of doing as something that follows knowing what to do, which is true, but there is a blind spot here because that's only half the story. It's equally true that every bit of doing affects our subsequent knowing so there is a knowing – doing – knowing – doing, cyclic progression. That's the way our mind and body swing.

When we want to change our habits it is often more helpful to simply do something differently without having any clear idea of why this would work. As you keep doing it, you will find your way of thinking about it and your knowing has changed. Someone said about recovery from alcoholism and other serious addictions:

'it's hard to think your way into a better way of living, but you can certainly live your way into a better way of thinking.'

The next Chapter deals with one more aspect of knowing – the sixth and penultimate aspect – which has to do with knowledge, intelligence and wisdom as they arise through conversation.

***THE UNMADE PATH\****

We walk, our faces turned to what we want  
 The path we made is there behind us  
 Where is the path ahead to show us where to go?  
 It's not there - the wonder blinds us  
 We do not see the seed of our becoming  
 We cannot watch the choices grow  
 We don't choose an outcome, but we know what we attend to  
 And we do what we know

**We orient as we feel  
 And walk as we are  
 We orient as we feel  
 And walk as we are  
 What do I see?  
 Where am I looking?  
 What do I hear?  
 What am I feeling?  
 Do I know fear?  
 Do I know love?**

Our paths are stories of the past we have told  
 When we reflect we spread our feelings  
 We see with love it happened as it should  
 Everything according to our dealings  
 We think we know the why of all we do  
 But when we understand the how  
 We connect the presence of the past to future dreams  
 And see them here and now

CONTINUED

**Chorus**

We look and step with love upon the road  
Even though we know not where it takes us  
But when we cherish the beauty that we have  
We know that life does not forsake us  
We understand surrender to our being  
Connects our footprints to our star  
Freedom to tread surely with confidence and love  
Is for the person that we are

**Chorus**

\* Inspired by Pille Bunnell

# CHAPTER 14

## Knowledge and Conversation

*intelligence, wisdom and creating our culture*

Even though our knowing is socially constructed it is entirely personal in terms of the meanings we make; each of our stories is unique. Strictly speaking, we are not accumulating knowledge of the world as something separate from us; we are acquiring a history of connections with the world we have encountered. We don't know other people's precise interpretations of their world, but we are closely attuned to our fellows through an emotional congruence.

Then there is something else we call public knowledge, which we also regard as important. What we refer to as knowledge is assumed to be more rational than emotional, yet we have this sense of common knowledge, particularly with people we see often – at work, in our community or at home. The reason for this lies in the similarity of our individual histories.

If you and I have a similar history and are keen to engage emotionally and open ourselves to learning from one another, then the words I use, with my meanings behind them, will trigger very similar meanings for you. The language we are using has structured our worlds into very similar shapes and patterns and so we communicate with ease. This beguiles us into the comfortable thought that we both know the same thing.

It also reinforces the idea that we are dealing with something quite separate from ourselves, or our own perception; in other words, the objects and issues of which we speak must be independent of us because we can so readily agree about what they are and what they mean. It is as if some concrete information passed between us about an objective

world that exists independently of us and could be validated independently of our relationship.

But the biology of our minds is such that the validation of our shared knowing depends entirely on our relationship. If we had very different histories, or even a messy relational space due to contrasting emotions, we would find it much more difficult to reach agreement. We might have to conclude that the other is ignorant with regard to that particular 'knowledge.' If the other person does not know what I know, he or she must be mistaken.

So we come back to the point that we bring forth our own worlds and then we choose either simple objectivity or a personal 'objectivity in parentheses' as our way of languaging about it. In the latter way of using your mind, you will ask yourself: in what domain would that person's explanation be valid? In the first alternative, you would assume, for practical purposes, that this is the only version of reality needed at the moment, so we will not allow the personal nature of our knowing to interfere with our ability to work together.

Therefore our understanding of knowledge depends on the way we are using our mind. The child's game I mentioned in Chapter 5 - 'What's in my Hand' - illustrates these two contrasting attitudes to knowledge.

### ***How we create our culture***

The accumulated effect of all the histories we have in common is what we call our culture. It is generated by the flow of our languaging and emotioning as it manifests in our conversation and it is an influential guide for our living together.

Culture is described as 'the characteristic features of everyday existence shared by people in a place or time' or a 'set of shared attitudes, values, goals and practices' or, in anthropology, as 'the sum total of ways of living built up by a group of human beings and transmitted from one generation to another.' Only in recent times has it been realised that cultural change is the leading and driving force behind our evolutionary development and the role of our genes, while important, is secondary to this.

Another connotation of the word, culture, is a certain quality of excellence or high standing of the affairs of the mind such as great literature and fine arts. We seem to aspire towards our culture. That was also evident when we considered the evolution of mind. The emotioning-languaging flow which made our social brain is inexorably drawn, as if compelled, to create each new stage in our manner of living – our culture.

Greenspan and Shanker, in *The First Idea*, identified the ‘critical and culturally-mediated processes that have made us human’ including the way in which symbolic and reflective thinking arose as a direct result of emotional interaction (see Chapter 11). The way our language and our emotions blend together defines us as human beings at this point in our history and will create our culture in the future. Not only does our brain shape our culture – that culture goes on shaping our brain.

The role of language in this is easy to see. The way we divide up our world – whether we create hierarchical structures in pyramid shapes or interconnected circles and webs – has a huge bearing on what an observer would say about the state of our knowledge. Australian Aboriginal people might appear to lack knowledge about the simplest European workplace structures and Europeans may have no clue about the kinship between individuals who live separately, but inherit responsibility for the same ritual connection with a certain animal or star in the sky. Recall the quote from Alan Watts: ‘we suffer from the delusion that the entire universe is held in order by the categories of human thought ...’

The other half stems, of course, from our quest for emotional union. The social imperative is that one’s individual mind cannot construct its world in isolation. We have developed as a species because we learned how to relate more intimately and so our culture is filled with stories about love, with endings both happy and sad – as well as stories about the many faces of fear and all our other emotions.

We developed the ability to love and fear things that exist only in our imagination, whose physical reality we can’t prove. This capacity to love and respect the unknown, even as we fear uncertainty, is a crucial feature of the human mind. It has been a cultural cornerstone for a very long time.

So our culture arises purely through networks of conversation. We generate all the issues of our time and also the means of dealing with them by conversing together in small groups. It is an awesome responsibility, but also reassuring, to realise that every cultural change up to this point, and everything we will fashion for the future, was born and raised in conversation.

By far the most common forms of conversation take place within small groups of two to maybe eight individuals. In the broader biological sense, we are not helpless victims of mass media or autocratic governments; each of us is potentially a leader of cultural change, albeit through a long process of very tiny steps. Except in the most totalitarian states, for relatively short periods of time, our political ‘leaders’ actually

follow the meanings they pick up from our conversations and do their best to act upon them on our behalf.

The everyday and commonplace business of human conversation is the central element of this, the sixth and penultimate aspect of knowing. Its banality belies its hugely significant role in the operation of our mind. I think of the term, conversation, in a very general sense that embraces all possible kinds of verbal and non-verbal interaction and the entire range of emotional accompaniments. I am also thinking of it as an action in the way Alan Stewart has promoted through his preference for the verb, to converse, rather than the noun, conversation. Participating in conversation includes listening as well as speaking, of course, and the thinking and feeling processes are at least as active in the listener as they are in the speaker.

The central place of conversation for the human mind was foreshadowed very early in this book in the quote from Maturana: 'A human being is a living system living in conversations, where a conversation is ... A coordination or dance of behaviour that has become more complex.' He added that love was instrumental in developing this complexity and subtlety of conversation, because it guides the drift of our languaging-emotioning braid.

### *Different styles of conversation*

There are many different settings in which conversation occurs and these affect the style of the languaging-emotioning interaction. For example, a parliamentary debate in the British Westminster system of government or a session of the United States Senate has certain rules that guide the language and the emotional expression of the participants; they create an adversarial relational space in which arguments can be put and decisions made by voting for or against any idea. In technical matters we have conferences, tutorials and workshops and in all fields of human activity we place great importance on the lecture, which enables someone to speak at length about a particular subject, generally without being interrupted.

Listening to a long lecture taxes the attention span of most people so the emotional and mental engagement will wax and wane and may lapse altogether. Our justice system is a sophisticated form of inquisition where the words and actions of the protagonists are evaluated by independent observers to determine the innocence or guilt of the one who is on trial. Wherever questions and answers are part of the conversation, there is a characteristic relational space that imposes some



emotional weight of responsibility on the person answering the question and confers some power of direction upon the questioner.

We spend much of our time in vicarious forms of conversation, watching and listening to the stories portrayed in theatre, film and television and reading such stories in books. They are stories told by others about others, but they are also our stories; they carry the flow of our thoughts and emotions.

The various networks of conversation that create our culture all stem from the simplest kind of interaction, the chat. Typically, this is when two people are sitting, standing or strolling together, exchanging a few words here and there, which may be pleasantries, comments, questions, answers or gossip, perhaps, if someone else's life sounds more interesting than your own. When three or more people are involved the chat has a different emotional contour because some individuals will have a greater need to be heard than others. In the workplace, much of the conversation is organised into meetings that can take different forms and may include directions and detailed explanations, criticisms, congratulations and camaraderie, but you often find that a chat in the common room was at least as influential as what was said at the formal meeting.

How authentic are these various ways we use our minds to interact? In workplace meetings especially, it's common to find tacit agreement or approval accompanied by rather negative emotional states ranging from a lack of enthusiasm to passive hostility. Some agreement is necessary for the work to move forward, but many of the people involved may be saying privately: this is not the way it should be done.

The blind spot is the assumption that information is being transferred accurately from one person to another. In fact, each participant will know something slightly different as a result of the interaction. Each has learned from it, in that his or her organising idea has changed, but there may be little common understanding, unless there has been an emotional meeting of minds. Incidentally, this is also the way we communicate with animals – by emotional congruence, using words merely as triggers – if we grant them legitimacy through love.

It's hardly surprising there have been many books written about conversation. One called *Intimate Conversations* by Ansari in 11<sup>th</sup> century Persia remained popular for hundreds of years according to the historian, Theodore Zeldin. In his book, *Conversation*, he expressed a desire to usher in the New Conversation that will enhance the next stage of development of the human mind just as the Renaissance, the Enlightenment, and post-modernity did in the past. He noted that 'every new era changes the

subject of conversation' and might have added that it is the conversation that creates every new era. He did say that 'conversation changes the way you see the world and ... changes the world.' He also pointed out that conversation was not about conveying information, but about intermingling minds in a way that transforms them: 'conversation doesn't just shuffle the cards; it creates new cards.'

It was the development of rhetoric that made speech persuasive and enabled it to become an instrument of power. This kind of conversation has figured prominently in our culture for a long time. It meant that winning an argument could be substituted for discovering the truth about any situation. Imposing your will by force of reason can be used to bolster your own self-esteem, get others to do things that suit your life and even empower armies to coerce other communities into obedience to your culture and abandonment of their own.

Specialisation, such as in science, engineering or fine arts, created other ways of elevating yourself into an elite group by using language that others could not understand. Email conversations and telephone texting have brought some new idiosyncrasies into our conversing culture. Smaller family units and specialised work clusters have reduced the breadth of our conversation circles, and Zeldin was advocating more intermingling to provide the 'hybrid vigour' that our culture requires to be healthy.

One of the most influential ideas about conversation came from a group led by David Bohm who pioneered a practice he called dialogue. Bohm maintained that thought is essentially a collective phenomenon, which fits with the biology we've examined here. He noted that most conversations were like ping-pong games in which participants batted back and forth their solidly entrenched ideas and that the word, discussion, was apt because it has the same roots as percussion and concussion.

Through his proposed dialogue 'a new kind of mind begins to come into being, based on the development of common meaning,' Bohm wrote:

People are no longer primarily in opposition ... they are participating in this pool of common meaning, which is capable of constant development and change.'

The word, dialogue, has its roots in *dia*: to go through and *logos*: meaning. Tom Atlee, who founded the Co-Intelligence Institute and wrote *The Tao of Democracy – Using Co-Intelligence to Create a World that Works for All*, is one of many strong advocates for this attempt to improve the quality of conversation.

The many differences between dialogue and debate were summarised by Alan Stewart, *e.g.* debate is rigid, adversarial and single-minded whereas dialogue is flexible, collaborative and creative. Engaging in dialogue, you don't respond directly and immediately to what has been said. Instead, you reflect, invite spaces into the flow of talk, and 'speak to the centre' so as to engage with the commonality of meaning rather than peddle something that is your own personal property.

The essential difference is that debate assumes there is one true explanation of reality that is objectively independent of the human observer whereas dialogue shows respect for the different worlds each of us brings forth and for the unknown itself, wherein lies further meaning, beyond what we may form individually. In dialogue, Bohm said, 'people begin recognising that the common pool is more important than the separate pools.'

Another new initiative is called Appreciative Enquiry, which was described by its creators as 'a new theory and methodology of human development.' The idea is to pose questions together that invoke thoroughly positive images of the past and present and therefore 'ignite the collective imagination' for a better future. It can overcome the background noise of hopelessness to begin a meeting with questions such as 'Who am I?' 'What attracts me to be here?' and 'What do I bring to contribute?'

Alan Stewart is a leading exponent of both Open Space Technology, which was brought forth by Harrison Owen as a liberating alternative to the rigid format of business meetings, and the Conversing Cafe, which Alan developed as a variant of the World Cafe in California. His book, *Time to Converse*, and papers such as 'The Conversing Company' outline the essential features of conversing, several of which are mentioned in the lyrics of my song, *The Conversing Cafe* (at the end of this Chapter).

Based on the biology of mind, people get together, 'not to persuade, but to treat each other well.' The distinguishing feature of this kind of conversation is a relational space that is loving rather than controlling, in which the way of explaining is to hold 'objectivity in parentheses.'

Another essential feature is there are no predetermined outcomes. Instead, there are carefully chosen questions, that act like 'strange attractors' to harness the energy of the intermingling minds. There

Who has the most free will?:

- (1) senior executive,
- (2) ordinary employee,
- (3) freelance poet,
- (4) housewife/mother?

What other questions does this raise?

usually are outcomes, but the real excitement of this conversation comes from the freedom of being authentic and therefore open to the creativity that comes naturally to the human mind when it is free to play with the unknown.

For conversation to be creative, questions are much more important than answers, because answers close off any subject whereas questions open up new directions. The aim is to find a better question than the previous one. Often the starting point is a very limited view compared to the endpoint when the most useful question has been found.

Conversation Cafes have proliferated around the world and there is a Conversation Collaborative that links such bodies as the World Cafe, the Commons Cafe, New Stories, Circles for Change and others. A group called the Cultural Creatives, which boldly claimed to have 50 million adherents in the USA, sees itself at the forefront of what Zeldin called the New Conversation. The National Coalition for Dialogue and Deliberation organises a worldwide Conversation Week in which key questions of an ecological and humanitarian nature are canvassed. One of their questions is: how much is enough – for you – for others?

Whatever you and I say today, in conversing opportunities such as these, contributes something to the culture in which we will live tomorrow. It is human nature for our thoughts and feelings to meet with those of other humans in this way. The word, conversation, derives from words that mean ‘turn together’ – suggesting a dance. It is the playground for our mind.

A different style of conversation operates within those corridors of power where knowledge is seen as the basis of wealth and influence in the modern world. Most companies have ‘knowledge management’ experts and the industry of knowledge management is now larger than many of the industries it serves. This is understandable because people do what they know to do and a person who knows a lot is more effective than one who does not, especially in highly technical pursuits. That knowledge has value is undeniable and its worth will be measured in dollar terms within our culture of commerce. It is more commonly a person with knowledge, rather than a printout, that is being valued and therefore traded, but the printouts can change hands too, wherever there are people who can understand them.

The style of conversation that regards knowledge as a commodity stems from our cultural orientation towards ownership and the trading of commodities as a means of increasing financial wealth. This serves our society reasonably well in that it grows pockets of wealth, at least, and

sometimes, whole communities of affluence, but as I mentioned earlier, it has the biological consequence of creating tension and stress for human beings. The stress stems from the selfish and competitive nature of this kind of conversation, which disturbs the happy playground of the collective mind.

Some stress is unavoidable and even necessary, but it can also become a threat to our wellbeing and survival. This tricky balancing act of the mind is tipped one way or the other by the style of conversation, so it pays to be selective in choosing exactly how we want to converse, rather than simply taking every social situation for granted.

### ***What is knowledge?***

What we call public knowledge is the sum of those aspects of knowing that we generally expect to find in one another within our particular culture. This will vary according to the culture and each individual's expectations, so it is, once again, a personal interpretation. There is a major blind spot in the way we think about knowledge if we regard it as a commodity that is independent of our social relations.

The most common ways of defining knowledge mention awareness of facts about something, acquaintance with information, or familiarity with a subject, although some dictionaries also refer to it as a state of knowing. A related word, understanding, is usually linked to knowledge, but it has an extra connotation of agreement with other's opinions, which could be called a mutuality of knowing. This hints at the importance of human relations in determining what we will call knowledge.

Maturana captured this crucial element by describing knowledge as something we grant to one another, or confer upon another person, in the process of conversing. We attribute it to others whenever we deem their behaviour – be it an explanation or an action – to be appropriate for that situation. They may claim this for themselves by their own observation, but if nobody else agrees, it does not count as knowledge in the collective mind. So knowledge is a gift we can present to others, but never have for ourselves, unless others say so.

Advocates of pure reason, operating without the biological context outlined here, claim that knowledge exists independently of us and may be stored and transferred like other commodities – even appropriated and traded. Thus it is reified; its lofty status is quite artificial. We don't need to do this when we have an adequate explanation of the process that brings it into being.

What we find in libraries of books and on the World Wide Web is not knowledge; it is meaningless information. What converts that into knowledge is the act of connecting with it, carefully and deliberately, to make our own meaning. Knowing arises from doing and the most universal doing is conversing – in the broadest sense of the word. We naturally like and need to connect with people who know and to share our knowing with them. The incredibly rich culture we have today has been hard won and those who follow will have to continue this arduous, yet satisfying, process. Unfortunately, whole cultures of people who knew a lot have been wiped off the face of the earth.

Knowledge has important aspects that cannot be reduced to words or symbols, because it contains something else arising from that interplay between the known and the unknown. This is where insights from the Eastern metaphor of the brow chakra are helpful. Known as the vision centre and the ‘third eye,’ this chakra is named *Ajna*, which means ‘to perceive’ and ‘to command.’ Here, perceiving is not simply the physiological processes of our external senses; it is a more advanced knowing, enhanced by the idea of learning how to see more clearly. What we see, and the depth with which we see it, defines the scope of what we ‘command,’ in that it determines exactly what we do.

The kind of power associated with this aspect of knowing consists of reasoning ability together with an intuitive insight such as is suggested by the ‘third eye.’ Just as the power of will depended, paradoxically, upon surrender to a higher power, the power of mind depends on an awareness of the influence of the unknown. This suggests a spiritual path whereby we strive towards the truth in openness and trust rather than try to capture and contain it at every moment. In the same way that Buddhists say attachments confuse our mind, strict adherence to any one person's viewpoint, or any preconceived ideas at all, are obstacles to progress. It is through detachment, reflection and loving confidence that consciousness expands and we see clearly. While we may believe there is an ultimate truth, we no longer seek to identify it in any individual aspect of human knowledge.

The corresponding element for the brow chakra is light, its colour is deep indigo blue and it is associated with self-mastery and spiritual concentration. The pineal gland, situated at the level of the brow chakra, is known to be highly sensitive to light in that its hormones regulate our photoperiodic (day-night) rhythms. Like sound, which was related to the throat chakra, light is explained as vibrating energy, and it is the ultimate high frequency radiation known to physics. Our faculty of visualisation is

perhaps the most unlimited aspect of our imagination and clairvoyance is said to come from the opening of this chakra.

### ***What is intelligence?***

Intelligence has to do with knowing how to care for your relational space. Its meaning has been severely distorted by an overemphasis on the rational and analytical aspects of the mind. People who score a high Intelligence Quotient (IQ) are clearly better at logical and analytical reasoning than people with a low IQ, but they may not be as capable in other more empathic or creative pursuits. Howard Gardner introduced the idea of ‘multiple intelligences’ to allow for such traits as ‘musical intelligence,’ ‘bodily-kinesthetic intelligence’ and several others, including ‘intrapersonal’ and ‘interpersonal’ intelligence, which referred to our ability to understand ourselves and other people.

More recently we had Goleman’s concept of Emotional Intelligence (EQ), which concerns the functional connectedness between the limbic system (the emotional part of the brain) and the higher cortex where rational thought processes are centred. He proposed EQ as superior to IQ. Since then we’ve had Spiritual Intelligence (SQ) touted by Danah Zohar and Ian Marshall as better still, being more integrative and ‘unitive;’ more ‘suited to solving problems of meaning and value.’ The way we use the term, intelligence, or any other term for that matter, is evolving all the time.

Definitions of intelligence range from the capacity to acquire knowledge and use reason, at one end of the spectrum, through to the capacity for learning, which is closer to the mark from a biological point of view. Maturana pointed the way to a simpler description of intelligence as something like our ability to conduct a conversation or, more precisely, our capacity for consensuality. He described the evolutionary history I’ve detailed here as a gradual expansion of the capacity for consensuality, which was also an expansion of intelligence associated with our larger and more social brain. In biological terms, the most intelligent person is the one who has the most efficacious ‘social brain’ in that he or she participates in the creation of our culture in the most productive and life-enhancing way.

Except for certain specialised uses of our mind such as musical aptitude or mathematical skills, for example, intelligence is something every human being has in good measure. Human minds do not differ all that much in intelligence. To connect socially is something everyone can do, in one way or another, and most people find an appropriate niche in

which their particular languaging-emotioning flow will thrive. How we use our intelligence depends on our emotional state and the emotions that restrict our connectedness will be of no benefit to our intelligence.

Love is the only emotion that expands our intelligence and this has been the case throughout our evolution. You will recall that it is with love we see most clearly and through love we enlarge the niche of our existence by shining more light on a world that would otherwise be in darkness. Blaise Pascal wrote:

‘The more intelligence one has, the more people one finds original. Commonplace people see no difference between men.’

Knowing how to connect with one another is the hallmark of human intelligence.

### ***What is wisdom?***

Wisdom has to do with our ability to see the bigger picture. The value of reflection lies in freeing ourselves from mental chatter to observe the reality of our situation. Loving acceptance of this enables us to recognise more aspects of the larger system in which our living system is embedded.

Viktor Frankl wrote that ‘wisdom is knowledge plus ...’ – in other words, it is ‘knowledge and the knowledge of its limits.’ Respect for our unknowing allows intuitive and creative senses to operate and enliven the playground of our imagination. This is not the same process as understanding a mechanism in terms of simple cause and effect. It’s a higher intellectual capacity – the true power of the mind. It is the nearest we come to grasping the wholeness of our situation or unifying all the realities of our experience into a coherent whole.

Relying too heavily, with hubris, upon the incomplete details of our knowing, we strive to solve all our problems in a technological manner, even though most of them require an emotional and spiritual shift to see them clearly before they can be solved. There is a quote, often attributed to Einstein, but with several variants, that you can never solve a problem with the same manner of thinking that created it in the first place. This is a wise saying because it implies acceptance and surrender (the previous aspect of knowing) as a prerequisite to a more enlightened way of using our mind.

Wisdom appears when we can see, with sufficient depth and clarity, the interconnectedness, not just of our own living system, but of the larger system in which we exist. Its essential precursor is an attitude of



love towards all of this. In such a state, our knowing and our actions will be as harmonious and integrative as they could be at that time. This is a systemic kind of knowing. The people promoting Spiritual Intelligence said it had the special property of transforming the situation rather than being bounded by it.

We recognise wisdom as standing back and taking into account the coherence of the entire system; using the highest faculty of mind, which is to see as much as we can of the wholeness of the situation. We cannot see the whole in its entirety, for that would be a denial of the unknown. We don't have to explain how the whole works in terms of causal mechanisms. But, in humility and honesty, we can behold everything with wonder and joy because we are aware of and respect its unknown aspects.

It is not at all strange that wisdom is often playful, seeking the simplicity of wholeness, rather than complication. The human mind knows nothing greater than the joy that goes with wonder. There is no better use of the mind than in love and play, which Maturana called 'the forgotten fundamentals of humanness.'

So wisdom, intelligence and knowledge are often misconstrued, to our social detriment, because we reify them rather than seeing them as natural consequences of the biological process of the human mind.

The blind spot regarding knowledge is that we don't notice how important our conversation is. We rarely give credit to conversing for the way it changes our culture, so we unwittingly help to perpetuate negative drifts through idle talk and we tend to underestimate the value of persevering with respectful, loving conversation. We don't make much effort to create the conditions that promote healthy conversing as distinct from other forms of social intercourse (arguing, debating, discussing, *etc*). We tend not to notice that we change what we think by what we do – and what we mostly do is converse. We know as we do – in the process of conversing.

In the next Chapter we will consider the final aspect of knowing, the experience of spirituality, which takes us beyond the realm of scientific explanation.

***THE CONVERSING CAFÉ\****

I talk to people at work every day  
And I'm affected by things that we say  
We talk for power or self preservation  
Winning the argument, justification  
Needing agreement to guarantee outcomes  
Separately having our way

I long to be able to speak without fearing  
Trust and belong as a part of the whole  
When we're conversing we're working together  
Not just our minds but our heart and our soul

**For I've seen the sparkling eyes  
I have felt that connection  
We came together not to persuade  
But to treat each other well  
In this together whatever we say  
At the Conversing Café  
In this together whatever we say  
At the Conversing Café**

CONTINUED

Talking and listening we do every day  
Cultures created by all that we say  
Speaking oppression, how heavy the heart is  
Lightness and laughter are not just for parties  
Speak without needing the answer you wanted  
Let out your spirit to play

So we are able to speak without fearing  
Trust and belong as a part of the whole  
When we're conversing we're working together  
Not just our minds but our heart and our soul

**Chorus**

\* written for Alan Stewart



# CHAPTER 15

## Spirituality and Mindfulness

### *unknowing, imperfection, insecurity and meditation*

Simplistic self-satisfaction is like a mirage in the desert. To want it desperately makes it an illusory experience; we never reach what seems to be in view. Our will to control does not work sufficiently well because there is no simple cause and effect. Instead, our intelligence and wisdom come from relating to the larger system and being aware that not knowing affects our experience; it generates many of our feelings – the so-called subjective aspects of our knowing. This relocates our sense of self from the centre of our world, where it resides in the most primitive form of knowing, to another, more humble, place within the larger scheme of things, as one of many.

Self-transcendence is the form of knowing that leads, paradoxically, to the greatest self-satisfaction. To put it bluntly, if you can forget yourself, you will feel better about yourself. This phenomenon has traditionally been explained within the context of religious belief, but nowadays many people are trying to explain it scientifically as well. My preference is to let it be part of the mystery, but, at the same time, to explain those aspects of our experience that are affected by it. Our experience of knowing is, recognisably, both physical and spiritual.

The journey to this seventh aspect of knowing has taken us from the known to the unknown – from scientific explanations of sensory perception to subjective emotional experiences such as awe and wonder, which have more to do with what we don't know than what we know. In keeping with integral philosophy, it was our goal to amalgamate third-person and first-person story-making – to seek that 'higher synthesis' of the objective and subjective aspects of our experience.

At no time could we have ignored the unknown. A description of our sense of hearing, for example, could not be confined to the process of registering sounds. When applied to music, it included a sense of the melody and flow of our experience; the idea of holding onto an essential thread of meaning while venturing down an unknown path. Because music exists, we know that the visible and the tangible can't be all there is to our experience.

The fact that our brain process can't distinguish between what is real and what comes from our highly creative imagination also insisted that the mind must embrace the unknown. Given that perception is both sensory and non-sensory, intuitive feelings are a major part of our experience. In fact, there is no thinking without feeling.

We discussed the sense of wholeness that seems to be a human yearning, borne out of the feelings of separation we necessarily experience. Authentic wholeness is not apparent to conventional science because the scientific method is like the judge who compels the witness to answer the questions he himself has put, so it isn't open to seeing a bigger picture that it did not ask for or expect. The authentic whole can't be reduced to its parts because it isn't the sum of those parts, *i.e.* it isn't secondary – it was always there.

So we are looking beyond science to describe the experience of mind that reaches furthest towards the unknown. Science is not the only valid form of explanation, of course; the responsibility for validating any explanation always rests with its receiver.

### ***What is spirituality?***

Spirituality is not necessarily associated with religious practice. It is a word that points to the way the unknown affects our experience of life. Process philosophy refers to the wholeness of our experience – how we see things, what we feel about them and what we know intuitively as well as semantically. William James noted the difference between knowledge about something and knowledge of something in *The Varieties of Religious Experience*. Henry David Thoreau said he could see something more clearly when he went beyond understanding it.

The human mind naturally transcends the everyday experience of our immediate worldly connections to invoke a higher order of existence, making a special kind of meaning in which we are a part of something bigger than ourselves. Not to do this is Bateson's 'epistemological error' that has caused so many of our problems because it leads us to pit

ourselves against something – us against them – instead of taking responsibility for being a part of the whole.

The old idea that the spiritual realm was just another order of reality was based on pragmatic experience; the lack of scientific explanation was not an issue. Today, many writers place science and religion in opposition to one another, saying they are mutually exclusive versions of reality, whereas, in biological terms, they are not that – they are simply two different ways of bringing forth an individual's experience.

Amongst the many neuroscientists trying to find activity in the brain that would explain all aspects of the mind, there are some who have tried to relate spiritual experiences or God-consciousness to biochemical or electrical changes in specific brain regions. This is an understandable attempt to fill the void of the unknown with something known – a scientific explanation – but finding out that God lived in your brain might not be the best answer to the questions we have about knowing!

Philosophers have always exercised their right to explain these sorts of things. Metaphysics refers to what is beyond the reach of scientific explanation, nowadays, but that was not always the case. It was only the arrival of the modern scientific method that gave what had been called natural philosophy its empirical and experimental basis, which eventually distinguished science from philosophy.

Philosophy makes clear the distinction between determinism – whatever happens is causally determined by prior occurrences – and free will, which refers to rational agents exercising control over their actions. I have addressed this from the perspective of our experience, where it is our ability to embrace the present moment in a respectful relationship with a larger unknown that provides us with our experience of free will.

The premise that we are only explaining our experience places a limit on our knowing – a limit that does not apply in philosophy. This means our deterministic explanations are inevitably incomplete, so we are left, in the end, to simply wonder at the mystery that remains. Those who want to eventually know the mechanism for every single aspect of life are assuming a role for the human mind that is inappropriate. If we knew it all, there would be no life as we understand it now from our experience.

Spirituality is acknowledged as the seventh aspect of knowing simply because our experience of knowing is affected by what Rudolph Otto called the numinous, meaning the 'wholly other.' The word, numinous, derives from the Latin, *numen*, which originally meant 'nodding' and was associated with obedience to a higher power of some sort. The idea of obedience developed from the word, hearken, which means to listen carefully and take heed. Otto described the way we try to

make sense of these unfathomable aspects of our experience as a '*mysterium tremendum et fascinans*' – an awesome fascinating mystery.

### ***The cloud of unknowing***

In the 14<sup>th</sup> century, the time of Chaucer, religious writing in English was thriving. Much of it was concerned with the nature of Jesus Christ and the Passion, but one book, *The Cloud of Unknowing*, came from a different mystical tradition. It evoked a transcendent God who was completely beyond human understanding.

Its theme was contemplation, which was not new, but was now taken to a new level. The ultimate aim of contemplation was union with God, e.g. 'Here begins a book of contemplation called The Cloud of Unknowing in which a soul is made one with God.' The obstacle to achieving this was seen to be the capacity of the human mind for knowing. One sentence from the book sums it up: 'The Godliest knowledge of God is that which is known by unknowing.'

The extraordinarily contradictory nature of this argument has made this work one of the most famous and intriguing examples of the deep paradox that lies at the heart of spirituality. The most recent translator of this book concluded that:

'the very features that make the *Cloud* author's work dangerously self-contradictory are precisely those that are essential to its meaning.'

This way of thinking had already been christened *via negativa*, which means the way of negation. It called for intense contemplation, stripped of thought and motivated entirely by love. At its heart was the belief, paraphrased by a modern scholar, that 'love is the highest cognitive power, far superior to the powers of reason and intellect.' The author of the *Cloud* did his utmost to show that language was a barrier between the soul and God, a hindrance to his own efforts, and a futile tool with which to achieve the union with God; and he did this using some of the most powerful prose ever written!

If you delight in paradox this is fun and you will appreciate the mind as a playground, but if not it will be nonsense. My story tells of a playful, humble, mind, open to the idea that love alone may be limitless. Of all the aspects of mind that are so clearly limited, this seventh aspect represented by the crown chakra may be whatever lies beyond, and is pointed to, by love.

In the *Cloud*, love was the antithesis of knowing and the ultimate in not knowing. In my story, love is the central core of the continuum



between knowing and not knowing. If we allow this continuum to join up with itself in a circle, the end becomes the beginning and we ‘arrive where we started and know the place for the first time’ as T. S. Eliot famously wrote. The seven aspects of knowing are represented in a circular form as a seven-pointed star in the Coda at the end of this book.

In the Eastern tradition, the crown chakra has violet as its colour and is described as knowing or awareness that has no locality in time or space. It represents omnipresence – being everywhere and through all time – and is therefore a connecting point with some higher consciousness that is beyond the normal time- and space-bound operation of the human mind. It is also a thousand-petaled lotus. If each chakra represents a certain level of order or organisation, this last one points to the cosmic order – a level of organisation we can only acknowledge, but never achieve ourselves.

### *The need for imperfection*

The limited nature of our mind is an essential condition for life because, if we knew everything, or knew nothing, our living would have no driving force. This means that spirituality involves seeing ourselves, paradoxically, as imperfect beings and discovering it is through this imperfection that we find serenity, peace and true satisfaction.

It has been said in many ways that we become aware of our spirituality through our wounds and our weaknesses rather than our successes. Meister Eckhart wrote, nearly 700 years ago: ‘to get at the core of God at his greatest, one must first get into the core of himself at his least.’ But this is not the same as thinking badly of oneself. Humility comes from knowing and accepting our limitations, not from exaggerating or minimising them. Dag Hammarskjöld wrote: ‘Humility is just as much the opposite of self-abasement as it is of self-exultation.’ Our imperfection has been a help, not a hindrance, in developing the social brain and evolving the capacity to love that constitutes the human mind.

Some telling examples of the practical benefits of ‘the spirituality of imperfection’ were described in a book of that name by Ernest Kurtz and Katherine Ketcham. They said the yearning to be united – a ‘root sense of connectedness’ – is fundamental to being human because ‘that connectedness is lost, missing or wounded.’

They cite Alcoholics Anonymous as a prime example of people re-connecting in a life-giving way by telling and hearing one another’s personal stories about their addiction and recovery. There is no better way for

humans to connect meaningfully than through storytelling because that is the very nature of our mind and brain. Kurtz and Ketcham wrote:

‘Stories are the vehicle that moves metaphor and image into experience. Like metaphors and images, stories communicate what is generally invisible and ultimately inexpressible ... allowing us to see reality in full context, as part of its larger whole ...’

They also told how identification in one’s fellows of the very weaknesses we recognise in ourselves, generates a kinship of common imperfection. Identification leads to a manner of following one another, but this isn’t merely imitation; it’s an empowerment through community. There is ‘obedience’ to a higher cause, simply through ‘listening and taking heed.’ This need to share humbly with one another has been a driving force in our evolution. Spirituality flourished in communities that had sufficient honesty and humility to acknowledge imperfection. Even if it’s discovered in solitude, spirituality can only be fulfilled in community.

It’s as if we are looking for something we have lost and we find it when it is being looked for in us by someone else. There is a story about a lost child for whom people had been searching for a long time who called out, as her father came running to her: ‘I found you.’ What we obtain from one another is some essential meaning for our own story and the realisation that one’s knowing develops, not through being told what we must do, but by hearing what others do, taking heed, and then doing something ourselves. If you bring your body, your mind will follow or, as William James put it, you can ‘act yourself into a new way of thinking.’ Spirituality is a practical pursuit; it is not a theory. Our mind approaches it imperfectly, yet draws from it great strength.

### ***The wisdom of insecurity***

One of the most widely read writers on spirituality around the middle of the last century was Alan Watts and one of his books bears the title above. He said it was ‘a message for an age of anxiety’ and drew attention to the human consciousness of time as the main source of mental suffering and pain. Describing our inability to accept, graciously, the uncertainty contained in the ‘marvellous present moment,’ because we dwell on what we think we know from the past, he wrote:

‘The more we accustom ourselves to understanding the present in terms of memory, the unknown by the known, the living by the dead, the more desiccated and embalmed, the more joyless and frustrated life becomes.’

What he advocated was to enjoy the mystery and approach the unknown with a sense of wonder. Again, his own words deserve to be quoted in full:

‘Steadily [one] approaches the point where what is unknown is not a mere blank space in a web of words but a window in the mind, a window whose name is not ignorance but wonder. The timid mind shuts this window with a bang, and is silent and thoughtless about what it does not know in order to chatter the more about what it thinks it knows. It fills up the uncharted spaces with mere repetition of what has already been explored... If we are open only to discoveries which will accord with what we know already, we may as well stay shut.’

Eugene Stockton called his book, *Wonder: A Way to God*. Even the great Goethe said: ‘The highest to which man can attain is wonder.’ The allegorical writer, Ursula LeGuin, wrote: ‘the only thing that makes life possible is permanent, intolerable uncertainty; not knowing what comes next.’

So my conclusion, which I know is sorely contradicted by my efforts, is we do not need to explain spirituality in any rational way. As Kurtz and Ketcham put it, ‘... spirituality slips under and soars over efforts to capture it, to fence it in with words.’ When asked to explain Lao-tzu’s dictum: ‘those who know do not say; those who say do not know,’ a teacher replied to the effect that you know the fragrance of a rose, but can you put it into words? Spirituality is like the wind; it can’t be seen, but we experience it, nevertheless. We know it is powerful; we feel its presence and see it affecting other things around us, but it remains beyond our possession or control.

The love and worship of false idols that seem immediate and real is our most common form of blind spot. This includes romantic attachments, material things and reliance on technological solutions to try to solve what are essentially emotional and spiritual problems. The selfish hubris that tempts our human mind to worship what we know and demean the unknown has created a fiendishly complicated world that only illustrates more clearly the life-threatening consequences of a lack of spirituality. Saint Gregory of Nyssa said, in the fourth century:

‘Concepts create idols; only wonder comprehends anything. People kill one another over idols. Wonder makes us fall to our knees.’

*The value of mindfulness*

If we are leaving the ‘information age’ behind, as I suggested, what kind of new age will gradually take its place. The paradigm of information transfer is far from dead, but it is slowly giving way to a more mindful attention to the kinds of connections we need to make. Chatterjee said we are in a transition period – the ‘age of attention deficit.’ As we realise the crucial need to attend to the connection ahead of the content – to value the quality of the relationship rather than the goods it may entail – we will come to emphasise different behaviours, which strengthen our humanity rather than weaken it.

Behaviours that result from the misplaced emphasis on information include faster and faster scanning of letters, newspapers, books and television and a fervent desire to remember details rather than simply experience what we are seeing. Hearing as a means of knowing has fallen further behind, because looking is more proactive and therefore better suited to the urgency of the task of acquiring information.

There are telling signs that this increasingly frantic quest for information has passed its saturation point. The World Wide Web made it obvious there is so much information one could never expect to tap more than a tiny fraction of it. The stress said to be due to ‘information overload’ has become a deterrent for many people who are overwhelmed by the demands this culture makes on us. An example is the proliferation of notices in public places to warn of even the most improbable dangers, or prohibit smoking, or dogs, or whatever it might be. There are so many of these our mind pays little attention to them.

Attention deficit is a widespread problem today. An increasing number of children and adults are being treated for various Attention Deficit Disorders, often including hyperactivity and causing social disruption and difficulties for parents. Educators are concerned about the ability of many children to maintain their concentration or hold a train of thought. The creators of television content and film have responded to our shorter attention spans by speeding up their scene changes.

Faster reaction times have some advantages, particularly where we interact with technology. So many of us are keyboard operators and screen watchers today, which requires skill and concentrated effort, whether you are a serious gamer, an anxious email reader with an overflowing in-box or simply a customer pressing buttons at the shop counter.

We know the evolution of our mind follows the path of all the connections we make with one another and with the world and so our

interaction with electronic machinery is shaping the human mind quite forcibly today. This will equip us to handle more and more complex technology, which may have many benefits as well as some obvious dangers.

One consequence is that respect for the unknown tends to shrivel up in the bright light of our spectacular successes. We tend to think we know it all and can control any situation; at least until something bad happens to awaken the deeper aspects of our mind. This sharp-edged concentration on working with our machines is a rather specialised use of our mind where agility is more important than depth. Speed of thought has become the flag bearer for the ongoing march of development of the human mind.

But thinking is a double-edged sword. Eckhart Tolle wrote in *The Power of Now* about his own sudden and dramatic realisation that he and his thoughts were not the same thing. When people asked Tolle whether he could give them the serenity he seemed to have found after his experience, he set about trying to explain it in a series of books, despite also saying to them: 'You have it already. You just can't feel it because your mind is making too much noise.' The paradox of spiritual teaching is evident here again; also the biological impossibility of a direct transfer of meaning.

Mindfulness must include the stillness that is found beyond thought. The thinking aspect of mind, from which we gain so much, can also be destructive when it is master and not servant. The ego and all forms of self-will identify themselves through thought and pass themselves off as the essential nature of your being, whereas they are only constructs of your mind, formed through the connections you have made. By discovering an inner space you become aware of the machinations of thought and your 'pathological ego' and see them in the context of their playground, as friendly allies rather than controlling agents.

Defining yourself through thought is the most common way of limiting yourself. Hence, mindfulness – the fullest expression of your mind – involves more than thinking about what you already know. Honouring the unknown unlocks the human mind's potential. Tolle wrote: 'If you can be absolutely comfortable with not knowing who you are, then what's left is who you are.'

A common example of mindlessness is to be trapped by categories and the distinctions we made in creating them. Rigidly adhering to rules or structure is not compatible with being mindful because you are unable to see the present situation clearly. William James explained that we substitute a conceptual order for the perceptual order of our experience.

Freud added that new concepts both simplify and falsify what we are talking about, so the trick is to know when the rule does not apply.

Another example of mindlessness is to respond automatically to repetitious circumstances without pausing to think. Confusion about context is also a common way of misusing our mind. This is nicely illustrated in the story of the ugly duckling who was really a young swan and who was despised by ducks and even by a hunting dog, but eventually found acceptance amongst her own kind. Eliza Doolittle became beautiful as 'My Fair Lady' when she was taken off the London streets and her speech and clothes were redesigned.

Ellen Langer pointed out that mindlessness diminishes our self image and wastes our potential. There is a psychological phenomenon known as 'learned helplessness' that exemplifies this. In contrast, mindfulness includes creativity and an orientation towards process rather than outcome. She referred to a 'creative uncertainty' that leads to ingenious solutions such as using an object for a completely different purpose, *e.g.* a drinking glass for a pencil holder. The metaphorical structure of our knowing has been a great help to us.

Like spirituality, mindfulness is best known by doing it rather than explaining it. One of the best known exponents of mindfulness as a therapeutic practice is Jon Kabat-Zinn. He aimed to open our eyes to this by honouring our blindness, citing Homer's *Odyssey*, supposedly written some 800 years before Christ, in which it is a 'blind seer' who gives the most crucial advice to Odysseus. Kabat-Zinn wrote:

'Homer seems to be saying that real seeing goes way beyond having functional eyes. In fact, functioning eyes can be an impediment to finding one's way. We must learn how to see beyond our own habitual and characterological blindnesses ...'

For Kabat-Zinn, mindfulness goes hand-in-hand with meditation. The essential benefit of this he explained in terms of an ancient story about the origin of shoes, which I can paraphrase as follows. A princess, while out walking, had stubbed her toe on a root sticking out of the ground. The prime minister's desire to appease her, and the king, knew no bounds and he felt the entire kingdom should be paved in leather to prevent this from happening again. But he knew this was impracticable, so he suggested that pieces of leather be attached to the bottom of her feet, which would have the same effect. The story ends: 'The princess was well pleased with this suggestion, and so shoes came into the world, and much folly was averted.' Our minds are often 'stubbed' in daily life, but we can wear our own protection rather than try to impose our willful

prejudices and judgments on the rest of the world to try to get relief. The best protection for our mind is some form of meditation.

### *The practice of meditation*

There are many definitions of meditation ranging from ‘stilling the fluctuations of the mind’ to ‘the ability to direct the mind exclusively towards an object and sustain that direction without any disturbance.’ It’s said to help us understand ‘we are not the masters of everything we do’. The Eastern tradition identified obstacles to perception such as attachments and insecurity. Having an object of meditation draws the mind away from these obstacles towards a clearer perception. The first and foremost object of meditation is the breath. Working with the breath takes many forms, but their common basis is simply paying attention to your breathing.

The benefits of breath work are now widely acknowledged in Western medicine, particularly with regard to chronic stress-related diseases. Andrew Weil, who pioneered ‘integrative medicine,’ said the general aim is to make one’s breathing deeper, slower and more regular, which will be associated with a smoother operation of mind and of all physiological processes. When you are angry or upset, your breathing becomes more rapid, shallow and irregular. Telling yourself not to be upset doesn’t help, whereas attention to breathing alters your physiology immediately. The cycles of your breathing affect the rhythms of your mind.

Perhaps the most interesting biological implication of being aware of your breathing is that it integrates two completely different neural networks – the voluntary and the involuntary nervous systems. The action of breathing is unique in that it can be performed both consciously and unconsciously – we can attend to our breathing or we can ignore it. Bringing the voluntary nervous system to bear on the involuntary nervous system, either by following or directing cycles of breathing in a respectful fashion, affects vital subconscious processes throughout the body.

Many common disorders such as high blood pressure involve an overactive sympathetic arm of the involuntary nervous system. Chemically suppressing the sympathetic nervous activity has unwanted side effects whereas breath work simply stimulates the parasympathetic nervous system to restore a healthier balance.

Meditation is also a way of diverting your attention from the physical to the non-physical aspects of your world – from the known to the unknown. The breath is our most obvious way to open channels between the conscious and the unconscious mind; it’s a practical

alternative to the way psychotherapy gains access to the unconscious. You can experience breathing in your mind and in your body, uniting these two.

Very different spiritual traditions all focus on the breath because, in many languages, the same word is used for spirit as for breath. Our word, spirit, comes from *spirare* (to breathe). Weil referred to breath as the animated, non-physical, aspect of your being, so when you focus on your breath, you see your spiritual self. When alcoholic drinks were first distilled, this substance was called ‘spirits,’ meaning it was the concentrated essence – the power without the extraneous matter.

Even though it consists of inhalation and exhalation, the breath cycle has no beginning or end; it flows on as it goes back and forth. The mental component of breath is a sense of rhythmic expansion and contraction, like the rhythm of life and the cycles of nature over which we have no control, but within which we can assert our autonomy as autopoietic beings. It’s a safe haven for our consciousness within the larger scheme of things where we find respite from our thoughts.

Programs such as the ‘mindfulness-based stress reduction’ regime of Jon Kabat-Zinn include lying, sitting and walking meditations, often with spoken ‘guided imagery’ and musical accompaniment. Independent researchers found this program reduced subjective states of suffering, improved immune function, accelerated rates of healing and enhanced relationships and wellbeing.

The seventh aspect of knowing refers to our attunement with those aspects of the world and other people that we cannot know with thoughts and words. The ultimate connection might be described as the best attunement, which would still not be stress-free, as we shall see in the next Chapter, but would be life-promoting rather than life-negating. In mindfulness we form the basis for our attunement with the world through an inner attunement with ourselves. From a neuroscience perspective, Dan Siegel, proposed that mindfulness is ‘a kind of personal attunement that promotes love ... A form of self-relationship’ and he thought this may be the mechanism by which it promotes wellbeing.



# ***DRIFTING***

*We lay down our path and our path draws us onward*

I hear the singing that streams through the valley

I hear the merry voice calling

I see the dark clouds that drift o'er the mountain

I feel the gentle rain falling

How do I know that their call is for me?

Or where the path goes when the path is so free?

I know the music that flows through my forest

For I sing the song that is calling

**Drifting here and there I go**

**Only drifting can I know**

**Over the mountain and down through the valley**

**Drifting toward my calling**

You do and I do and I know and you know

Two lonely voices are ringing

Where is the harmony given by nature

For the duet we are singing?

Where is the dancing, the movement so free?

There in the calling - the drifting - for me

When all the people join hands in the forest

There will be love in our calling

**Chorus**

We hear the singing that streams through the valley  
We hear the bright voices calling  
We see the dark clouds that drift o'er the mountain  
We feel the gentle rain falling  
Now we are joined, 'tis a chorus we hear  
The calling of love is the absence of fear  
We know the music that flows through the forest  
For we sing the song that is calling

**Chorus**

# CHAPTER 16

## The Meaning of Stress

*coherence, flow, short circuits and your personal coach*

Stress is a word we use quite often, but we rarely use it kindly. A few people say they enjoy stress, but for most it has a negative connotation, which is not surprising because prolonged or severe stress often leads to serious ill health. Stress may not be the sole cause, but it's thought to be a contributing factor. Many diseases of the cardiovascular system, the digestive system, the immune system and, for that matter the mind, are said to be stress-related. Stress is believed to weaken the body's defenses against infectious agents such as viruses that cause the common cold.

A Canadian doctor, Hans Selye, coined the term, stress, in 1936 to describe a 'general adaptation syndrome' he first observed in rats that were physically stressed by strenuous exercise and exposure to cold. They developed stomach ulcers, their lymph glands shrank, indicating a problem with their immune system, and their adrenal glands became enlarged. This effect on the adrenal glands soon became the typical diagnostic feature of stress; it's often measured as a rise in the blood levels of adrenal stress hormones.

Selye's definition of stress was so general it was not taken seriously for quite a while. He said stress was 'the non-specific response of the body to any demand.' In other words, the normal coping mechanisms whereby a living system adapts itself to its environment are also a potential source of damage to the system. If the system becomes overloaded or its coping reserves are exhausted, the internal processes that are usually life-sustaining become life-defeating.

It was the bemusing circularity of the meaning of the word, stress, which intrigued me from the beginning, becoming a lifetime research interest and the driving force for me to develop most of the ideas

outlined in this book. It seemed that stress was a necessary life force which could also cause problems, yet it was also the living system's way of responding to that force; it was both a cause and a consequence.

This can be sorted out, of course. The crucial elements of stress are (1) the stressors, which trigger (2) the responses and result in (3) the stressprint, which is the residual effect within the living system. I coined the term, stressprint, in my research. The broader issue of the remediation of stressprints is not covered in this book because I want to consider stress from a salutogenic rather than a pathogenic point of view, *i.e.* the emphasis is on how we stay healthy rather than what causes disease. The term, salutogenesis, comes from the medical sociologist, Aaron Antonovsky, and refers to the origin of wellness (*salus* = health), as distinct from the origin of disease.

### ***How does stress occur?***

When we become aware of stress, what has happened to bring about this state of affairs? This is a more useful question than to ask: what is stress, because we are not pinpointing the stressors, the responses or the stressprints; we are looking at the process itself. What has happened is the relationship between the living system and the medium in which it exists has gone awry. There is a mismatch of some kind, so the relationship is discordant, not harmonious – strained rather than comfortable. To put it very simply, as told in my musical play (*Stress: the Musical*), stress is a 'disagreement between your insides and your outsides.'

The ultimate attunement of complete connectivity can never be achieved, of course, so a living system is constantly under some stress. When the first living system appeared it closed itself off from direct correspondence with its medium and became self-governing. That autonomy is the first aspect of knowing. It ensures there will never be perfect equilibrium between our insides and our outsides for as long as we are alive. And neither inside nor outside stands still. Rest and recuperation, achieved by lying low or choosing a benign environment, can't be sustained for too long. Boredom is stressful, too, because our minds and bodies, and our world, are always moving.

No matter what the stream of changes in the outside world may be, the living system has to keep in touch with these if it is to survive. This is what Maturana and Varela called the 'conservation of adaptation' and it points to the second aspect of knowing – the need to be connected. Biologists rejoice in seeing the way organisms adapt to their environment. When we see overt signs of stress we are seeing

the limitations of this adaptation process. We see grasses curl at the tip due to lack of moisture in the soil, leaves and flowers wilt when the sun is too hot for them, and thirsty or starving animals become increasingly desperate for water and sustenance. They are experiencing a severe form of stress. Their internal system requirements are not being matched by external circumstances and they are having difficulty correcting this imbalance.

As a human being you can take great solace from your ability to adapt, but you also know you aren't going to be comfortable all the time. Even when you make yourself comfortable you know it won't last and you'll need to change something quite soon to optimise your adaptation. To be thirsty or hungry is to experience a very obvious form of stress and many of us are fortunate enough to be able to correct this situation quite easily.

But most of our common experiences of stress are far more subtle and we are often unsure what to do about them because we don't see how the mismatch occurred. We forget it's our process of connection with the world around us that enables us to be comfortable. Understanding that this connectivity is our stress-regulating valve – and also our stress-indicator gauge – helps us to know what to do.

### *Using stress as your coach*

Since stress is a natural side effect of being alive, with the mind we have, it makes sense to view it as an asset rather than a problem. In fact, awareness of stress can be a very useful attribute of our mind and one of our most valuable guiding lights. Angus Jenkinson called it our 'life coach.' His concept of stress was the more typical way of speaking about it in terms of the ratio of demand to capacity, and he wrote: 'Each time I experience stress it is a signal to reduce the pressure or develop increased capacity.' This often-heard 'solution' to stress problems sounds simple, but it's very hard to achieve in practice unless you appreciate the connectivity aspect of your mind.

The imbalance between demand and capacity occurs when the connection between you and the world is weakened or blocked. It is the flowing nature of the mind as the agent of connection that regulates stress in our lives. Here we are talking about everyday stress rather than some extreme overload of your system in which the subtleties of mind and the connection process would be irrelevant.

Jenkinson described stress as being 'out of tune' with yourself and the world and we know that attunement depends on the kinds of connections we make. In the simplest possible terms, the cause of

everyday stress is separateness and stagnation and the solution is connectedness and flow.

Just as the first and second aspects of knowing are basic elements of stress, so is the proactive nature of our perception, which is the third aspect of knowing. What I perceive to be a stressor and what you perceive to be a stressor may be quite different. This bedevils all research on stress; some of my animals were not stressed at all when others were quite severely stressed by the same situation. Happy people and unhappy people do indeed live in different worlds. Failing to take responsibility for bringing forth our own world is a common cause of stress. Once we blame the world for the way we see it we lessen our chances of understanding the meaning of stress.

We all know from experience that the trials of life can also be gifts and the unpleasantness of stress nearly always contains some benefits. Viktor Frankl wrote in *Man's Search for Meaning* about prisoners of war:

'It is often just such an exceptionally difficult external situation which gives man the opportunity to grow spiritually beyond himself.'

What Joseph Campbell called the Hero's Journey is typically a story of being awakened to a task, probably refusing that task until forced into it, and then experiencing growth, like a rite of passage, through which our mind acquires new dimensions. This maturation of our mind owes a great deal to the existence of stress in our lives. And to use stress as a coach requires a certain attitude that strives to find its meaning and work with it rather than oppose it.

This doesn't mean excessive stress should be encouraged, as a martyr encourages persecution; stress should be welcomed, but not worshipped. At low levels the stimulation will be beneficial, but there are critical levels at which the living system starts to fail and remedial action is needed. These critical points are hard to determine even though we can measure stress responses. More research is needed to show which changes in the biochemistry of the immune system or the heart muscle are the crucial signs of danger. By the time disease symptoms appear and blood test results become diagnostic, much damage has already been done.

The salutogenic approach is to maintain wellness by using small changes in the level of stress, regularly, as guide posts – subtle elements of knowing that point our doing in the right direction. Rather than perceive stress negatively, we can be thankful for it and attentive to it every day. This is part of the developing culture of awareness and attention.

The early signs of stress include being restless, irritable and discontented, a lack of laughter, play or wonder, self-criticism, judging of others and all those emotional states that weaken or shut down our connections with one another and the world. This is where the fourth aspect of knowing – our emotional state that determines our relational space – comes into play. The key to managing stress is to realise that each sign of stress is an invitation to connect differently and this involves the emotional mind.

A stark example would be the challenge of being verbally abused by someone you regarded as a friend. Fear and anger produce narrower, less open and more sharply focused connections, so the level of stress will rise. If you can draw strength from an emotional state of love, the relational space will be vastly improved and the level of stress will fall. The old maxim ‘love your enemy’ has a strong biological foundation. Jenkinson said that ‘love becomes a path from stress to strength and on to serenity.’

Many other examples stem from our consciousness of time. If I’m not attending to the present moment, the memories or wishes that occupy my mind will diminish my connectivity with what I’m doing and produce stress. And, I will not be aware of this growing stress unless my mind has developed its capacity for acceptance and surrender, and subsequent reflection, which is the fifth aspect of knowing.

Attention to the present moment is the most crucial single behaviour for managing stress. I like the reminder from Kabat-Zinn: ‘you have only moments to live.’ And Nadine Starr, at 85, said with regard to moments that she would try to have more of them next time around – in fact she would try to have ‘nothing else but moments.’ To bring yourself into the moment, the most powerful ally you have is your breath. Simply thinking of your body is the best way to start because it’s already here and now; your mind might follow suit.

In the Hebrew language, health and vitality is signified by the letter *Chet*, which is a combination of two other letters. One is *Vov*, which refers to our relationships with people and the other is *Zayin*, which refers to our relationship with time. These are the two most important elements of stress management. Not doing – just being – is something most of us have to practice if we want to be comfortable with the stress that relates to time.

Using stress as your coach draws on all seven aspects of knowing. Without the sixth aspect, your knowledge of this delightfully double-edged sword that living systems wield would be incomplete. Without wonder, playful paradox and some spiritual humility, you and I might take ourselves too seriously – the cardinal sin!

*Sense of coherence*

We make meaning by making connections and meaning is dynamic – never static. There is a flow of meaning within our brains and bodies that is contingent upon healthy connections both within and without. The common blocks or breaks in this flow cause discomfort that we usually call stress. This hampers our ability to make meaning and, when the meaning is not clear, our system begins to fret. Carried to extremes this makes us sick – the discomfort becomes disease. Our aim is to contentedly make meaning in every situation. Although we never achieve this completely, assuming this orientation is the way we maintain a healthy, rather than an unhealthy, experience of stress.

A sense of meaning is another way of describing the holistic aspect of knowing. Integration of thinking and feeling works better than too much attention on either because the emotional centres in the limbic system remain connected with the higher cortical centres in the brain. Habitual reliance on language-based, computational, kinds of thinking (left brain) without complementary exercising of visual imagery and artistic senses (right brain) reduces connectivity, and hence the sense of meaning that we obtain and this will contribute to stress.

This is because logic and meaning are not the same thing. Viktor Frankl regarded the ‘will to meaning’ as a ‘primary force of life’ and he created a branch of psychology called logo-therapy, the name coming from the Greek word, *logos*, which denotes meaning and, incidentally, also meant spirit. Noting that man is self-determining, he wrote:

‘The ultimate meaning necessarily exceeds and surpasses the finite intellectual capacities of man; in logo-therapy we speak of it in the context of a supra-meaning. What is demanded of man is not, as some existential philosophers teach, to endure the meaninglessness of life; but rather to bear his incapacity to grasp its unconditional meaningfulness in rational terms. *Logos* is deeper than logic.’

He maintained that mental health is always associated with a degree of tension; if we recognise this stress as the quest for meaning we see the way towards good health.

The inventor of salutogenesis, Aaron Antonovsky, proposed that the key factor in wellbeing is a person's ‘sense of coherence’ (SOC). He defined SOC in a rather wordy fashion as:



‘a global orientation that expresses the extent to which one has a pervasive, enduring, though dynamic, feeling of confidence that one's internal and external environments are predictable and that there is a high probability that things will work out as well as can reasonably be expected.’

Living with uncertainty, which I have described as our mind's basic challenge, was obviously central in Antonovsky's thinking. He distinguished three elements of salutogenesis as (1) control, being the person's belief that he or she is able to influence the course of events; (2) commitment, embracing a curiosity for and sense of meaningfulness in life; and (3) challenge, which is the individual's expectation that it's normal and beneficial for life to change. Along with some control and predictability, he counsels acceptance – finding meaning in change – and having confidence that one's mind will adapt.

Antonovsky's SOC implies a love of life. An attitude of love enables us to see most clearly and this is reflected in the meaning we make. When you love something you know it better because you feel you understand its significance and its value, which are two aspects of meaning. To care about yourself is to say that you mean something – to yourself, to the world and to somebody else. Loving your work gives it meaning and purpose. The most satisfying meaning seems to be associated with this sense of coherence and pleasure regarding one's place in the world and one's right to be there.

Lifestyle factors promoting salutogenesis are said to be social support, spirituality, happiness, humour and love. Exercise of the body is equally important. Chiropractors promote wellbeing by ensuring that the individual's ‘connection with the world is not compromised by vertebral subluxation,’ meaning improper relationships amongst the spinal vertebrae. They work on the principle that wellbeing prevails as long as there are no blocks in the system.

All therapies rely to some extent on the ability of the living system to heal itself, but the so-called Wellness Industry makes most use of this principle. Homeopaths, naturopaths, osteopaths and some spiritual healers believe in working with the body and mind rather than attacking disease agents. They tap into the natural self-healing flows of the body and mind. The practice of yoga, tai chi or any other psychophysical activity is also an appeal to the natural flow to do whatever it does best. Spinal flexibility, in particular, is regarded as essential to the smooth functioning of the whole body and mind. These practices are treating the stagnation and disconnection which brings about stress.

*Going with the flow*

The most pervasive emotion underpinning stressful experiences is fear. There is an old saying from Seneca: 'I thought I ran away because I was frightened, until I realised I was frightened because I ran away.' The greater connectivity obtained by engaging with the fearful stimulus, rather than trying to avoid it, invariably lessens its impact as a stressor and leads to a quicker resolution of the problem.

This is not to say we should resist or oppose all threatening stimuli. In fact, what we resist or oppose only pushes against us more strongly. The approach of the Eastern martial arts is far more effective. It is to yield to the force with one part of the body while transferring that energy to another part where it could be used effectively against your opponent. When you go with the flow in this way you do not disengage, as in running away; you continue the engagement, but in a more effective way.

Peter Senge, author of *The Fifth Discipline* and other books and an eminent management guru, said his business principles were based on Maturana's biology. He created 'learning organisations' according to the biological principles I have outlined here. A later book, *The Dance of Change*, about 'sustaining momentum in learning organisations,' contained many examples of going with the flow to be successful, which is exactly what living organisms do. Maturana called it 'drifting,' but it isn't aimless. We lay down our path and our path draws us onward (see *Drifting* song, Chapter 15). It also explains how animals and humans can be lured into traps if they don't stop and reflect from time to time.

Another example of the power of flow is the way distracting itches, aches or thoughts are hard to ignore when you are meditating, but if you welcome them, they are more likely to change by themselves. As we accept our situation, we obtain the freedom to change; permission to be as we are, gives us permission to be something different. Interfering with that natural flow is a basic cause of stress.

In the management of chronic pain it's suggested that you spend some time working with the pain, visualising it and engaging with it, rather than trying to ignore it. But, distractions are also helpful, to take your mind off the pain. It's a challenge to find the right balance between these two. There is benefit in finding some meaning in the pain and, conversely, it tends to be worse if you can see no reason for it and feel helpless.

The founders of Integrative Medicine such as Andrew Weil point to an association between mental attention, connection with the world

and internal regulation of the body. If you are attentive you will make the best connections and this will facilitate the regulation of your body processes. That's a healthy cycle because it equips you to go on being attentive. On the other hand, when attention falters, the connection is weakened and the regulation of the body becomes less precise, because it does not have the full resources of the adaptation process at its disposal. Similarly, if attention is misdirected the connection is distorted, leading to some physiological dis-regulation that could become disease.

Our self-regulating system can only govern itself efficiently if it attends to the connections. This promotes the natural regulation of your health by guiding you towards the right food, activity and rest. The flood of 'information' about diet, lifestyle and health is not useful without your own mindful attention. The best advice regarding stress is to regularly check the connection or, to put it another way, if the lights go out, check the circuit breakers in the electricity supply box.

It's obvious your mind has to work to optimise stress, but this can be a joyful experience. Music comes from sound and sound comes purely from movement, which requires effort of some sort. The sense of movement we obtain from music tells us something about this need to go with the flow. Another analogy is a guitar string under tension; if you pull it too tight, it will break; if you leave it too loose, it will not set up the rhythmic vibration that makes the musical tone.

### ***Short circuits***

A common cause of stress is to short-circuit ourselves by self-gratification or the process of ditention (see Chapter 12). In the language of physics, a short circuit is when the current flows along a different path from that intended because there is an accidentally low resistance between two points. Ditention is like shorting out your mind's battery so it goes flat. Whereas cotention is the natural biological union our mind strives to make with others, ditention is a divided attention where one's main concern is self-interest such as wondering whether your words and actions are causing the other person like or dislike you.

Short-circuiting yourself is characteristic of all addictive behaviours. The self-pleasuring aspect of using mood-enhancing drugs, for example, reinforces the desire to repeat that behaviour, which becomes an insatiable, vicious cycle. It is by regaining the natural connections with the world that addicts are enabled to break out of this trap. The connecting force of love is the crucial element in such a recovery process.

This applies also to the many milder forms of addictive short circuit that create stress in our lives.

Prolonged stress leaves stressprints, which are structural changes that distort the normal flow because they change the connectivity. The remediation of stressprints is achieved only by wiping over the unhealthy circuits with more life-giving patterns of connection. Just as the lapping of the sea washes away footprints in the sand, the gentle waves of love flowing between people can heal even the most entrenched stressful habits.

### ***The fine line***

Each of us must find our own version of the meaning of stress and our own way of fine-tuning this stress so it works for us, not against us. If you love what you are doing, here and now, you will enjoy the stress, almost regardless of how hard you work. That is, unless you get into a rut and become dishonest with yourself, pretending to love doing it when deep down you know you don't. Without reflection and responsibility, work can become another form of addiction.

Using all the aspects of knowing, your love of anything you do need not become obsessive because it will include that wisdom from the unknown that we seem to need to be complete. There's a fine line between useful reflection and introspective over-analysis, between unhealthy self-gratification and satisfying your natural instincts for food, sex, rest and play. It's one of the wonders of the mind that we are able to do this as well as we do.

Understanding the meaning of stress comes from appreciating your mind as an exquisite instrument of connection and enjoying the fine music it plays. In *Stress: the Musical*, I proposed that we come to know this as 'the biosong,' which is the way life sings to us to keep us well. The punch line is to 'sing along with your life.'

Of all the practical experiments suggested in this book for learning about mind and life, I think singing songs works best. The lyrics of two songs from *Stress: the Musical* follow this Chapter.

The next Chapter deals with the seven aspects of knowing as they apply to all kinds of relationships.

***WE ARE THE SONG***

Threads connect us every day in everything we do  
Everything we notice and pay attention to  
These threads are hardly broken; they just renew each day  
They follow one another in an incremental way  
Honouring these details, the truth will set us free  
Where we are right now is where we're meant to be

**We are the songlines of our lives  
We are the laughter and the cries  
We are the being right and wrong  
We are the singing, we are the song**

We often think of what we are as what we ought to be  
Some imagined super being, absolutely free  
Or perhaps a victim of events that were not kind  
This denies us our free will; suffocates the mind  
We can only be exactly what we have become  
The product of our history; the race that we have run

**Chorus**

***KNOW YOURSELF***

**Know yourself  
And you will know who you're being  
And then accept yourself  
So you will like what you're seeing  
And then forget yourself  
That's all you need to do  
And it will help you to keep up with  
Everything that happens  
In the big wide world**

It helps if you will use all your senses  
Even those you're not sure they exist  
Otherwise you might put up defenses  
And think of all the things you must resist

Whatever we oppose, opposes us  
That with which we flow, flows with us.  
Whatever we embrace, goes with us.  
What we suppose, knows with us.  
So sing with us

**Chorus**

# CHAPTER 17

## Relationships

*intimate knowing, shared meaning and staying in love*

It seems obvious that love would be the crucial element in personal relationships. But we form many different kinds of relationship with other people and the manner of connecting will not be the same with them all. While out shopping, for example, you might meet and greet acquaintances from your work, neighbours, an old and dear friend you hadn't seen for a while and several perfect strangers behind shop counters. The relational space in each encounter will depend partly on the other person, but mostly on your emotional state – the extent to which you are preoccupied with your history or your expectations.

None of us is so fully accepting of our present experience that we have a perfect relationship with anyone or anything. Yet our mind's greatest gift is the way it influences the quality of all our relationships. Just as the seven aspects of knowing clarified the meaning of stress, they can help in understanding our relationships.

### *The ties that bind*

This whole book is about relationships; that is to say, about coherence, from which we gain the satisfaction of making meaning. To cohere means to hold together; to be incoherent is to 'lack meaningful connection.' The very essence of our mind is its ability to form relationships between thoughts, feelings and events that are separated in time or space.

The idea of relationship extends from the purely physical to the spiritual end of the spectrum of mind. We can easily explain a mechanistic relationship between two parts of our body such as a motor nerve and a muscle. We can also explain the more organic relationship amongst all the cells of the body in terms of the abstract idea, autopoiesis. By looking at

emotional aspects of mind we learn something about relational space and our inter-personal experience. It is our relationship with the unknown that really stretches our mind and fires our imagination.

Whether you experience this as the ultimate manifestation of love through a union with God, an awesome encounter with the natural beauty of the land and sky, or a muddling trust that everyday things will work out if you take the next right step, you will be using your mind to relate to the unknown. We can't avoid doing this. We need to do it, anyway, for another reason. The simple relationships we can explain are, by their nature, so binding they tend to deny us the freedom of mind and experience we value so much.

Many of our most habitual relationships become a bondage of some sort. Reliance on the same people and institutions, day in and day out, leads to feelings of dependence, which include a loss of enthusiasm, waning of spirit and, eventually, a fear of change. What is familiar becomes 'the devil we know' and we lose that trust in the unknown that enables us to try new things and make significant changes.

The most potent mood-changing or self-gratifying behaviours will bind us to them with the greatest force. An obvious example is addiction to alcohol or drugs, but people get just as severely addicted to a human relationship.

The foundation of all addictions is the 'bondage of self,' which is an inability to see one's self as part of a larger system. When this happens, your self becomes the centre of your world in a way that corrupts most of the connections your mind needs to be healthy. It's a classic case of the stressful short-circuit described in the previous Chapter. The ability to connect mutually with others, influence relational space, reflect honestly, or enjoy awesome experiences, is severely limited for a mind that is self-centred.

Yet it is our nature to yearn for intimacy and to seek the closest possible personal relationships, at least with a few special people in our lives. The relationships that affect our quality of life most are our family bonds, the close partnerships we form in marriage and the enduring friendships we make. It is here that the most intimate knowing occurs and the possibility of truly shared meaning is greatest. So the ties that bind most strongly can be bitter-sweet; they bring the deepest joy and also predispose to the greatest pain. Little wonder, then, that all seven aspects of the mind are vitally involved in this, our most consummate experience.

### *Using the seven aspects of knowing*

The first aspect of knowing, autonomy, is not only a biological imperative in a physical sense; it is also an awareness of one's



responsibility as a self-governing entity. Some of us are tempted to feel like helpless victims when we've been thwarted or hurt in some way, as though our ability to be ourselves and to adapt had been taken away, when all that had happened was things didn't go the way we wanted. To be looking outside of ourselves for emotional security is an abrogation of our basic biological responsibility and an unhealthy dependence that weakens any relationship.

If you forget you have the same basic right to be here as any other living thing, you limit your mind's ability to make the connections you need most. When you honour your autonomy, you can enjoy the differences between yourself and others, knowing you are worthy in your own right and capable of many kinds of relationships. The virtue of love as self-regard and the arrogant folly of self-contempt were described earlier (see Chapter 12). Our human mind has this validity through autonomy as its most fundamental property.

The ability to connect is the complementary aspect of autonomy. It points to the need to respect every opportunity for connection and not be careless about even the smallest detail of connecting. This promotes sincerity in all our dealings and is the basis of the long-term commitment that is essential for our most important relationships.

Failing to realise that meaning is not directly transferable is the most common blind spot affecting the quality of relationships. We mistake congruence of feelings for a precisely shared meaning. This leads to misunderstanding and disappointment and an undue emphasis on bits of information, in the hope they might contain the meaning we are seeking. Simply honouring one another by honouring the connection is the best way to sustain the relationship through any difficulties that arise from misunderstanding.

If we are aware of the third aspect, the proactive nature of our perception, we are more likely to take responsibility for the particular world each of us brings forth rather than wasting time arguing about supposedly objective, but indeterminable, details of reality. Owning your own stuff means you don't have to blame your partner or the world for what you perceive them to be at that time. We tend to look outside of ourselves for informative detail or external 'proof' rather than engage better with what we have in front of us now, trusting that this present meaning is the only knowing that counts at this point in time.

The essence of relationship is found in the first three aspects of knowing, which imply a healthy self-responsibility that I referred to as self-love. The biological basis of any relationship is that we are autonomous, but need to be properly connected, and we bring forth our

own world. We honour that biology by believing in ourselves and promoting the unselfish connections that will open our mind to its full potential. Without that foundation we wouldn't be able to express the more mysterious aspects of our mind that add the richer colours to relationships.

With the emotional aspect of mind we are midway between the physical and spiritual ends of the spectrum and a new force is being experienced. It is the coming together of self-interest – within a limited world that we know quite well – and other-interest demanded by a much greater world, which is largely unknown. The emotional state we call love is an openness that needs no justification in terms of altruism or politeness; it's a biological imperative. The attitude of love has defined the relational space between human beings that guided the evolution of our species, guides the development of each individual's mind from birth to death, and makes possible all our relationships.

In all relationships, the most debilitating emotional state is fear. It is fear of uncertainty and fear arising from a selfish preoccupation with what others are thinking and feeling towards us that does the most damage. Self-will of all kinds, which includes self-condemnation substituted for self-respect, ruins the connections we make with other people. On the other hand, love makes the kind of connections in which there can be a sharing of meaning, which is perhaps our greatest joy of all.

Close correspondence of feelings is not a transfer of meaning, in the strict sense, but it gives us the ability to make meaning that is so similar to another person's meaning, we say that the meaning is shared. This most intense form of connecting is what sustains close personal relationships over long periods of time. There is always the possibility of misunderstandings in this delicate work of the mind, but persevering with love will transcend these, so that human couples can build enormous mutual trust and find their deepest satisfaction from this mutuality.

When the emotional aspect is honoured, we can exercise our imaginative mind through artistic pursuits and all kinds of play to further enrich our relationships. Being too serious is not the true nature of the human mind because it implies that we know more than we do. Our unknowing is our saving grace. Play is our way of having fun with uncertainty and nothing is more nourishing for relationships than this.

The fifth aspect of knowing refers to the experience of placing trust in a higher power, or some greater force, by surrendering some individual needs to the larger needs of the relationship and the world in general. Of course, this does not mean submitting to direct threats to one's autonomy or ability to connect or bring forth one's own world. But it is a

way of saying that the sense of belonging to something bigger is the essence of commitment to a relationship.

Commitment includes being interested in the uncertainty about what might happen and acknowledging that there will be all the more mystery now you are living in a close relationship. It is more complex than living on your own. Being in the present moment is indispensable because only then are we real, in the sense that we know the reality of our situation. Thinking about the machinations of cause and effect and obsessing about the past and future makes any relationship unnecessarily complicated, whereas trust based on love keeps it simple.

Respectful conversation creates our culture and that includes the cultural context of our relationships. This is an aspect of knowing we tend to take for granted. We may not bother to take the time to converse, which is speaking and listening, nor promote the circumstances in which healthy conversation can flourish. Being more attentive to this avoids negative drifts in conversation where one criticism or complaint leads to another – and so on. Making a habit of listening, unreservedly, to what others have to say about their feelings ensures that negative drifts in conversation are owned and aired before they develop into bigger issues.

Finally, the way we imagine the unknown and develop our mind to embrace it with love is a vital part of any relationship, but it is also highly personal and may not even be discussed at great depth with anybody else. When inevitable worldly difficulties arise, that ‘supra-meaning’ Viktor Frankl nominated to help us with pain and suffering can be easier to find in a trusted relationship than anywhere else.

### ***Love and meaning***

We need to make meaning at all times and our close personal relationships provide many opportunities to do this, not because of their successes, but because they don’t always run smoothly and we learn from the difficulties; the stress helps us grow. As long as there is love, we can make meaning – this is a natural law. We live in a culture that seems to contradict this in many ways, but the fact that we survived and are flourishing is due to this biological principle.

Brian Goodwin described the biological roots that our way of thinking has in common with the ways of nature. He said the meaning in nature is not different from the meaning in us. In his last book, *Nature’s Due – Healing our Fragmented Culture*, he wrote:

‘The links between nature and culture that I shall explore ... revolve around coherence, wholeness and meaning.

Coherence and wholeness we use to describe natural phenomena, such as lasers and living organisms, but meaning tends to be reserved for humans. I shall develop the position that these three concepts belong together and describe similar processes of creativity in different realms. Our unique attributes of language and consciousness are regarded as the portals that give us access to understanding the meaning of life and of our universe. I shall suggest that looking for the meaning of life is a distracting chimera, while what we are actually looking for is lives of meaning through relationship. I shall indicate how nature is engaged in a similar process of finding meaning, coherence and wholeness in relationship, and that this is the basis of its intelligibility to us. Meaning, in fact, permeates the creative cosmos that we know.'

We are aware of fragmentation – of many parts – but we are also aware of unity and coherence – a bigger picture – in which we can play a part because we have a mind that enables relationship. We do not need to see ourselves as separate. A mystical view – even a scientific view based on quantum entanglement – is that everything is already connected anyway; it is only our human mind that has taken it apart. The meaning we seek is, indeed, a meaning in terms of relationship.

An early poem of Walt Whitman was called *The Base of all Metaphysics*, which he described as: 'The dear love of man for his comrade, the attraction of friend to a friend ...' Then, in a final poem called *So Long*, written shortly before he died, Whitman described this vision of what he believed was to come:

'I announce adhesiveness, I say it shall be limitless, unloosened,  
I say you shall yet find the friend you were looking for.'

The *Little Song of Meaning* that follows this Chapter, intruded, against my will, into my preparation for a serious seminar on 'The Biology of Meaning' some years ago; I called it a 'song of little meaning' at first. But singing it always reminds me not to take anything too seriously – to have fun with it, wherever you can.

Meaning is emotionally based so whatever we enjoy and feel happy about will help to keep our mind alive. The final Chapter is a brief look at future prospects for the human mind.

***LITTLE SONG OF MEANING***

**There's the funniest thing about making meaning  
That it seems to be like being in love  
There's the funniest thing about making meaning  
That it seems to be like being in love**

I know I want to make some meaning  
But the words don't come out right  
That's why I have to sing this song of my experience  
I know I want to make some meaning  
But the words don't come out right  
That's why I have to sing this song to you

**Chorus**



# CHAPTER 18

## The Future

### *keeping the human mind alive*

The mind we enjoy today is an evolutionary process. Its most fundamental characteristics, autonomy and connectedness, stem from the beginning of life. The features we proudly call human have developed over the last few million years, mainly since the advent of *Homo sapiens*, less than 100,000 years ago. When you think about how many details of our life experience have changed in the last 100 years, you wonder where the human mind will be after even a few more generations.

This impression is exaggerated if it is only based on superficial aspects of our experience. The emotional shapes underpinning our mind's work and the respect for the unknown that enables us to experience wonder in a spiritual way are undergoing much more gradual change. Superficially, you might say they are going backwards because of attacks on religion by prominent scientists, but such outbursts of hubris would need to be far more prevalent and more salient before they would significantly alter the course of evolution.

We can imagine future paths that are life sustaining; and other paths that are not. The biological process acts to conserve what is needed for the organism to adapt, while allowing everything else to change around that central axis. It's a flowing sequence of tiny steps – a history of connections. Every little thing we experience today contains something of our past and is contributing to our future. The unmade path ahead is laid down in the walking. Add to this the incredible social matrix in which we all live and you begin to think we might be simply caught up like flotsam in a great stream of human existence.

But our individual will and our ability to love are the two strongest currents in that stream. Our free will operates as we experience each of

these present moments in the context of the larger whole. What is most important is our orientation – the direction we decide to head. Our intentionality is the meaning we make at that time; and every meaning has within it a commitment. Our sense of commitment lies deep in the emotional and spiritual framework of our mind and, more than anything else, it gives our lives the meaning that we seek.

### *Commitment and joy*

Take your experience of reading this book as an example. If you enjoyed it and found your own meaning as you read, that is because you committed your mind in that direction – you were oriented accordingly. And it is whatever you enjoyed about it that is most meaningful for you. The mind at work is also a mind at play.

Affairs of the mind are inevitably uncertain, yet you can always make satisfying progress when you feel quietly confident about heading in a certain direction. This requires all seven aspects of knowing, from a sense of autonomy to a love for the unknown. The very using of our mind is a commitment to life and making meaning, whether we are motivated by simple curiosity, the satisfaction of desires or some divinely-given quest.

In practice, we are often half-hearted about projects or plans because of the uncertainty associated with them. There is a place for caution, but when we reflect we often wish we had taken a few more risks. Commitment is a positive attitude towards the unknown and an expression of trust in the potential of the human mind. It comes from what you believe in – whatever has meaning for you.

Goethe's famous words about this are some of the most encouraging and inspiring ever written. He wrote:

'Until one is committed, there is always hesitancy, the chance to draw back, always ineffectiveness. Concerning all acts of initiative and creation, there is one elementary truth, the ignorance of which kills countless ideas and splendid plans: the moment one definitely commits oneself, then Providence moves too. All sorts of things occur to help that would never otherwise have occurred. A whole stream of events issues from the decision, raising to one's favour all manner of unforeseen accidents and meetings and material assistance which no man could have dreamed would come his way. Whatever you can do or dream you can, begin it. Boldness has genius, power, and magic in it.'



In a biological sense, one connection leads to another and we ‘drift’ effectively toward our ‘calling’ so long as we commit ourselves honestly to whatever that is (see the song, *Drifting*, Chapter 15).

Just as there cannot be freedom without responsibility, there cannot be joy without commitment. The main purpose of life – and the main pleasure – is to give one’s life meaning. If I am committed to my life I want to do it as well as possible so I declare that I love my life and I expect my mind to make it meaningful for me.

If we embrace the unknown as well as the known we don’t have to know the ultimate meaning of everything; enjoying the mystery is part of the fun. We are blessed with a mind that can always make some meaning of our existence because it can always make some connections – not perfectly, but well enough. My joy fluctuates from day to day, but deep down it comes from gratitude that, having committed to believing in this process, I find this kind of outcome is granted to me.

It was harder for me to come to realise that you don’t need to be analytical or strive too hard for intellectual clarification – unless you are required to write a thesis. Wonder and enjoyment are the outcomes of most importance to the mind. Rudolph Steiner was saying this a century ago:

‘In an age of criticism ... ideals are degraded. Reverence, awe, adoration and wonder are replaced by other feelings – they are pushed more and more into the background. As a result, everyday life offers very few opportunities for their development. Anyone seeking higher knowledge must create these feelings inwardly, instilling them in the soul. This cannot be done by studying. It can only be done by living.’

Joyful commitment is what will keep the human mind alive. Where the mind goes in the future depends on the intentionality of each one of us, which will determine each new connection we make. Commitment is a certain orientation we assume, combined with a deep trust that the amalgam of will and love will go on making meaning for us.

Not caring will be our greatest danger. Emotional states such as apathy and indifference deny the possibility of commitment or joy and jeopardise the flow of will and love. A sense of futility often stems from a misguided desire to control, rather than to appreciate the flow. The superficial aspect of our mind tells us it needs to control, but it is the true nature of our mind that we need a sense of coherence far more than we need to have control. As long as it means something to be a living human being, here and now, we will keep our mind alive.

Charles Birch compared the way we humans think of ourselves with the way we think of our world. We see ourselves as having consciousness, free will and purpose whereas we think of the world as being mindless and non-purposive. This is to deny love for our world. If we love it we will give it meaning.

A commitment to our lives will carry with it a commitment to take care of our world. 'A barren, destructive mind produces a barren, devastated environment,' Daisaku Ikeda has written. Barren means lifeless; the principle guiding a biological approach is the need for a reverence for life. This is also a reverence for mind, but not for its rationality; rather for its role in connecting us to one another and our world. Maturana wrote:

'The basic illness of the soul of modern humanity is its blindness to its connectedness with all dimensions of nature through the belief that what makes us human beings human is rationality through which we have power over nature in a linear dynamics blind to its circular nature.'

He went on to say we think of ourselves, mistakenly, as simply rational animals when we are actually emotional beings who have a strong tendency to use rationality to justify our desires. Our emotional mind is the source of the meaning and the enjoyment that comes from doing what we believe in doing.

The most striking cultural change affecting our languaging-emotioning braid in the short term is the increasing reliance on electronic forms of communication. The so-called 'screen culture' is affecting all aspects of our lives. People are discussing the 'convergence of evolution, group mind and the internet' and Donald Duchinos, for example, sees our passion for internet and cellphone interaction as today's manifestation of our deepest spiritual quest. He coined the term, *neosphere* – just a slight variation on Teilhard de Chardin's famous term, *noosphere*, which referred to an evolving global consciousness.

The connectedness within us and the patterns of connection we experience as we communicate will evolve together. The challenge will be to satisfy the emotional basis of our search for meaning using forms of languaging that are often not face-to-face and are becoming increasingly cryptic. Fortunately, there will always be the unknown as our stimulus and our reminder, lest we become too complacent, too clever and too controlling.

### *Heeding love*

When addictive patterns develop, as they always do, two things are needed. Firstly, love to loosen the patterns that bind, which is the unlearning part of the process; secondly, new doings to create new patterns of behaviour, which will be new frameworks in our mind. The best catalyst for positive evolutionary development will be to heed love in all our endeavours. As long as we do this we should not become trapped by the limitation of our own knowing.

There is a sense in which you can let love lead. To do this, you need to be able to 'hear' so you can 'see' where love is pointing. Rather than try harder to make life work, which it does anyway, the idea is to bring more loving into it. We will always be moving in the direction of our loving.

This love is not, primarily, a moral virtue; it has been accorded that status through the evolution of our humanness. But, firstly, it was – and is – a biological necessity. Without it we would gradually lose the experience of communality and without that we would have no future. If love did not exist, our evolutionary journey as a species would have ended long ago. We know it's essential, but we don't really know what love is, because it involves the unknown.

Rational explanation can't capture what love is. The only way we can know love is to experience it. Certain kinds of experience are more revealing than others. Because music exists, we know some things we could not know otherwise.

Yehudi Menuhin told how music exposed the limitations of rational explanation, which he said creates a kind of order that is no longer real or alive, having lost its wholeness and most of its meaning by alienating itself from us. Yes, rationality provides some of the building blocks of knowing, but in the end it cannot construct the true reality. What we recognise as life has an organic quality of wholeness and flow which music can evoke in our experience.

Musical performance is a great metaphor for life and mind because it's usually done with others and may include improvisation, which is not so much a skill you develop as an unlearning of habitual patterns of non-awareness and disconnectedness. It is precisely the experience you would imagine was created for holons to operate within hierarchies of holons. When you listen to or otherwise experience someone else's musical performance, you get a sense of this integrative consciousness occurring.

Menuhin described improvisation in music as the greatest sense of freedom you can ever experience, because he said you cannot know what freedom is until you are aware of the discipline called for by the larger

scheme of things. Then, you can be truly yourself, knowing this is not at the expense of the larger system – it is the larger system manifest within you. This is the sacred work of our mind.

The most natural expression of music that humans can make is with our voice. Occasionally, I've had the experience of letting a tone emerge gently from my throat while holding two hands close to my heart, then swelling the tone with more breath and reaching outwards with both hands, which creates the feeling that my whole body and mind is communicating with the world. It's as if the sound comes from every cell of my being and connects with everything else. Sometimes I just enjoy singing, especially with others, for the sheer fun of it. I love doing this and do it as an expression of love.

Richard Tarnas wrote a parable about two different kinds of suitor for the world. One was cold and critical, attributed no goodness or nobility to the world and his attitude was disrespectful and exploitative; the other admired the world for its mysterious wisdom, saw it as at least as intelligent as himself and had a desire to co-create with it for some, slightly hazy, but mutually beneficial, purpose. Which one do you think will be the most successful suitor?

What you enjoy and what you love will have meaning for you, which gives it life as it keeps you alive. We see into things by loving them; our mind gives to them the life it also needs, as it gives them its meaning.

### ***Sacred unity***

Bateson's ideas about the 'necessary unity' of mind and nature and an 'ecology of mind' emerged in parallel with Maturana's biology of cognition. Bateson wanted to 'unify and thereby sanctify' that wider knowing which he said holds everything together. He called this the 'sacred unity' of the biosphere. Recall Brian Goodwin's words that both nature and ourselves, as part of nature, are 'engaged in a similar process of finding meaning, coherence and wholeness in relationship.'

We experience unity first within ourselves, by integrating mind and body, before we seek union with everything else. What mind and body have in common is the meaning created by their patterns of connection. The connective patterns amongst the cells and chemicals of the body create the emotional mind, the flow of which is interwoven with our thoughts to manifest in our knowing.

This is also how David Bohm reframed the relationship between the mental and the physical, or somatic, aspects of our being. He coined the term 'soma-significance' to emphasise the common element of

meaning that can be seen to exist in both, because they are ‘two aspects of the one indivisible reality.’ Each aspect reflects and implies the other when we recognise their common property.

Tim Read espoused ‘significance and meaning as an organising principle of consciousness.’ He referred to seven levels of significance that correspond with the seven chakras. The continuum from the first to the seventh level of consciousness represented for him the passage from the explicate to the implicate, so it parallels my metaphorical structure of seven aspects of knowing.

Scientific explanation, leavened with process philosophy, has been employed in this book to open windows through which the reader’s imagination may create images of a ‘necessary unity’ beyond what we already know. The ‘integral philosophers’ refer to an overarching spiritual reality, which comes into view when we combine science with aesthetics – the known with the unknown – to create a broader meaning. Of course, words can only point to the reality of anything; they are not that reality.

Returning to the reality of our experience, we find we have not escaped that unrequited yearning for some further union that would provide relief from the fundamental isolation that our biological autonomy ordains. We are destined to remain separate individuals, striving through communality to do the best we can in every moment.

Walter Freeman encapsulated the two neurophysiological tenets around which my operational description of mind has been built:

- (1) the private and impenetrable nature of the meanings we make; and,
- (2) the fact that human intentionality is not effective until it has been acculturated, leading to cooperative social action.

Our human will and our capacity for love cannot be satisfied completely. But your life and mine work well because mind and love are conjunctive, quintessential elements of the human living system. They make us what we are and will guide us as long as we live.

Biology honours death as well as life because there could not be one without the other. We have an acute awareness of our impermanence, which implies that we know permanence as well – in some form. That permanence can be given meaning by our imagination where it will rest beside our sense of aesthetic unity in a place where connectivity is no longer necessary because all is one.

In the meantime, we embrace the unknown future with love. What else does our mind do? This is a bitter-sweet, but beautiful, experience.



# CODA

## *Seven aspects of knowing*

I picture my mind, which is my life, as a thousand-faceted diamond. I imagine that every facet is sparkling, but I'm content that most of them sparkle with mystery. There are just seven facets I wanted to try to describe.

They imply a continuum from knowing to not knowing, across which my conscious human mind plays its part in some larger scheme. Then, these seven aspects seem to form another shape that is something like a circle; the end is also the beginning. So I offer them here as a seven-pointed star.

I consider us all to be autopoietic (autonomous, connected and operationally closed), proactively perceiving, emotionally framed, accepting, knowing beings, belonging to a larger unknown whole by virtue of our imagination.

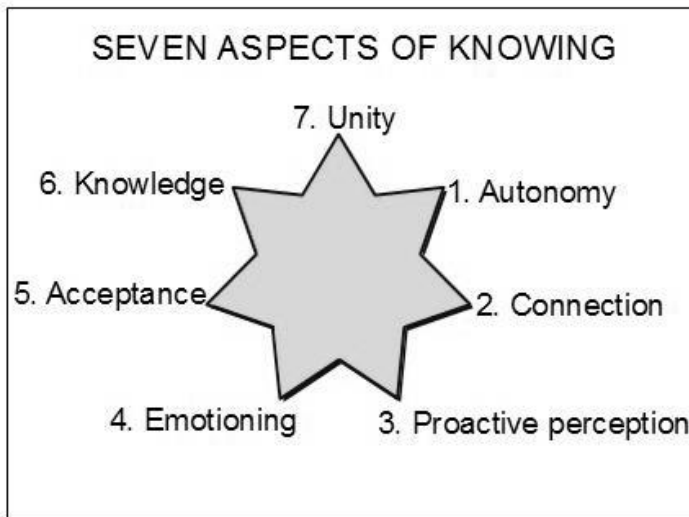


Figure 14. Seven aspects of knowing.

*The seven blind spots*

1. Not recognising our AUTONOMY (which implies connectedness), we think of ourselves as steered by outside influences, look outside ourselves for security, notice aloneness and fragmentation and promote a monoculture - a false togetherness - rather than respecting diversity and connectedness.
2. Unaware of the CONNECTEDNESS that arises directly from our operational CLOSURE, we connect casually rather than sincerely, mistakenly assume that meaning is transferable, often experience misunderstanding and worship objective information above relationship.
3. Misunderstanding the proactive and personal nature of our PERCEPTION, we blame the world for how we see it, waste ourselves arguing about an external reality, value objectivity instead of our connectedness, and strive, unrewardingly, to obtain more information.
4. Denying the EMOTIONAL mind and the primacy of emotional interconnectedness, we disconnect ourselves by privileging rationality, mismanage our relational space, misrepresent knowledge, undervalue aesthetics and demean our imagination.
5. Avoiding ACCEPTANCE and the freedom of SURRENDER, we deny the validity of our present moments as the true product of our history of connections, create machinations based on cause and effect, sabotage trust and thus meet resistance in much of what we do.
6. Misrepresenting KNOWLEDGE, we overestimate expertise underestimate the effect of everyday CONVERSING, not realising how it creates our changing culture, and therefore we neglect opportunities to promote respectful conversation.
7. Fearing and forsaking the unknown, we forget SPIRITUALITY by not acknowledging UNITY, thus shutting out the glory that our IMAGINATION gives us, settle for petty worship of false idols, go on trying to solve problems (which are emotional and spiritual) by technological means and deny our own perfection.



## CONCLUSIONS

- Meaning is emotional-visceral before it is conceptual-propositional.
- Meaning can't be transferred from one person to another.
- Meaning can be shared by means of emotional congruence.
- Decision-making is not simply due to conscious awareness.
- Free will exists only as we experience present moments in the context of a larger whole.
- Knowledge and intelligence are reified and misconstrued, to our social detriment.
- Not knowing is as important as knowing; our quality of life depends on how we relate to the unknown.
- Self-transcendence leads to the greatest self-satisfaction.



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