

Doylestown, Pennsylvania, 1914, two women open a public library. The first two kids registered as borrowers, a girl of 13 and a boy of 7, soon read all the children's books, so are actively encouraged by the women to move on to more adult-type books on a range of topics. The girl develops an interest in people of different cultures that becomes a passion and influences her life's work. Anthropologist Margaret Mead, author of 20 books and recipient of honorary doctorate degrees from 28 universities.

The boy lives in poverty. Abandoned as a baby, he is raised by a widow with a child of her own and several other orphaned or abandoned children. The widow earns barely enough money to keep them fed by washing other people's laundry ten hours a day. To keep a roof over their heads, she works for a real estate man who moves her and the children from shack to shack "to clean them up and make them saleable". The widow encourages reading, understanding that it may lead the children in her care out of poverty, and take Jimmy's mind off things she cannot provide. The boy reads everything he can, and it does make him a good student for the short time he spends in school. The need to help his mother provide for the eleven children in her care, however, means he is working by the time he is a teenager.

Jimmy kept his love of reading despite the long hours of tiring work at fairgrounds, factories, and farms. One kind employer notices the breadth of Jimmy's knowledge, a learning way beyond his years, and arranges a scholarship exam for him. Jimmy does well, and is accepted into college, and later into the Navy. The war years come and go with Jimmy writing of his experiences. The book wins the Pulitzer Prize, and by the time he's done, James Michener will have written more than 40 books that will collectively sell more than 100 million copies. He will be granted 32 honorary doctorates in 5 fields and his cash donations to public libraries and universities will exceed 153 million dollars. I think the factors that give people this sort of direction and keep them on track are worth looking at.

Why Humans Dream, and why it matters.

An Irish psychologist by the name of Joe Griffin, using his own dreams as well as a body of research built up over the years, is credited by the scientific community as being the first to provide a conclusive answer to this question. In this context, dreams are the result of the subconscious mind processing parts of our waking state experience. In a sense they are a 'residue' of this process, material we access with the conscious brain at the point of waking. Two things usually happen. Firstly we forget most of the dream unless a conscious effort is made to preserve it. Secondly, the conscious mind has to sequence the events in an attempt to make sense of it. Dreams are essentially in sensory form, the thinking brain has to convert them into narrative form, hence making the dream seem longer. Griffin's theory strips away a lot of the mysterious and the mystical, it severs the links with the supernatural and esoteric, making them an essential dimension of being human.

Dreaming occurs in a phase of sleep called REM sleep - so called because of the rapid eye movement underneath the closed eyelids. A better understanding REM sleep was seen by Griffin, and others before him, as the likely source of explanation into why we dream. This sleep phase, about 20% of a night's sleep, requires enormous amounts of energy, and it has long puzzled people as to why during a sleep process – necessary to restore the body for the next day – a process took place that used a lot of mental energy.

Research on animals established that REM sleep was in fact vital for life – an animal deprived of it could not be kept alive no matter what other basic needs for life were catered for. This posed some interesting questions such as “Do all animals have REM sleep?” Until recently, the answer was yes, but the real test of a general animal principle is to examine the unique Australian ones. Two interesting things emerged, firstly the platypus has REM sleep – more than any other known animal. Nearly all its sleep is in this state, one of the factors that has made it so difficult to keep platypuses alive in captivity. Secondly, the echidna does not appear to have any REM sleep. We now have an animal that we can use to test our theory about REM sleep, so we will return to the echidna later.

In the early stages of his research, Griffin proposed the ‘expectation fulfilment’ theory. It states:

All arousals of the autonomic nervous system – the generation of an emotion – form half of a process.

The second half is that the brain has to fulfil that expectation through an action of some kind.

Griffin J. *Human Givens Journal*, Vol 12-1 p13 2005

The autonomic nervous system is aroused during REM sleep because the ‘startle response’ is activated. This response is triggered from the primitive part of our brain that receives information from the senses ready for processing elsewhere in the brain. It is primitive in the sense it is pre-thought, sub-conscious, and if sufficiently startled or threatened, sets us up to respond before thinking. It is a basic survival mechanism prompting doing nothing, fighting, or running away. This part of the brain, variously called the ‘emotional brain’, ‘primal brain’, ‘limbic system’, is the subject of major research endeavours at the moment, principally because of the role emotion plays in nearly everything we do, including dreaming.

However, during sleep, the senses and the ability to process the information they provide are switched off, so the question becomes: “What has activated the startle response, and what is being processed in the sub-conscious?”

(as) the brain is getting no information from the outside world at this point, it has to release from memory its current unfulfilled expectations, as its best guess as to what the ‘something happening’ might be.

Griffin J. *Human Givens Journal*, Vol 12-1 p14 2005

The startle response has no 'off' switch, so one of the organs in the limbic system, the hypothalamus, regulates homeostasis, creating that vital balance between the various systems in the body. As well as regulating such things as thirst, hunger, body temperature, spatial orientation, water balance, and blood pressure, it restores emotion to a non-aroused state. REM sleep then switches off emotional expectation, allowing the expectation to be discharged, or in Griffin's words: *the dream state is the internal theatre where we metaphorically act out our expectations, thus de-arousing us.*

REM sleep has two other vital functions. It creates extra storage capacity in the cortex or thinking brain. Managing increasing numbers of expectations would place stress on the brain, and reduce processing efficiency. According to this theory, the echidna that does not have REM sleep, must have some way of storing expectations that are not discharged. They do. Echidnas, although about the same body size as a possum, have a brain four times their size.

Another function of REM sleep is preserving the integrity of innate programs or genetic templates. My fox terrier chases every rabbit he sees, a futile exercise for a dog with such short legs. During REM sleep, he no doubt completes this scenario, catches the rabbit, and preserves the expectation that next time he will be able to chase and catch food. The dog's survival would be threatened if this innate program was changed by experience, and he no longer expected to catch food.

It has been established that animals deprived of REM sleep die because they lose innate templates critical for the management of their bodily systems, most notably the control of body temperature. According to the theory, the echidna has to have some other way of controlling body temperature if the vital templates are not restored during REM sleep. Some very interesting things emerge. The echidna has a unique capacity of being able to lower its body temperature to just above freezing point, sinking into a torpor lasting for weeks. During this time it may not draw breath for long periods. More than that, it can recover from these extreme states and restore normal functioning within hours. It has not been established why it has this amazing capacity for 'stand-by mode'; made all the more puzzling by the fact that it seems to choose this state entirely on whim. While a lot of research is continuing into this amazing creature, the evidence that REM sleep and the preservation of instinctive patterns for survival is conclusive.

Griffin's explanation also provides insight into why we generally forget our dreams. As we have seen, a dream metaphorically fulfils the expectation and switches off the arousal. Homeostasis is restored. In the process however, we converted an unrealised expectation into a non-real memory of fulfilling it. If this memory were stored, it would corrupt the memory store and greatly diminish our ability to reliably predict the outcome of future events, and reduce our ability to distinguish between reality and fantasy. To avoid this happening, the conscious brain is switched off during dreaming, and at the point of waking, we are able to compare dream content with our waking state. Some mental disorders are characterised by this confusion.

Now I would like to talk about why this process of having expectations preserved even if not met is important. At the time Joe Griffin was conducting his dream research, an English psychologist, Ivan Tyrrell, was on a quest to find out why the hundreds of therapy methods did not seem to be having any real effect on the rise of depression. He was drawn to Griffin's more complete explanation of REM sleep, for it is widely known that people suffering from depression can spend up to 80% of their night's sleep in this phase. The two men collaborated, and in 2003 published their new paradigm that has made a significant contribution to our understanding of how the brain processes information – both in the dream, waking, and depressed state. Known as the 'human givens', the paradigm's central idea is that human beings, like all organic beings, come into this world with a set of needs and an internal guidance system to get these needs met. According to Griffin and Tyrrell, REM sleep is at the heart of this guidance system.

It is appropriate here to mention another major development in our understanding of the brain. The capacity to examine functioning brains in sleep phases as well as waking activities with sophisticated imaging equipment has led to overwhelming support for the idea that brains are not pre-set but have a high capacity for adaptation. The terms 'personality', 'intelligence', and more recently 'multiple intelligences' - each supposedly measurable and quantifiable – carried with them a notion of being pre-set and comparatively fixed. The idea of adaptive intelligence, however, recognises that humans have both a set of innate templates programmed during the long periods of REM activity in gestation, plus ones learned or created by our environment. The innate templates are our genetic code, geared for survival, procreation, as well as the learned ones are preserved by the REM state our entire life.

One of the earliest challenges to the notion of our thinking being 'programmed' came with the publication of Maxwell Maltz's seminal work: *Psycho-cybernetics* in the early sixties. He used a guided missile as an analogy for a life oriented by a goal and attaining it by constant feedback and communication with itself rather than a bullet that continues on course regardless. Maltz was a plastic surgeon. His life centred around giving people a good image of themselves in the mirror. He was at a loss to explain why a number of his patients were no happier after their operation than before, even if disfiguring scars or other malformations had been removed. Maltz suggested our perception of ourselves came from a 'self-image':

... a mental blueprint of ourselves ... our own conception of the 'sort of person I am' ... formed from our past experiences, our humiliations, our triumphs, and the way other people have reacted to us, especially in early childhood. We do not question its validity, but proceed to act upon it as if it were true.
Maltz, M. *Psycho-cybernetics*. Simon & Shuster New York, 1960.

The self-image, in Maltz's view, became life determining. All action, feelings, behaviour, even abilities are consistent with this self-image and one cannot act in any way inconsistent to it regardless of effort or desire. Another important factor was the self-image is value-neutral; it does not care if it is empowering or destructive. It could, however be changed. With our more complete understanding of the limbic brain, Maltz's techniques for changing the self-image are seen as remarkably sound and well before their time.

Maltz's work became a powerful force in the self-help movement, essentially because achievement was now seen as a matter of *choice* rather than inheritance – genetic or otherwise. Recent developments have validated Maltz's work and made it very relevant to discussions about artificial intelligence and the role of the feedback loop. His claim, for example that the brain is poor at telling the difference between actual experience and that imagined in vivid detail, has been confirmed by recent research, as too has his proposition regarding the 'malleability' of such things as self-image.

So, in addition to innate templates, we have ones learned during infancy and childhood – indeed any period of life – templates that may be preserved in the same way or modifiable as a result of experience and learning. These templates become our self-image, our guidance system that orient us at a very deep level of thinking and influence the choices we make in relation to life events and our perception of them. At a sub-conscious level we are set up to be attracted toward, or driven away from, situations on offer in accordance with an image of ourselves and in response to our internal guidance system. I am suggesting these learned templates have an expectation that seeks to be fulfilled, and are preserved in the same way that other life-sustaining templates are, by dreaming.

Let us return to James Michener, for it will help explain why I believe so passionately that dreaming matters. You will remember his early years of poverty. One could wonder how wealth, when it came, could mean so little to him. How he came to donate over 153 million dollars to universities and libraries. Perhaps it tells us something about an internal guidance system established by his response to life circumstances, and preserved intact for years.

I never had a wagon, or a pair of roller skates, or a baseball glove, or a tennis racket, or a radio, or a bicycle. I listened to my mother explain why others could have these things but I could not, and with an act of will as powerful as a steel bear trap snapping shut, I simply closed my mind to them. I satisfied myself there were no such things.

Michener, J. *The world is my home: a memoir*.
Random House, New York. 1992 p438.

As well as specific responses to life circumstances establishing templates, childhood stories are now recognised as a major factor in setting and directing one's journey. I have been in the habit of asking people accomplished in any field if they can bring to mind a childhood story that played a pivotal role in them achieving the things they have. Invariably there is a story, a person, an event, or a mixture of these, that became a powerful guiding system.

This leaves us, as I see it, a powerful reason to offer those we work with the chance to develop (or in Malt'z's language, 'manufacture') a positive self-image; to help them create templates or patterns in the sub-conscious that become part of their internal guidance system. It sounds awfully like tampering with minds, so let me describe what it can look like.

It is likely that each of us here do some sort of goal-setting exercise with our students, so let's call it a 'mind map'. This term means different things to different people. In this context it is simply a way of representing the direction of our thinking, a 'target' sheet, a guide to enable us to focus certain thoughts, and discard others. Essentially allowing an internal capacity for orienting our minds with feedback and correction to stay on course, rather than a random array of influences to steer us all over the place. Here is an example:

I place my helmet on my head and get on my moped. As I start it up I smile as the wind whips the hair out of my eyes. I drive around town, and when I stop to buy lunch, I pack it in the compartment under my seat. This moped is my pride and joy. As I drive out into the woods, I remember when I was young and how I tried everything to get one. Now I feel like that little girl again.

Now I am not claiming this process guarantees the writer will tour Italy on a moped. But what I can be sure about is that with this map on her bedroom wall as a constant reminder, the sensory-rich descriptions and her emotional connection to the content, the chances are high. Knowing what we do now about the way patterns are preserved intact in the subconscious, about dreaming discharging unfulfilled expectation to maintain emotional integrity, and about internal guidance systems, we can be sure the map is a very real target for the system to home in on.

Let me give you another example. One of my students prepared a great mind map. On it was his objective to be a doctor; pictures of him in his surgery, degrees on the wall, rich in sensory language all very real. Later in the year, all the students organise their work experience, and this boy, not surprisingly, wants to do his with a doctor. Not any doctor, but a surgeon. He was told it was out of the question. The hospital could take him in the garden, the kitchen, the maintenance team, but nothing like what he wanted. Everything the boy heard was steering him away from his target, so he made an appointment with a surgeon, took his mind map and showed him. The boy's commitment and explanation of self-image impressed the

surgeon, so he agreed. The boy became his shadow for a week, with patients, in the operating theatre, even observed a caesarean. Just last month his mother told me he had bought a stethoscope on e-bay, he wears it around the house. He finds it hard to watch TV now, the stethoscope directs him to his study desk instead. I asked him for a photo, and this is what he sent - the subject line: 'The importance of symbolism'.

Attached is a photograph of me as a young medical student as per your request. I believe the photo will suffice but if there are any problems just call my practice and my secretary will book you in for an appointment.

Sincerely,

Dr Joshua Saunders (MD FracGP MasPD)

Once again, no one can guarantee him a place in medical school, but I think you will feel as I do that his subconscious contains an expectation that it will seek to fulfil. Not only that, but he has a template, a self-image that he is emotionally committed to, a template that will arouse him, and during his dream state the arousal will be metaphorically completed, and next morning his target will still be intact.

Templates can be created at any stage of our lives. Michener, in his early 40's, describes being in an overloaded aircraft, attempting to land on a tiny strip between huge mountains, at night, the third and final possible attempt before fuel ran out. The pilot succeeds, slumps over the controls, too exhausted to hear the heartfelt applause. Michener is too tense to eat, drink or sleep. Hours later, he walks the airstrip in the darkness from end to end, and in his mind creates the targets for the rest of his life. He sees the mountains and the stars above them, and he swore:

I am going to live the rest of my life as if I were a great man. I am going to erase envy and cheap thoughts. I'm going to concentrate my life on the biggest ideals and ideas I can handle. I'm going to associate myself with people who know more than I do. I'm going to tackle objectives of moment.

And in the nearly fifty years since that night, I have steadfastly borne testimony to all my deeply held beliefs.

Michener, J. The world is my home: a memoir.

Random House, New York. 1992 p264.

It seems to me that Michener's defining moment on that dark island airstrip has the vital ingredients for a life-affirming template. Firstly it was sensory rich, loaded with images, emotion, sounds. Secondly, it was his own, not a copy. It related to the image of who he was, what he will no longer be, and what he will do. And finally, there was no part of him that night that was not fully committed to the image of himself. He would dream that night, and subsequent nights, and the expectation of it being fulfilled was preserved.