

Dirty Walls – An evolutionary theory to explain the dream function

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I am dissatisfied with past and recent theories relating to dreams mainly because they have no very plausible account of why dreams might confer an evolutionary advantage to human beings (or other animals) but also, in my view, because they do not investigate thoroughly enough the links or obvious similarities between wakeful psychological manifestations - creativity, daydreams, flashes of inspiration, déjà vu, LSD trips, schizophrenic delusions, etc. - and dreaming.

One set of theories defer to Freud (1900) who said that the motivation for all dream content was wish-fulfilment albeit that this becomes more and more distorted as we grow older. Psychologists have also recognised similarities between some aspects of dreams and the output of computers during data configuration. (Crick, F., Mitchison, G. 1983. Hennevin, E., Leconte, P. 1971) Another theory proposes that repeated negative experiences in dreams help us to cope with adverse experiences in real life. (Revonsuo, A. et al. 2003)

Alternatively, dreams may be just a random by-product of some other process. The natural world is full of these. One can easily see why, for instance, a caterpillar has evolved a green skin to hide from predators in the green tree where it lives. The fact that the tree has green leaves does not need an evolutionary explanation, however. It's simply because the photosynthesising molecule, chlorophyll, happens to be green. In biology, this is known as a spandrel.

There may be no evidence to prove that dreams are anything other than a spandrel – or some incidental by-product of the immensely complex processing of data in the brain but, if that is the case, why do we have to 'experience' them at all? One would think that we have more than enough to experience in tasting, smelling, feeling, hearing, seeing, remembering and recalling in our waking life.

Given the extreme precariousness of the lives of our hunter gatherer ancestors and that of our pre-human forebears, our brains must have surely evolved every means possible of 'thinking' our way out of danger, just as our legs have evolved to meet our life or death hunting and escaping needs. Is it possible that dreams could have played an important role in our efforts to survive and thrive and continue to do so?

Even if we can't yet prove that dreams have an independently useful function, surely the fabulously exotic experience of dreaming and the degree of mystery dreams create in our lives must be more important than a mere by-product of the mechanisms of our body. And if there is a reason for dreams, we should try to find out what that might be.

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Proposal

Leonardo da Vinci said that when he was lost for inspiration for his paintings he used to leave his studio to look for shapes and colours on dirty walls which could form unusual patterns resembling animate and inanimate objects which wouldn't otherwise occur to him. I believe that dreams serve the purpose of dirty walls.

I propose further that dreams are a manifestation of a function of the brain that operates intermittently throughout the day not only in sleep but also in wakefulness. The dreaming process has evolved to provide our conscious levels of reasoning with an input of novel and creative notions.

I think that this theory might enable us to throw light on certain other mysterious functions of normal and abnormal mental conditions.

Everyday experience

Psychologists are interested in why it is that we experience various degrees of consciousness during our waking hours. We may pay a great deal of attention to delicate tasks such as decorating a cake or measuring a piece of woodwork but at the same time we might be oblivious to a conversation being broadcast on a nearby radio. On the other hand, we may be hardly aware of driving a car safely through winding streets while we concentrate on a conversation with a fellow passenger.

We hear ourselves talking quickly and at length usually in perfectly grammatical sentences but could not possibly design such easily flowing speech if we had to stop and think how each sentence is to be constructed.

Another example of our multi-layered brain function occurs when the solution to a cryptic crossword clue suddenly pops into our mind when we are not even aware that we are thinking about the crossword which we might have been attempting to solve hours before.

We are clearly able to draw upon the resources of several 'networks' of unconscious activities of the mind some of which are (unlike the common view of subconscious activity as being, say, interesting but irrational) coldly logical.

These simple observations support the universally accepted theory that our awareness of the things around us, and the many other processes of our mind, occur on several different levels – one or more of which we can note and memorise - while others are functioning at sub-conscious levels.

The importance of imagination

Many of the activities we undertake require what we call 'imagination'. This is regarded as being a more complicated process than the exercise of mere logic. If we want to capture the attention of an audience when we are speaking, for instance, we might try to use similes or humour to enliven

what we are saying. We might, for instance, say that we are 'down to the last few sheets on the toilet roll of life', rather than 'I am getting old'.

The invention of these imaginative ideas may come naturally and seem obvious to some very gifted people but, to the rest of us they often come as a sudden 'flash of inspiration'. We are unlikely to arrive at these strange revelations using the 'higher' levels of consciousness that we might use, for instance, to add up a shopping bill. We are not aware of the process of the generation of these imaginative ideas. They come from some sub-conscious level(s) of brain activity.

Homo sapiens have an obvious advantage over other animals because our species has powers of logic to help us to increase our chances of finding food and shelter, and to avoid predators, but sometimes pure logic is not enough. We often call for the use of mental efforts beyond traditional step-by-step logic and describe them as like 'thinking outside the box' or 'lateral thinking'. (de Bono, E. 1967)

In games and sport and even in war we are more likely to win if we use bluff and subterfuge and novel manoeuvres. Our imagination enhances our chances of survival. In evolutionary terms we have a greater chance of having children if our creativity has enabled us to survive and, what's more, our children are likely to inherit our creative skills.

A model for an 'inspiration machine'

If we were to sit down and try to invent a mechanism that would help us to add inspiration to our efforts to solve problems in our daily lives we would very quickly realise that its components would be very like many features of dreams.

In order not to confuse the all-day process we use for generating novel ideas with night-time dreams only, I would like to call it the 'inspiration machine'. We might think about it as a very much extended and animated version of Leonardo's dirty wall.

And, like the dirty wall, the output of the machine might involve a degree of randomness or even somewhat chaotic processes offering an ever-changing palette of notions for our more conscious selves to choose, amend or reject. Another useful feature of the mechanism would be for it to use rich areas of experience such as our sensations and our emotions as well as images and ideas.

There would be an even greater chance for the mechanism to provide notions and sensations which might hold the solution to a task or puzzle that was occupying our conscious mind if this stream of strange ideas and emotions were not entirely random but, instead, linked to our perceived needs and unique life experiences.

The memories we can access while awake are coloured by logical approaches to our immediate worries and our need for practical tasks to be completed. While dreaming we cannot utilise these channels to the memory banks we use in waking life so the 'knowledge' that we use to construct our wonderfully elaborate dreams must draw on memories that come to our sleeping selves through different channels. These memories may be strange and inaccurate but they provide the raw material needed to stimulate our imagination.

We could go even further and add to the specifications of an inspiration machine, designed for our unique, personal use, a link to our deepest desires and anxieties and an ability to reflect childhood memories or obsessions. Such features have been identified as components of dreams by

many psychologists searching for a theory of dreams.

An important feature of sleeping dreams is their tendency to have storylines...quirky and disjointed as they may be. What additional purpose might these have in exciting creative thinking?

I believe that we use stories to make sense of our lives. We plan future encounters with our surroundings by first acting them out in our head. Ever since our time as hunter gatherers we have made up stories to confirm our identity and retold them around the campfire. A narrative tradition defines nations and peoples all over the world. The Australian aborigines have a complex network of belief, social guidance and self-identity. They call it dreamtime. Any mechanism designed by evolution to offer original solutions to problems is likely to feature some kind of story-telling component.

All these influences are connected in dreams with subject matter which is often, but not always, handily constructed from the previous day's waking experiences – 'day residue' as Freud put it.

Dirty walls gave Leonardo unexpected choices of two dimensional images which he could select if he decided they would be useful in his work as an artist. In their function as sources of inspiration, dreams differ from dirty walls in that they are multi-dimensional, in all the ways described above, yet their ever-changing kaleidoscope of emotions and images fulfil the function of presenting us with choices that other parts of our thinking processes, of various degrees of consciousness, can select (or reject) for any use in their work in the control-centre of our lives.

Controlling the machine

Useful as this inspiration machine might be as a source of novel and personally relevant ways of looking at a problem it would be a serious impediment to our efforts to conduct our daytime activities if it was switched on all the time and/or it was too loud and insistent.

A powerful and constant stream of communication between the machine and our conscious level(s) of thinking would diminish our ability to deal with everyday problems. A stream of nonsensical, semi-random ideas and emotions is the last thing we need to arrive in our heads when we are trying to work out our route on a London Underground map.

If the stream of communication were weak and/or intermittent it may be exactly what we need if we are designing theatre sets or working out a strategy for confusing the office bully.

To fulfil its function as a generator of useful new ideas our mental apparatus is likely to require some kind of control of our access to the output of the inspiration machine. We might call this a portal – a restricted two-way communication system that opens and closes, widens and narrows.

The inspiration machine, equipped with the right kind of two-way portal with our conscious selves, would clearly represent a useful tool for coming up with bright ideas as we go about our problem-solving daily lives... but what possible role could the machine play while our senses are frozen in sleep?

Once again some everyday experiences may offer a clue. There are countless examples of artists and scientists who have attributed their best ideas to dreams. We say they have 'dreamed them up'. Friedrich Kekulé is said to have realised that the molecule of benzene must have the form of a ring

after dreaming of a snake biting its own tail. Paul McCartney's *Yesterday* and Robert Louis Stevenson's *Dr Jekyll and Mr Hyde* were also products of dreams. If we have a particularly knotty problem we are very likely to decide to 'sleep on it' and very often find that the answer has come to us in the morning.

If the inspiration machine works while we are awake, unconscious of its processes as we may be, dreams during sleep seem to work in a more uninhibited way but with the same evolutionary function. We may forget the 'content' of our dreams very soon after we wake but, when dreaming has ended we are often left with answers to our daytime questions.

Also, when we are waking from sleep we can have some crystal clear ideas and revelations delivered by the combining of the choices some more rational part of our unconscious has made from the kaleidoscope of dream sensations, and our freshly opened daytime memory channels.

Evidence

We know that dreams occur when we are in an unconscious state (or sometimes, in a semiconscious state). In short, many of the exceptional experiences we have during what we call conscious or wakeful thought – flashes of inspiration, daydreaming, *déjà vu*, solutions to problems, sudden ideas popping up in our mind, the idea that we can solve a problem by 'sleeping on it' – could be explained if our conscious mental life were linked weakly and intermittently with the process that causes us to dream. And, if this is the case, the dreaming process must be functioning constantly or intermittently during our waking hours.

Many studies have been made of sleep deprivation and it is clear that human beings cannot exist for long without sleep. As the days of sleep deprivation go by individuals quickly begin to experience mental and physical deterioration to the extent of causing death within a few weeks. Sleep deprivation is, of course, a well-known form of torture.

Studies have been undertaken to observe the more specific effects of the deprivation of REM sleep. These have shown that depriving people of the dreams associated with REM sleep has no observable physical or psychological effects except that the volunteers that were the subject of the study reported having very vivid dreams once the deprivation had ceased. (Endo, T., et al 1998) No link has been made between the deprivation of REM sleep and memory consolidation or learning ability.

Of course, if the dreaming function continues throughout waking hours as well as in sleep, the deprivation of REM sleep and its associated dreams would only have an effect for eight hours or so out of 24 – so it wouldn't be surprising if very little effect is seen in the volunteers.

Some studies have even shown that REM sleep deprivation reduces depression in individuals suffering from that condition.

Recent research using neuroimaging and first-person content reports seems to indicate that many of the brain's structures operate while dreaming in very similar ways as those when we are awake but when our mind is 'wandering'. (Fox K C R, Nijeboer S, Solomonova E, Domhoff G, Christoff K. 2013)

In this work the authors widen the definition of mind wandering to include other 'undirected' mental states, that is,

daydreaming and spontaneous thought, although it's possible to envisage that these states could be wilfully initiated.

Although such conditions might be a tell-tale indication of the inspiration machine at work, I wouldn't rule out the possibility of it working unconsciously during other states of wakefulness.

The authors allow for the possibility that the purpose of the continuum of brain activity could be to assist in our efforts to be creative citing neuro-scientific analysis by Michael Schredl (2007).

The portal

In this proposal I am suggesting that just as the dream function (inspiration machine) operates intermittently during sleep (approximately every 90 minutes in 20 minute bursts) it also operates intermittently while we are awake. Although we are unconscious of this process, we benefit from its output in the form of creative ideas. I'm also proposing that the communication system, or portal, operating between the inspiration machine and more conscious thinking not only works intermittently but is also restricted in some way to avoid our conscious thinking processes being flooded with strange, though occasionally useful, thoughts in the intermittent periods when the inspiration machine is operating during the day.

Although we all dream, everyone's creative abilities are different. Some people very rarely 'think outside the box', nor are they suddenly driven to write a poem. There are some very dull or overly-practical people while other people can be severely hampered by their inability to block out a constant stream of wild ideas. And the difference may be in the nature and function of the portal.

There may also be times when either the inspiration machine is not in operation or when the portal becomes very restricted. This may account for such phenomenon as writers' block and those maddeningly barren occasions when we cannot find a creative flourish for the work we are doing.

The portal acting abnormally

Many drugs, both recreational and medicinal, may also act on the function of this portal between dreamland and the sensible world of wakefulness. Some, like LSD, might widen the portal, while lithium may restrict it.

Much of the content of dreams is bizarre and strange, consisting of images, sensations, emotions and ideas often spun out into disjointed narratives. Our dreaming self can often surprise us with its twists and turns even though we, at some other level, must be doing our own surprising.

The nature and function (or malfunction) of the portal may play some role in certain mental diseases. Hallucinations and delusions are common symptoms of both schizophrenia and dreams. Schizophrenic people are considered to be abnormal for hearing disembodied voices while 'awake', yet no one would be surprised if the hearing of such voices were a feature of a vivid dream. I understand, from the people I have discussed this subject with, that they share my fairly rare dream experience of having more than one identity in a dream. 'I' can put a question to 'myself' in a dream, for instance, and be surprised by both the question and the answer. Although such an experience might occur in a dream, it would be considered alarmingly abnormal in the wakeful state. (Such scenes in dreams are another indication, if one

were needed, of how quick-witted and multi-layered the apparatus is that we use to construct them.)

Another piece of evidence that may go some way to support my explanation for the nature of dreams comes from studies that show that people who take certain antidepressant medications have little or no REM sleep and no apparent negative consequences have been noted in these individuals. (Watts, A., Gritton, H.T., Poe, G.R. – 2012) While the effect of such medication may be to lower the anxiety of the patients, it may also make them duller, less imaginative people. Such medicines may not operate to alter the communication portal but to shut down the dreaming apparatus altogether.

Dream 'interpretation'

From the earliest periods of recorded history to Freudians in the 20th century many people have believed that the explanation of dreams can be found in their content. It was thought that the content of dreams has some important psychological or even mystical and divinatory qualities and, through its analysis, we might throw some light on the nature of our individual psychology. It seems to me, however, that if dreams contained such potentially useful insights, evolution would have ensured that we at least remember them so that we could make use of them. The content of dreams is quickly forgotten, however, which would be more in keeping with the theory for the function of dreams that I am putting forward.

I believe that research carried out to explain the useful function of dreams that relies on analysing the content of dreams is unlikely to be useful either to the dreamer or those trying to understand the psychology of dreamers.

Possible lines of research

Through the improvement in brain-mapping technologies, researchers can detect when dreams are being experienced. They have shown that REM sleep is not always accompanied by dreams and that some dreaming occurs outside REM periods.

More attention should be given to the results of investigations of minds which show 'lighting-up' patterns associated with night-time dreaming that occur at any time during waking hours and not just in periods of 'mind wandering' which could be self-initiated. Apparently, PGO (ponto-geniculo-occipital as in REM sleep) waves appear at a constant daily rate in cats but appear less frequently while awake – (Hobson, J. A. 1997)

Such studies might be used to compare results from highly creative and less creative subjects.

My theory might be strengthened if it was found that more imaginative people had more interesting dreams, i.e. a better inspiration machine.

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