**Sleep and dreams**

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Everyone dreams, though some people claim never to. The proof is easy to come by. If a self-professed non-dreamer is woken up when their brain is showing the characteristic signs of REM (rapid eye movement) sleep, then they will almost certainly report a dream. So the non-dreamer is really just forgetful; it is dream recall that varies widely, rather than dreaming itself. Another way to demonstrate this is to give them a pencil and paper and ask them, every morning, to write down any recollections they have on waking. Anyone can do this, and the usual effect is a dramatic increase in dream recall. Within a few days most people find themselves swamped by dreams and quite happy to go back to a little less reliable recall.

In a typical night’s sleep the brain cycles through four stages of non-REM sleep; first going down through stages 1–4, then back up to stage 1, and then into a REM period, repeating this pattern four or five times a night. If people are woken at the different stages they describe different experiences. In REM sleep they will usually, though not always, say they are dreaming, while in non-REM sleep they may describe thinking, mulling something over, watching rather static images, or nothing at all. Children, and even babies, show the same physiological stages, but the capacity for complex and vivid dreams develops only gradually, as cognitive skills and imagination develop.

A great deal is known about the physiology of sleep and some of the ways in which it can go wrong. But this knowledge hides a much less certain picture when it comes to considering sleep as a state of consciousness.

Like much to do with consciousness, the notion of states of consciousness and altered states of consciousness (ASCs) seems superficially obvious. For example, we all know that it feels different from normal to be drunk or delirious with fever, and we may guess, even without experiencing it, that it feels different again to be high on drugs, or to be in a mystical state. So we can call all these ASCs.

Yet any attempt to define ASCs immediately runs into trouble. There are two obvious ways to try. First, there are objective measures, such as how much alcohol a person has drunk, or which method of hypnosis was used on them. This is not ideal because two people may drink the same amount and one become completely inebriated while the other is hardly affected. Similarly, induction techniques affect different people differently, and some not at all. Few states of consciousness are associated with unique physiological patterns, and measuring brain states gives confusing results. Measures of behavior can be unhelpful because people can claim to have been in profoundly altered states without their behavior apparently changing at all. In any case, all these objective measures really seem to miss the point that an altered state is how you feel it is, and is something private to the person having it.

For this reason, subjective definitions are usually preferred. For example, psychologist Charles Tart defines an ASC as ‘a qualitative alteration in the overall pattern of mental functioning, such that the experiencer feels his consciousness is radically different from the way it functions ordinarily’. This certainly captures the idea of ASCs but also creates problems, such as knowing what a ‘normal’ state is, and dealing with cases in which people are obviously (to anyone else) in a strange state but claim to feel completely normal.

Also, curiously, this definition hits a problem when we look at the most obvious state of all – dreaming. One of the most characteristic features of an ordinary dream is that we do not feel that our ‘consciousness is radically different’ – at least not at the time. It is only afterwards that we wake up and say ‘I must have been dreaming’. For this reason, some people even doubt that dreams can be counted as experiences. After all, we do not seem to be experiencing them at the time – only remembering them afterwards. So did they really happen as they seemed to or might they have been concocted at the moment of waking up? And can we know?

Interestingly, there are ways of finding out. For example, it is possible to incorporate features into people’s dreams by, for example, playing sounds to them or dripping water on their skin. Sometimes they will later report having dreamed of church bells or waterfalls. By asking them to estimate the timing of these events, it has been shown that dreams do take about the time they seem to.

An even better method is to use those rare people who can have lucid dreams at will. A lucid dream is when you know, during the dream, that it is a dream. In surveys, about 50% of people claim to have had a lucid dream, and 20% have them fairly frequently. For those who have never had one they sound rather strange. A typical lucid dream starts when something peculiar happens and the dreamer starts to have doubts – how did I get on top of this building, and why is my grandmother here when I thought she was dead? Instead of accepting the peculiarity, as we usually do in dreams, the dreamer realizes it cannot be real. With that realization everything changes. The dream scenery seems more vivid, the dreamer feels more like their normal waking self, and may even take control of the dream. At this point many people start to fly and have fun, but lucid dreams rarely last long and most people lapse back into the ignorance of ordinary dreaming very quickly.

A few (very rare) expert lucid dreamers have taken part in laboratory experiments and learned to signal from their dreams. In REM sleep almost all of the body’s muscles are paralyzed, otherwise you would act out your dreams, but the eyes still move and breathing carries on, so lucid dreamers can sometimes signal by moving their eyes. This allows experimenters to time their dreams and to observe brain activity during the dreams. Generally speaking, this confirms the realistic timing of dreams and also shows that the brain is behaving very much as it would if the person were really running down the street, playing tennis, singing a song – or whatever they are dreaming about. The difference is that they are not physically doing it.

This REM paralysis has another consequence. Sometimes people wake up before the paralysis has worn off and find they cannot move. This is known as sleep paralysis and can be a very frightening experience if you don’t know what it is. Often it includes rumbling or grinding noises, eerie lights, and the powerful sense that there is someone close by. Most cultures have their sleep paralysis myths, such as the Old Hag of Newfoundland who comes and sits on people’s chests in the night, or the incubus and succubus of medieval lore. Alien abduction experiences may be the modern equivalent – a vivid experience concocted in that unpleasant paralyzed state between waking and dreaming.