

## “De-Freuding Your Dreams”

“To sleep! perchance to dream! ay, there’s the rub . . . .” Sorry, Hamlet, but you didn’t know the half of it. Far more complicated than you realized. Same for Freud who misled generations of 20<sup>th</sup> century psychoanalysts who collected big bucks by getting their patients to find Freudian “meaning” in their dreams. Hard to distinguish here between defrauding and de-Freuding. If you want an update on what dreaming is all about, here is a reasonably good summary of what today’s neuroscientists say about the dreaming process. It’s all in the head . . . er, brain.

Andrea Rock, *The Mind at Night* (New York: Basic Books, 2004)

A Commentary by  
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REM (rapid eye movement) sleep was discovered by Eugene Aserinsky and Nathaniel Kleitman of the University of Chicago in the early 1950s and jointly published by them in *Science* in 1953. Dreaming occurs principally but not exclusively during REM sleep. Recall of dreams is more likely if sleepers are awakened during REM sleep. REM sleep occurs in the womb at about the 26<sup>th</sup> week. Animals also exhibit REM sleep.

Allan Hobson and Robert Carley in 1977 proposed that dreaming is a function of neuron firing patterns in the brainstem (pons) that alter the balance of neuromodulators: norepinephrine and serotonin, which respectively focus attention and affect judgment, learning, and memory. During sleep, they stop circulating and are replaced by acetylcholine, which stimulates visual, motor, and emotional centers of the brain, and triggers REM and visual imagery. For these two researchers, dreams hold no hidden symbolic “meanings” *a la* Freud.

Other researchers—Mark Solms, Tom Balkin, Allen Braun—established through PET scans that the forebrain is also active during dreaming, along with the pons, thus giving a “plot” to dreams, although one distorted by emotional and visual imagery. Researchers also found that non-REM sleep also produces dreams. In both cases, long-term memory recall is activated but short-term memory is blocked.

A Darwinian explanation of dreaming is this: Dreaming in humans evolved from a brain process inherited from earlier mammalian species who, faced with survival challenges, during REM sleep processed genetically-encoded survival-related information along with experiences from daily life, thus enabling them to cope with such survival challenges. Humans, too, in dreaming simulate events occurring in daily life, reflecting a long history of hunter-gatherers having to face predators and other threats; hence, the common threads of fear, flight-or-fight, anger, and other strong emotions are a legacy of those earlier times in human evolution. In effect, during dreaming the brain rehearses such survival skills and thus conditions the sensory network so that it can respond during waking

hours. The neuromodulator acetylcholine helps encode such skills in memory, while lowered levels of serotonin and norepinephrine block memory recall. Dream content for the most part consists of conditions and associated fears of the ancestral hunter-gatherer world, not the modern world, although these fears take on modern forms during dreaming.

During REM sleep (and other kinds as well), the brain consolidates and integrates into memory some of the experiences encountered during waking hours. The hippocampus is the area where memory is stored and which is connected to the amygdala that generates emotional responses. In dreaming, these two areas interact with the neocortex to make sense of the experiences, consolidating them in memory and discarding those elements that are not needed (hence, the bizarre components that are being discarded from experience and memory). In other words, the brain is learning during sleep, readying the sleeper for the next day's challenges, and storing the previous day's events in memory. This suggests that dream imagery comes primarily from neocortex activities, not simply from the brain's centers of emotion (hippocampus) and memory (amygdala).

Dreams as we experience them do not necessarily "mean" anything in the rational sense of meaning or signifying something. Freud was wrong in attributing sexual symbolism to dream objects; Jung was wrong in believing that universal archetypes are embedded in dreams of peoples everywhere (except those related to evolutionary survival). Although the left brain tries to make sense of dream imagery, while the right brain may be generating some of these images, the chemical state of the brain does not permit it to operate as it does during waking.

Creativity may consist of a self-organizing activity that arises out of a chaotic mixture of bizarre dreaming images, where the brain's chemical state encourages odd associations to occur. Then, if at the same time, memory is being consolidated by the neocortex, these dreaming insights might then be reproduced on waking, taking the form of what we call "creative" thoughts.

Waking and sleeping are not two unrelated, or even different, states of consciousness. The brain's neural networks reflect a history of experience acquired during waking hours, as well as a rehearsal of those experiences during dreaming and a consolidation of them in memory. Most people drift from one state to the other, not just during sleep but during waking time also as we "day dream," which is common. The same neural networks are used in both cases and can arouse the same sets of emotions.

"Lucid dreaming" occurs when the dreamer is aware that he/she is dreaming. In some cases, the dreamer can "control" the dream's content, although doing so is likely to end the dream. There is a fair amount of nonsense written about lucid dreaming as if it gives one new insights into one's life and problems. Some Buddhists are big on it: 'Nuff said.

Even more off-the-wall speculation comes from those who obsess about "consciousness" and its "location" in the brain (this is my opinion, not the book's). Most researchers will say that the human brain is more capable than other mammalian brains

(e.g., apes) of allowing *Homo sapiens* to “be aware of oneself” as a separate entity, as well as to think about one’s existence in relation to others and to one’s “place” in the world, much of this adding up to “sense of self” and “free will.” In this scenario, dreaming is supposed to be a way that the brain updates one’s neural networks and refines the brain’s map of the external world (which is unique for each person), the better to navigate it in waking life. The empirical evidence is shaky. Francis Crick of DNA fame is one of the figures involved in chasing this notion of “consciousness,” but he has much company. Again my opinion—these efforts are one part of the constant attempt to demonstrate that humans are somehow unique in the animal world, which though true, is no more true nor important than the difference between frogs and people.

Two bizarre dream disorders are interesting, not to say frightening. “Parasomnia,” a genetic disorder, occurs when a dreamer while still in deep sleep (but not REM sleep) gets up and carries out actions that he/she planned for the next day, including murder in two documented cases. Parasomniacs do not see, hear, feel, or remember what they are doing. Another disorder is “REM behavior disorder”—mainly seen in middle-aged and elderly men—which occurs when the dreamer arouses (but does not get up) while still asleep and acts out a dream. It probably stems from abnormal cells in the brain stem responsible for motor activity. Normally, motor activity is restricted during dreaming. But these guys can go all out and kick and punch an attacker generated by the dream. As one researcher said, “Unfortunately, it’s often the spouse who’s injured by the dreamer’s behavior.” Another ‘nuff said. Sorry about that, Millie. Just kidding, of course.