



# Capitol Sleep Medicine Newsletter

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## Your Dream World

Can recent waking experiences influence the construction of the dream world? A simple yet brilliant study was performed in which subjects wore goggles with red filters throughout the day that excluded all other wavelengths of visible light. The goggles were worn by the participants every waking minute with the exception of brief rest periods when the subjects' eyes were closed and covered with black patches. The visual experience created by looking through colored filters was replicated in the construction of the visual surround of dream settings, for instance rooms, furniture, clothing, lawns, trees, lights, and sky were all transformed into being colored shades of red similar to those observed through the filters during the preceding few days. The first REM periods of the night were found to be most affected by the preceding day's visual experience, requiring only one day for the red goggle effect to be present in at least half of the dreams. Within a week, this effect was also seen in dreams that were reported during awakenings from REM sleep periods at the end of the night.<sup>1</sup> Clearly the dream scene is dependent on recent real life experience and one's recent experience is incorporated into their dreams.



Dream time is the time it takes to dream. In 1896, it was proposed that the production of the dream report begins at the moment the sleeper begins to awaken and ends after the report is completed.<sup>2</sup> In other words, the thought was that although the dream seemed to play out in normal time, it actually was completely constructed and then played out as a dream in an instant. A hypothetical example of this logic would be a dream where the dreamer is a woman surrounded by a fire in her house. The dreamer immediately feels incredible fear and anxiety as she remembers her baby in the nursery. She gathers all of her courage and strength and bursts through the door into the nursery. She grabs her baby and runs down the stairs and outside into her front yard where she hears a loud siren and a fire engine pulls up onto her yard. She then wakes up to suddenly realize that the siren was actually her alarm clock incorporated into her dream. Could it be that the entire dream was created in an instant by the sound of her alarm clock and then played in what seemed like real time in her dream? This idea was later discredited when it was found that the time between the presentation of an external stimulus, such as a spray of water, and the time of being awakened from sleep matched the duration of the dream report, which in turn, equaled the time required to act out the narrative. In other words, it appears that dream time ticks by at the same rate as waking time.<sup>3</sup>

There is another pearl of information here. Loose associations are the rule in REM sleep. Incorporation of a stimulus from the outside world is more of an exception but it can occur. When it does, the loose

associations start up again from a new set point. In this last study the spraying of water on a dreamer induced a dream report that rain suddenly appeared. This is the incorporation of the stimulus. The next event in the dream was that the dreamer then began using their umbrella. This is the reset and takeoff of the next loose association. The stimulus is incorporated into the dream, the dream then resets, and then goes with the flow and keeps changing. The dream world is always changing.

Following the discovery of REM sleep in 1953 and the discovery that the most vivid dreaming occurs in REM sleep in 1957, the fascination with the dreaming brain gave birth to a great deal of REM sleep and dream research in the 1960s and 1970s, only to subsequently subside. The problem with this research is that much of it was based on subjective dream reports but very little on cold hard objective scientific data. The biggest problem with dream research is that it relies on subjective reports of the dreamer. The dream report cannot be obtained in real time as it is happening, it can only be obtained following awakening. A sleep study can measure many things including brainwaves, heart rate and rhythm, breathing, blood oxygenation levels, leg movements, and more. While asleep, the brainwaves can determine in what state of sleep a subject is, whether it be stage I, stage II, slow wave sleep, or REM sleep. While in REM sleep, the brainwaves can reveal when the muscle paralysis first begins, the onset of sawtooth waves, and the timing and density of rapid eye movements. What a sleep study cannot tell us is what the subject is dreaming. If we had a tool to do that, we could take sleep research to a whole other level. There would be no more uncertainty about the subjective contents of the dream. Dream subject matter such as people, animals, and inanimate objects could be analyzed on a more objective level, for instance the duration of presence, visual intensity, emotional intensity, and association with other elements in the dream could be better qualified and quantified so that a soft subjective science could suddenly transform into a measurable objective science that could then begin to provide clues as to how the dream world is really being enacted in a more objective and concrete way.<sup>4</sup>

- <sup>1</sup> Roffwarg, H. P., Herman, J. H., Bowe-Anders, C., & Tauber, E. S. (1978). The effects of sustained alterations of waking visual input on dream content. In A. M. Arkin, J. S. Antrobus, & S. J. Ellman (Eds.), *The mind in sleep: Psychology and psychophysiology* (pp. 295-350). Hillsdale, NJ: Lawrence Erlbaum Associates.
- <sup>2</sup> Hall, C. S., & Raskin, R. (1980). *Do we dream during sleep?* Unpublished manuscript.
- <sup>3</sup> Dement, W., & Wolpart, E. (1958). The relation of eye movements, body motility, and external stimuli to dream content. *Journal of Experimental Psychology*, 55, 543-553.
- <sup>4</sup> Walter, T (2007) Chapter 4, Your Dream World. In *REM Illumination Memory Consolidation* (pp. 41-49), Grove City, OH: Lotus Magnus.

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