

What Is Sleep?

By [SIRI HUSTVEDT](#)

The New York Times, April 21, 2010, 9:00 pm

I am convinced that during bouts of insomnia I have sometimes slept without knowing it. The thoughts of waking seem to mingle with thoughts that may be part of sleep. Has the clock moved too quickly? Did I doze off? Some years ago in a rented house in Vermont, I couldn't sleep and lay awake listening to the sounds of mice in the walls, bears that sounded like owls calling to each other in the woods and the wind in the trees. I then dreamed I was lying awake on the very bed where in fact I was sleeping, but someone had broken into the house. Because the room where I actually was and the room I dreamed were identical, the threshold between waking and sleeping had blurred and, when I woke up, I thought I heard the burglar moving around downstairs. It was a frightening experience, a temporary loss of the boundaries between waking experience and the illusions of dreams.

Once, my sister Ingrid, while lying on her bed, certain she was fully awake, was amazed to see a strange man wheel a bicycle into her bedroom. After a minute or so, the man and his vehicle disappeared. They had been either a dream or a hallucination. As with me, my sister's confusion of the real and the unreal turned on the fact that both were located in the same place.

In his "Meditations," Rene Descartes asked if he could be really certain he was awake. "How often, asleep at night, am I convinced that I am here in my dressing gown, sitting by the fire when in fact I am lying undressed in bed ... I see plainly that there are never any sure signs by which means of which being awake can be distinguished from being asleep." Most of us accept that although we may believe our dreams to be real events, upon waking we can tell the difference between nocturnal hallucinations and reality.

The curious relation between wakefulness and sleep continues to puzzle philosophers and scientists. In recent years I've come across many articles in the popular press about sleep, sleep deprivation and sleep disorders. It's a big subject, probably because Americans don't sleep enough and spend huge amounts of money on sleep aids. These writers often present the science of sleep as if steady progress were being made toward complete understanding, but the truth is fundamental questions remain unanswered. Nobody knows what either

sleep or waking consciousness is, even though these two have long been seen as the two sides of being; part of life's unvarying diurnal rhythm. Aristotle put it this way: "It is inevitable that every creature which wakes must also be capable of sleeping, since it is impossible that it should continue actualizing its powers perpetually."

When I don't get enough sleep I am cranky, vulnerable to headaches, and my concentration is poor. The benefits of sleep are well known, but there is no consensus among scientists as to what its biological purpose is. Theories have ranged from memory consolidation to memory expulsion to restoring brain function, but nobody knows why we must turn away from the productive waking world and enter another state or states. Insomniacs long for sleep and keep themselves awake with worry. But what exactly does the insomniac crave?

Until the middle of the 20th century researchers agreed that fatigue led to reduced brain activity in sleep, that sleep was by and large a dormant state of mind. But this was proved wrong. In REM (rapid eye movement) sleep, brain activity is often equal to or more intense than it is during full wakefulness, which is why this stage is also called paradoxical sleep. Our brains are charged but our skeletal muscles are in a state of near paralysis: atonia. When atonia in animals is disrupted through surgery, they move around in REM sleep. They act out their dreams as we would if our muscle movements weren't inhibited.

People do not sleep walk during REM, but during slow wave sleep — SWS. And yet, it turns out that we can dream during SWS sleep as well, although the debates go on about what all this means. Lucid dreams are dreams in which the dreamer knows he is dreaming, a form of double consciousness that would put Descartes by the fire and in his bed at the same time. The neuroscientist Rodolfo Llinas has proposed that consciousness and dreams are not distinct but part of the same intrinsic brain functions, "that wakefulness is nothing other than a dreamlike state modulated by the constraints produced by specific inputs." Because crucial mechanisms for REM are in the oldest parts of our brains in evolutionary terms, Jaak Panksepp, a neuroscientist and psychologist at Washington State University, has postulated that dreaming may actually predate our more evolved form of waking consciousness and cognition, that our ancestors lived in a kind of primitive dream consciousness. V.S. Ramachandran, another brain researcher writes, "Perhaps we are hallucinating all the time and what we call perception is arrived at by simply determining which

hallucination best conforms to the current sensory input." At the very least, these speculations ought to make us think about what it means to be awake and what it means to be asleep. Are we back with Descartes meditating by the fire or are we asleep and dreaming? Is waking another form of dreaming?

Most of us, most of the time, do not ask these questions. All we know is that we need sleep. Our survival probably depends on it. If you keep rats awake, they die within two to four weeks. Of course, in order to prevent the poor creatures from sleeping, the scientists have to make it impossible for them to drop off, and some have questioned whether the animals die of stress rather than sleep deprivation. Fruit flies and cockroaches also perish when kept awake.

But some human states keep people wide awake. When I was a volunteer writing teacher at the Payne Whitney Psychiatric Clinic in New York, I had bipolar patients in my classes who had been admitted to the hospital during bouts of mania. A number of them told me that they had stayed awake for days, flying high as they had sex, shopped, danced and even wrote. One woman reported she had written thousands of pages during her most recent manic phase. A strange illness called Morvan's syndrome can cause people to remain essentially sleepless for long periods of time. In 1974, Michel Jouvet, a sleep scientist, studied a young man with the disorder who remained awake for several months. He was entirely cogent and suffered no memory impairment or anxiety. He did, however, have visual, auditory, tactile and olfactory hallucinations every night for a couple of hours. He dreamed while awake. Depending on their location, brain lesions can make people sleepy or prevent them from sleeping. They can also cause exceedingly vivid dreams or the cessation of dreaming altogether. Then again, people with no brain injury can experience all of these symptoms as well.

Understanding waking consciousness, sleep and dreams depends on how the lines are drawn among them. Ernest Hartman at Tufts University School of Medicine proposes a waking-to-dreaming continuum, a range of states that move from highly self-conscious, logical, category bound, sequential wakefulness to daydreaming and reverie with their more fragmented, less logical thoughts to dreaming. This makes a lot of sense to me. The insomniac remains on the focused or daydreaming side of the continuum, unable for any number of reasons to let go.

Hundreds of years before Hartman, Gottfried Leibniz argued for a continuum of perception from unconsciousness to full self-consciousness. Leibniz died in 1716, but his insight remains startling. We may not know why we sleep, dream or wake up, but these states are never static. Another philosopher Maurice Merleau-Ponty wrote in "The Phenomenology of Perception" (1945): "The body's role is to ensure metamorphosis." Surely, that is exactly what we do when we move through the various stages of being wide-awake and concentrated to the piecemeal musings of reverie, to sinking drowsiness, to sleep and dreaming or to sleep with no dreams at all.

References:

Michel Jouvet, "The Paradox of Sleep: The Story of Dreaming," trans. Laurence Garey. Cambridge, Mass: MIT Press, 1999.

Jaak Panksepp. "Affective Neuroscience: The Foundations of Human and Animal Emotions." Oxford: Oxford University Press, 1998.

For an overview on the debate about sleep states:

"Sleep and Dreaming: Scientific Advances and Reconsiderations." Eds. Edward F. Pace-Schott, Mark Solms, Mark Blagrove, Stevan Harnad. Cambridge: Cambridge University Press, 2003.