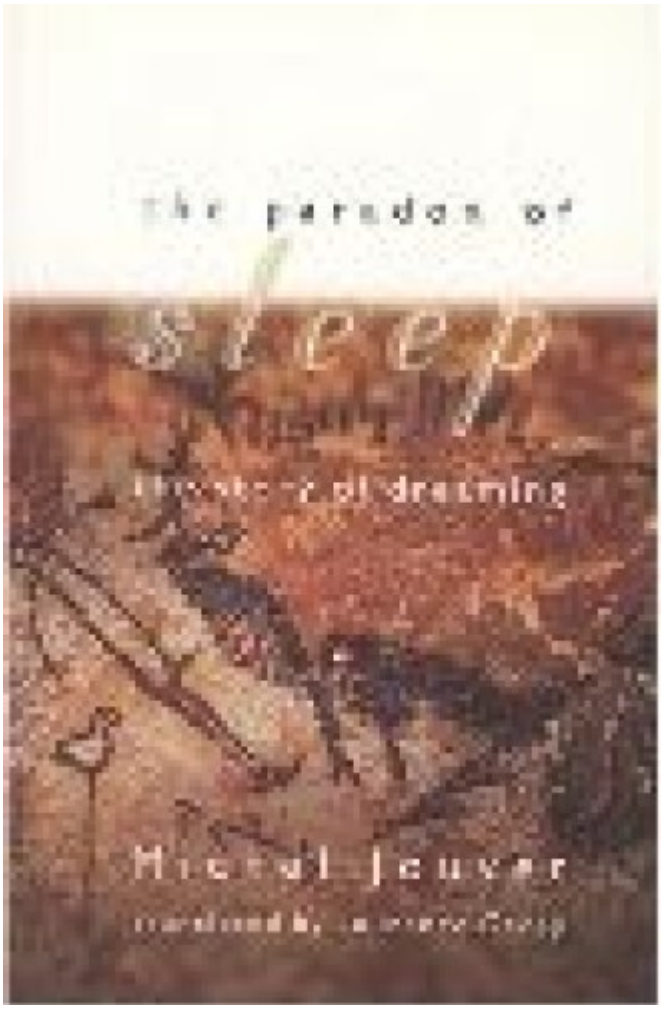
Deep sleep

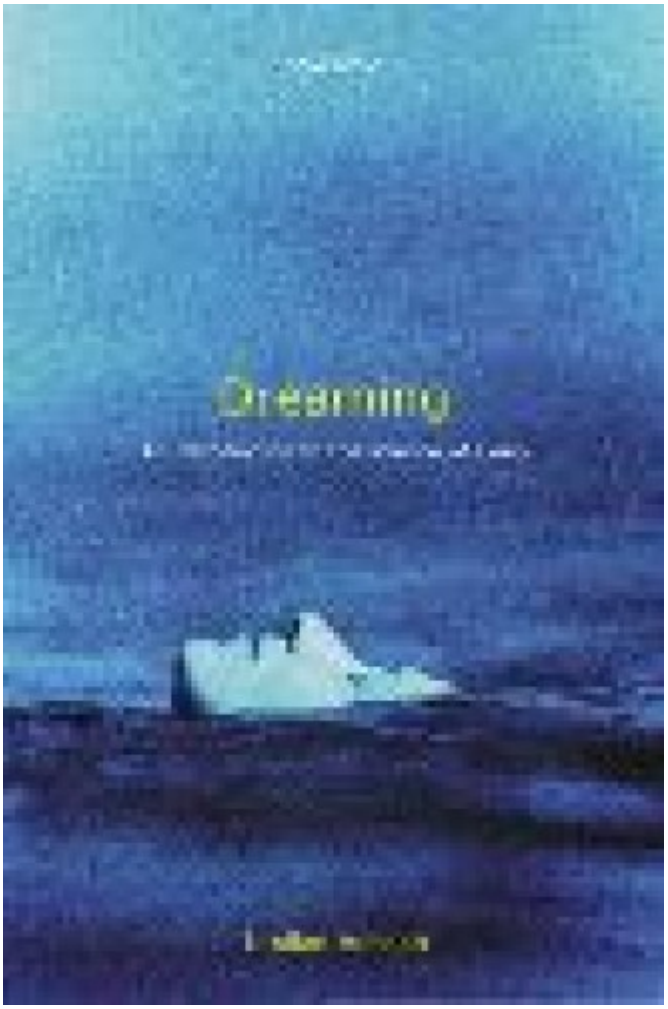
By Jon Magnuson in the June 28, 2005 issue

In Review



The Paradox of Sleep: The Story of Dreaming

Michel Jouvet
MIT Press



Dreaming: An Introduction to the Science of Sleep

J. Allan Hobson
Oxford University Press

Not long ago I had a conversation with a Roman Catholic bishop who is an excellent administrator, a thoughtful leader and a world traveler. We met in his office not far from the burial place of Bishop Frederick Baraga, a 19th-century missionary to the Ojibwa known as the “snowshoe priest”—a beloved figure among Indian people and the creator of the first Ojibwa dictionary. When our conversation turned to personal and pastoral matters, I happened to ask the bishop about dreams. He responded cordially, but with a touch of amusement: “I don’t dream.” When I asked what training he’d received over the years on working with dreams, he replied, “None. At least none that I can recall having any impact on me.”

Should this good, wise bishop be interested, there is a fascinating world awaiting him. In the 1990s the scientific study of sleep and dreams catapulted into public awareness because of a federal initiative that funded brain research. Using sophisticated computer-driven imaging techniques like PET (positive emission tomography) and the MRI (magnetic resonance imaging), researchers opened up new details about the operation of the brain.

After a decade of study, two tightly written volumes by distinguished neuroscientists have emerged, each posing varied perspectives on this body of research. J. Allan Hobson is professor of psychiatry at Harvard Medical School. Michel Jouvet is a member of the French Academy of Sciences and professor of experimental medicine at the University of Lyons. Both neurologists remind us that all warm-blooded mammals dream, to various degrees, each and every night. Though we may not remember these nightly excursions into our own personal psychic landscapes, research continues to confirm what was first reported from electronic monitoring during the 1953 landmark studies at the University of Chicago: we’re wired to dream.

Human beings sleep in episodic stages of REM (rapid eye movement) and non-REM cycles. Dreaming is associated with REM sleep. Dream sleep accounts for about 20 percent of adult sleep time. Children and infants spend 60 to 80 percent of their sleep time in the dream state. Certain pharmaceuticals, including barbiturates (sleep medications), as well as alcohol, repress REM sleep. Studies show that if dream sleep is repressed, the brain will compensate during following sleep cycles with increased REM sleep. And when REM activity is suppressed, people may sleep longer but don’t feel fully rested.

Hobson, recipient of the Distinguished Scientist Award from the Sleep Research Society, examines dreaming through the lens of physiology. He lays out the complexity of thermoregulation during the dream state, the shifting interplay of neurotransmitters, and the profusion of chemicals that every second fire off billions of neural connections in the thinking-sleeping brain.

Interestingly, Hobson has reservations about common pharmacological interventions in brain function. In a description of a sleep disorder known as RBD, in which patients enact their dreams through movement, he notes that a deficiency of dopamine (a specific brain neurotransmitter) is one key marker of Parkinson’s disease. He suggests, chillingly, that the prolonged use of antidepressants known as

SSRIs can lead to RBD. Accordingly, he warns against long-term use of such psychotropic medications when treating depression and anxiety disorders.

Hobson casually dismisses any notion that dreams have a deep, nonphysiological meaning. He calls such notions “the mystique of fortune cookie dream interpretation.” He holds up the “formal functions” of sleep states, emphasizing several critical physiological forces at play in the dreaming brain. One of the first signs of sleep deprivation, he notes, is the breakdown of the skin. Even a slight decrease in REM sleep causes a measurable drop in immune function. Thermoregulation is also affected when brains are deprived of the dream state. In lab studies, sleep-deprived rats have been invaded by bacteria from their own bowels. These lab rodents, Hodson graphically reports, are “eaten up by normally symbiotic hitchhikers that were no longer satisfied just to go along for the ride.”

Every night sleep revives our emotional life and reinforces basic brain mechanisms that allow us to fight, flee, feed and procreate. A physiological restoration happens during REM sleep. Hobson is persuasive and straightforward on this point and on the goal of his research: “In the place of dream mystique,” he writes, “we aim to install dream science. And the science we intend to install has a solid, firm base in neurobiology.”

Jouvet’s essays take readers on a scientific and sociological tour of the history of sleep and dream research. Regarded by many of his peers as the world’s leading sleep and dream researcher, he identifies the dream state as a distinct, vital “third state” of mental activity to be respected for its unique function. For Jouvet, the function of dreaming is to restore, protect and preserve individuality.

Though highly respected for the rigor of his research, Jouvet nonetheless approaches the “cold reason” touted by Hobson with a measure of caution. He leaves open the possibility that dreams have more than physiological meaning, as elusive as that is to demonstrate. He quotes biologist Frances Crick (codiscoverer of the double helix of DNA): “Absence of proof is not proof of absence.”

Jouvet refers to the dream state as “paradoxical sleep,” pointing out that while the body goes into a semiparalysis, the limbic system (the emotional and memory parts of the brain) moves into heightened activity. Neither behaviorism, which avoids the problem of relating the brain and consciousness, nor functionalism, which is interested only in chemical interactions, adequately addresses this phenomenon.

The dream state, Jouvet suggests, is primarily a cleaning function by which the brain, operating as a closed circuit, rids itself of parasitic modes by creating new information circuits. It's a necessary life-or-death process protecting survival and individuality. Dreaming allows us to function in shifting, often threatening environments.

From a physiological perspective, then, it's clear that dreaming is critical for sustaining life and normal brain functioning. But what other, if any, contributions may the dreaming brain offer?

Respected neurologists such as Andrew Newberg of the University of Pennsylvania, along with colleagues Eugene D'Aquili and Vince Rause (authors of *Why God Won't Go Away*: *Brain Science and the Biology of Belief*), say not only that we're wired to dream but that we are wired to have unifying mystical experiences. Herbert Benson, a cardiologist and director of Harvard Medical School's Mind Body Institute, suggests an even deeper, broader integration of mind and environment that humans achieve: "I am astonished that my scientific studies have so conclusively proved that we are wired to believe," he writes, "that our bodies are nourished by prayer and exercises of belief. The veracity of the experience of God is undeniable to me" (*Timeless Healing*).

Perhaps the deeper, more complex and underlying question that needs to be asked about dreams, given the scientific evidence, is whether our brains are part of "closed" or "open" systems. Are we the sum total of our biology and environment or are we capable of being influenced by forces outside the boundary of personal consciousness and physical connection? Hobson and (perhaps to a lesser degree) Jouvet both maintain that the brain is part of a "closed" system.

As children of modernity, we are left to wonder what to do with the legacy of dream interpretation found in all great religious traditions. Judeo-Christian scriptures and teachings are shaped by such experiences. What about the dreams of Jacob and Joseph, the prophet Daniel, the wise men, Pontius Pilate's wife and Peter? What about the dreams of St. Jerome, Constantine, Martin of Tours, St. Ignatius of Loyola and, in our own era, Martin Niemöller, the German pastor who, on the basis of a dream, decided to publicly oppose Hitler?

Jouvet and Hobson offer a valuable service by introducing us to the complexity of neurological findings. One contribution that the religious community can make is to

remind researchers that the long tradition of religious dream interpretation cannot be reduced to biology. Such a reduction is like dismissing a Rembrandt painting as nothing more than a sequence of brush strokes.

Resistance to listening and recovering our own dream lives may be rooted in the secular, economically driven egocentricity of the West. Paul Tillich and others have warned about the captivity of one-dimensional thinking which has drained religious symbols of their power. Speaking about this problem of modern consciousness, Edward Edinger, a Yale-trained physician and analyst and author of *The Creation of Consciousness*, quotes Carl Jung:

> All modern people feel alone in the world of the psyche because they assume there is nothing there that they have not made up. This is the very best demonstration of our god-almighty-ness which simply comes from the fact we think we have invented everything psychological; that nothing would be done if we did not do it. It's an extraordinary assumption. That one is alone in one's psyche. Sometimes, something suddenly happens which one has not created, something objective and then one is no longer alone. This is the object of (religious) initiatory practices. To train people to experience something which is not their intent, something strange, something with which they cannot identify. This becomes the experience of God.

Hobson concludes his book reflecting on this dilemma from the perspective of neurological science. The relationship between the conscious awareness of a dream (and its subjective meaning) and the physiological interaction of the brain's chemistry presents, he said, a "hard problem." What value does an awareness that we're dreaming carry? Why does the meaning of a dream often haunt us? He acknowledges, reluctantly, that neuroscience many never solve this question.

Some cultures, still rooted deep in their tradition and fused to their religious teachings, have their own answer to Hobson's "hard problem." For the past several years I've worked on environmental projects with American Indian communities in Michigan's Upper Peninsula, and I've become acquainted with remnants of an Ojibwa religion called Mediwiwin. Originating on the shores of Lake Superior hundreds of years ago, this community is described by its followers as a "dreamer society." An elder from the Red Cliff Reservation recently told a friend of mine this Mediwiwin story about the origin of the world:

> The Great Manitou first created the waters, then the rock, the sun, then the forests. Soon he was lonely so he created the animals of the land and the fish of the sea. Each was dependent on the other. He was delighted with his creation so he next fashioned a couple of two-legged creatures and called them man and woman. Suddenly he realized he had made a terrible mistake. The two-legged ones were, because of their dependency, vulnerable upon everything else. He pondered this and asked himself, "What shall I do?" He decided to give the two-legged ones a chance to be equal, to exercise balance through insight and visions. He gave them a special power, a gift: the dream.

More recently I visited a Potawatomi Indian community near the shores of Lake Michigan. There I met Don and Vicki Dowd of the Mediwiwin Society. Don mentioned that he had met with a priest who had asked about native spiritual traditions and how they might be recovered. His reply to the priest was: "Tell the truth about Bishop Baraga and the journal entries." He explained that the Mediwiwin believe Baraga not only attended native ceremonies and prayed with Ojibwa but asked to be initiated "into the way of the dream."

There is no record in his published journals that Baraga ever explored the Mediwiwin dream spirituality. The tale of his crossing over into the dreamer society may be apocryphal. Nevertheless, the story itself hints of hidden worlds, or of a single universe connecting disparate realities.

In our own time and place, the worlds of myth and science, of religious experience and empirical research, are frequently set in opposition to one another. It may be a striking irony that neurologists like Hobson and Jouvet can contribute to a recovery of what many people in churches have abandoned: a belief in a divine force outside ourselves, a healing presence deep within that still speaks through dreams and visions.