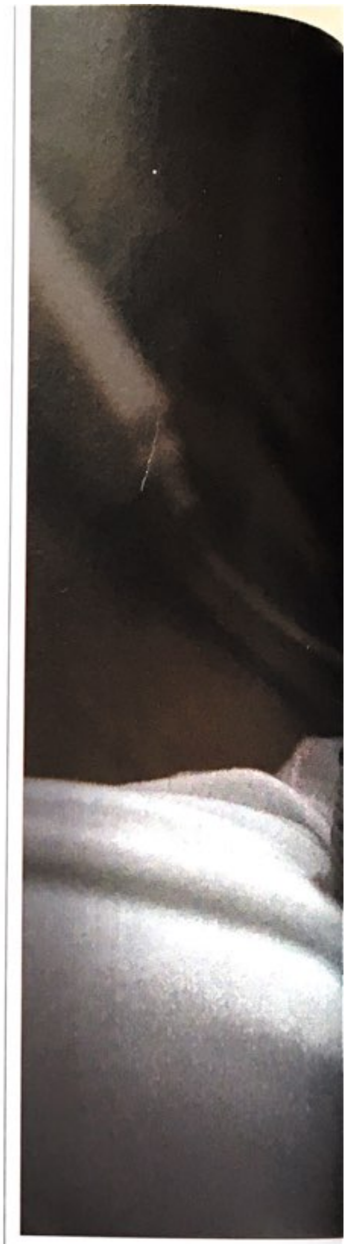
Nearly every night of our lives, we undergo a startling metamorphosis.



Swathed in tubes and electrodes, 10-year-old Francis Ajua awaits "lights out" for his overnight sleep study at Children's National Health System in Washington, D.C. He was being tested for sleep apnea, in which breathing repeatedly pauses.

PREVIOUS PHOTO

At the Philharmonie de Paris, composer Max Richter leads a performance of *Sleep,* a minimalist, scientifically informed piece that aims to guide listeners through a rejuvenating rest. It lasts eight hours.

Our brain profoundly alters its behavior and purpose, dimming our consciousness. For a while, we become almost entirely paralyzed. We can't even shiver. Our eyes, however, periodically dart about behind closed lids as if seeing, and the tiny muscles in our middle ear, even in silence, move as though hearing. We are sexually stimulated, men and women both, repeatedly. We sometimes believe we can fly. We approach the frontiers of death. We sleep.

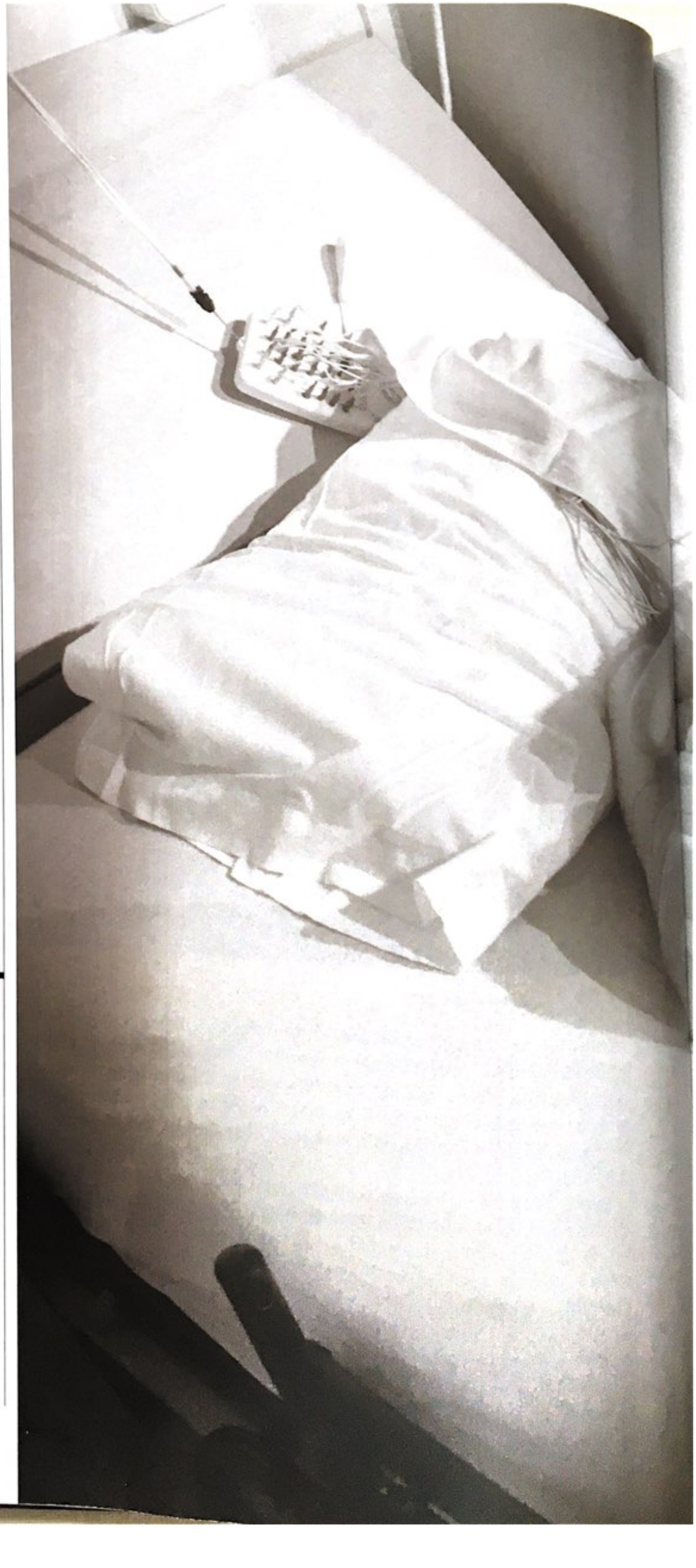
Around 350 B.C., Aristotle wrote an essay, "On Sleep and Sleeplessness," wondering just what we were doing and why. For the next 2,300 years no one had a good answer. In 1924 German psychiatrist Hans Berger invented the electroencephalograph, which records electrical activity

in the brain, and the study of sleep shifted from philosophy to science. It's only in the past few decades, though, as imaging machines have allowed ever deeper glimpses of the brain's inner workings, that we've approached a convincing answer to Aristotle.

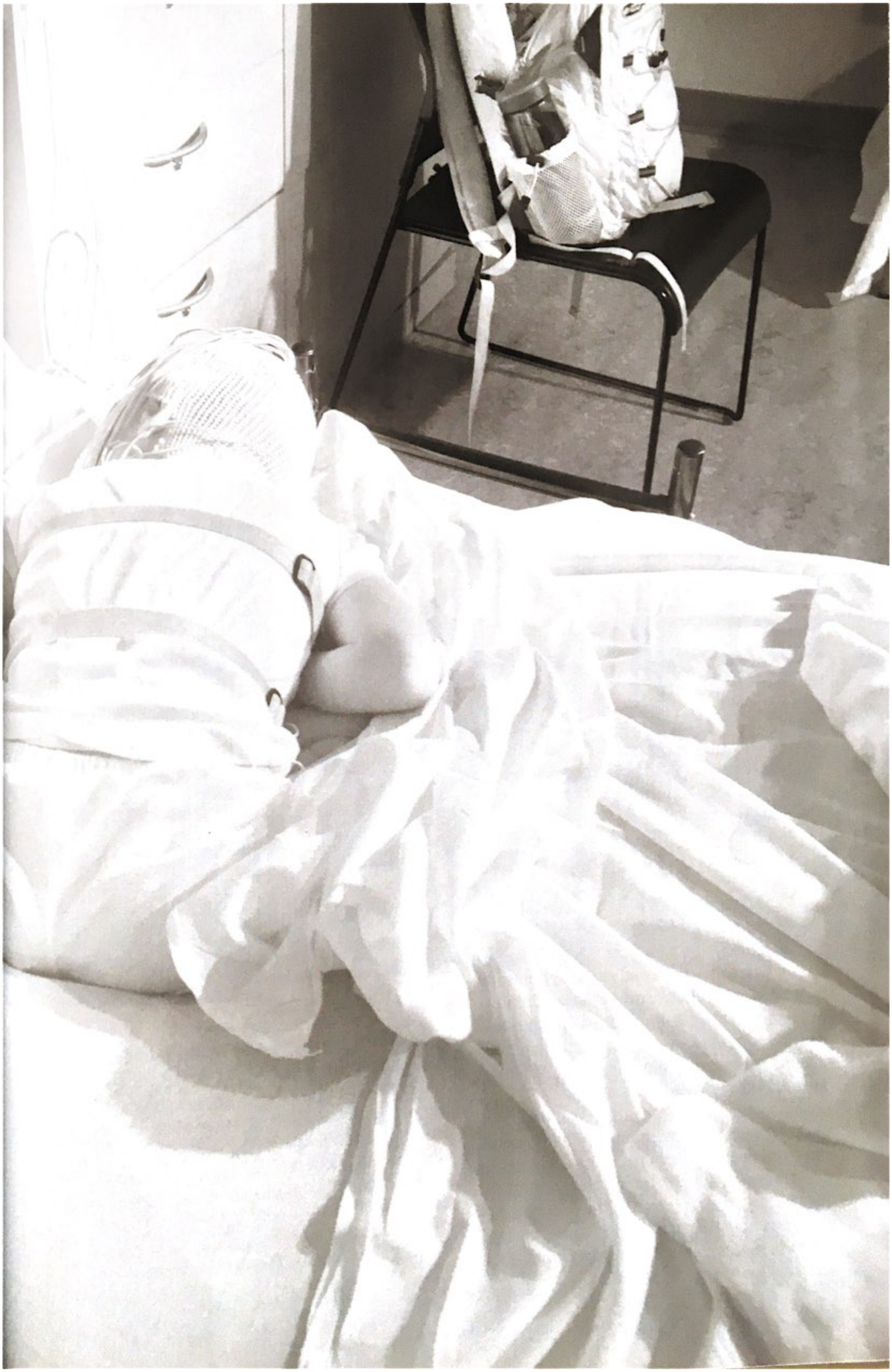
Everything we've learned about sleep has emphasized its importance to our mental and physical health. Our sleep-wake pattern is a central feature of human biology—an adaptation to life on a spinning planet, with its endless wheel of day and night. The 2017 Nobel Prize in medicine was awarded to three scientists who, in the 1980s and 1990s, identified the molecular clock inside our cells that aims to keep us in sync with the sun. When this circadian rhythm breaks down, recent research has shown, we are at increased risk for illnesses such as diabetes, heart disease, and dementia.

Yet an imbalance between lifestyle and sun cycle has become epidemic. "It seems as if we are now living in a worldwide test of the negative consequences of sleep deprivation," says Robert Stickgold, director of the Center for Sleep and Cognition at Harvard Medical School. The average American today sleeps less than seven hours a night, about two hours less than a century ago. This is chiefly due to the proliferation of electric lights, followed by televisions, computers, and smartphones. In our restless, floodlit society, we often think of sleep as an adversary, a state depriving us of

The waking brain is optimized for collecting information, the sleeping brain for consolidating. At night we switch from recording to editing.



At the Children's sleep clinic in Washington, Michael Bosak, eight, sleeps through his exam in a position that helps prevent the repeated narrowing of the upper airway—the cause of his snoring. (This photo was taken in the dark with an infrared camera so as not to disturb him.) Sleep is crucial for childhood health and development; it's when most growth hormone and infection-fighting proteins are released. Poor sleep in kids has been linked to diabetes, obesity, and learning disabilities.



productivity and play. Thomas Edison, who gave us light bulbs, said that "sleep is an absurdity, a bad habit." He believed we'd eventually dispense with it entirely.

A full night's sleep now feels as rare and old-fashioned as a handwritten letter. We all seem to cut corners, fighting insomnia through sleeping pills, guzzling coffee to slap away yawns, ignoring the intricate journey we're designed to take each evening. On a good night, we cycle four or five times through several stages of sleep, each with distinct qualities and purpose—a serpentine, surreal descent into an alternative world.

STAGES 1-2

AS WE FALL INTO SLEEP, OUR BRAIN STAYS ACTIVE AND FIRES INTO ITS EDITING PROCESS—DECIDING WHICH MEMORIES TO KEEP AND WHICH ONES TO TOSS.

The initial transformation happens quickly. The human body does not like to stall between states, lingering in doorways. We prefer to be in one realm or another, awake or asleep. So we turn off the lights and lie in bed and shut our eyes. If our circadian rhythm is pegged to the flow of daylight and dark, and if the pineal gland at the base of our brain is pumping melatonin, signaling it's nighttime, and if an array of other systems align, our neurons swiftly fall into step.

Neurons, some 86 billion of them, are the cells that form the World Wide Web of the brain, communicating with each other via electrical and chemical signals. When we're fully awake, neurons form a jostling crowd, a cellular lightning storm. When they fire evenly and rhythmically, expressed on an electroencephalogram, or EEG, by neat rippled lines, it indicates that the brain has turned inward, away from the chaos of waking life. At the same time, our sensory receptors are muffled, and soon we're asleep.

Scientists call this stage 1, the shallow end of sleep. It lasts maybe five minutes. Then, ascending from deep in the brain, comes a series of electric sparks that zap our cerebral cortex, the pleated gray matter covering the outer layer of the brain, home of language and consciousness. These half-second bursts, called spindles, indicate that we've entered stage 2.

New memories are consolidated during sleep. What happens in the brain? At the University of Tsukuba, near Tokyo, Takeshi Sakurai studies the question with optogenetics—in which a laser turns individual brain cells on or off in mice that are genetically engineered to be sensitive to it.

Our brains aren't less active when we sleep, as was long thought, just differently active. Spindles, it's theorized, stimulate the cortex in such a way as to preserve recently acquired information—and perhaps also to link it to established knowledge in long-term memory. In sleep labs, when people have been introduced to certain new tasks, mental or physical, their spindle frequency increases that night. The more spindles they have, it seems, the better they perform the task the next day.

The strength of one's nightly spindles, some experts have suggested, might even be a predictor of general intelligence. Sleep literally makes connections you might never have consciously formed, an idea we've all intuitively realized. No one says, "I'm going to eat on a problem." We always sleep on it.

The waking brain is optimized for collecting external stimuli, the sleeping brain for consolidating the information that's been collected. At night, that is, we switch from recording to editing, a change that can be measured on the molecular scale. We're not just rotely filing our thoughts—the sleeping brain actively curates which memories to keep and which to toss.

It doesn't necessarily choose wisely. Sleep reinforces our memory so powerfully—not just in stage 2, where we spend about half our sleeping time, but throughout the looping voyage of the night—that it might be best, for example, if exhausted soldiers returning from harrowing missions did not go directly to bed. To forestall post-traumatic stress disorder, the soldiers should remain awake for six to eight hours, according to neuroscientist Gina Poe at the University of California, Los Angeles. Research by her and others suggests that sleeping soon after a major event, before some of the ordeal is mentally resolved, is more likely to turn the experience into long-term memories.

Stage 2 can last up to 50 minutes during the night's first 90-minute sleep cycle. (It typically occupies a smaller portion of subsequent cycles.) Spindles can arrive every few seconds for a while, but when these eruptions taper off, our heart rate slows. Our core temperature drops. Any remaining awareness of the external environment disappears. We commence the long dive into stages 3 and 4, the deep parts of sleep.

STAGES 3-4

WE ENTER A DEEP, COMA-LIKE SLEEP THAT IS AS ESSENTIAL TO OUR BRAIN AS FOOD IS TO OUR BODY. IT'S A TIME FOR PHYSIOLOGICAL HOUSEKEEPING—NOT FOR DREAMING.

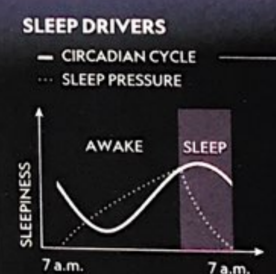
Every animal, without exception, exhibits at least a primitive form of sleep. Three-toed sloths snooze about 10 hours a day, a disappointing display of languor, but some fruit bats manage 15 hours, and little brown bats have been reported to laze for 20. Giraffes sleep less than five. Horses typically sleep part of the night standing up and part lying down. Dolphins sleep one hemisphere at a time—half the brain sleeps while the other half is awake, allowing them to swim continuously. Great frigatebirds can nap while gliding, and other birds may do the same. Nurse sharks rest in a pile on the ocean floor. Cockroaches lower their

MASTER CLOCK

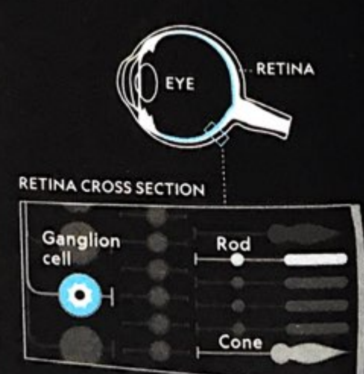
HOW LIGHT AFFECTS US

How perky we're feeling at any moment depends on the interaction of two processes: "Sleep pressure," which is thought to be created by sleep-promoting substances that accumulate in the brain during waking hours, and our circadian rhythm, the internal clock that keeps brain and body in sync with the sun. The clock can be set backward or forward by light. We're particularly sensitive to blue (short-wavelength) light, the kind that brightens midday sunlight and our computer screens, but can disrupt our cycle—especially at night, when we need the dark to cue us to sleep.

SUNRISE

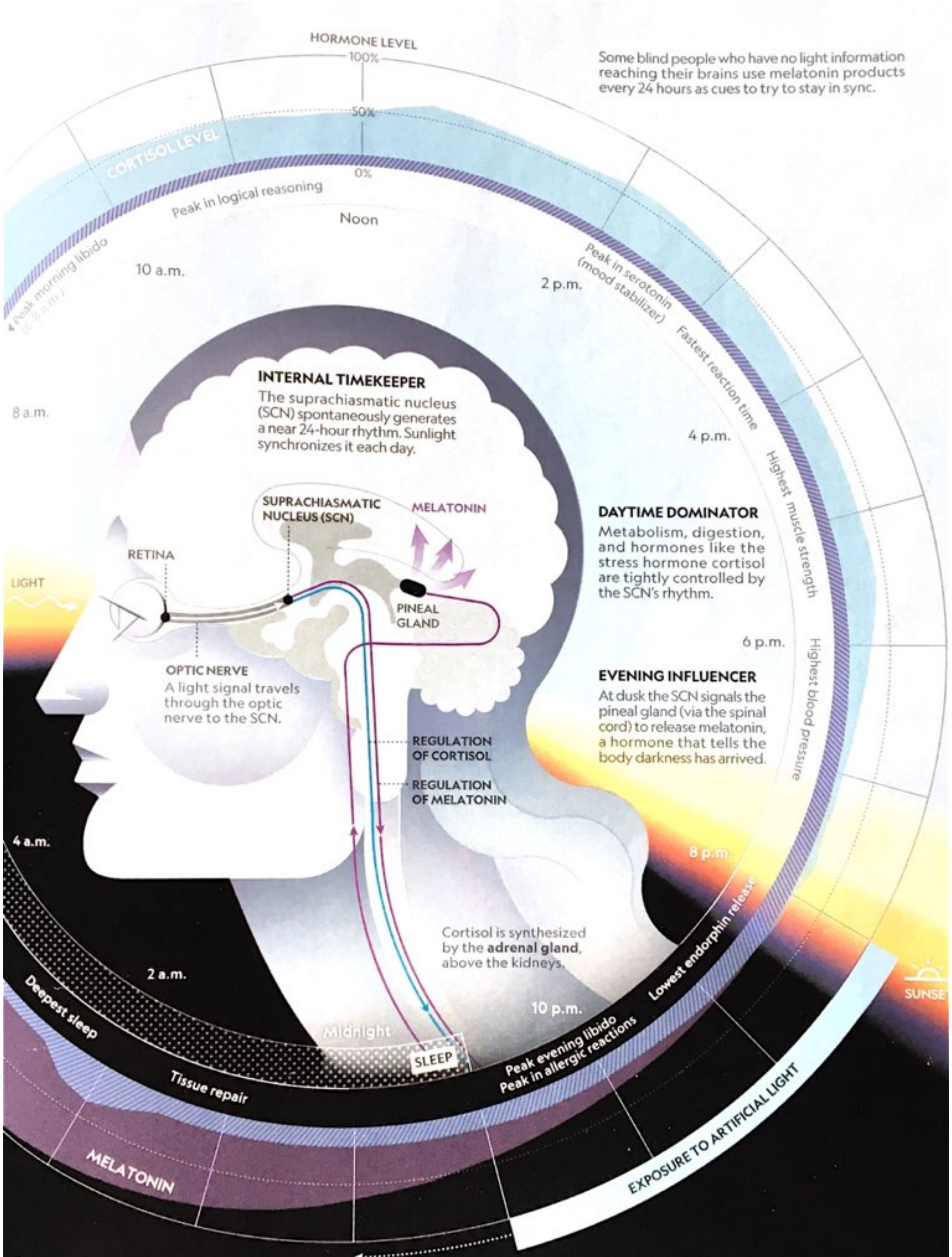


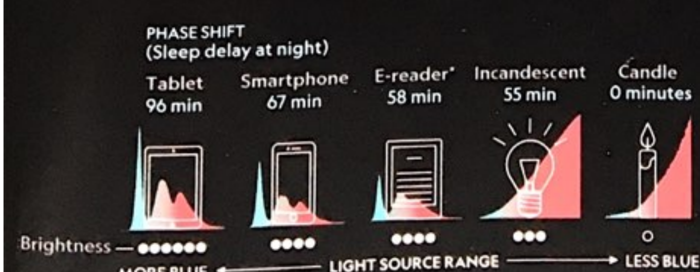
The pressure to sleep builds throughout the day.



LIGHT SETS OUR INTERNAL CLOCK ...

Some ganglion cells have blue-light-sensitive receptors that tell our brain to set our circadian clock to night or day. They also gather subtle light information from rods and cones.





...AND ARTIFICIAL LIGHT DISRUPTS IT

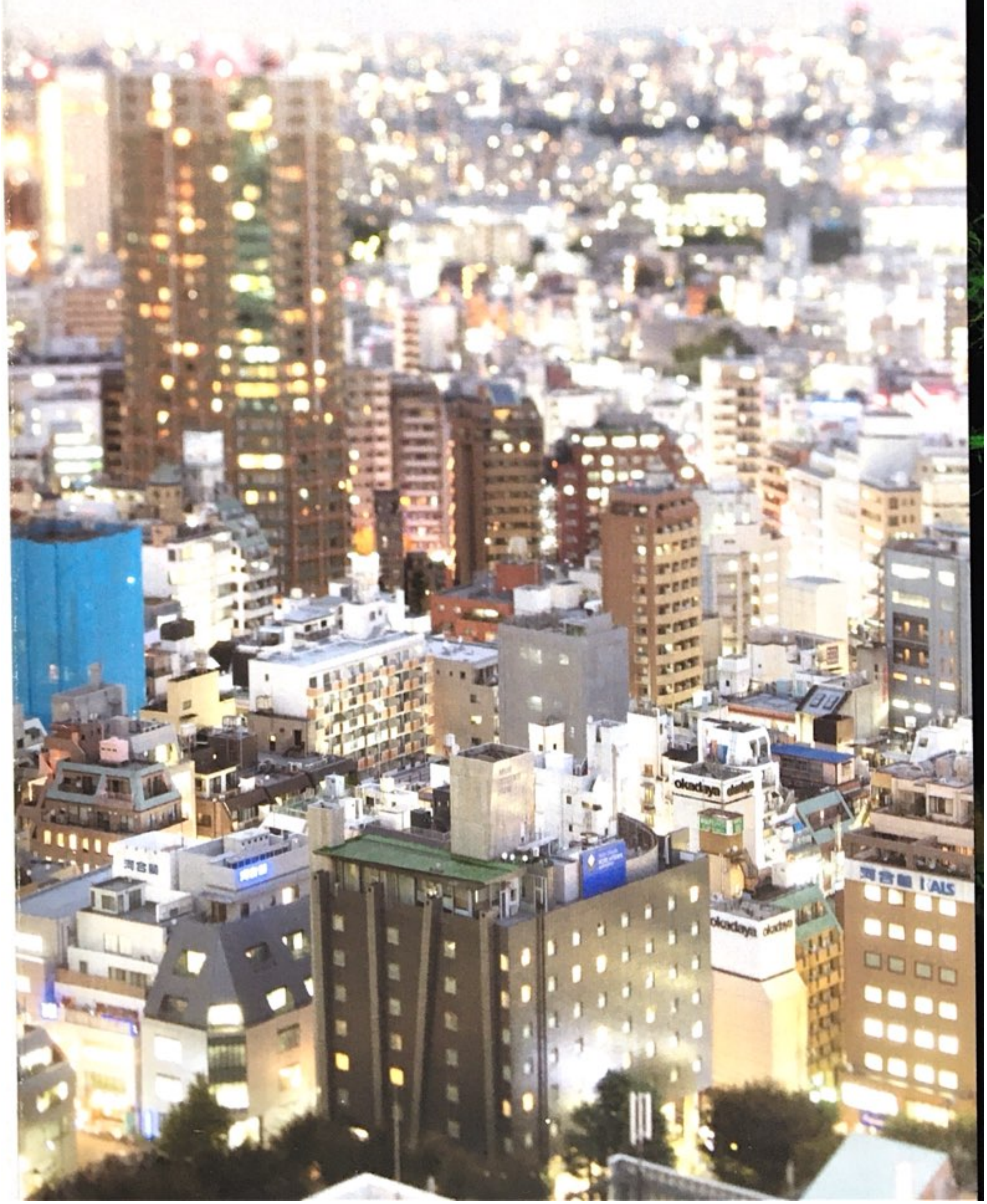
The bluer and brighter the light, the more likely it is to suppress melatonin release and shift our sleep cycle—especially when we're exposed to it at night and up close on electronic screens.

*WITH BACKLIT DISPLAY

MÓNICA SERRANO, NGM STAFF; MESA SCHUMACHER. SOURCES: STEVEN LOCKLEY, BRIGHAM AND WOMEN'S HOSPITAL; RUSSELL FOSTER, UNIVERSITY OF OXFORD; DAVID SLINEY, JOHNS HOPKINS UNIVERSITY SCHOOL OF PUBLIC HEALTH; MICHAEL PERLIS; F.LUXOMETER PROJECT

THE POWER OF ARTIFICIAL LIGHT

The war on sleep began when incandescent bulbs first made it easy to banish night. Big cities such as Tokyo are now often illuminated with LED bulbs. They're more energy-efficient, but they tend to produce a lot of blue light, the most sleep-disrupting kind.



antennae while napping, and they're also sensitive to caffeine.

Sleep, defined as a behavior marked by diminished responsiveness and reduced mobility that is easily disrupted (unlike hibernation or coma), exists in creatures without brains at all. Jellyfish sleep, the pulsing action of their bodies noticeably slowing, and one-celled organisms such as plankton and yeast display clear cycles of activity and rest. This implies that sleep is ancient and that its original and universal function is not about organizing memories or promoting learning but more about the preservation of life itself. It's evidently natural law that a creature, no matter the size, cannot go full throttle 24 hours a day.

'You're talking about a level of brain deactivation that is really rather intense,' says Michael Perlis, the director of the Behavioral Sleep Medicine program at the University of Pennsylvania. 'Stage 4 sleep is not far removed from coma or brain death. While restorative, it's not something you'd want to overdose on.'

"Being awake is demanding," says Thomas Scammell, a neurology professor at Harvard Medical School. "You've got to go out there and outcompete every other organism to survive, and the consequences are that you need a period of rest to help cells recuperate."

For humans this happens chiefly during deep sleep, stages 3 and 4, which differ in the percentage of brain activity that's composed of big, rolling delta waves, as measured on an EEG. In stage 3, delta waves are present less than half the time; in stage 4, more than half. (Some scientists consider the two to be a single deep-sleep stage.) It's in deep sleep that our cells produce most growth hormone, which is needed throughout life to service bones and muscles.

There is further evidence that sleep is essential for maintaining a healthy immune system, body temperature, and blood pressure. Without enough of it, we can't regulate our moods well or recover swiftly from injuries. Sleep may be more essential to us than food; animals will die of sleep deprivation before starvation, says Steven Lockley of Brigham and Women's Hospital in Boston.

Good sleep likely also reduces one's risk of developing dementia. A study done in mice by Maiken Nedergaard at the University of Rochester, in New York, suggests that while we're awake, our neurons are packed tightly together, but when we're asleep, some brain cells deflate by 60 percent, widening the spaces between them. These intercellular spaces are dumping grounds for the cells' metabolic waste—notably a substance called beta-amyloid, which disrupts communication between neurons and is closely linked to Alzheimer's. Only during sleep can spinal fluid slosh like detergent through these broader hallways of our brain, washing beta-amyloid away.

While all this housekeeping and repair occurs, our muscles are fully relaxed. Mental activity is minimal: Stage 4 waves are similar to patterns produced by coma patients. We do not typically dream during stage 4; we may not even be able to feel pain. In Greek mythology the gods Hypnos (sleep) and Thanatos (death) are twin brothers. The Greeks may have been right.

"You're talking about a level of brain deactivation that is really rather intense," says Michael Perlis, the director of the Behavioral Sleep Medicine program at the University of Pennsylvania. "Stage 4 sleep is not far removed from coma or brain death. While recuperative and restorative, it's not something you'd want to overdose on."

At most, we can remain in stage 4 for only about 30 minutes before the brain kicks itself out. (In sleepwalkers at least, that shift can be accompanied by a bodily jerk.) We often sail straight through stages 3, 2, and 1 into awakeness.

Even healthy sleepers wake several times a night, though most don't notice. We drop back to sleep in a matter of seconds. But at this point, rather than repeating the stages again, the brain resets itself for something entirely new—a trip into the truly bizarre.

According to the U.S. Centers for Disease Control and Prevention, more than 80 million American adults are chronically sleep deprived, meaning they sleep less than the recommended minimum of seven hours a night. Fatigue contributes to more than a million auto accidents each year, as well as to a significant number of medical errors. Even small adjustments in sleep can be problematic. The Monday after a daylight saving time change in the U.S., there's a 24 percent increase in heart attacks, compared with other Mondays, and a jump in fatal car crashes too.

During our lifetimes, about a third of us will suffer from at least one diagnosable sleep disorder. They range from chronic insomnia to sleep apnea to restless leg syndrome to much rarer and stranger conditions.

In exploding head syndrome, booming sounds seem to reverberate in your brain as you try to sleep. A Harvard study found that sleep paralysis—the inability to move for a few minutes after you've woken from dreaming—is the genesis of many alien abduction stories. Narcoleptic attacks, uncontrollable episodes of sudden sleep onset, often are triggered by strongly positive emotions, such as listening to a joke, being tickled, or tasting delicious food. People with Kleine-Levin syndrome will, every few years, sleep nearly nonstop for a week or two. They return to regular cycles of consciousness without any discernible side effects.

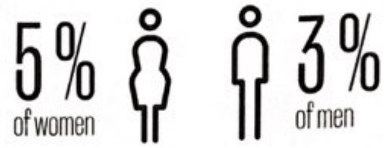
Insomnia is by far the most common problem, the main reason 4 percent of U.S. adults take sleeping pills in any given month. Insomniacs generally take longer to fall asleep, wake up for prolonged periods during the night, or both. If sleep is such a ubiquitous natural phenomenon, refined across the eons, you might wonder, why do so many of us have such trouble with it? Blame evolution; blame the modern world. Or blame the mismatch between the two.

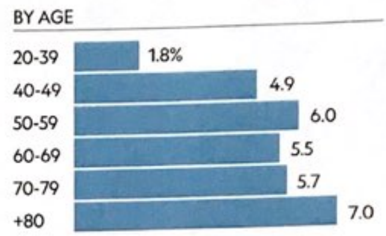
Evolution endowed us, like other creatures, with sleep that is malleable in its timing and readily interruptible, so it can be subordinated to higher priorities. The brain has an override system, operating in all stages of sleep, that can rouse us when it perceives an emergency—the cry of a child, say, or the footfall of an approaching predator.

The problem is that in the modern world, our ancient, innate wake-up call is constantly triggered by non–life-threatening situations, like anxiety before an exam, worries about finances, or every car alarm in the neighborhood. Before the industrial revolution, which brought us alarm clocks and fixed work schedules, we could often counteract insomnia simply by sleeping in. No longer. And if you're one

THE AGE OF SLEEP AIDS

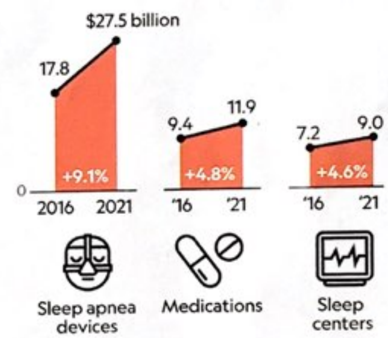
A Centers for Disease Control and Prevention study found that older Americans are more likely to use prescription sleep aids than their younger counterparts. Women were also slightly more likely than men to report they used sleep aids.





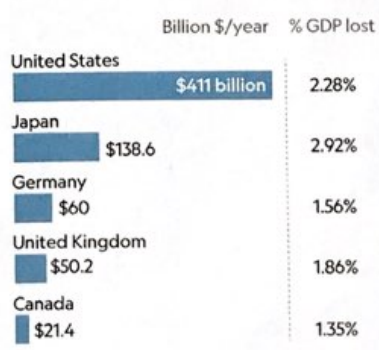
THE MARKET FOR SLEEP

Sleep-deprived consumers paid $66 billion in 2016 for devices, medications, and sleep studies. The figure could rise to $85 billion by 2021.



THE COST OF SLEEPLESSNESS

A 2017 Rand study found that lack of sleep can result in reduced productivity as well as more work absences, industrial and road accidents, health care expenses, and medical errors.



NGM STAFF. SOURCES: U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION; BCC RESEARCH; RAND EUROPE of those people who are proud of being able to fall asleep quickly just about anywhere, you can stop gloating—it's a distinct sign, especially if you're less than 40 years old, that you're acutely sleep deprived.

The first segment of the brain that begins to fizzle when we don't get enough sleep is the prefrontal cortex, the cradle of decision-making and problem-solving. Underslept people are more irritable, moody, and irrational. "Every cognitive function to some extent seems to be affected by sleep loss," says Chiara Cirelli, a neuroscientist at the Wisconsin Institute for Sleep and Consciousness. Sleep-deprived suspects held by the police, it's been shown, will confess to anything in exchange for rest.

Anyone who regularly sleeps less than six hours a night has an elevated risk of depression, psychosis, and stroke. Lack of sleep is also directly tied to obesity: Without enough sleep, the stomach and other organs overproduce ghrelin, the hunger hormone, causing us to eat more than we need. Proving a cause-and-effect relationship in these cases is challenging, because you can't subject humans to the necessary experiments. But it's clear that sleeplessness undermines the whole body.

Power naps don't solve the problem; nor do pharmaceuticals. "Sleep is not monolithic," says Jeffrey Ellenbogen, a sleep scientist at Johns Hopkins University who directs the Sound Sleep Project, which counsels businesses on how their employees can achieve better performance through healthier rest. "It's not a marathon; it's more like a decathlon. It's a thousand different things. It's tempting to manipulate sleep with drugs or devices, but we don't yet understand sleep enough to risk artificially manipulating the parts."

Ellenbogen and other experts argue against shortcuts, especially the original one—the notion that we can mostly do without sleep. It was a glorious idea: If we could just cut the unnecessary parts of sleep, it'd be like adding decades to our life. In the early days of sleep science, the 1930s and '40s, the second half of the night was considered by some to be the doldrums of rest. Some thought we might not need it at all.

That period turns out, instead, to be the wellspring of a completely separate but just as essential form of sleep, practically another type of consciousness altogether.

REM

IN A WILD STATE OF PSYCHOSIS, WE'RE DREAMING, WE'RE FLYING, AND WE'RE FALLING—WHETHER WE REMEMBER IT OR NOT. WE'RE ALSO REGULATING OUR MOOD AND CONSOLIDATING OUR MEMORIES.

Rapid eye movement, or REM, sleep was discovered in 1953—more than 15 years after stages 1 through 4 had been mapped—by Eugene Aserinsky and Nathaniel Kleitman at the University of Chicago. Before then, because of its unremarkable pattern on early EEGs, this period was usually thought of as a variant form of stage 1, and not particularly significant. But once the distinctive eye darting was documented, and the engorgement of sexual organs that always goes with it, and it was understood that virtually all vivid dreaming takes place in this phase, the science of sleep was upended.

Generally, a healthy sleep begins with a spiral down to stage 4, a momentary return to wakefulness, and a five- to 20-minute REM session. With each ensuing cycle, REM time roughly doubles. Overall, REM sleep occupies about one-fifth of total rest time in adults. Yet stages 1 through 4 have been labeled as non-REM sleep, or NREM—80 percent of sleep is defined by what it's not. Sleep scientists speculate that specific sequences of NREM and REM sleep somehow optimize our physical and mental recuperation. At the cellular level, protein synthesis peaks during REM sleep, keeping the body working properly. REM sleep also seems essential for regulating mood and consolidating memories.

Every time we experience REM sleep, we literally go mad. By definition, psychosis is a condition characterized by hallucinations and delusions. Dreaming, some sleep scientists say, *is* a psychotic state—we fully believe that we see what is not there, and we accept that time, location, and people themselves can morph and disappear without warning.

From ancient Greeks to Sigmund Freud to back-alley fortune-tellers, dreams have always been a source of enchantment and mystery—interpreted as messages from the gods or our unconscious. Today many sleep experts aren't interested in the specific images and events in our dreams. They believe that dreams result from the chaotic firing of neurons and, even if imbued with emotional resonance, are devoid of significance. It's only after we wake that the conscious brain, seeking meaning, quickly stitches together a whole cloth out of haphazard scraps.

Other sleep scientists strongly disagree. "The content of dreams," says Stickgold of Harvard, "is part of an evolved mechanism for looking at the larger significance of new memories and how they could be useful in the future."

Even if you never recall a single image, you still dream. Everyone does. Lack of dream recollection is actually an indication of a healthy sleeper. The action in dream sleep takes place too deep in the brain to register well on an EEG, but with newer technology, we've inferred what's going on, physically and chemically. Dreams also occur in NREM sleep, especially stage 2, but these are generally thought to be more like overtures. Only in REM sleep do we encounter the full potent force of our nighttime madness.

Dreams, often falsely said to be just momentary flashes, are instead thought to span almost all of REM sleep, typically about two hours per night, though this decreases as we age—perhaps because our less pliant brains are not learning as much while awake and have fewer new memories to process as we sleep. Newborn infants sleep up to 17 hours a day and spend about half of that in an active, REM-like condition. And for about a month in the womb, starting at week 26 of gestation, it seems that fetuses remain without pause in a state very similar to REM sleep. All this REM time, it has been theorized, is the equivalent of the brain testing its software, preparing to come fully on line. The process is called telencephalization. It's nothing less than the opening of the mind.

The body doesn't thermoregulate in REM sleep; our internal temperature remains at its lowest setting. We are truly out cold. Our heart rate increases compared with other sleep stages, and our breathing is irregular. Our muscles, with a few exceptions—eyes, ears, heart, diaphragm—are immobilized. Sadly, this doesn't keep some of us from snoring; this bane of the bed partner, impetus for hundreds of anti-snoring gadgets, is caused when turbulent airflow vibrates the relaxed tissues of the throat or nose. It's common in stages 3 and 4 too. In REM sleep, whether snoring or not, we're completely incapable of physical response, slack-jawed, unable to regulate even our blood pressure. Yet our brain is able to convince us that we're surfing on clouds, slaying dragons.

Belief in the unbelievable happens because in REM sleep, stewardship of the brain is transferred away from the logic centers and impulse-control regions. Production of two specific chemicals, serotonin and norepinephrine, is completely shut off. Both are essential neurotransmitters, permitting brain cells to communicate, and without them, our ability to learn and remember is severely impaired—we're in a chemically altered state of consciousness. But it's not a coma-like state, as in stage 4. Our brain during REM sleep is fully active, guzzling as much energy as when we're awake.

REM sleep is ruled by the limbic system—a deep-brain region, the untamed jungle of the mind, where some of our most savage and base instincts arise. Freud was right, in effect, that dreams do tap our primitive emotions. The limbic system is home to our sex drive, aggression, and fear, though it also allows us to feel elation and joy and love.

Every time we experience REM sleep, we literally go mad. Psychosis is a condition characterized by hallucinations and delusions. Dreaming, some sleep scientists say, *is* a psychotic state—we fully believe that we see what is not there, and we accept that time, location, and people can morph and disappear.

While it sometimes seems as if we have more nightmares than pleasant dreams, this probably isn't true. Frightening dreams are simply more likely to trigger our override system and wake us.

Down in the brain stem, a little bulge called the pons is supercharged during REM sleep. Electrical pulses from the pons often target the part of the brain that controls muscles in the eyes and ears. Our lids usually remain shut, but our eyeballs bounce from side to side, possibly in response to the intensity of the dream. Our inner ears too are active while we dream.

The Japanese term *inemuri,* or "sleeping while present," is a distinct form of napping in which a person dozes in a place not meant for sleep, such as the subway—or even at a dinner party or the office. "Since you're officially not sleeping," says Brigitte Steger, a Japan specialist at the University of Cambridge in England, "to be socially acceptable you should behave as is appropriate in a certain situation. For example in a meeting, you half pretend listening or hide your sleeping head behind paperwork." If you're not already known as a slacker, Steger adds, a little inemuri may even enhance your business reputation: It demonstrates that you're working yourself to exhaustion.

So are the parts of the brain that generate motion—which is why there's frequently a sense of flying or falling in dreams. We dream, as well, in full color, unless we've been blind from birth, in which case dreams do not have visual imagery but remain emotionally intense. Men's and women's dreams seem to be similar in emotional content. Every time a man dreams, even if the content isn't sexual, he has an erection; in women, blood vessels in the vagina are engorged. And while we dream, no matter how absurd, despite all transgressions against the laws of physics, we're almost always convinced we're awake. The ultimate virtual-reality machine resides inside our head.

Thank goodness we're paralyzed. When you dream, your brain is actually trying to produce movements, but a system in the brain stem completely shuts down the motor-neuron gate. There's a parasomnia—a sleep abnormality that affects the nervous system—called REM behavior disorder in which the gate does not fully lower, and people act out their dreams in spectacular fashion, punching, kicking, swearing, all while their eyes are closed and they're fully asleep. This often results in injuries to the sleeper and his or her bedmate.

The end of a REM session, like the end of stage 4, is usually marked with a brief awakening. If we rest naturally, without an alarm clock, our last dream of the night often concludes our sleep. Though the amount of time we've been asleep helps determine the optimal moment to wake, daylight has immediate alerting properties. When light seeps through our eyelids and touches our retinas, a signal is sent to a deep-brain region called the suprachiasmatic nucleus. This is the time, for many of us, that our last dream dissolves, we open our eyes, and we rejoin our real life.

Or do we? Perhaps the most remarkable thing about REM sleep is that it proves the brain can operate independently of sensory input. Like an artist ensconced in a secret studio, our mind appears to experiment without inhibition, let loose on its own personal mission.

When we're awake, the brain is occupied with busy work—all those limbs to control, the constant driving and shopping and texting and talking. The money-earning, the child-rearing. But when we're sleeping, and we commence

Joe Diemand, 76, has spent the past 20 years as a truck driver, sometimes driving all night. Such work, he says, leaves you "so tired that you can't sleep." The World Health Organization has described night shift work as "probably carcinogenic to humans."

our first REM session, the most elaborate and complex instrument known in the universe is free to do what it wishes. It self-activates. It dreams. This, one could say, is the playtime of the brain. Some sleep theorists postulate that REM sleep is when we are our most intelligent, insightful, creative, and free. It's when we truly come alive. "REM sleep may be the thing that makes us the most human, both for what it does for the brain and body, and for the sheer experience of it," says Michael Perlis.

Maybe, then, we've been asking the wrong question about sleep, ever since Aristotle. The real wonder isn't why we sleep. It's why, with such an incredible alternative available, do we bother to stay awake?

And the answer might be that we need to attend to the basics of life—the eating and mating and fighting—only to ensure that the body is fully ready for sleep. ▯

Michael Finkel's latest book, *The Stranger in the Woods,* is about a hermit who, after 27 years alone, had achieved this insight: "Get enough sleep." Swedish photographer **Magnus Wennman**'s exhibit on refugees, Where the Children Sleep, has toured worldwide.