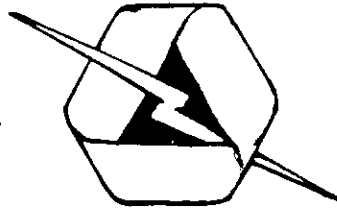


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## Snoring May Be Clue To Dangerous Sleep Disorder

Snoring has long been considered a harmless, if irritating, quirk of nature. But, for two to five million Americans, snoring can be a symptom of a potentially fatal, yet usually curable sleeping disorder known as sleep apnea.

Apnea, only recently recognized as an adult sleep disorder, is now receiving considerable attention from sleep experts across the country. The condition is characterized by halted breathing during sleep which can last as long as two minutes and occur as many as 600 times nightly.

Symptoms include extremely loud snoring, followed by a period of silence that is broken by a loud snort or gasp as the sleeper awakens just enough to restore breathing and then goes back to sleep.



One difficulty in treating apnea is that sufferers often are unaware of the disorder because they are unconscious when it happens and there is no obvious daytime after-effect. For the condition to be identified, the nightly symptoms often must be observed by another individual. Faulty diagnoses can be another problem: Because of the repeated sleep disruptions, the apnea sufferer may complain of inadequate sleep and report excessive daytime drowsiness. As a result, apnea is often misdiagnosed as insomnia and is dangerously mistreated with sleeping pills.

Recent research has underscored the hazard of mistaking apnea for insomnia. Studies have shown that sleeping pills, which slow the respiratory system, aggravate apnea and actually cause repeated and prolonged attacks. Each attack, marked by the interruption of breathing, may cause a dangerous oxygen deficiency, possibly increasing the risk of hypertension, cardiac

failure, or cardiac arrhythmia. The problem is believed to be particularly severe among the elderly, who often take sleeping medications. In addition, apnea sufferers may be courting danger by using alcohol or tranquilizers.

Researchers now believe that undiagnosed sleep apnea may be largely responsible for the high incidence of sudden death at night: One study revealed that at least 30 percent of the population 65 years of age or older experience apnea, and that most of these individuals have no sleep or respiratory complaints.

Apnea appears to have two causes. One type results from a partially obstructed airway, possibly because of a collapsed windpipe due to obesity. Weight loss can cure the problem. Another form of adult apnea is caused by a defect in the respiratory center of the brain due to disease, such as polio or a tumor. Although more difficult to cure, this form of apnea is now being treated successfully with drugs and respiratory stimulators.

Anyone who snores heavily and suffers from excessive daytime sleepiness should contact an accredited sleep center. Write: Association of Sleep Disorder Clinics, Sleep Disorders Center, Department of Psychiatry, SUNY at Stony Brook, New York 11794.

—Kate Weinstein.

SLEEP

## DRUG STOPS NIGHTMARES

**Case history:** During World War II, Charlie was captured by German soldiers. Both his arms were broken and he was forced, along with other sick prisoners, into deep, rat-infested pits. There he and the other healthier prisoners hid behind their dying buddies for protection from the rats and listened to their friends scream as they were eaten alive.

For 30 years after Charlie left the service, the screams of his buddies haunted his dreams. Even while awake, he suffered from panic states characterized by paralyzing fear, chest pains, sweat and nausea. Leaving his job because the attacks got so acute, he became a recluse, afraid of enclosed spaces and crowds.

But when Charlie began taking phenelzine sulfate, his nightmares started to fade. He felt progressively calmer, and now, a year later, he is functioning moderately well even without medication.

Phenelzine, a drug used to treat anxiety and depression, was given to five war veterans in a study conducted by psychiatrist George L. Hogben at the Bronx Veterans Administration Center in New York. Hogben decided to try using phenelzine after it was learned that the drug blocked rapid-eye-movement (REM) sleep, which is associated with dreaming. He reports that a number of recent studies have shown that REM sleep can be inhibited without harmful effects.

The five patients were suffering from war-induced neuroses and had been treated with psychotherapy and other drugs without success. Hogben reports that all five felt calmer almost immediately after being given phenelzine. In each case debilitating nightmares ceased, and daytime flashbacks of horrifying war experiences ended for all the participants but one.

Three of the subjects stopped using the drug after 3 to 6 months, and their nightmares and panic attacks did not return during an 18-month follow-up. One continues to do well with treatment; the other was lost from the follow-up study.

Hogben believes most cases of war neuroses are misdiagnosed. All the patients in his study were originally thought to have a variety of mental disorders, mainly chronic paranoid schizophrenia. "Traumatic war neurosis is a sad and serious problem that has generally been ignored by the military," he says. "It often demands aggressive and careful taking of case histories to uncover the problem. Many veterans are ashamed of their war experiences and conceal them from others as well as from themselves."

# How To Fall Fast Asleep

*One old-time cure for insomnia is to smell one's socks after removing them before bed. Others invoke crows, onions, and various odd modes of behavior...*

by Tim Clark

illustrated by Bruce Hammond



□ NAPOLEON BONAPARTE COULD not do it. Winston Churchill had problems. Charles Dickens and Franz Kafka had to get into unusual positions to achieve it. The Earl of Rosebery had to resign as Prime Minister of England because he couldn't do it. And Thomas Edison hardly did it at all.

What these famous people and up to 50 million modern-day Americans have found difficult or impossible is the simple, natural act of falling asleep. Insomnia, an ailment as old as mankind, is little understood even today, after three decades of vigorous and ground-breaking research into the nature of sleep.

Insomnia is defined by most researchers as an inability to sleep that interferes with efficient daytime functioning. In other words, it's not how much you sleep that makes you an in-

somniac, but how well you function when you're awake. Some people can get along very nicely on as little as three or four hours of sleep a night. They may even complain of needing more sleep because we've all heard that we need eight hours a night. It's just not true for everyone. Edison, who rarely got what we call "a good night's sleep," performed very efficiently on a few naps, especially after a particularly troublesome problem had been solved.

But we can't all be like Edison, and chronic insomnia can be devastating. An insomniac understands too well why sleep deprivation is a favorite form of torture. It explains why sleeping pills are, after aspirin, the most commonly used drugs in the United States, with an estimated 30 million tablets swallowed before bed every night.

And yet, paradoxically, misuse of sleeping pills is one of the leading causes of insomnia, in addition to a variety of other ills, including drug dependence.

It is comforting, however, to learn that the latest scientific methods for inducing sleep are not so different from the tried and true. Indeed, the recommendations of modern sleep experts for improved "sleep hygiene" — or how to fall asleep — have a familiar ring to them.

Take counting sheep, for example. This ancient and reliable method — some old-timers prefer to imagine crows circling in the sky — draws support from current-day sleep researchers who cite recent discoveries about the nature of the brain to explain the success of counting sheep. The human brain is divided into two hemispheres whose functions are different. The right side of the brain is chiefly concerned with visual images, the left side with speech and counting. Counting sheep puts both sides of the brain to work, providing enough distraction from worries or other intrusions to allow sleep to sneak up on our consciousness. In modern sleep clinics similar techniques are recommended to patients with problems falling asleep — they are urged, for example, to imagine writing the numbers 1 to 100 on a blackboard.

Another unusual approach is called "paradoxical intention." People who have trouble sleeping are instructed to try as hard as they can to stay awake at night (without using drugs or caffeine). In laboratory experiments where insomniacs were ordered to stay awake for 30 minutes, many of them fell asleep almost immediately. Conversely, when the sleeping subjects were called over an intercom at the end of the 30 minutes and told it was all right to go to sleep now, many of them woke up and were unable to go back to sleep.

A psychologist named Richard Bootzin developed a therapy called "stimulus control" for people who

have grown to associate insomnia with being in bed. It is a demanding process, requiring the patient to stay out of bed except when sleepy. That means no watching TV, reading, knitting, or any other nonsleeping behavior (except sex). If the patient can't fall asleep within ten minutes of getting into bed, he has to get up and go to another room until he feels sleepy. Then he goes back to bed and, if necessary, repeats the process until he falls asleep within the allotted ten minutes. Regardless of how many times he has to get up, he must rise for the day at exactly the same time every morning, avoid daytime naps, and keep a careful written record of the number of times he had to get up before falling asleep.

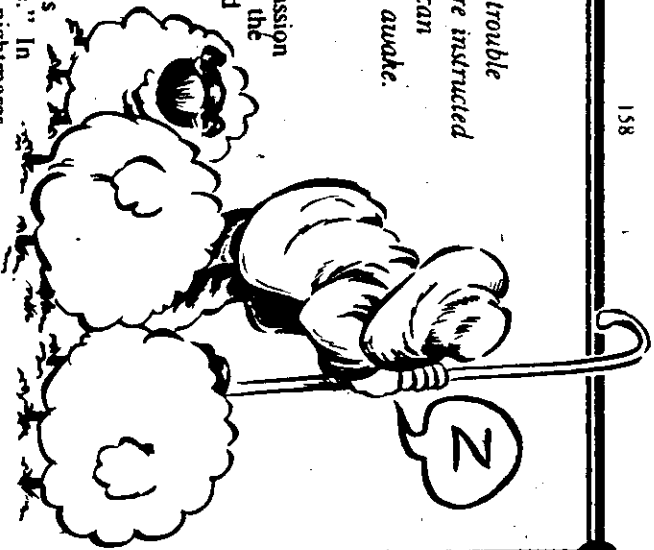
With most patients the immediate effects have been horrible — the sleeper gets out of bed as many as ten times the first night. But after a few weeks the anti-bed conditioning begins to weaken and within six weeks most patients, even insomniacs who haven't had a full night's sleep in ten years, are sleeping through the night.

Another familiar folk remedy is a glass of warm milk just before retiring. A book published in 1430 testified to the effectiveness of the method: "She gave him milk, (and) ye slepe fell in his hede." Now scientists have discovered that milk contains a substance called L-tryptophan, which is chemically related to a substance in the brain called serotonin. Serotonin appears to increase in the brains of sleeping animals, and injections of serotonin into waking animals' brains put them to sleep.

There is some disagreement, however, on whether a glass of milk before bedtime would give a human being enough L-tryptophan to do any good — some skeptics claim you would have to drink six or seven glasses to get an effective dose — more than enough to wake you up a few hours later for obvious reasons.

A number of herbal teas have been put forward as sleep-inducing, includ-

*People who have trouble sleeping are instructed to try as hard as they can to stay awake.*



ing camomile, boneseet, passion flower, and catnip, which the late Euell Gibbons claimed would prevent nightmares. An English herbalist of the 17th century recommended tying the dried root of the peony around one's neck to ward off "the Incubus" in those days people thought nightmares were caused by goblins that sat on a sleeper's chest, threatening him with suffocation. An old New England folk cure for nightmares was to smell your socks after taking them off before bed. Some might prefer suffocation.

Eating before bedtime has long been associated with bad dreams and troubled sleep. "Those who indulge in late suppers, or eat heartily before retiring, are usually troubled with unpleasant dreams, nightmares, and are often found dead in the morning," a 19th-century herbalist warned gravely. But modern researchers agree that it is better to have a light snack before bedtime than to go to bed hungry. Laboratory rats deprived of food slept less, and in humans severe dieting and loss of sleep seem to go hand in hand. One English folk remedy for insomnia recommends eating onions, preferably raw, but stewed or made into soup or jelly is also fine.

All authorities agree that you should stay away from caffeine, a stimulant found in coffee, tea, chocolate, cola drinks, and many over-the-counter pain relievers and cold remedies. Caffeine is the most widely used stimulant in the country, and studies have shown that it will disturb sleep even in persons who believe that it does not affect them. Nicotine has a similar effect. Drinking in moderation, however, does tend to promote drowsiness. Heavy drinking has the unpleasant consequence of canceling out the normal periods of dreaming. When the drinking stops, the dreaming comes back for longer, more intense periods, often in the form of nightmares.

Nightmares also seem to increase as the temperature of the bedroom gets colder, contrary to the folk wisdom that it is easier to sleep in a cold room. But too warm a room also disturbs sleep — a cat will sleep longer with the temperature around 72 degrees Fahrenheit, but humans move around more when it reaches 75 degrees and have less refreshing sleep. It hardly seems surprising that loud noises tend to wake people from sleeping, but scientists have devoted much study to the effects of noise on sleepers. In general they have found that women and older people are awakened more easily, although the sensitivity to noise varies greatly from one individual to

another. Interestingly, a loud noise is less likely to awaken a sleeper who incorporates that noise into the content of his or her dream. And the specific meaning of a noise can make a big difference — a mother who sleeps soundly through a thunderstorm may awaken instantly when her baby starts to cry, however faintly.

Another bit of folk wisdom about sleeping is the belief that sleep is promoted by lying so that the head points north, in line with magnetic currents (one variation on this is the belief that one's head should be pointed east so that, as the earth turns, one is propelled through space headfirst). Charles Dickens was always careful to get himself properly oriented with his head to the north before sleeping, and another writer, Franz Kafka, used to cross his arms and put his hands on his shoulders to make himself "heavier." But sleep research has not yet shown body positioning, curvature of the spine, or the type of bedding to be significant in determining how well or how quickly one will sleep.

Yet another famous author, the Frenchman Alexandre Dumas, was ordered by his doctor to eat an apple under the Arch of Triumph every morning at 7 A.M. exactly. This was a scheme to make Dumas observe regular hours, which scientists today agree will help one sleep. Dumas's sleeping problems might have had something to do with his estimated 500 illegitimate children, however.

Between walking to the Arch of Triumph in the morning and hiking up the French population growth in the evening, it would seem that Dumas got plenty of exercise. But he got it at the wrong times. The latest studies indicate that regular exercise, while helping one to sleep well, is most beneficial in the afternoon or early evening, and violent exertions at bedtime are more likely to keep one awake. As Florence

Nightingale observed, "Sleeplessness in the early night is from excitement generally."

That's why the authorities agree that one should avoid too much mental or emotional stimulation just before bedtime. Reading or watching TV is fine, but not if the subject matter is likely to get your heart pounding and adrenaline pumping. Don't do your income taxes or talk about your in-laws. And if you don't fall asleep right away and feel yourself getting tense and frustrated, get up and do something else. Ben Franklin advocated a brisk walk around the bedroom as well as a thorough airing of the bedclothes, shaking them at least 20 times. He did not mention the effect of this on his bed partner.

"These are the rules of the art," Franklin concluded in a letter to a lady who had asked him how to avoid unpleasant dreams. "But, though they will generally prove effectual... there is a case in which the most punctual observance of them will be totally fruitless. The case is when the person who desires to have pleasant dreams has not taken care to preserve what is necessary above all things, A Good Conscience." □ □



## Dietary Habits and Sleep After Bedtime Food Drinks

Kirstine Adam

*Edinburgh University Department of Psychiatry, Scotland, United Kingdom*

**Summary:** Sixteen volunteers aged 52-67 had their sleep recorded electrophysiologically after each of four conditions of bedtime food intake: (a) an inert capsule, (b) milk, (c) a proprietary malted milk drink, and (d) a flavored drink nutritionally equivalent to the proprietary malted milk drink. Analysis of variance revealed no significant differences over the four treatments, but the study had set out to test the specific predictions that the malted milk drink would lead to longer and less broken sleep than the capsules, milk alone, or the flavored drink. In the first 6 hr of accumulated sleep, the malted milk drink was associated with significantly less broken sleep when compared with the milk or the flavored drink but not when compared with the inert capsule. The last finding differed from previous reports. To examine this difference the usual daily pattern of food intake of the subjects was assessed. The subjects were divided into two groups of 8 according to whether, at home, they usually ate a lot (Eaters) or a little food (Non-eaters) near bedtime in relation to their total intake after 1700 hr. These two groups differed in how they slept in the sleep laboratory after the four treatments. The Eaters slept significantly worse after capsules compared with milk or the malted milk drink, whereas the Non-eaters tended to sleep best after capsules, i.e., no nourishment. The subjects were ranked (1-16) according to the relative amount of food they ate in the latter part of the evening, and this rank order was found to be significantly correlated with the sleep pattern on the various sleep treatments. The more a person usually ate near bedtime, the greater the impairment of sleep after the capsules, which had no nutritive value, compared with sleep after milk or the malted drink. The smaller the amount subjects usually ate near bedtime, the better they slept after capsules compared with milk or the malted milk drink. The general conclusion from this study is that a departure from a person's usual pattern of food intake in the evening impairs subsequent sleep. **Key Words:** Sleep—Eating habits—Food composition.

Insomnia, especially in older people, is a common problem, to judge by the consumption of sleeping pills (Dunnell and Cartwright, 1972). Hypnotic drugs are effective in reducing wakefulness through the night, but their withdrawal can lead to a considerable increase in wakefulness interrupting sleep for many nights

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Address reprint requests to Dr. Adam, University Department of Psychiatry, Morningside Park,  
Edinburgh EH10 5EH, Scotland, United Kingdom.

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# Sleep

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## EDITORS-IN-CHIEF:

William C. Dement, M.D., Ph.D.  
 Christian Guilleminault, M.D.  
 Sleep Research Center TD-114  
 Stanford University School of Medicine  
 Stanford, California 94305, U.S.A.

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Original manuscripts on any aspect of sleep (clinical, experimental, biochemical, etc.) will be considered. Laboratory, clinical, social, and historical notes not exceeding 1000 words and two figures will also be published, as well as announcements of meetings and awards, and book reviews. All manuscripts and other copy should be submitted to Dr. William C. Dement or Dr. Christian Guilleminault at the above address. See first issue of this volume for detailed instructions to authors.

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## Chronotherapy: Resetting the Circadian Clocks of Patients with Delayed Sleep Phase Insomnia

\*†‡Charles A. Czeisler, \*†Gary S. Richardson, \*\*Richard M. Coleman,  
\*Janet C. Zimmerman, †Martin C. Moore-Ede, †William C. Dement,  
and †Elliot D. Weitzman

\*Laboratory of Human Chronophysiology and Sleep-Wake Disorders Center,  
Department of Neurology, Montefiore Hospital and Medical Center, and Albert  
Einstein College of Medicine, Bronx, New York; †Sleep Disorders Program,  
Department of Psychiatry, Stanford University School of Medicine, Stanford,  
California; and ‡Department of Physiology, Harvard Medical School,  
Boston, Massachusetts

**Summary:** We report here the development of a brief drug-free rescheduling treatment ("chronotherapy") for Delayed Sleep Phase (DSP) insomnia, a syndrome characterized by sleep-onset insomnia with difficulty in morning awakening. We postulated that patients with DSP insomnia had an inadequate capacity to achieve phase advance shifts of the circadian pacemaker which times the sleep-wake cycle. Chronotherapy was therefore designed to reset these patients' biological clocks by the phase delay route. This single 5-6 day treatment was tested in 5 patients with a 4-15 year history of DSP insomnia. All 5 patients reported a lasting resolution of their symptoms substantiated by systematic long-term self-reports and objective polygraphic recording before and after treatment (average follow-up of 260 days, range, 42-910 days). The average sleep onset advanced from 4:50 a.m. before treatment to 12:20 a.m. afterwards, and wake times advanced from 1:00 p.m. to 7:55 a.m. (for both,  $p < 0.001$ ), with no reduction in sleep efficiency. As a result, all 5 patients were able to end their chronic dependence on hypnotic medications. **Key Words:** Sleep scheduling disorders—Chronotherapy—Circadian rhythms—Insomnia.

... they lie awake, for perhaps two or three hours, after going to bed, and do not fall into slumber till towards morning. Persons of this description often in fact, and are reputed to be, early risers, although, in practice, they actually sleep less than these early risers themselves.

Robert Macnish, 1836

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Address correspondence and reprint requests to Dr. Czeisler at Sleep Research Center, Room 2100, Stanford University School of Medicine, Stanford, California 94305.

# Sleep-Promoting Factor Isolated

*Glycopeptide from human urine causes a 50 percent increase in deep sleep in animals*

*O sleep! O sleep! Do not forget me. . . O, I am tired!*

—JUAN INGLEW

This plaintive cry of the 19th-century poet is still heard today. An estimated one-third of all Americans suffer from occasional sleep disorders and as many as one in every ten use medication to help them sleep. Over-the-counter pharmaceuticals are of limited value in helping these individuals, however, and prescription drugs often have undesirable side effects. The recent isolation from humans of a glycopeptide that induces safe, normal sleep in laboratory animals thus represents a significant breakthrough toward both the development of more natural, more effective sleeping aids and a better understanding of the sleep process. It will clearly be many years before the glycopeptide or a modification will be available for use in humans, but the promise is present.

The sleep-promoting substance, known as factor S, was isolated from human urine by James M. Krueger, now at the **Chicago** Medical School, and John R. Pappenheimer and Manfred L. Karnovsky of the Harvard Medical School. The isolation and purification of about 30 micrograms of the glycopeptide from more than 4.5 tons of urine from healthy males was reported in the *Journal of Biological Chemistry* [257, 1664 (1982)] and at a recent seminar at Harvard.

Factor S is composed of the amino acids glutamic acid, alanine, and diaminopimelic acid and the sugar muramic acid in the molar ratio of 2:2:1:1 with a mass of 922 daltons. When infused into the brain of a rabbit at a concentration of about 5 picomoles per kilogram of body weight, factor S induces a 50 percent increase in what is known as slow wave sleep, a deep, dream-free sleep that occurs in animals and humans after sleep deprivation, and is normal as judged by various criteria.

Pappenheimer, Karnovsky, and their colleagues had previously isolated sleep-promoting substances from the cerebrospinal fluid and the brain of sleep-deprived goats. These substances have not been completely purified and characterized, but preliminary evidence suggests that they are similar, if not identical, to each other and to factor S from humans.

These substances induce excess slow wave sleep in rats, rabbits, and cats. Koji Uchizono and his colleagues at the Tohoku University School of Medicine in Japan have partially purified and characterized a sleep-promoting factor from the brain stems of sleep-deprived mice, and this is also similar or identical to factor S.

In contrast, Marcel Monnier and his colleagues at the University of Basel in Switzerland have isolated and characterized a nonapeptide sleep-promoting factor by dialysis from the blood of sleeping rabbits. This substance, called delta-sleep-inducing-peptide or DSIP, causes a transitory increase in slow wave and delta wave (another type of brain wave associated with sleep) activity at concentrations (20 nanomoles per rabbit) substantially higher than required with factor S. The Basel group demonstrated last

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## The sleep-promoting agent may be derived from bacterial degradation products.

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year that synthetic DSIP could produce deeper sleep with fewer awakenings in six individuals with severe, chronic insomnia. Synthetic DSIP has no activity, however, in their laboratory assay, says Karnovsky.

The identification of the constituents of factor S has recently been confirmed by mass spectrometry by Klaus Biemann and his associates at the Massachusetts Institute of Technology. Biemann will soon begin studying fragmentation patterns and hopes to have the sequence within a year. Meanwhile, Karnovsky and Pappenheimer are trying to develop a sensitive assay that could be used to monitor factor S at the low concentrations found in biological fluids. Among other things, they would like to know whether the concentration of factor S increases in individuals deprived of sleep and whether the concentration is abnormal in individuals with sleep disorders.

The structure of factor S is rather unusual. Glutamic acid and alanine both are common amino acids, but both mu-

ramic acid and diaminopimelic acid are more typically associated with the cell walls of bacteria. After extensive studies, the Harvard investigators are convinced that factor S does not arise from bacterial contamination during their isolation procedure. This suggests, says Pappenheimer, either that mammals can synthesize peptides containing muramic acid in quantities too small to have been detected previously, or that the sleep factor is derived from bacterial products absorbed through the gut. The factor, says Pappenheimer, would thus "be akin to any of the essential amino acids or vitamins which cannot be synthesized by mammalian cells." Some bacterial degradation products, in fact, have sleep-antagonist properties, suggesting that they have different structures but share a common receptor.

While isolating and characterizing factor S, Pappenheimer and Karnovsky have been exploring its mechanism of action with some synthetic analogs. Edgar Lederer of the National Center for Scientific Research at Gif-sur-Yvette, France, has synthesized more than 300 muramyl peptides in a search for immunostimulants that could serve as adjuvants or potency increasers for vaccines. Pappenheimer and Karnovsky have studied many of these to develop structure-activity correlations. One of the most potent of these in rabbits is *N*-acetylmuramyl-L-alanyl-D-isoglutamine, also known as muramyl dipeptide or MDP. It produces about a 50 percent increase in slow wave sleep when infused into the brain of rabbits at concentrations about ten times higher than that required for factor S. The same effect is observed when a millionfold higher dose is administered orally.

In addition to the potential for assisting individuals with sleep disorders, factor S could open the door to a much better understanding of the biochemical nature of sleep—an area where almost nothing is now known. Once its structure is determined, it will be possible to synthesize it in a radioactively labeled form that could be used to locate receptors in the brain, to determine how the glycopeptide binds to the receptor, and to trace the chain of chemical commands that are subsequently issued.

—THOMAS H. MALGH II



## Apparatus electro-sleep

(INVENTION INTELLIGENCE p. 257)

In persons suffering from chronic insomnia originating from bronchial asthma and minor pains, sleep has to be induced either by internal means (eg. taking pills) or by external means (eg. passing low intensity alternating current through the patient's head). Since the former method often leads to side effects and may be harmful in some cases, it is the latter method that is now generally used to induce sleep in hospitals.

The Electronics & Radar Development Establishment, Bangalore has developed an apparatus electro-sleep to induce sleep electronically in hospitals, clinics and homes for the treatment of sleep disorders. The estimated demand for this type of equipment in the country is about 1000/yr.

The unit comprises a transistorized wide band electrical noise generating circuit. The therapeutic electrical noise current is applied to the patient through a set of mosh electrode. The unit operates at 230v, 50hz single phase mains ac supply. The amplitude of the output current can be controlled continuously.

The main components required for fabricating this equipment are ½-watts carbon film

resistors, potentiometers, electrolytic capacitors, bridge rectifiers, zener diodes and power transformers, all of which are indigenously available.

All the equipments required for this process are indigenously available. These include facilities for welding, sheet metal working, painting, engraving, front panel making, and cabinet making; cutter, grinder, sandar and polisher; transformer/choke winding and impregnation facilities; printed circuit cards; shaping and drilling equipments; and facilities for moulding/potting of high voltage components.

Due to relatively low turnover, the project should be taken up only by firms having the necessary background and experience in production of professional grade systematized general electronic/medical electronic equipments. No special machinery is required for manufacturing this product. Its estimated cost is Rs 600/unit.

# What's the Best Bed? <sup>U.C.</sup> CLIP SHEET

DAVIS—Waterbed or orthopedic hard bed? Standard 500-coil bed or new "hybrid" waterbed?

Findings that add insight to the age-old question of "what's the best bed" are provided in a study recently completed by orthopedist Steven R. Garfin, an assistant professor at the University of California, San Diego School of Medicine. His results will appear in the *Archives of Physical Medicine and Rehabilitation*.

Using pressure gauges, Garfin determined that a standard waterbed provides the most even pressure distribution over the entire body. An orthopedic bed with a built-in bed board supported the body's weight at only slightly fewer points; a soft bed supported the body in only six places and a hybrid-type waterbed topped with foam padding provided the most uneven support and was regarded as the worst.

Sixty-five water-filled balloons connected to pressure transducers were used by the

UCSD orthopedist to measure the pressure distribution patterns of the human body. These pressure measuring balloons were distributed on a sheet shaped to conform to the human figure and then placed on five different surfaces.

The surfaces tested — all commercially available — included an "orthopedic" 720 coil mattress and box spring, a standard 500 coil bed, a standard 10-inch deep waterbed and a hybrid bed composed of a central water core surrounded by polyurethane. The floor was used as a control.

Five different subjects varying in height and weight were tested while they lay face up and then face down on the various surfaces after the pressure measuring sheet was interposed.

Study results showed a more uniform pressure distribution over the entire body on both the waterbed and the orthopedic bed than on any of the other surfaces. The softer

(500 coil) bed, the hybrid bed and the floor supported the body essentially on only five points (back of the head, shoulders, buttocks, calves and heels) in the face-up position.

How do the findings relate to bedridden patients or the general public? Paraplegics, diabetics and other patients with sensory neuropathies should choose a bed with the most even pressure distribution to help minimize the chance of tissue damage and thus aid in their total care or rehabilitation, Garfin says.

"In this group of patients, either the waterbed or the hard bed with a foam support would seem to be appropriate. The soft bed and the hybrid waterbed gave extremely high skin pressures. These probably are not beds that should be routinely recommended for debilitated persons or those with sensory impairments," he says.

Although he is careful not to extrapolate from the findings, Garfin says that "the same gen-

eralizations could probably be made for the normal individual. Conceptually, an even distribution of body weight with a bed that gives support over a larger surface area should be beneficial and perhaps give an individual a more restful period during recumbency. The frequency of movements necessary to relieve prolonged excessive tissue pressures also may be reduced on these structures."

As for the subjective views of the bedtesters in the study, Garfin says, "All five felt the combination foam-waterbed was uncomfortable, and reported an exaggerated lordosis [spinal curvature] created by the hybrid bed. This was not true of the hard or waterbed, and no complaints were voiced about them."

Asked which bed he would select for himself, Garfin answers, "Never less than the 720 coil . . . and certainly never the hybrid type."

—Pat Johnson JaCoby  
(714) 294-6163

## Sleep: Do it at the right temperature

Throw the alarm clock out the window and see how long you sleep. Most people would guess that the tired they are or the longer they have been awake, the longer they will sleep. Not so, according to experiments reported in the Dec. 12 SCIENCE, which conclude that natural body rhythms and especially body temperature determine the length of human sleep. It turns out that the warmer you go to bed the longer you'll sleep.

Previous studies had confounded sleep researchers. So-called "recovery" sleep after even 10 days of total sleep deprivation rarely exceeded 11 to 16 hours, while both longer and shorter sleep times were seen in subjects not deprived of sleep who lived on a self-scheduled routine. Such wide variation led some to characterize sleep duration as random and irregular. "We now report that such variations in sleep duration occur in a consistent and predictable manner which depends on when subjects went to sleep, rather than how long they have been awake beforehand," say the researchers: Charles A. Czeisler of the Laboratory of Human Chronophysiology at Montefiore Hospital in the Bronx, N.Y., and the Sleep Research Center at Stanford University School of Medicine; Elliot D. Weitzman of Montefiore and the Albert Einstein College of Medicine in the Bronx; Martin C. Moore-Ede of Harvard Medical School in Boston; and Janet C. Zimmerman and Richard S. Knauer of Montefiore.

Twelve male subjects lived separately for up to six months in an environment free of time cues — no windows, clocks, radios, etc. Each subject developed free-running, non-24-hour sleep-wake, body temperature and hormone-level cycles. Researchers monitored these circadian, or daily, rhythms and found that body temperature at the time of going to sleep is the best indicator of how long a person will sleep.

Human body temperature varies on a regular daily cycle. The researchers report that if subjects go to sleep when the body temperature is at its lowest they sleep an average of 7.8 hours and wake on the rising phase of the temperature cycle. If subjects go to sleep at or after the peak of the temperature cycle they sleep almost twice as long — 14.4 hours. They sleep through both the high temperature phase and the low temperature phase and wake up during the next upslope of the temperature curve. "No significant correlation ... was observed in these experiments between sleep duration and the length of prior wakefulness, provided that the subjects had been awake for at least 14 hours," say the researchers.

The internal structure of sleep was also found to vary with the phase of the tem-

# HOW TO THRIVE On Less Sleep

Family Weekly Sept 6 '81

By Lesly Berger

**H**ave you ever wished there were more hours in a day for you to accomplish all you've set out to do? Well, you can't extend those 24 hours, but you may be able to increase the amount of time you spend awake.

Many of us have always assumed that a minimum of eight hours of sleep each night was a prerequisite to good health, but according to Dr. Robert Van de Castle, clinical psychologist and head of the Sleep and Dream Laboratory at the University of Virginia Medical Center in Charlottesville, most of us can probably get along on less sleep than that. "Six and a half or seven hours of sleep a night is average for most people, and studies have shown that this can often be reduced by about half an hour with no

curs) and 'stage four' or 'slow wave sleep' (when the deepest sleep takes place)."

Van de Castle stresses, however, that there are bound to be individual differences in the amount of sleep one may need. "In some ways, the amount of sleep a person gets may be similar to his waking style," he says. "Try to think of it in terms of the tortoise and the hare. The active, kinetic, quick-talking and fast-moving 'hares' seem to need less sleep, while the more phlegmatic, slower-talking and less-active 'tortoises' may need a bit more."

If you are not getting enough sleep, it's likely that your body will let you know. Lack of sufficient sleep will cause you to feel tired and nervous. In this case, Van de Castle recommends taking one day a week, perhaps during the weekend or on your day off, to indulge yourself and sleep later.

But try not to go overboard and sleep more than nine and a half hours, he cautions, or you may wake up groggy or with a slight headache and find that it's even harder for you to get going.

Before you begin a sleep-reduction program, Van de Castle emphasizes, make sure that you have not chosen a hectic or difficult time in your life or a period when you are feeling run-down. Also recognize that in order to derive the maximum benefit from sleep reduction, you must take a gradual approach.

Dr. Van de Castle recommends that rather than trying to stay up later than you're

accustomed to, you start by going to bed at your normal time and setting your alarm clock so that you wake up earlier. You might begin by waking up only 10 minutes earlier than usual for the first few days, then 15 minutes earlier for several days, then 20, and so on. Thus it could take you up to a month to shorten your sleep by half an hour, but your body would be ready for it.

How should you use this bonus time? Maybe you could start reading that book you've been meaning to, writing some letters or exercising.

Author Everett Mattlin, who himself sleeps six hours a night, points out: "When you've got things to do that you're excited about, the loss of sleep doesn't seem critical. But if you don't have any special reason for getting up earlier, sleep reduction probably won't work for you."



Joanne Kaplan

ill effects," Dr. Van de Castle says.

In the recent book *Sleep Less, Live More* (Ballantine, \$2.50), author Everett Mattlin points out that throughout history, dynamic people have found that sleeping less has enabled them to accomplish more. Napoleon, the Duke of Wellington, George Bernard Shaw, and such modern-day figures as writer Isaac Asimov and former President Jimmy Carter have all been short sleepers, Mattlin says.

Cutting down on your sleeping time shouldn't interfere with your body's needs, according to Van de Castle. "Sleep is divided into stages," he explains, "and when you shorten your sleep you'll still get adequate time in the two stages which research has found to be the most important: 'stage one,' the R.E.M. or 'rapid eye movement' stage (when dreaming oc-

# Sleep: Are you a 'lark' or an 'owl'?

By Zonia Cleigh  
Copy News Service  
OAKLAND TRIBUNE  
2 OCT '80

Some 30 percent of all Americans complain of a sleep problem this year, like every year.

And when this happens to you, one of the most important things to remember is not to worry, according to Dr. Cheryl Spinweber, a sleep researcher at the Naval Health Research Center in San Diego, Calif. It's not a tragedy to lose a night of sleep, Spinweber says, and it is important not to set yourself up to have sleep problems by expecting that you will.

Secondly, when you do have difficulty falling asleep, think twice before you reach for sleeping pills — benzodiazepine like Dalmane, Valium and Librium, or barbiturates like Seconal.

According to Spinweber, long-range studies by Anthony and Joyce Kales, sleep researchers at Hershey Medical School in Hershey, Pa., have shown that people who take sleeping pills for years turn out to have worse sleep performances than people who complain of poor sleep but do not resort to sleeping pills.

The Kales sleep studies, Spinweber said in an interview in the Navy's Sleep lab at the Naval Hospital, tend to show "that sleep is not improved by chronic use (of sleeping pills)."

Spinweber said it is important for people to realize there is no right and wrong way to sleep.

"There is a myth that everybody needs eight hours of sleep," Spinweber said. "That isn't true. Some people need a lot less. Some people need a lot more. It's important for people to know what their sleep requirement is to feel good and work well the next day, and then to try to meet that sleep need."

Sometimes people who need a great deal of sleep are married to people who need very little, and are made to feel embarrassed and lazy since our culture values the "early-to-bed and early-to-rise" ethic.

Napoleon was a short sleeper. Einstein, however, needed a great deal of sleep.

It is also important to recognize that some people are "larks" — that is, they feel best early in the morning, while

others are "owls" and operate best at night. This is due to the body's circadian cycles (the behavioral, body and sleep rhythms related to the 24-hour cycles of the earth's rotation) and the time of the day in which the body's temperature is at its highest, leading to the period of most wakefulness and energy.

The trick is to recognize individual differences and live with them. Turn the volume down if you must stay up into the wee hours watching Johnny Carson while your husband or wife snoozes. Put the coffee on and keep the whistling down in the morning while she or he sleeps.

For people who feel compelled to use a sleep aid, Spinweber says a substance commonly available in health food stores — L-Tryptophan — will induce sleep without morning-after side effects.

L-Tryptophan is an amino acid available in many health food stores in tablet form.

In March, Spinweber presented results of a study on L-Tryptophan to a conference of the Association for the Psychophysiological Study of Sleep in Mexico City.

Her findings on the amino acid, she said, replicate the work by Dr. Ernest Hartmann, a psychiatrist and well-known sleep researcher at the Sleep and Dream Laboratory at Boston State Hospital, where Spinweber, who has a Ph.D. in psychology from Harvard, was assistant director until accepting her present job.

L-Tryptophan, taken in a minimum recommended dose of one gram (two 500-milligram tablets) with water or fruit juice, will take effect between 20 minutes and half an hour after it is ingested.

L-Tryptophan is naturally found in milk, meat and other high-protein foods, which is why a cup of warm milk has traditionally been known as a household nostrum for insomnia.

Scientists do not know exactly how L-Tryptophan works, Spinweber said, and not all are convinced of its efficacy, but it seems to be a dietary activator of serotonin, a brain transmitter that has been linked to the control of sleep. Researchers are not certain whether sero-

tonin actually initiates sleep or deactivates waking, making a person more relaxed so sleep can occur.

Researchers hope the understanding of substances such as L-Tryptophan may cut down on people's use of sleeping pills.

"One problem with sleeping pills," she said, "is that they improve sleep in terms of how quickly you fall asleep and how well you stay asleep, but they may leave you foggy the next day."

"Your reaction time is slowed down, and overall your performance may not be as good because you are actually hung over."

Spinweber said research has shown that sleeping pills alter the normal cycle of sleep. A good sleeper progresses in 90-minute cycles throughout the night through four successively deeper stages of sleep to a period of REM (rapid eye movement) sleep.

The brain waves change during the four stages of sleep, from the preparatory first stage, to stage 2, characterized by the onset of "sleep spindles," measurements of fast brain activity which denote the beginning of actual sleep.

Stages 3 and 4 are characterized by large numbers of slow delta waves, indicating deep sleep and very slow brain activity.

During REM sleep, the heart rate and respiration measure the same on polygraph machines as readings for a person in a normal waking state. This phase of sleep is the one in which the person is most likely to be dreaming.

Toward morning, the normal sleeper will cycle through stage 2 sleep and REM sleep, since stages 3 and 4 occur only in the first three hours of sleep.

According to Spinweber, numerous studies show that benzo-diazepines like Librium, Valium and Dalmane "greatly reduce the amount of stage 4 sleep, greatly increase the amount of stage 2 sleep, and increase the number of sleep spindles and decrease delta waves." Barbiturates like Seconal greatly reduce the amount of REM sleep.

"We're not exactly sure what that means," Spinweber said, "but we do know that when you come off those pills sleep gradually returns to normal."

# Sleep therapy: filling that yawning gap in your life

By Linda Matchan  
Boston Globe

If you're one of those folks who falls asleep easily, you should count your blessings. Millions of others are counting their sheep.

About 50 million Americans have sleep problems, and most of them would describe their problem as insomnia.

Insomnia, though, means different things to different people. Some people feel weary if they sleep less than six hours a night, while others do just fine on five, or even three.

Insomniacs may have trouble falling asleep, or staying asleep, or they might wake up early and not be able to get back to sleep. Their problem might be a psychological one, owing, for example, to stress; a physical one, owing to something like caffeine stimulation; or the result of something in their environment: the bed's too hard, their sleeping partner snores and kicks, there's noise outside the window.

Regardless of the cause of their problem, most insomniacs hate it.

People who have no problem sleeping find it difficult to know how exasperating, how wretched it feels not to be able to sleep, especially for days or weeks on end. At the very least, it's boring and lonely; at worst, it makes anxious victims more anxious and distressed, even despondent. While the clock's ticking away, the family's asleep in bed, even the dog is dozing, the helpless insomniac will resort to almost any measure to pass the time and induce sleep. Some take warm showers, do crossword puzzles or housework in the wee hours, or read a dull book; others just lie there, smoldering in resentment. Many people, in their frustration, turn to food or alcohol or drugs.

Although insomnia over a period of a few weeks or months generally isn't a life-threatening condition, lack of sleep can leave its victims feeling crabby, short-tempered and less productive than they could be. And it's a problem that elicits little sympathy, compared with, say, a broken arm, since there's no physical manifestation of it like a cast or sling. ("An invisible epidemic," says Dr. Quentin Regestein, a psychiatrist who heads the Sleep Clinic at Brigham and Women's Hospital in Boston.)

Often in desperation, many people resort to pills. In 1978, about 30 million prescriptions were written for sleeping medications, such as Valium or Dalmane, according to the Food and Drug Administration, despite the fact there is little evidence that the pills are effective for more than a few weeks and that some scientists say pills have such side effects as daytime drowsi-

ness, and despite the fact that sleep medications, including over-the-counter sleep aids like Sominex and Sleep-Eze, can actually make sleep problems worse by disrupting the normal pattern of sleep.

But there are effective ways to treat insomnia. With persistent or severe insomnia, though, it's best to treat the cause rather than avoiding the issue with medications. The first step, of course, is to figure out exactly what the problem is, since insomnia is a symptom of many different problems.

Anxiety, for example. Stress is known to interfere with sleep, and many insomniacs can attest to the fact that daytime troubles tend to roar into consciousness at night. Often, however, the problem is short-term or situational — a dreaded exam, a death in the family, financial worries — and the insomnia goes away when the crisis passes.

But some people are constantly unable to handle stress well and they're often the ones who have a lot of trouble sleeping. Bedtime, for them, is a time to mull over and ruminate about their problems, since the house is quiet and there's nothing else to distract them. People who have trouble relaxing, who are introspective and self-absorbed, who are easily aroused and always alert, also have trouble simmering down at night.

Irregular sleep schedules can also promote insomnia by disrupting the body's natural rhythms. Shift workers often suffer from "poor man's jet lag," according to Dr. Michael Biber of the Sleep Unit at Beth Israel Hospital in Boston. Their bedtimes are so erratic that their body is affected like that of a traveler jetting across time zones.

Insomnia is also a side effect of caffeine, found in cola drinks and some other sodas, as well as coffee and tea. And hot toddies notwithstanding, when alcohol is consumed in anything but the smallest quantities it can reduce the amount of REM (rapid eye movement), or dream sleep, and can make insomnia worse.

Other culprits are drugs, such as certain asthma and antihypertensive medications; some disease conditions, including those associated with pain, shortness of breath, and itching; and naps.

Sleep during the day is often related to sleeping poorly at night, and it's a common phenomenon among the unemployed and elderly.

Noise has turned many a sound sleeper into an insomniac, too. Some people can get through anything — the Beth Israel Hospital Sleep Unit knows of one man who slept through an earthquake in Mexico even though it

cracked the wall in his hotel room. Other less fortunate souls sleep fitfully or lie awake for hours if someone's snoring in the same room or if the bed springs squeak.

Children can be insomniacs, too, especially infants and toddlers; insomnia is one of the most common complaints at the sleep disorder clinic at Boston's Children's Hospital Medical Center. There are a number of causes — stress, for example, since even young children can detect anxiety and distress in the home, or bedtime habits.

Some parents think they are helping their children sleep by giving them a bottle when they wake up but are inadvertently keeping them awake. The fluid may be causing bedwetting or, possibly, increasing the child's intestinal activity. Regular nighttime feedings can also teach children to feel hungry at night, to learn to wake up and expect food.

Insomnia in children can last for several months, keeping the hapless parents from sleep, too, and disrupting the household. But sleep experts say it is amenable to therapy, that parents don't have to wait miserably, and sleeplessly, for their children to grow out of it.

Adult insomnia, too, is responsive to therapy. But many people can be helped by trying a few relatively simple procedures.

Here are some tips:

- Don't go to bed if you're not tired. And if you can't sleep, don't just lie there and fume; you'll only get more worked up. Get up and engage in a quiet, relaxing activity, like reading a book or watching TV (preferably not a violent program or a talk show that will arouse you more), until you do feel tired.

- Restrict your intake of caffeinated beverages, especially in the evening or before bedtime. And remember that alcohol may make you drowsy and help you fall asleep, but it may not help you stay asleep, or give you a sound sleep.

- Regulate the time you go to bed, and avoid naps during the day. Before bedtime, avoid activities that are likely to provoke you, like paying bills or arguing.

- Exercise during the day — the huffing and puffing kind, not limbering exercises. It's known to make for sounder sleep at night. Don't do anything strenuous at night, though.

- Many insomniacs, as well as doctors, have found that the old bromide about drinking warm milk can actually help if you can't sleep, though it's not known why. But you might as well give it a shot. Like they say about chicken soup, it couldn't hurt.

P15

# 'Serenade of wakeful nightingale'

By TIMOTHY HARPER  
Associated Press Writer

NEW YORK — The young woman needed to know whether Robert Crossley's anti-snoring invention really worked. "If it does," she said, "I might get serious about the guy."

Another customer, a prison inmate, wrote that his cellmates had threatened to set his bunk on fire if he didn't stop snoring.

And a Connecticut man worried that if he didn't stop snoring before he died, "it'll take the undertaker

three days to quiet me down."

About 35 million Americans — the American Medical Association estimates the number at one in every eight persons, evenly divided between men and women — "saw dogs" regularly and enthusiastically.

Letting off sleep, as snoring as been euphemistically termed, can be a sign of serious medical problems, but is generally not considered abnormal, doctors say.

In fact, some of history's more noted snorers include Beau Brumm

ell, Cato the Elder and U.S. presidents such as George Washington, Abraham Lincoln and Theodore Roosevelt.

Some people claim their mates' snoring is a most comforting sound, and Irish playwright George Farquhar, circa 1700, hailed the snorer's various sniffls, chirrs, buzzes, zips, pops and wheezes as "The tuneful serenade of that wakeful nightingale, the nose."

But snoring can be a real problem for roommates, husbands and so-

metimes even neighbors whose sleep is shattered by a blissful lumberjack of the night.

The complainers have a point: tests in London concluded that a hearty snore can reach a noise level of 69 decibels. Some jackhammers are quieter.

"He snored so loud," 18th century satirist Jonathan Swift once wrote of a fellow traveler, "that we thought he was driving his hogs to market."

More recently, David Reed of (Turn to Page 4, Col. 3)

Seattle learned that two tenants in his apartment building had moved out because of his snoring. He was not surprised.

Reed, 38, ruefully recalled that once, after snoring through a night in a barn during a church outing, "Someone thought it was a tractor."

Snoring is caused by vibrations of the soft palate, tongue and other muscles in the mouth as air is inhaled. Drinking, smoking, obesity, and lack of exercise can contribute to snoring, as can more serious medical problems such as enlarged tonsils and adenoids, oral and nasal deformities, nasal polyps, allergies and inflamed sinuses.

Dr. Phillip Green of the sleep disorders clinic at the Marshfield (Wis.) Clinic said snoring can also be a sign of a dangerous condition called sleep apnea.

Apnea is caused by a deformity that makes the sleeper stop breathing for anywhere from 20 seconds to two minutes several times an hour. It can be successfully treated by a tracheotomy, making an incision in the windpipe.

Advice columnist Ann Landers tells wives of snorers to sew ping pong balls to the backs of their husbands' pajamas to discourage them from sleeping on their backs.

A similar ploy was used 200 years ago when snoring colonial soldiers were ordered to do the same thing with musket balls so their comrades

## Better sleep for non-snorers

Dear Ann: This is for all the people who write to complain about snorers, teeth-grinders and night-sniffers and snorters.

I used to have that problem with my husband, until last summer when it got so bad I brought a fan into our bedroom. From the first night on I slept better than I had in years. In the winter when it became too cold for a fan I got something I spotted in a Sears catalog. It is called Sleep-Mate II. I ordered it and it solved the problem at once.

Whenever my husband starts to snore, I just push a button and this little plastic box creates a sound like rushing wind — very soothing. It blocks out the racket and allows me to get a good night's sleep.

My son made fun of it when he first saw the box but one Sunday afternoon he took it to his bedroom when he wanted to nap. (His dog snores something awful.)

I know you don't advertise products in your column, but this is like that terrific General Motors ad you printed a while back — a public service. — No Name Please, Just Well Rested In Chicago

Dear Well Rested: I agree... it IS a public service. The device sells for about \$32. And now if Mr. Sears and Mr. Roebuck want to say thank you for what might be a spectacular increase in sales, they can send a check to the Rehabilitation Institute in Chicago. The address is 345 E. Superior, Chicago, Ill. 60611.

Ann Landers' advice is to sew ping pong balls to the backs of snorers' pajamas. A similar ploy was used 200 years ago when snoring colonial soldiers were ordered to do the same thing with musket balls so their comrades

could get enough rest to fight the Revolutionary War. But what about people who snore in any position? Or don't wear pajamas? Ann Landers admits the ping pong ball method is only about 50 percent effective.

It's still better, however, than some other methods, such as the bicycle horn a woman tried to get her husband to strap on so he would root himself awake when he snored.

Like alcoholism, the snorer's biggest battle may be admitting he or she does rattle the roof. Tape recordings sometimes work, if the snorer doesn't protest, "That can't be me!"

"There ain't no way," Mark Twain mused, "to find out why a snorer can't hear himself snore."

Snorers who do want to reform may try everything from tape to hypnosis. Snorers who can no longer suffer a partner's sibilant insulflations may resort to earplugs or separate bedrooms.

For those willing to try almost anything, patents have been issued on more than 100 various anti-snoring contraptions involving straps and springs, flaps and prongs.

But the only one with a money-back guarantee is the "snore suppressor" invented and sold by Crossley, a reformed snorer and retired engineer in Austin, Texas. For \$79.95, Crossley's 1,000 cushioned three-ounce plastic sleep collar that sends electrical impulses into the neck with each snore.

# 'Snore-No-More' pillow:

By Carol Brydolf  
Tribune Concord Bureau

Paul Henne, Lafayette marketing expert, says he is not interested in the wealth or fame his unusual looking, pyramid-

shaped pillow may bring, but rather in helping solve the snoring problems that plague an estimated 53 million Americans and their families.

"Whatever we make on the pil-

low will make us happy," said Henne, co-inventor with Dr. Nolan Armstrong of Oklahoma, of the "Snore-No-More" pillow. "We are not dependent on this as a source of income. We sincerely



believe we can help the majority of snorers," said Henne, whose clinical tests showed the new invention to be 96 percent effective in silencing snorers.

Since Henne began promoting his new product this winter, he says he has been deluged with inquiries from snorers, who say their problems are emotional as well as physiological.

"I have gotten letters from people who say they've been ridiculed, have gone into therapy and can find no help. I get requests from people who want the pillows sent anonymously to friends. If a man and woman get a good night's pill sleep, it opens the avenues of the relationship and improves communication."

Henne said that his invention will help snorers come out of the closet and stop being ashamed of their affliction.

"When you tell people the name of the pillow, 'Snore-No-More', they laugh. That's good, there's animation: it provides an opening for discussion. It's not a hidden problem. Family members will love it and will support the snorers in their efforts to get help. This could bring a ray of sunshine into many people's marriages."



Paul Henne demonstrates how to use 'Snore-No-More' pillow.

The pillow is designed to support the sleeper's head so that the jaw muscles do not block the air passage, and obstruct breath-

ing. Snorers can be "trained" by using the pillow for several weeks and then return to their regular pillows, Henne said.

Those interested in the new pillow should write: Snore-No-More, P.O. Box 1063, Layfayette, CA. 94549.

Are you one of those people who has a hard time trying to sleep at night — yet do not want to resort to sleeping pills for fear of forming a bad habit?

Well, an internationally known Swiss doctor has some simple tips to help you relax and get a good night's sleep. Dr. Raymond Abrezol, director of the International Soporology Institute in Lausanne, said he has used these methods successfully with Swiss Olympic athletes.

To sleep well without pills, he offers these tips:

1. When in bed, close your eyes and get in your most comfortable position. Try to concentrate only on your breathing. Breathe from your stomach, slowly and deeply.

With every breath in and out, say mentally to yourself the word "calm." After one minute, picture yourself in a place where you are happy, peaceful and calm, perhaps on a seashore at dawn or hiking in the mountains.

If you wake up in the middle of the night, just use the same technique to fall back asleep.

2. Take a hot bath before you go to sleep. It works.

3. Drink a warm glass of milk with a little honey. The milk must be warmed because the heat liberates the body's serotonin, a chemical that can help relax you.

Eat something before you go to bed. You shouldn't have a large meal before sleep, but you must have something, because if you are hungry, you can't sleep.

5. Exercise mildly before going to bed, but nothing highly vigorous like jogging.
6. Try sleeping with more "negative ions." Ions are electrically-charged atoms the action of the nerves is

bound to them. To get more negative ions, which are found in natural materials, walk barefoot on a wooden floor or a lawn in natural fiber shoes.

7. Do not watch television

before going to bed. It may make you fall asleep but you will not sleep well. This is because TV charges your body with positive ions.

8. Orient your head north and your feet south to help lull you to sleep. This helps

align your body's electromagnetic forces.

9. Try not to go over your problems in bed. That is what keeps most people from a good night's sleep. It's better to solve your problems in the morning.

# to help you get a good night's sleep

# NEW HOPE FOR INSOMNIACS

BY JOHN ERNO RUSSELL

Dr. James C. Paupst, the noted sleep-research pioneer, has written a book that's a real eye-shutter.

Whether you lie awake at night counting your misdeeds and dilemmas, wake up early and wonder why the rest of the world doesn't get up with you, or simply stay up all night feeling as though your eyes were propped open by toothpicks, Dr. Paupst has a cure for you.

Drawing upon the latest scientific research, Dr. Paupst reports on everything you wanted to know about sleep but were too tired to find out.

For example, astonishing discoveries have been made recently at the University of California Sleep Research Facility, University of Florida Sleep Research Laboratory, Stanford University Sleep Disorders Clinic and Albert Einstein College of Medicine.

Dr. Paupst reports on these discoveries and tells how they may provide salvation from your sleep problems.

He tells, for example, how pill popping

and alcohol affect sleep, how snoring can be stopped, the enormously important role of sex in restful sleep, how to interpret dreams psychologically, how to overcome jet lag, how to eliminate bedwetting, sleepwalking, nightmares, difficulty in falling asleep, etc., etc., etc.

## QUACKERY

The average person spends 22 years of his life in sleep. Dr. Paupst aims to make them pleasurable instead of a nightmare.

Unfortunately, for the majority of Americans sleep is anything but pleasurable. Studies show that 65 percent of us suffer from sleep disturbances.

Dr. Paupst says that this has given rise to a whole industry of sleep nostrums, psychological quackery, and worthless gadgetry. Dr. Paupst offers an antidote to this hokum.

The title of Dr. Paupst's volume is *The Sleep Book* and the author says he was prompted to write it by the abysmal ignorance of the medical profession. Most doctors don't know the basic facts about

sleep, yet they blithely write millions of prescriptions annually for barbiturates and other drugs detrimental not only to sound sleep but to overall health.

Dr. Paupst also attacks the over-the-counter drug industry for bombarding consumers with misleading advertising and dangerous sedatives.

Well, then, do any sleep aids work?

Dr. Paupst thinks so, and he particularizes them in his book. The ones that really work may surprise you.

Dr. Paupst reports such recently discovered facts as:

- Many people sleeping eight hours would be much better off with four.
- Nearly twice as many women as men sleep in the nude.
- People over 50 require only a fraction of the sleep needed by persons in their 20s and 30s.
- Masturbation can be a positive factor in getting a good night's sleep.
- Prayer can be, too.

• Persons who sleep a great deal possess completely different personality traits

from those who sleep little.

- Celebrities have sleeping patterns quite different from the norm.
- Body position is of paramount importance to sound sleep.
- Barbiturates taken by mothers during pregnancy alter the sleeping habits of their children for life.
- Dream recall can be increased enormously via certain simple steps.
- In some cultures, people attend their daily chores while fast asleep.
- Careful napping can add 20 percent to your useful waking hours.

## TO ORDER

For a copy of Dr. Paupst's historic, supremely useful *The Sleep Book*, readers of *Money* worth need merely send their name and address with the book's title and a trifling \$3.95 (plus 95 cents for postage and handling; total, \$4.90) to: Matera Medica, Dept. M, 1775 Broadway, New York, N.Y. 10019.

Here, if ever, is a book that will put you to sleep.

## CAN MILK INDUCE SLEEP?

A glass of warm milk is perhaps the best known of all folk remedies for curing insomnia, but old wives' tales are not the only evidence for the value of milk as a sedative.

Milk contains a biochemical agent that may help the weary drift off. The agent, L-tryptophan, is an amino acid essential to the body. The amount in a single glass of milk is not itself sufficient to bring on sleep directly. But combine L-tryptophan with soothing warmth, a feeling of satiety from milk's many nutrients and, not least, a belief that milk will do the job—and together they can all add up to a ticket to

the land of nod.

One of the things for which the body uses L-tryptophan is to make serotonin, a brain chemical that recent research has suggested may be a key link in the mechanism that triggers the onset of sleep. Serotonin is secreted by neurons to the reticular activating system, located deep in the brain. This system controls the level of activity of the whole central nervous system and partly regulates the mind's ability to direct its attention. The lower portion of the reticular activating system is thought to maintain the brain's normal state of wakefulness. And insomnia has been linked to damage to the neurons that normally secrete serotonin into the system. Thus, conversely, an extra supply of serotonin may assist in the restful sawing of logs.

## Cocaine: can it cure hypersomnia?

Researchers say the most commonly-treated sleep disorder in the U. S. isn't insomnia — the inability to fall asleep — but just the opposite — falling asleep without warning. More than half of those who visit sleep disorder clinics complain of hypersomnia, as it's called, and Stanford University's William Dement says their symptoms are much more severe than dozing off during a dull lecture. True sufferers, Dement says, fall asleep during conversations, exciting movies or TV shows and even during — not after — meals. Even though hypersomnia isn't nearly as common as insomnia, Dement says its victims are more likely to seek treatment, both because of the embarrassing symptoms and because it's often accompanied by dangerous lapses in breathing and muscle control during sleep.



# New <sup>1984</sup> ~~1983~~ <sup>WALL ST J.</sup> Firms Hope Americans Won't Find These Sleeping Pads a Woolly Idea

By MARY CATFIELD  
Staff Reporter of THE WALL STREET JOURNAL

Two helpful hints for the sleepless: Count sheep or lie on them.

Not *literally* lie on sheep, but lie on a two-inch-thick pad made of 100% wool. That's what about 70,000 insomniacs have been doing recently, and many say it's truly soporific.

"If it weren't for that thing I think I'd have gone crazy," says Dorothy Dunbar, an actress who played Jane in the silent movie "Tarzan the Golden Lion." A mild case of arthritis had kept her tossing and turning until she bought the pad two years ago. "It's like somebody sent me waiting up" in a "warm, draftless cloud," she says.

## New Zealand

Two companies—Woolrest USA Ltd. and Gillette Industries Inc.—sell the pads, which slip under the bottom sheet of any size bed. Woolrest, the Seattle-based unit of a New Zealand company, claims about \$12 million in sales in the U.S. since 1982. Its 100% New Zealand wool pads sell for an average of \$189, and the company offers a 90-night money-back guarantee. Gillette, based in La Crosse, Wis., is new to the market, and it has no sales figures available. Its polyester-backed pads sell for an average of \$89.

A researcher for Woolrest thinks that the fleece eliminates some annoyances for the sleeper by diffusing body weight, heat and

dampness over a larger area than conventional bedding. As a result, sleepers don't toss and turn as much.

"All the claims we make for the product are true," says Gordon Chesterman, president of Woolrest USA. "One guy wrote to us from his bed saying he had lost his wife and his job because he didn't want to get up anymore."

## Rug-Turned-Pad

Frederick McDuffie, medical director of the Arthritis Foundation, says that "warmth and a comfortable surface are good for arthritis," but that "we don't endorse those pads or any product."

Woolrest's successful pad evolved from a poorly selling rug made by a sporting goods company called Hallmark International Limited. Howard Tuck, a 72-year-old retailer from Tauranga, N.Z., told Hallmark that after putting a wool rug made by Hallmark on his mattress, he woke up feeling better than he had in years. So Hallmark created Woolrest, maker of wool pads.

The rug-turned-pad has sold well in New Zealand and Australia because people there know the value of sleeping on wool, says Woolrest. "Selling the concept of a better night's sleep" to Americans, however, has been Gordon Chesterman's biggest challenge, he says. "They are very wary of what sounds like snake oil."

# How to fall asleep more easily

Some tips researchers have found that will help you get a good night's sleep.

1 Create your own bedtime rituals. Wind down an hour or so before bedtime. Give your self a bedtime routine to ease your transition from wakefulness to sleep.

Sheila, a lawyer, closes her briefcase and picks up a novel every night around 10 o'clock. "Reading fiction separates day and night for me," she says. Some people tell themselves that it's time to sleep by watching the late news on television, walking the dog or soaking in a warm bath. Young children may beg to hear the same story or to be tucked in with a favorite teddy bear and security blanket.

(Choose bedtime rituals that you can do even when you're sleeping away from home. These might include brushing your hair a specific number of strokes or washing your face a certain way. The poet Tennyson reportedly said his own name over and over to induce sleep. Be aware that once you establish a sleep ritual, disturbing it may give you grief.)

One important caveat: "While bedtime routines often prove beneficial for good sleepers, they may be detrimental to poor sleepers," notes Peter Hauri, Ph.D., director of the Sleep Disorders Center at the Dartmouth Medical School. "If brushing your teeth previously has been followed by many nights of frustration and arousal, this act then may trigger a bad night," he adds. "If poor sleepers change their customary routines or sleep away from home, they may sleep better for a while."

2 Use your bedroom only for sleeping. Some of us snack, study, read and listen to music on the bed, even if not actually between the sheets. Many of us treat the bedroom as an office, we put bills and bin out tax returns

there, spreading out paperwork on the bed. We talk on the phone and watch television while in bed. Some of us use bedtime as a quiet time to refresh the day's events and plan — or worry about — tomorrow.

"Such activities are not conducive to falling asleep," asserts Richard Bootzin, Ph.D., of Northwestern University. "Reserve your bed for sleep," he says. Sex is the primary exception to this rule. If you associate light reading with falling asleep and are able to stop after a few minutes, reading may be OK, too.

For some of us, however, the basic problem is not that the bedroom and bed are cues to stay awake. Rather, it is that we try too hard to fall asleep. We toss and turn, anxiously wonder, "Will I ever get to sleep?" If this is your problem, "distractions can help you get to sleep faster," says Hauri. "Read, listen to music or watch television. Keep your mind occupied. Give in to the urge to fall asleep only when you cannot fight it any longer. Get up at your regular time, after a few days on this regimen, you probably will be so sleepy that you will fall asleep quickly at bedtime."

3 Don't count on smoking at bedtime to relax you. Nicotine is a stimulant. Hence, it may make you awaken more frequently during the night. Smoking in bed also poses the danger that you might fall asleep with a lit cigarette and start a fire.

4 Keep your bedroom dark. Even though your eyes are closed, light can have an arousing effect. Use blinds, opaque shades or heavy curtains; if you can't get your room dark enough, consider using eyeshades. Keep a flashlight nearby or use a night light to minimize the risk of hurting yourself in the dark if you get up frequently.

# How to Get Some Sleep

by Ruth Adams

It may not work for everyone, but tryptophan, the amino acid, has been used successfully in several experiments involving people with insomnia. One researcher thinks that 1,000 milligrams of the protein, taken before going to bed, should prove helpful in healthy people suffering from insomnia.

People with insomnia tell us there is nothing more aggravating and more destructive to a happy life than chronic insomnia. They've tried everything, they say, including sleeping pills, and nothing works. In fact, by the time they're "hooked" on the pills, these innocent-looking tablets may create more insomnia.

The first real nutritional breakthrough came several years ago when scientists at a number of universities were giving the amino acid tryptophan to insomniacs and getting good results with no side effects. Amino acids are just links of protein which exist in every high protein food.

Tryptophan is one amino acid which we must get in food since our bodies cannot manufacture it, as they do some other amino acids. You will usually find this amino acid

referred to as L-tryptophan, which is the natural, not synthetic, form of it that is generally used.

As long ago as 1974 a physician at Boston State Hospital wrote an editorial in *The Journal of the American Medical Association* suggesting that L-tryptophan may solve the problems of at least some insomniacs. He reviewed experiments in his laboratory in which large doses of this amino acid (five to 12 grams) reduced sleep latency (the length of time it takes to get back to sleep once you've awakened). The therapy did not interfere in any way with the normal pattern of sleep stages. He thinks that one gram (1,000 milligrams) of this protein, taken before going to bed, should prove helpful in healthy people suffering from insomnia.

The theory is that tryptophan is effective because it makes the

body's own processes work more effectively rather than just drugging the individual into insensibility. The same doctor said later in *The Journal of the American Medical Association* that "tryptophan taken in larger doses — usually two grams taken three times a day — can have antidepressant effects . . . In Great Britain tryptophan is on the market as an antidepressant and is frequently used as an adjunct to the standard antidepressants (tranquilizers)."

In 1984 a psychiatrist presented evidence that a certain tranquilizer, plus tryptophan plus another amino acid called tyrosine are effective in helping cocaine addicts to overcome their addiction. Dr. Jeffrey S. Rosecan reported decreased use or abstinence in 12 of 14 patients on cocaine who were undergoing his treatment.

So far, 20 of 25 patients who entered his program of their own volition or were "dragged in by spouses or bosses" have been treated with tranquilizers and the amino acids for 10 weeks to one year. Fourteen have stopped using cocaine entirely and six have decreased cocaine use by at least 50 percent while taking one to two grams of tryptophan in the evening, plus one to two grams of tyrosine in the morning, along with a tranquilizer.

Meanwhile, two professors at Massachusetts Institute of Technology have been using tyrosine for depressed patients, while a professor at Wright State University finds that tryptophan can, to some degree, block pain. The reason, he believes, is the same reason that makes this amino acid effective in insomnia — it increases the amount of serotonin in the brain. Serotonin is a neurotransmitter. It helps to send messages to nerves and receive messages from nerves. It seems that taking this apparently harmless link of protein may make it unnecessary for sick people to take powerful pain drugs, many of which have very serious side effects.

Dr. Robert C. Atkins, a New York cardiologist who uses nutritional methods extensively in his practice, said in his book *Dr. Atkins' Superenergy Diet* published in 1977, "Inositol is a B vitamin which I personally have found to be invaluable . . . Inositol's effect on the brain is similar to that of a moderate-to-mild tranquilizer-sedative. Dr. (Carl) Pfeiffer finds 2,000 milligrams per day to be an effective treatment for high blood pressure. I have found 2,000 milligrams of inositol, taken at bedtime, to be a remarkable sleeping medication in many patients and 650 milligrams makes an effective daytime sedative. And how much safer it is than sleeping pills!"

In his latest book, *Dr. Atkins' Nutrition Breakthrough*, he calls inositol one of "the sleep vitamins." His patients take from one to three grams an hour or two before anticipated bedtime. If more than inositol is needed, he recommends pantothenic acid (another B vitamin) in doses of 500 milligrams or as much as two grams an hour or two before bedtime. He also uses L-tryptophan — one gram to begin with, increasing it to two or three grams later if needed. He has also used niacinamide (vitamin B3) and the minerals calcium and magnesium.

The best idea is probably to take two parts of calcium to one part of magnesium, he says. Dr. Atkins' latest book has 16 references to inositol for therapy for insomnia and

*Continued on page 50*

## SLEEP

*Continued from page 7*

other ailments. His "sleep formula" goes like this: 200 milligrams of L-tryptophan, 300 milligrams of inositol, 200 milligrams of pantothenic acid, 100 milligrams of niacinamide, 200 milligrams of calcium gluconate and 200 milligrams of magnesium gluconate. The usual dose: one to six tablets before bedtime. All these nutrients are available at your health food store.

It is difficult to understand the reluctance of other physicians and the editors of medical journals to accept the abundant evidence Dr. Atkins presents in his books. He has treated many thousands of patients with his diet — low in refined carbohydrates, high in protein — and the supplements which he recommends. Obviously, if his therapies do not work, he would soon have no patients.

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## NOCTURNAL LEG CRAMPS

Though cramps in the leg muscles during sleep can occur at any age, they are more common among the elderly. They are often precipitated by stretching of the legs and the feet during sleep, leading to extremely painful muscle contraction.

Dr. Israel H. Weiner, a Baltimore neurologist, and his son, Dr. Henry L. Weiner of Yale University, have proposed a simple explanation — and an even simpler solution — to the problem. They say it is almost always a mechanical difficulty, not a sign of salt imbalance or neuromuscular disease. It occurs primarily when the foot is extended (as in a ballet dancer on her toes) and the muscles in the calf are relaxed — the likely posture for someone asleep on the stomach or back.

When the calf muscles in this position are stimulated by the nerves, there is no limit to their contraction, so sudden, uncontrolled cramping can result.

The easiest way to avoid the problem would be to sleep on your side. If you sleep on your back, keep the bed covers loose, use a prop to keep them off your feet or rest your feet against a pillow to keep your toes from pointing. If you sleep on your stomach, let your feet hang over the end of the bed to keep them in a more neutral position.

If you develop a cramp, use the same maneuver that relieves swimmers' leg cramps: grab your toes and force them toward your knees to bend the ankle and stretch out the cramped muscles in the back of the calf.

You might also try a preventive technique before bed each night by stretching the calf muscles the way runners do: Stand about three feet from a wall and then lean forward, keeping your heels on the ground. Hold this position for 10 seconds and repeat it with a 5-second relaxation period in between.

Spontaneous awakening from sleep is controlled by an internal and quite rigorous waking mechanism linked to oscillations in deep body temperature, according to new data from a Harvard researcher. This natural alarm appears furthermore to be unrelated to prior wakefulness or sleep safety, lending support to the complaints of shift workers that they wake up exhausted.

According to Charles A. Czeisler, several studies over the past few years have indicated that sleep duration is more closely linked to the time of day people go to bed than it is to how long they have been awake. What has remained unclear is why — whether the need for rest fluctuates during the day, perhaps, or whether sleep is more efficient if taken at certain hours. Czeisler's recent research — reported at the meeting of the Association for the Psychophysiological Study of Sleep in San Antonio — indicates that the explanation may instead involve the existence of an active waking system that is powerful enough to rouse sleepers before they are fully rested.

Czeisler has analyzed data from five subjects who were "free running" — going to sleep and waking without interference from the outside world — for over six months. What he found is that as subjects free run, certain components of the circadian system fall apart; specifically, the sleep-wake cycle advances from the habitual 24-hour cycle to a 30-, 40- or 50-hour cycle, while the core body temperature maintains a stable 24- to 25-hour cycle.

Core body temperature, Czeisler says, is a marker for the deep body oscillator that controls waking. Analyzing the subjects' sleep episodes for over six months, he found that sleep onset was distributed around the clock; the subjects, that is, fell asleep just as often when their body temperatures were rising as they did when temperatures were falling. In contrast, the preponderance of awakenings occurred as body temperature was rising, and further analysis revealed that, regardless of whether subjects had slept four, eight or 12 hours, they tended to wake spontaneously

as temperature began to rise.

For most people, Czeisler explains, the body temperature cycle is synchronized with the normal nocturnal sleep cycle, though there seem to be slight differences between "night people" and "morning people." These findings have important implications for occupational health policy, Czeisler says. When workers are forced to go to sleep at abnormal hours — early morning, for example, which normally comes well after the trough of the core temperature oscillation — they are apt to sleep poorly and wake poorly rested a few hours later. People who work rotating shifts — airline pilots, for example — are especially susceptible to disturbed sleep, because they are constantly moving in and out of phase with the commands of the internal alarm. —W/Herbert

## SCI. NEWS

### Insomnia myths

Recent research calls into question two commonly held notions about insomnia. The first holds that insomniacs lie awake at night because they cannot stop thinking. The second assumes that insomniacs actually don't lie awake for as long as they think they do — that they are simply poor at estimating the passage of time. Robert R. Freedman and Howard Sattler of the Lafayette Clinic in Detroit studied the sleep patterns of 12 insomniacs and 12 controls, including reports of mental activity prior to sleep; although it took the insomniacs much longer to fall asleep (43 minutes compared with 12 minutes for controls), there were no differences between the groups in the occurrence of repetitive thoughts, in the character of mental activity, or in the progress from one thought to another. Although all the insomniacs reported being unable to fall asleep because they were unable to "turn off their mind," so did 11 of the controls — leading the researchers to conclude that clinical reports of cognitive hyperactivity may be explained by the fact that it is a common experience, but one unrelated to insomnia.

Another research group, headed by Linda Kamens of the Illinois Institute of Technology, investigated the "time distortion" hypothesis of insomnia. They studied a group of 13 insomniacs and 14 controls and found that, while insomniacs tended to overestimate the time that it actually took them to fall asleep by about 11 minutes, they were no different from controls on time estimation tasks performed during the day. The tendency to overestimate time spent lying awake at night cannot be due to a general perceptual difficulty, the researchers conclude.

### Sodium and sleep

The low-sodium diet prescribed for many elderly people may have an adverse side effect — disturbed sleep. In order to study the relations between sympathetic nervous system arousal and nighttime wakefulness, psychiatrist Michael V. Vitiello of the University of Washington tested young subjects on a low-sodium diet, which reduces blood levels of norepinephrine, a marker for nervous activity. He found that they awoke more often, had less REM sleep, less deep sleep and less total sleep — suggesting that sodium restriction might exacerbate sleep problems caused by the norepinephrine increase that accompanies aging.

## A nation of sleepyheads SCI. NEWS

If you only listened to television commercials, you might think Americans' number one sleep problem was difficulty in falling asleep at night. But that isn't true, a study reported by Richard M. Coleman of Stanford University School of Medicine and colleagues in the Feb. 19 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION reveals. The major difficulty is excessive daytime sleepiness, not insomnia.

Coleman and his colleagues conducted a large survey of patients with sleep-wake disorders who had been diagnosed both objectively with electrophysiological recordings and subjectively with a new comprehensive diagnostic system drawn up by sleep-wake disorder authorities. The most common problems include:

- Fifty-one percent of the patients surveyed experienced excessive daytime sleepiness. This problem, in turn, was due mostly to any one of three sleep disorders — sleep apnea (43 percent), narcolepsy (25 percent) and idiopathic central nervous system hypersomnia (nine percent).
- Thirty-one percent of the patients surveyed were insomniacs. Thirty-five percent of insomnia cases, in turn, were due to trouble staying asleep because of psychiatric disturbances, 15 percent to difficulty getting sleep because of anxiety, and 12 percent to interrupted sleep resulting from drug or alcohol dependency.
- Fifteen percent of the patients experienced snoring, swallowing, choking or other behaviors while sleeping that either interrupted their sleep or their bedmate's sleep.
- The final 3 percent of patients surveyed had an abnormal sleep-wake schedule, most commonly where an individual's 24-hour temperature rhythm was phase-delayed three or more hours relative to the pattern seen in persons with conventional bedtimes and wake times. As a result, patients were unable to fall asleep until three or six in the morning.

# Behavior/digest

## Laying Insomnia to Rest

Experts say that giving up bad habits will help you sleep better.

**W**hen the task at hand is to get a good night's sleep, trying hard is not the way to succeed. Twisting and curling in search of a comfortable position in bed makes your body do the opposite of what it's supposed to do at night. Instead of slowing down, your heartbeat races. Instead of relaxing, your leg muscles twitch. You watch the clock and curse the night and wonder what you're doing wrong.

Ten million Americans are seeking medical help for chronic insomnia—difficulty falling or staying asleep. For years it has been called a symptom of a number of psychological problems, such as depression, that somehow knock the body's sleep-wake cycle out of sync. Now sleep

Insomniacs share another trait, says psychiatrist Thomas Coates, of the University of California, San Francisco: They spend an excessive amount of time thinking about sleep. Contrary to the image of bad sleepers as workaholics, Coates's study indicates that insomniacs spend more time relaxing than others do. He thinks their relative inactivity during the day may alter their body's clock, or circadian rhythm. Instead of signaling the mid-brain to slow brain waves at night, the clock calls for more activity.

Sleeping late on weekends can also disrupt your circadian rhythm. This is the first bad habit Watson makes patients shake at the Sleep Disorders Center. He tells them to rise at the same time each

a building block for another sleep-inducing neurotransmitter, serotonin.

"There's something to the old wives' tale of drinking warm milk before bedtime," he says. "Warming it won't increase its tryptophan content, but it will help you to relax."

—Susan Gilbert



If you don't want to toss and turn all night, don't worry about it and lay off pills.

specialists are saying that "bad habits" can do the same thing. These include too little daytime activity and, ironically, its opposite, too much exercise.

"Insomniacs usually begin losing sleep over some problem, such as a death in the family," says psychiatrist Robert Watson, director of the Yale-affiliated Sleep Disorders Center. "But unlike other people, they continue to have trouble sleeping—for months, even years." Insomniacs present a consistent personality profile, according to Penn State University psychiatrists Joyce and Anthony Kales, as outlined in the November *American Journal of Psychiatry*. They take things hard, feel they haven't lived "the right kind of life" and are high-strung.

day, even after a night of poor sleep. "After a while," he says, "sleep improves."

Even though it tires you out, exercise won't guarantee a sound sleep. If it is too strenuous, especially just before bedtime, it can drive your pulse too high, causing a restless night. The Kaleses use moderate afternoon exercise, along with psychotherapy and biofeedback, to treat severe insomniacs.

What's best to do on occasional sleepless nights? Forget sleeping pills. They can actually cause insomnia after three days by suppressing the brain's production of dopamine, a neurotransmitter that promotes sleep. Watson recommends drinking milk or eating cheese or tuna, because they are rich in the amino acid tryptophan,

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Sci Digest  
MARCH 84

A commonly prescribed sleeping pill may exacerbate a life-threatening sleeping disorder in the elderly, according to research reported this week at the meeting of the Association for Psychophysiological Study of Sleep. Furthermore, the disorder—called sleep apnea—often goes undiagnosed by physicians, increasing the likelihood of untoward effects, according to independent research also reported at the San Antonio conference.

Apnea is characterized by frequent respiratory failure during sleep. People who suffer from apnea stop breathing and are awakened hundreds of times during the night, though they do not remember waking, when they do not wake up, they die. According to research reported by Stephen C. Coburn of the Stanford (University) Sleep Disorders Center, presumably normal elderly subjects who were given the sleeping pill "flurazepam" before bed experienced three times the respiratory distress of controls. None of the subjects had reported problems sleeping, nor had any been diagnosed as suffering from apnea.

It is unlikely that the drug induced sleep apnea in a single night, Coburn says, but it is possible that it exacerbates an unde-

tected condition. This finding is even more interesting in light of other research that indicates that there is a high incidence of undetected apnea in the general population. According to psychiatrist Daniel F. Kripke of the University of California at San Diego, a study of 28 hospital patients, none of whom had been diagnosed as having apnea, revealed that 27 percent were suffering at least 30 apneic episodes a night (each lasting at least 10 seconds); three suffered in excess of 200 episodes a night. In addition, an ongoing random survey of the elderly population—also conducted by Kripke and his colleagues—indicates that more than 30 percent of all people over 65 suffer from apnea of comparable seriousness, most of it undiagnosed and unaccompanied by complaints about sleep.

In light of such data, Coburn argues, the prescription of any central nervous system depressant should await testing for apnea. It is impossible to know how often such drugs lead to apnea-related death, he says, but it may be that a significant death rate is masked by society's attitude toward death during sleep. "Death during sleep," he says, "is taken far too lightly."

—W. Herbert

## Forty Winks and Other Numbers

**I**nsomniacs do a fair amount of complaining; most of us have by this time become immune to the gripes of friends who just couldn't sleep a wink last night. But, says *Science News*, the people who suffer most with sleep problems are not insomniacs, but day-time sleepers.

A survey of patients who showed up at a sleep disorder clinic indicated that 51 percent were excessively sleepy during the daytime. Only 31 percent had trouble sleeping at night.

Another 15 percent of the patients showed up at the clinic because of snoring, swallowing in their sleep, or other habits that interrupted their sleep.

The remaining legends in their own time who used to the mugs, statuses and...

## Despair Now, Sleep Later

**T**he key to a good night's sleep for an insomniac, reports *Psychology Today*, may be a deep depression. At Northwestern University a group of insomniacs and non-insomniacs were tested on how their moods affected their sleep.

The subjects, who spent a succession of nights sleeping at the university, were asked to think about such statements as "Sometimes I wonder if what I do is all that worthwhile."

Not surprisingly, the people who had normal sleep patterns slept best when they were in good moods, worst

when they were depressed.

For the insomniacs, however, the results were reversed. When they were depressed, they slept better than when

they felt fine.

The researchers theorize that feeling happy is so unusual for insomniacs that it is disruptive. On the other

hand, however, if insomniacs can't sleep, why aren't they depressed, and if they are, then why can't they sleep?

□ □

...and he and his wife, Linda, an experimental psychologist, have patented a device that's designed to stop it.

The idea is fairly simple.

When snoring exceeds a certain volume, the device wakes the patient up. It also counts snoring episodes during the night, to help make the patient aware that he really was snoring. During the two-week treatment period the device is set to respond to progressively lower snoring volumes.

So far over 80 percent of people using the device have reduced their snoring considerably, and many continue to improve even after the treatment is finished, claims Rosen (who says, by the way, that neither he nor his wife snores). The device isn't on the market yet, but Rosen is talking with possible manufacturers who could market it for less than \$100. — Jeff Hecht

49

Researchers from the Harvard Medical School may have discovered the biological clock that tells us when to sleep and when to wake up. It's a cluster of neurons in the hypothalamus in the brain.

"We believe this pacemaker sends out nerve impulses—like a clock in a computer," says Dr. Martin Moore-Ede, who headed the research group.

What makes them think it is a clock?

"Destruction of the clusters in rodents and primates causes their periods of sleep and waking to be randomly distributed through the day," Moore-Ede explains.

"We can't perform human experiments that would prove the cluster acts as a pacemaker. But the evidence strongly suggests that it does."

# Woman gets the most out of life by sleeping only 3 hours a night

TEXAS

By PEGGY ZIEBARTH  
Valley Living Editor

Are the sands of time are running out too swiftly these days? Do you find yourself sighing in gloomy resignation "If I only had more hours in the day...?"

Well, wake up, slug-abeds! Leroy Bradford is working on a way to squeeze more grains into your hourglass.

You can challenge the dominion of the clock, claims the author of *Staying Awake: More Fun Than Sleeping* with its teasing subtitle, *Secrets of a Happy Hyposomniac*. The time budget for a typical Bradford day runs from an up-at-dawn 5 a.m. to lullaby-and-good-night at 2 a.m.—day after day after day, with no ill effects, she asserts. "Motivation" is the key element. "Motivation" is the key element, she says firmly, "having something you want to do." When you have something to do, you want to do it. So, something to stay awake for — a drive toward accomplishment — there's hope for teaching your "body/mind" to get along on much less sleep, to compress your sleep phases.

When you're anticipating something, the author uses as illustration, "you can't sleep at night. Your mind gets a kind of glow about it."

High I.Q.

Leroy Bradford does not look like a leader in a revolutionary attack on time. Short, graying, by her own description "plump." This hyposomniac housewife has no gleam of the zealot in her eye, no hint of the self-proclaimed expert in her voice. Just a warm sharing of laughter at the human condition.

The only thing unusual about Mrs. Bradford — other than her

## Neighbors



'You set a definite time you want to get up every morning'

—Mrs. Leroy Bradford

"I just didn't have the feeling that I needed more sleep," she recalls. She noticed that some foods seemed to influence her feelings of need for sleep and began keeping a journal on her observations.

Began eight years ago

Until seven or eight years ago, there was no particular aberration in Mrs. Bradford's lifestyle. She worked. She ate. She slept. She was alone.

quiet assurance than you can function well on three hours sleep a night — is that she belongs to an elite association known as Mensa. Mensa membership is limited to those rarities who can pass two intelligence tests at a level in the top 2 percent of the population — genius in I.Q. terms.

Mrs. Bradford has no degrees, no Ph.D. to add credibility to her claim. All she knows is what she's gleaned from experiment and considerable study of writings on sleep research, dreams, diet, biological rhythms, "body clocks", lifestyle and powers of the mind.

"There are five phases of sleep," she says. "Two of these are absolutely essential and the rest can be cut out." The essential stages for maintaining equilibrium, she says, are Stage 5 or the dreaming state and Stage 4 — that period of deepest sleep. The others can be "compressed" as you teach your body to limit sleep.

Where do you start?

Set wake-up time

"You set a definite time you want to get up every morning," she says. That must be stable. Then you begin to cut slices of time off the other end, going to bed later and later.

It won't work in reverse, she says. You can't go to bed at a certain time and get up earlier. And there's a science in cutting sleep by 90 minute cycles that's linked to the rhythms of sleep stages.

Training in sleep-less arts are detailed in her book, opening with the challenge chapter *Hyposomniacs of the world: Arise! You have nothing to lose but sleep*. In *Food can fog your mind* she includes some dietary warnings on caffeine, alcohol, sugars and other foods that she believes may interfere with results.

How did a McMicken Heights housewife launch her rebellion against the time lost in sleep?

"I've always had this problem — that I had more things to do than time to do it," she says simply. She was working an evening job shift and keeping odd hours when she first began to realize that maybe the dictate on eight hours sleep a night wasn't ironclad.

She was 56 before she finally indulged in a dream. She started to study art and writing at Highline Community College.

Her sleep-less chronicle notes: "I had attended a workshop where, it was promised, I would learn in one weekend how to change my life. . . ." One exercise that weekend was to write an "ideal day" schedule. "When I wrote this fantasy schedule, I worked from 8 to 4 each day at a dull, tedious, dead-end office job. I was not married. I did not even have a boy friend, much less a loved one in my life." Her fantasy day began at 7 a.m., ended in dancing with a "loved one" in the wee hours of the morn.

She attended a course in assertiveness training at the YWCA, read some books on creative dreaming techniques. "My self-esteem began to rise."

She read an article in a magazine about eligibility for membership in the Mensa organization.

Began to do outrageous things

"I took the tests. I passed with a score in the top 1 percent. My self-esteem began to soar. I began to do outrageous things — like getting married; going to college to study art history and fine arts, simply saying 'no' to doing a lot of things I had been doing all my life. . . ." the Bradford chronicle compresses the waves of change.

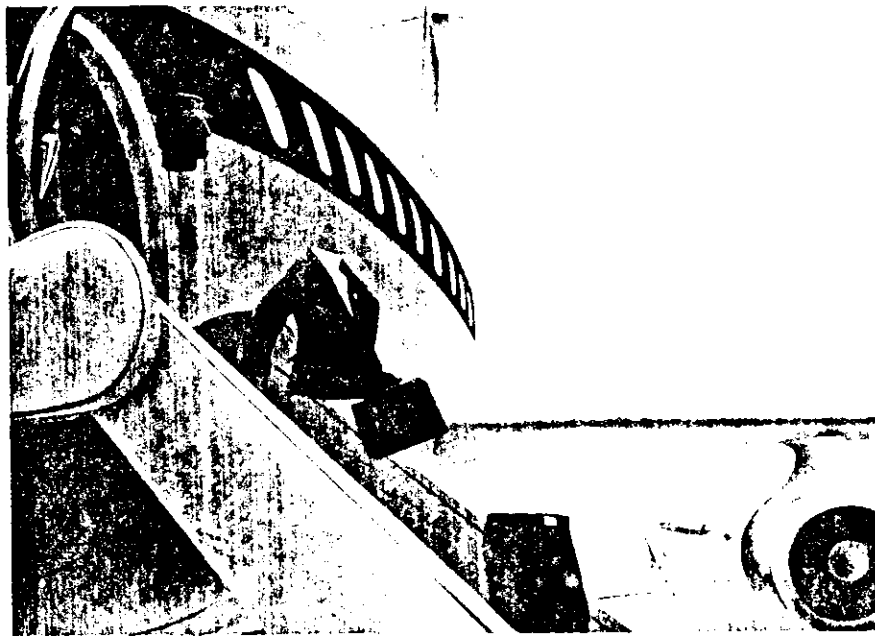
While Mrs. Bradford was pursuing the much-delayed dream at Highline, she described her "time budget" — by then at 20 to 21 hours a day — in a writing assignment. The paper impressed a teacher, who suggested that she might want to develop and expand her writing on the sleep-less lifestyle.

Looking for a way to expand her base for delving into the realms of sleep, she included an item in the Mensa newsletter, inviting members to join in an experiment in ways to train your body to require less sleep.

More than 100 from Mensa responded — doctors, lawyers, students, housewives. They filled out forms, corresponded, shared their views of her directions on diet and the regimen in training for achieving sleep-less hours.

# Probing the Secrets of Jet Lag

A quick change of time zone disrupts your internal clock.



Long airplane flights can throw off eating and sleeping patterns for as much as a week.

Visitors entering Tom Stunkard's windowless, soundproof room never say "good morning" or "good evening," and they scrupulously leave their wristwatches outside. Stunkard (not his real name) has no clock, no radio, no TV—nothing to give him time clues. Friendly people bring him meals or come by to chat. All of them know exactly what time it is. But they won't tell.

Stunkard is one of about 50 male volunteers, 35 to 60 years old, who will be paid to live in isolation for 15 days at the Institute of Chronobiology, part of New York Hospital-Cornell Medical Center in White Plains. They are taking part in a meticulous study of jet lag, the discombobulations of the human "body clock" caused by swift crossing of time zones.

## Pilots Keep Logs

Our body clock—our customary patterns of eating and sleeping, for example—runs on a circadian rhythm, about a 24-hour cycle. But rapid transfer to a new daily rhythm throws the clock off kilter. The jet-lag study, headed by research psychologist Timothy Monk, is part of a larger investigation by Curtis Graeber, a physiological psychologist at NASA's Ames Research Center in Mountain View, California. The researchers hope to learn

exactly how the body clock is affected and how long it takes to recover.

For two years, Graeber, associate Philippa Gander and their coworkers have been tackling the rigors of jet travel. Commercial pilots and their crews, wearing Walkman-size monitors, have measured their own physiological responses to actual flight. They have also kept detailed logs of when they sleep, wake and eat, and rated how tense or calm, weary or motivated, they feel. "No two flights are the same," Graeber says. "Weather, mechanical troubles and mood all enter in."

Meanwhile, in White Plains, Timothy Monk sends his volunteers to other time zones artificially. For about a week, their temperature is taken every 60 seconds, their mental acuity and motor skills are tested, and their sleep and dream patterns are recorded. At various intervals, their mood is assessed. Then, suddenly, their entire routine—meals, lights-out and so on—is advanced by five to eight hours, as though they had "flown" to Europe, and they are monitored for another week.

"We want to know how long it takes for the circadian rhythm to synchronize with the new routine," Monk explains. "Mood is affected; subjects become uptight and tend to lose motivation. Our early data indicate that the effect can last up

to a week, as can the physiological changes, such as an altered temperature cycle." (Our temperature naturally rises and falls at certain times of day.)

Monk is now testing various antidotes to jet lag. Does a nap before lunch on the first day help or hinder the clock's adjustment? What about sleeping pills?

It's still too early to tell, but sleep researchers at Stanford University and Henry Ford Hospital in Detroit report in *Science* that short-acting sleeping pills—which last only eight hours—can reverse the nighttime insomnia and daytime sluggishness associated with jet lag. Long-acting pills, which increase daytime drowsiness, make the symptoms worse.

Later in the study, other volunteers will "fly west," which may be easier on them, Monk says. Our internal clock naturally tends to run slow, toward a 25-hour day, so lengthening the day by flying toward the sunset is easier on the body. Eastward flights have the opposite effect.

—Alton Blakeslee



# Advice on how to avoid ills of jet lag offered

Associated Press

Feb 20 '82 SF. CHRC

PROVO, Utah — Drinking and driving don't mix, Americans are advised in advertising messages. But drinking and stress from jet lag can produce other forms of physical disability for the business traveler, a Brigham Young University expert warns.

After considerable research, V. Lynn Tyler, coordinator of research and resource services at BYU's International and Area Studies Center, concludes:

"Since airline cabins have the same air pressure found at 6,000 feet, the combined effect of alcohol and altitude often enhances fatigue. Two or three drinks in the air are like three or four at sea level."

Smoking in flight also causes fatigue equivalent to the lack of oxygen at 10,000 feet, he said.

In an effort to assist overseas travelers, the BYU Center has published a briefing on "Jet Lag and Decision Making" with advice about how to diminish the punishing effects of long-term travel. Travel stress is also a topic that will be discussed in a forthcoming book by Tyler.

Since there may be more than 100 different bodily, mental and emotional functions that can be altered when one abruptly changes conditions and time zones, "a traveler should expect some irritability, indigestion, insomnia or drowsiness and depression," Tyler said. "All are common jet stress reactions which can be lessened through some foresighted anticipation.

"It is normally advisable to avoid using tranquilizers, sleeping pills or alcohol," he said. "These can further interfere with the sleep and behavior patterns already disrupted by the flight."

Tyler added that it is best to avoid heavy, irregular or skipped meals to allow body adjustment to different meal times.

Travelers should devise a rest schedule well before leaving on a trip to preadapt the body to the time zone of the destination, he suggests. Depending on the number of time zones crossed, one could go to bed and get up earlier or later for one or two days prior to leaving.

A warm bath, exercise or even reading a boring book may help induce sleep if the person experiences difficulty resting after reaching his destination.

Tyler said mental stress and worry can be decreased by making prearrangements to pay bills or take care of other work or home obligations while away on longer trips.

To avoid loneliness caused by missing family or familiar experiences and activities, Tyler said letters, pictures, taped messages and other mementos can be taken along.

Many physiological systems maintain a circadian rhythm around a 24-hour period — metabolic, glandular and sleep rhythms that persist despite dislocation of day and night in high-speed travel.

Body temperature, which varies a degree or two every 24 hours, can be altered, causing a person to attempt to sleep when his temperature is at the highest — normally a time when the body is most alert, Tyler notes.

Even the liver, which controls the level of energy providing glucose to the body, is affected. Normally, the liver has used up much of its storage of glucose by 3 to 6 a.m. When this occurs, an individual usually becomes irritable, depressed or anxious.

"No one would try to participate in contract negotiations from 3 to 6 a.m.," Tyler pointed out.

Though a person can adjust to a new sleep-wake and eating cycle in just a few days, Tyler said, daily rhythms in hormones and body temperature may take up to a week or more before they catch up and become resynchronized.

"Jet stress is a common experience of travelers; but some executives scoff at the idea that it does affect their performance, Tyler says.

However, he reports, studies of people subjected to real and laboratory-created disruptions of the circadian rhythm have revealed decreased mental alertness, reaction time, short-term memory, and ability to solve simple math problems as well as human relations dilemmas.

## ANTI-JET-LAG DIET HELPS TRAVELERS

An easy-to-follow diet has been found to help travelers avoid the irritability, insomnia and disorientation of jet lag.

Long-distance air travel throws the body's internal clock out of sync with environmental time cues such as sunrise, sunset and mealtimes. By rescheduling meals for a few days before a flight and altering the amount and type of food eaten, voyagers can reset their inner clocks to the time zone of their destination.

"It normally takes about a day to adjust to each time zone crossed," says biologist Charles Ehret, who developed the meal plan at Argonne National Laboratory in Illinois. "But with the anti-jet-lag diet, travelers can adjust to as many as five zones within a day after landing."

On the first and third days of the diet, the traveler feasts on proteins for breakfast and lunch and on carbohydrates for supper. Proteins help produce adrenal-like compounds that wake up the body, while carbohydrates aid in the synthesis of serotonin, a neurotransmitter that promotes sleep. On day two, the traveler "fasts" with low-calorie meals that deplete the liver's store of carbohydrates. "We don't fully understand why," says Ehret, "but this seems to speed the shift to a new time zone."

On day four—flight day—the traveler fasts again, until people at the point of arrival are having breakfast. At that hour, a high-protein meal is eaten to synchronize the body with the new environment. Then the traveler assumes the eating schedule of the destination.

Direction of travel doesn't affect the diet, except for caffeine intake. For three days, all voyagers drink coffee only in the afternoon. On day four, evening coffee sets ahead the inner clocks of eastbound travelers; those going west shift to morning coffee to reverse their clocks.

For a copy of the diet, send a stamped, self-addressed envelope to Anti-Jet-Lag Diet, OPA, Argonne National Laboratory, 9700 South Cass Ave., Argonne, IL 60439. □

LEONARDO DA VINCI'S POLYPHASIC ULTRASHORT SLEEP: A STRATEGY FOR SLEEP REDUCTION?  
I. SLEEP ARCHITECTURE.

Claudio Stampi, Allan Moffitt and Robert Hoffman  
University of Ottawa and Carleton University, Ottawa, Canada

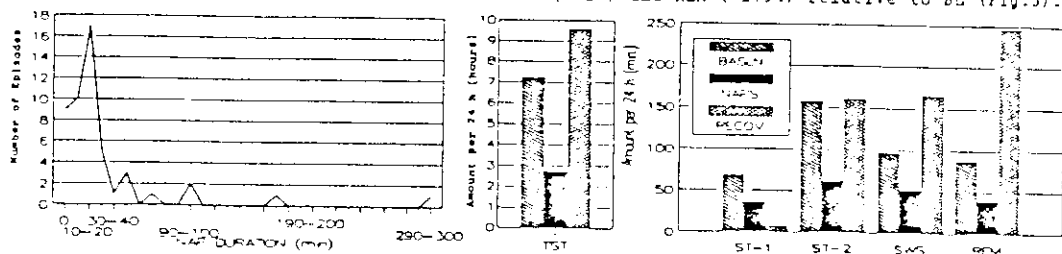
Amongst the numerous legends that circulate about Leonardo da Vinci, one deserves particular attention: apparently Leonardo adopted ultrashort sleep patterns to enhance his productivity. He would sleep 15 min out of every 4 hrs, for a daily total of only 1 and 1/2 hrs of sleep. While no historical proof has been found so far concerning this intriguing enigma, recent studies suggest that Leonardo's idea makes significant biological sense and may lead to practical applications, especially under continuous work situations. It has been shown in fact that adult humans appear to adapt surprisingly well to polyphasic (multiple napping) sleep patterns (cf. Stampi, 1989). In the present study the sleep architecture and performance effectiveness of a subject voluntarily attempting to adopt Leonardo's multiple napping regime were investigated.

**METHODS:** A healthy male graphic artist (FJ), age 27, followed for three weeks a (computer driven) polyphasic sleep schedule consisting of (in consecutive order): (A) 2 days of baseline (BL) sleep at the subject's habitual time (00:00 to 08:00 h); (B) 2 days of transition from monophasic into polyphasic sleep (day1: 4h "anchor sleep" + three 80min naps; day2: 2.5h + four 80min naps); (C) 15 days (polyphasic) with 6 naps/day initiated at 0, 4, 8, 12, 16, 20 hrs; nap duration reduction (C1) from 80 to 15min was achieved exponentially within 6 days (i.e., 80, 61, 46, 34, 24, 18 and 15min), while in the remaining 9 days (ultrashort-C2) FJ schedule was kept to 15min of sleep out of every 4h, for a total of 1.5h sleep per day; (D) 2 days of ad lib recovery sleep at study termination. EEG, EOG, ENG, EKG and tympanic temperature were ambulatory recorded for 17 days with Oxford Medilog (UK) units. A 6min performance test battery was submitted upon arousal and 20min before, 30min and 60min after arousal from each nap throughout the study. FJ continued his professional activity during the whole experiment.

**RESULTS** concerning analysis of sleep architecture for a total of 50 naps of ultrashort (C2:9 days), versus BL (A) and day 1 recovery (D) conditions are reported. Performance analysis will be reported elsewhere. FJ was not able to follow strictly such extreme schedule but achieved nevertheless remarkable levels of sleep reduction: mean daily TST (excl. st-1) was of 2.7h (Fig.2), i.e. only 38% of BL TST (7.2h). Sleep episode durations (SEDs) showed a median of 12.9min and mean of 26.3min (SE=6.9). Fig.1 displays SED frequency distribution. Mean nap sleep efficiency of 70.1% (excl. st-1) was high compared to previous nap studies (50%). FJ was not able to reach sleep depths beyond st-1 in 9 naps (18%). The nap mean overall composition of stages 1 (18.9%), 2 (32.8%), SWS (27.4%) and REM (20.9%) was virtually identical to BL (respectively of 13.5, 38.6, 26.1 and 21.8%). The total daily amounts of each stage were, however, considerably reduced (Fig.3). Despite such percentual similarity, nap sleep structure was radically different from BL:

- REM and SWS rarely occurred together (this happened for only 8 naps, mostly exceeding 50min duration); when REM was present (showing the usual circadian effects: peak between 00 and 12h), it frequently occurred in close proximity to nap onset (15 SOREMPs out of 19 naps with REM).
- sleep latencies were considerably reduced from 16.6 (st-1) and 21.5 (excl. st-1) of BL to nap means of 5.5 and 9.4min, respect. Mean SWS (present in 50% of naps) latency was of only 10min.

There was a circadian effect of sleep pressure: all except one of 11 unskeduled sleep episodes occurred between 06:30 and 15:30h; mean SED=20.7min (range 0.73-110). FJ's most difficult task was not to stay awake but to wake up at computer bell (~90db): wake-up was self-delayed in 11 naps (mean delay=71min, max.=285min) with no circadian predominance. Day 1 recovery sleep (TST=9.6h) showed a marked increase of both SWS (+71%) and REM (+179%) relative to BL (Fig.3).



**CONCLUSIONS:** (1) Contrary to previous findings from polyphasic sleep studies, in which only REM but not SWS total amounts were penalized, all sleep stages were proportionally reduced. This was probably due to the longer duration of this, compared to previous, studies. It may suggest that, on the short term, REM and st-2 sleep can be reduced (within certain limits) to the advantage of "obligatory" SWS, but that this may be no longer true in the long term.

(2) Confirming previous findings, the subject appeared to adapt surprisingly well to such extreme polyphasic sleep schedule, considering that he slept for a total of 2.7h per day (divided into 6 episodes) for almost three weeks. As is observed in most mammalian species, polyphasic sleep may prove to be, in fact, a feasible (and perhaps the only) human strategy to achieve remarkable levels of sleep reduction during quasi-continuous work situations.

Stampi C: Ultrashort sleep-wake patterns and sustained performance. In: D Dinges, R Broughton (eds), *Sleep and Alertness: Chron. Behav. Med. Aspects of Napping*. Raven Press, N.Y., 139-169, 1989.

NAME: \_\_\_\_\_ YEAR: \_\_\_\_\_

MONTH: \_\_\_\_\_

DAY of MONTH	EXAMPLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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CODES:

|| SLEEP

○ WORK

△ MEAL

○ COFFEE or TEA

△ ALCOHOL (equiv. 1 beer)

OTHER:

# X

ALERTNESS EVALUATION: please report every 2 h. how alert you feel (1-10)

1=VERY SLEEPY

10=VERY ALERT

10:15 → 8:15  
CALC. SLEEP?

# J. Hopkins shows way to dreamland

Scripps Howard News Service  
12/86 SEASIDE, N.J. ENTERPRISE

If you're one of the millions of Americans who have trouble getting a good night's sleep, heed a new do-it-yourself insomnia treatment developed by researchers at Johns Hopkins University.

The therapy, which worked in 39 of 51 chronic insomniacs, cures sleeping problems with a coordinated program of morning, noon and evening activities and new sleep habits.

The key to better sleeping, Hopkins psychologist Richard Allen says, is physical activity. Those who lead sedentary lives frequently are plagued by insomnia.

Here are the highlights of the Hopkins treatment:

- Spend 20 minutes in the sun shortly after you arise in the morning. This makes you feel alert and establishes the body's circadian rhythm (the internal clock which regulates humans' daily physical activities).
- Exercise for 15 to 30 minutes in the late afternoon.
- Walk or do light stretching exercise two hours before bedtime.
- Eat light breakfasts and lunches; make dinner your major meal.
- Never take naps.
- To eliminate the amount of time you spend tossing and turning, deliberately restrict the amount of time you spend in bed to four or five hours. This brief amount of sleep will make you tired for awhile, but the sleep you get will be sound. When you get the uninterrupted sleep habit established, gradually increase your time in the sack.

# Waking Up Is Hard to Do

## Blame it on the cold, dark dawn

BY GURNEY WILLIAMS III

AMERICAN HEALTH MAGAZINE

**E**ven on the best of days it can be tough to get out of bed. And in the cold, dark mornings, greeting the morn can seem a mission impossible. What causes this winter lethargy?

Some scientists believe the answer is lack of light.

"Dawn comes later in the winter, and humans tend to cue their clocks to dawn. So the later the dawn, the later we want to get up," says Dr. Alfred Lewy, a professor of psychiatry at Oregon Health Sciences University.

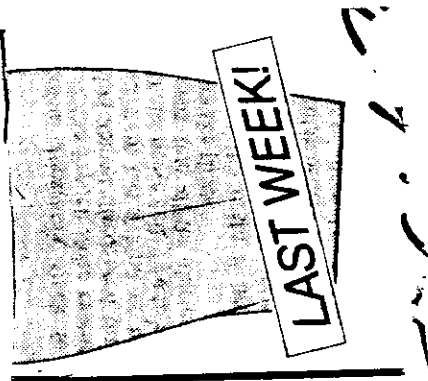
But, in any season, waking up can be difficult because it requires your body to go through a dramatic shifting of gears. It takes immense physiological changes to move from sleeping to being wide awake.

For some people, that means morning is prime time for trouble. Researchers at the National Institutes of Health recently found that strokes — interruptions in the flow of blood to a section of the brain — are most likely to occur between 8 a.m. and 9 a.m. Dr. Thomas Robertson at the institute says the heightened incidence could result from morning clumping of platelets, blood cells involved in coagulation. Other doctors theorize that a natural morning rise in blood pressure could force blood through the walls of fragile vessels in the brain. Heart attacks, too, are most common at 9 a.m., according to research by Dr. James Muller of Brigham and Women's Hospital in Boston.

The brain stem — the knoblike bundle of large nerve cells at the top of the spinal cord — is a key component in the body's complex

low of about 98 degrees just before you woke up, now continues to rise. As you stir into morning action, heart and breathing rates increase. All of this happens without our conscious control, but there are still ways you can make waking up easier — and easier on your body:

■ **Exercise.** If you're in good health, morning workouts are a great way to start the day. By raising your body temperature and increasing blood flow, exercise gives



It seems a small regret given such accomplishments after such beginnings. "My sister Sally was a psychiatrist... She said I defied the book. There were so many ways I should have turned out wrong."

And there is some consolation to be found in his game of tennis. Field, who lives in Belvedere with his second wife, Marilyn, a dog and three cats, took it up 20 years ago and keeps improving, even holding his own now with people who played tennis back in the days when he was pumping gas.

... play get mad at them-  
they

it's especially important to ease into exercise on winter mornings. Your body functions are at their lowest then. Too much too soon may indeed strain your heart, says John Duncan, a research associate at the Institute for Aerobic Research in Dallas. He suggests 10 minutes of gentle stretches that will get your heart rate up to about 100 to 110 beats per minute, before you go full steam into aerobic work.

■ **Don't oversleep.** Some people — about one in 10, slightly more women than men — need nine or more hours of sleep a night. But if you normally get only seven or eight hours, sleeping late on week-ends can add to the woes of waking up Monday morning.

Sleeping late is a disaster for night owls, says Charmane Eastman, lab coordinator of the sleep-disorders center at Rush-Presbyterian-St. Luke's Medical Center in Chicago. By waking up later, you push your body's clock forward, leading to insomnia when you try to go to sleep earlier on the following nights. Eastman's advice: Keep to a consistent sleep schedule, even on weekends.

■ **Avoid sleeping pills or alcohol.** Taken the night before, they can lead to a "groggy awakening," says Rosalind Cartwright, director of the sleep clinic at Rush-Presbyterian-St. Luke's in Chicago. Some drugs also cause forgetfulness. "If you've tried to learn something new at night — studying for an exam, for instance — and then you take a sleeping pill, you'll be less likely to remember in the morning what you studied the night before," she says.

■ **Meditate.** It can help prepare you for the day. Your routine need not be elaborate or mystical, says psychologist Robert Pasen, executive director of Chicago's Institute for Stress Management. "After the alarm goes off, lie there and appreciate the day," he suggests. Think positive thoughts while taking one or two deep abdominal breaths.

... LEE MESSING/SPECIAL TO THE CHRONICLE

you morning pep that can last well into the afternoon. In light of the recent findings on morning stroke and heart attack, though, it's important to check with your doctor before beginning a wake-up exercise program.

In any case, don't schedule those workouts near bedtime, or you'll confuse your body's biological clock into believing it's earlier in the day. That can lead to insomnia, and difficulty the next morning.

No matter how healthy you are,

# Insomniacs, Rejoice!

**By John Erno Russell**

**NEW YORK**—Dr. James C. Paupst, the noted sleep-research pioneer, has written a book that's a real eye-shutter.

Whether you lie awake at night counting your misdeeds and dilemmas, wake up early and wonder why the rest of the world doesn't get up with you, or simply stay up all night feeling as though your eyes were propped open by toothpicks, Dr. Paupst has a cure for you.

Drawing upon the latest scientific research, Dr. Paupst reports on everything you wanted to know about sleep but were too tired to ask.

For example, astonishing discoveries have been made recently at the University of California Sleep Research Facility, University of Florida Sleep Research Laboratory, Stanford University Sleep Disorders Clinic and Albert Einstein College of Medicine.

## **The Role of Sex**

Dr. Paupst reports on these discoveries and tells how they may provide salvation from your sleep problems.

He tells, for example, how pill popping and alcohol affect sleep, how snoring can be stopped, the enormously important role of sex in restful sleep, how to interpret dreams psychologically, how to overcome jet lag, and how to eliminate bedwetting,

sleepwalking, nightmares, and any other difficulty in falling asleep.

He also supplies the most up-to-date findings on such subjects as the therapeutic value of daydreams, the difference between children's and adults' dreams, the capacity of human beings to learn foreign languages while sleeping, and the value of strenuous exercise as an aid to sleep. (Forget it; it doesn't work.)

What's more, he maps out a comprehensive strategy for unlucky spouses of problem sleepers. That includes suggestions for dealing with such problems as teeth-grinding, groaning, and the worst nocturnal habit of all—kicking.

The average person spends 22 years of his life in sleep. Dr. Paupst aims to make them pleasurable instead of a nightmare.

Unfortunately, for the majority of Americans, sleep is anything but pleasurable. Studies show 65 percent of us suffer from sleep disturbance.

Dr. Paupst says that this has given rise to a whole industry of sleep nostrums, psychological quackery, and worthless gadgetry. Dr. Paupst offers an antidote to this hokum.

The title of Dr. Paupst's volume is *The Sleep Book* and the author says he was prompted to write it by the abysmal ignorance of the medical

profession. Most doctors don't know the basic facts about sleep, yet they blithely write millions of prescriptions annually for barbiturates and other drugs detrimental not only to sound sleep but to overall health.

Dr. Paupst also attacks the over-the-counter drug industry for bombarding consumers with misleading advertising and dangerous sedatives.

Well, then, do any sleep aids work? Dr. Paupst thinks so, and he particularizes them in his book. The ones that really work may surprise you.

Dr. Paupst reports such recently discovered facts as:

- Many people sleeping eight hours would be much better off with four.
- Nearly twice as many women as men sleep in the nude.
- People over 50 require only a fraction of the sleep needed by persons in their 20s and 30s.
- Masturbation can be a positive factor in getting a good night's sleep.
- Prayer can be, too.
- Persons who sleep a great deal possess completely different personalities from those who sleep very little.
- Celebrities have sleeping patterns

quite different from the norm.

- Body position is of paramount importance to sound sleep.
- Pre-bedtime showers can have a remarkable effect upon your sleep habits—and your dreams.
- You can "program" yourself to make your dreams more exciting.
- Barbiturates taken by mothers during pregnancy alter the sleeping patterns of their children for life.
- Dream recall can be increased enormously via certain simple steps.
- In certain cultures, people perform daily chores while fast asleep.
- Careful napping can add 20 percent to your useful waking hours.

## **How to Order**

To obtain a copy of Dr. Paupst's historic and supremely useful *The Sleep Book*, readers of *Better Living* need merely send their name and address with the book's title and a trifling \$3.95 (plus 95 cents shipping; total, \$4.90) to this address: *Materia Medica*, Dept. B-4, 1775 Broadway, New York, N.Y. 10019.

Here, if ever, is a book to put you to sleep.

# 35 SIMPLE WAYS YOU CAN GET A RESTFUL NIGHT'S SLEEP WITHOUT TAKING PILLS

YOU can beat sleeplessness forever without taking pills by following these 35 simple tips from three of America's leading experts on insomnia.

A staggering 32-million people go through a nightly ordeal trying to get to sleep — but it needn't be that way, according to the doctors.

Dr. Samuel Dunkell, a professor of psychiatry and author of *Sleep Positions* (William Morrow & Co), Dr. Rachel Copelan, a psychotherapist and author of *How To Hypnotize Yourself and Others* (Harper & Row) and Dr. Abraham A. Chaplan, who runs a clinic for insomniacs, put together this advice for STAR readers.

## Relaxation Exercises

TRY to start relaxing a few hours before bedtime. Avoid any challenging or heavy concentration work.

WHILE watching television, relax your body and mind to get yourself ready for sleep.

Progressively relax the muscles of the body from the toes to the feet.

Then go to relaxing the ankles, the lower legs up to the thighs. The hips to the lower back, then your stomach, upper back, chest, upper arms and shoulders, lower arms, hands, neck, face, forehead, ears and top of the head.

MILK and dairy products help some people get to sleep.

AN EVENING snack of an English muffin with jelly may help sleep. But don't eat too close to bedtime. It causes early waking and gives you a poor night's sleep.

AVOID alcohol before bedtime. It causes early awakening and gives you a poor night's sleep.

CUT DOWN on liquids before bedtime. Heavy intake of fluid can cause frequent risings to urinate. The best beverage before bed is plain water or fruit juice.

SAY your prayers or read a passage from the Bible before bedtime. This is very comforting.

## Staying asleep

IF YOU have trouble staying asleep, avoid naps in the early afternoon or evening.

HAVE someone make a tape of a boring story. You make a tape yourself — giving hypnotic suggestions. Tell yourself: "you're falling asleep now, your eyes feel heavy, your shoulders feel heavy, relax." Then listen to the tape to help you fall back to sleep.

IF A pressing problem wakes you, don't fight thinking about it. But stay in bed. Very frequently, it helps to put a tape recorder next to the bed. Think about what you are going to do and speak that decision into the recorder. This way, you can securely put the problem off until morning.

## Drug aids

SLEEPING preparations should be avoided. The human body develops tolerance to sedatives after repeated use. After a while, you have to take more and more of the sedative to make you feel sleepy. They can also cause nightmares.

## Set the stage

MAINTAIN a sleep schedule. Go to bed and rise at about the same times every day. Establishing a schedule helps regulate your body's inner clock.

MAKE your sleeping conditions as comfortable as possible. Your bedroom should be relatively cool and dark. Try to block out noise with heavy curtains or blinds, or use earplugs.

AVOID very warm colors in bedroom furnishings — oranges, red, purple, Kelly green. Cool colors such as browns, beiges, are more conducive to sleep.

IF YOU tend to worry about safety, check windows, doors and the stove before going to bed.

DON'T use your bedroom for working or watching television. Learn to associate that room with sleep.

AVOID stimulating TV programs or books prior to going to bed.

## Sleep partner

IF YOUR partner snores, steals the covers or is a restless sleeper, encourage him to think about his habits before going to sleep so he can change his sleeping patterns.

REMEMBER that sex can help

you sleep — but only if it's satisfactory to you. If it leaves you frustrated, it may aggravate your sleeping problems.

AVOID late-evening arguments with your partner or heavy financial discussions which stimulate mind and body.

DON'T take worries to bed with you. Tell yourself that you can't do anything about them until morning.

MAKE decisions about problems before going to bed.

PACE yourself for sleep during the day. Don't become overwrought — this is one of the main causes of wakefulness.

TALK out whatever is on your mind before going to bed.

## Breathing

BREATHE through your nose; keep your mouth closed. This will induce sleep. If you wake try subtracting 3 from 100 progressively... 97, 94, 91, and so on.

CLOSE your eyes and place your hands on your lower diaphragm right about the navel. As you breathe in, count to five, then hold your breath for one count. Let your breath out in five counts. Continue until you feel drowsy.

As you regulate your breathing rhythm this way, visualize yourself stretched out on a hammock, swaying in the breeze from side to side.

VISUALIZE a blackboard. You are holding chalk in one hand and an eraser in the other. Mentally draw a large circle on the blackboard. Fill the circle with a large X. Erase the X with your free hand, starting at the center. Erase carefully so as not to erase the circle.

Now write the word SLEEP inside the circle. Write it slowly and deliberately. Erase it and go deeper. Repeat this until you feel yourself drifting off.

IF YOU wake during the night, get back to breathing in the prescribed manner above. Then close your eyes and visualize the number 100 within a circle. Erase it and take a deep breath, then exhale.

Next, write number 99. Erase it mentally. Breathe and exhale. Continue down from 100 to 0 on a descending scale.

## During the day

EVERY morning tell yourself: "Every day in every way I feel better and better. When I go to sleep tonight I will sleep all night and awaken feeling fresh and relaxed."

IF YOU tend to wake during the night and have difficulty going back to sleep, tell yourself before bedtime: "I will sleep peacefully until morning."

BEAT the stress of daily life by telling yourself: "I will rise above problems which I cannot solve."

MODERATELY strenuous exercise about three times a week will help you to sleep — but don't exercise too close to bedtime.

A WARM bath before bedtime is soothing, tranquil and can induce drowsiness. But a hot bath tends to be too invigorating.

AVOID coffee, tea, chocolate and other foods with caffeine.

Caffeine can remain eight hours or more in your body. If you have a problem sleeping, have no caffeine past lunchtime. And even then, drink no more than 2 cups of coffee or 3 or 4 cups of tea.

AVOID foods like greasy potatoes, crackers and pizza before bedtime. They're hard to digest.

# 8 hours sleep not enough for some,

By AMERICAN MEDICAL ASSOCIATION

**N**ONE OF US would walk into a store expecting to get a comfortable fit from shoes of an "average" size. But many of us believe that all adults should spend eight hours asleep each night. We worry that not getting that magic number of hours will have dire effects, not only the next day, but over a lifetime, making our hands crumble or our lives shorter. On the other hand, many of us also think that eight hours are enough and that long-sleepers are lazy.

Seven to eight hours of sleep per day is, indeed, the norm or average, for adults, numerous studies show. The average of seven to eight hours holds true even in far northern latitudes, where there are extreme shifts in the ratio of light to darkness over the course of the year. People who live for weeks or months in caves, research laboratories or other isolated environments without clocks, windows or other indicators of time, sleeping and arising whenever they choose, spend one-third of their time asleep.

Some people interpret these averages to mean that sleeping seven to eight hours is good for us, a goal toward which we all should work. But that's as unrealistic as aiming to be exactly 5 feet 4 inches tall. "One size fits all" does not apply to sleep. Astonishingly, even Siamese twins require different amounts of sleep and may sleep and be awake independently, a fact confirming the individuality of the need for sleep.

The amount of sleep that's right for you is part of your genetic makeup. Your age, physical and emotional health and lifestyle may affect the amount that your body demands at different times. Yet individual needs, like shoe sizes, have a limited range. No one sleeps constantly. No one goes without sleep at all.

About two people in 10, slightly more men than women, sleep less than six hours a night, the National Center of Health Statistics reports. About one in 10, slightly more women than men, sleeps nine hours or more a night. Six and nine are the numbers sleep specialists generally use when they talk about short- or long-sleepers.

Perhaps one person in 25 sleeps less than five or more than 10 hours each night. Very short sleepers are so unusual that they generate reports in scientific journals. A 70-year-old nurse is an example. She slept an average of only 67 minutes per night on five successive nights in the sleep laboratory, with no naps at other times during the day and no signs of tiredness. It was a mystery to her why other people waste so much time sleeping, she told Dr. Meddis of the University of Technology, Loughborough, England. She said she had averaged only an hour of sleep a day since childhood.

The typical American adult seems to get too little sleep rather than enough or too much. That many of us are quite sleepy is illustrated by the

fact that we fall asleep easily when given the opportunity to do so. In a series of "nap opportunities" offered five or six times during the day, college students and middle-aged adults fell asleep in an average of 10 to 12 minutes.

If you're not getting enough sleep now, you probably fall asleep easily whenever you're sitting quietly - watching television, for example, or listening to a lecture. "Such situations don't cause sleepiness, they unmask it," says William Dement, M.D., director of the Sleep Disorders Center at Stanford University.

By contrast, when given the opportunity to sleep during the day, young children simply do not fall asleep. They are fully alert all day long. At night they fall asleep quickly and sleep solidly, with only brief and unremembered awakenings.

We recognize that it is not normal for a child to

fall asleep in school, but we shrug off similar behavior in adults. "The fact that nearly everyone is chronically sleep-deprived has led to an acceptance of less than ideal daytime alertness as 'normal,'" says Dement.

"It may be that if we slept more, the gain in our daytime pursuits over the long haul might more than compensate for giving up the extra hour or so of wakefulness," he adds.

Indeed, in one study, adults who slept only one hour more than usual for as few as three nights were less sleepy on the nap test and did better on tests of addition, memory, coordination and other aspects of performance.

## Are You Getting Enough Sleep?

• Do you need an alarm clock to awaken you? And do you have a hard time getting up in the morning? The best signs that you've had enough

sleep are that you awaken spontaneously and soon feel alert.

• Do you drop off easily in front of the television, at concerts or in meetings?

• Do you habitually "sleep in" an hour or more on weekends? That suggests that you are not getting enough sleep during the week.

• Are you trying to prove you're a superwoman or superman by getting along with less sleep than you need? Some people who claim to be short-sleepers are merely getting by with shortened sleep.

• Is feeling sleepy a way of avoiding sex or unpleasant tasks like paying bills? Are you feeling depressed? Stress and depression may cause fatigue and lack of energy.

On the other hand, are you trying to force yourself to get more sleep than you need? Do you lie in bed long after the lights are out, wondering when sleep will come? Do you awaken before the alarm goes off?

If you're spending more time than you need in bed, you probably lie awake for some time, or wake and doze and wake again in a pattern that may lead you to suspect that you have insomnia, rather than that you are a normal short-sleeper, says Dement.

## A Case of Mistaken Identity

Some people who call themselves insomniacs prove, when evaluated in the sleep lab, to have quite normal sleep. Some are natural short-sleepers who happen to live in a household of long-sleepers.

Debbie was determined to get her "proper" sleep, all eight hours of it. She set her alarm for 7 a.m. and jumped into bed at 10:30 p.m. When she found herself still awake at 11:30, she decided to move her bedtime forward. Soon she was going to bed at 9 o'clock. Now her complaint was, "It takes me three hours to fall asleep." Once she accepted the idea that six or seven hours apparently was all she needed, she started going to bed at midnight. Her "problem" evaporated.

Other people simply have locked their sleep into unusual time slots. Some find ways to cope with their "insomnia." Phil, for example, never fell asleep before 3:30 a.m., no matter when he went to bed. He needed two alarm clocks at opposite sides of the room to get him going in the morning. During the day, he napped whenever he could. Once he completed his surgical residency, he decided to structure his life around his desire to sleep until 10:30 or 11:00 a.m. Phil doesn't get his first case until noon.

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**Monday on the Feature Page: Insomnia: A symptom, not a disease.**

# too much for others



## S for Sleep

After 15 years of research, scientists at Harvard Medical School have found in the human body an elusive substance that may be nature's sleeping pill. John Pappenheimer told a University College audience in London recently that he, James Krueger, and Manfred Karnovsky had isolated and made a partial analysis of a powerful chemical they call Factor S, which they extracted from human urine. About one-trillionth of a gram of Factor S puts test animals into a deep sleep.

Scientists have long sought the body's sleeping potion, which they suspected must accumulate during waking hours to reach relatively high concentrations in animals deprived of sleep. Over the years, several natural narcotic substances have been identified, but they have produced only brief periods of sleep in laboratory animals. After frustrating attempts to extract the sleep compound from the brains and spinal fluid of animals, the team decided to look for the answer in human urine. The problems were formidable; several tons of urine had to be chemically processed in a complex series of steps that included the painstaking purification of the end product—30 millionths of a gram of Factor S, equivalent to the weight of a couple of grains of sugar. Injected into the brains of rats, rabbits, and cats, Factor S induced a deep, natural sleep that lasted from five to twelve hours. Other researchers have tested it successfully on primates.

The structure of Factor S, a peptide consisting of four or five amino acids with a sugar called muramic acid attached to the end, is unlike that of any other substance known to be manufactured by the body. Though the researchers do not dismiss the possibility that Factor S is produced in the brain, they speculate that it is made up of parts of food or bacteria living in the intestines, which are absorbed by the body almost like vitamins, and used as a sleeping agent.

Once Factor S is better understood and has been synthesized, says Krueger, "it could be a useful tool in deciphering the fundamental question of why we sleep." Meanwhile, insomniacs should not lose any sleep waiting for Factor S; it will take decades to reach the market, if it ever does.

Friday, June 8, 1984

# Report Says Sleep In Right Doses Cures Jet Lag

Washington

**People who travel or whose work schedule is changed drastically may be able to avoid "jet lag" and function nearly normally if they get the right amount of sleep after the disruption, scientists said yesterday.**

A study showed loss of sleep is just as important a cause of "jet lag" — the urge to sleep at inappropriate times — as the disruption of a traveler's body clock during journeys through several time zones.

"When people fly to England or change (work) shifts, they say they can't function, or they have jet lag. We're saying a good part of jet lag is loss of sleep," said Thomas Roth, head of the sleep disorders center at Henry Ford Hospital in Detroit and a co-author of the report published in *Science*, the weekly journal of the American Association for the Advancement of Science.

Although such a conclusion might seem obvious, "historically the emphasis has been on the (time) shift, not on the loss of sleep," Roth said.

The researchers made their conclusions after a study conducted at Henry Ford and Stanford Universities, in which people went to bed at noon for three days.

Those who coped most successfully with the change in hours took a short-acting prescription sedative that stayed in their bodies five to six hours. They functioned normally or nearly so.

Another group of volunteers took a longer-acting sedative and got a good sleep, but reported feeling drowsy and sluggish when they got up, the study said. In some cases they were drowsier than those who took a placebo, a fake drug.

The placebo group lost sleep and also had a hard time staying alert the following "day."

"The main thing the study does is suggest an adequate treatment for the short-term insomnia many people get with jet lag," said Wesley Seidel, a researcher at Stanford University's sleep research center. "It just helps you sleep when your circadian rhythms tell you to be awake."

This insomnia occurs mostly with travel from west to east, he said. Many travelers say east to west travel is easier to adjust to.

Seidel warned that drugs should not be used for weeks or months at a time, such as when night workers turn their schedules around to adjust to the weekend, but only for one or two nights during the initial rotation.

United Press

PHILADELPHIA (AP) — Babies who sleep on their stomachs are more apt to develop malformed jaws and unattractive facial features than kids who sleep on their backs, says a specialist presenting his paper — "Why Raise Ugly Kids?" — to a dental conference today.

Parents worried about proper development of their child's features have got it all backward, says Dr. Hal A. Huggins, a dentist from Colorado Springs, Colo.

"We say 'don't sleep the baby on its back, you'll flatten the back of his head,'" he scoffed. "Turn him over and mash his face!"

"Tummy sleepers have receding chins, severe anterior crowding and narrow chins, as well as curves in their spines and a nasal septum deviation," Huggins said in an interview during the 50th Annual Liberty Dental Conference here.

Huggins, a specialist on dental malocclusions, explained that at birth, the skull is primarily composed of cartilage that eventually calcifies, or hardens.

He said the first part to calcify is the occiput, or that little knot on the back of the head. The last part, he said, is the frontal area, site of over 40 little membrane bones that will eventually determine facial features.

"The calcification of the bones around the face begins at about two years," he said. "And by then in many cases the damage is done because of pressure exerted during sleep."

"A human head weighs 16 pounds," he said.

# Many People Are Sleeping as They Work

Washington

Nuclear safety and the national defense may be jeopardized by government workers being asked to perform critical tasks at a time their body clocks tell them they should be sleeping, a researcher said yesterday.

Charles A. Czeisler, an assistant professor at the Harvard Medical School, cited studies showing people are capable of appearing to be awake and functioning while their minds are asleep as measured by brain waves.

"This failure to cope with hu-

man factors may be the Achilles heel of modern industrial and military technology," he told a House subcommittee.

In a study done in a specially equipped automobile on a German autobahn, one subject's eye blink rate and brain waves indicated he was asleep for a 20-minute period even though his eyes remained open and he continued to drive the car.

"Researchers in Sweden have documented that train drivers fall asleep by brain wave criteria on one out of every six night runs," said Czeisler. "Nonetheless, the train drivers continue throughout

such trips to keep full pressure on the accelerator pedal, remaining unresponsive to red stop signals.

"I am sure that many in this room can recollect similar experiences of slowly drifting off the road onto the shoulder of an expressway before being startled awake by gravel under the tires," he continued.

"Unfortunately, circumstances — both on the highway and in the factory control room — are not always so forgiving."

Czeisler said the ability to stay awake and alert at times the human body clock says the person should

be sleeping — at 5 a.m. for example — bears little relationship to how much sleep the person has had.

That raises especially serious questions about how to schedule people for duty in such crucial jobs as airline pilots, nuclear power plant operators and military radar monitors, Czeisler said.

The subcommittee chairman, Representative Albert Gore Jr., D-Tenn., said the purpose of the hearing was to accumulate a body of research that would be available to employers wanting to adjust their work schedules to the biological clock as much as possible.

Associated Press

## It's not all in your head

NEW YORK — If you find that falling back asleep for a few minutes on Saturday morning sometimes leaves you with a throbbing head, you might be suffering from turtle headaches. People who wake up, want to go back to sleep and pull their heads back under the covers to block the sunlight are also be blocking their supply of oxygen, says Dr. Sharon Gilbert, discoverer of the turtle headache. They're contracting their heads the way a turtle would. Gilbert, a neurologist in St. Petersburg, Fla., described the turtle headache in the Journal of the American Neurological Association. Oxygen in the blood drops, and carbon dioxide rises, causing a headache similar to that seen in patients with cerebral arteriosclerosis at high altitudes.

## THE BEDWETTING CHILD — Five and a half million American children are afflicted

by bedwetting. The villain may be an allergy to cow's milk, chocolate, eggs, grain or citrus fruit. The food allergies cause the bladder walls to swell, reducing bladder volume and causing the muscles to become irritated and prone to spasm. The condition causes fatigue so the child sleeps more deeply and is less likely to get up during the night to relieve himself. Putting the child on a non-allergenic diet (after all other possible causes have been rejected) and then reintroducing foods one by one may isolate the allergen. In 60% of tested cases, milk was the culprit.

60%