BIOMEDICINE

A prod to the Land of Nod

A natural chemical substance that provides insomniacs with more restful sleep than drugs now being prescribed has been found by Althea M.I. Wagman and her psychophysiology team at the Maryland Psychiatric Institute in Catonsville, Md.

The substance is the amino acid L-tryptophan. Wagman and her co-workers have been testing the amino acid on 12 insomniacs over the past year. The insomniacs fall asleep twice as fast as they did without it, and they sleep about 45 minutes longer than usual. What's more, the amino acid does not disturb their normal stages of sleep. Certain drugs for insomniacs, such as barbiturates, cause unconsciousness, but not the proper proportion of rapid-eye-movement and slow-wave sleep stages.

Wagman predicts that the amino acid will be marketed as a sleeping pill within the next year by several drug companies. The Food and Drug Administration has already given the amino acid clearance to be sold over the counter as an antidepressant.

L-tryptophan is also present in many foods, such as meat and green vegetables. "What you eat is how you sleep," Wagman says, pointing out that the traditional home remedy for sleeplessness, a glass of warm milk, contains L-tryptophan.

The making of the male

In mammals, male sex determination depends on the presence of both a Y (male) chromosome and an X (female) chromosome. A gene or set of genes on the Y chromosome triggers the development of testes. The testes secrete testosterone, which induces male development of accessory glands and ducts. The masculinizing action of testosterone on target cells is then mediated by a gene on the X chromosome.

What are the protein products of these crucial sex-determination genes? Although the product of the X chromosome gene that brings about the masculinizing action of testosterone has been identified—it is a cell receptor protein—this has not been the case for the product of the Y chromosome gene or genes that trigger the development of testes. Now a team of investigators at the Memorial Sloan-Kettering Cancer Center, headed by Stephen S. Wachtel and Dorothea Bennett, have identified the elusive product.

As they report in Sept. 18 NATURE, it too is a cell receptor protein—a so-called H-Y antigen. Such a finding, they believe, makes sense. Development of a gonad into a testis under the influence of the Y chromosome begins as soon as the migration of primordial germ cells from the yolk sac to the gonadal ridge is complete, at which stage endocrine organs in general are not yet fully developed.

So a cell, surface protein or set of proteins concerned in cell-cell recognition might seem a likely candidate for the gene product or products responsible for initiating testicular differentiation.

Aspirin and newborn deaths

An increasing number of drugs are being found to hurt the fetus. Now none less than aspirin is being indicted for increasing anemia, hemorrhage, prolonged gestation, complicated deliveries and perinatal mortality.

Edith Collins and Gillian Turner of the Royal Alexandra Hospital for Children in Sydney, Australia, followed 144 pregnant women who took aspirin regularly during pregnancy—two to twelve aspirin a day. They compared them to pregnant women who did not take aspirin. They report in the Aug. 23 LANCET that the regular aspirin takers had the complications cited above; the controls did not.

Although the evidence is not watertight, it is strong.

SPACE SCIENCES

Viking: Supersafe sites sought

When the landing sites for the two Mars-bound Viking spacecraft were selected several years ago, a pair of backup sites were also chosen in case the primary ones should turn out to be too rough, too hard, too soft or otherwise unsafe for the robot probes to land. Now a team of geologists is studying eight potential *backup* backup sites, "where we can set the Viking landers down if the spacecraft should run into trouble during the mission."

"Trouble" could mean that the primary and backup sites turn out to be risky, or that other Martian conditions such as local winds pose a hazard, or that malfunctions with the spacecraft—either the landers themselves or the orbiters that carry them—have somehow limited the probes' access to certain parts of the planet. The Viking landing site staff, composed of scientists from the U.S. Geological Survey, Jet Propulsion Laboratory, Massachusetts Institute of Technology and Stanford University, has been studying the planet with the aid of the high-resolution radar at Arecibo in Puerto Rico and the Goldstone antenna in California. "Although we still have several months to go before we pick the supersafe sites," says team leader Harold Masursky of the USGS Center for Astrogeology in Flagstaff, Ariz., "the particular sites are visible to radar for only a few days at a time, and the radar itself is committed to a great number of other projects." The choices will also be updated next summer from the orbiters themselves.

"Sometimes we feel like old mother hens," Masursky says, "spending a lot of time worrying about a great number of problems that may never happen. Yet this has been part of the reason for the success of the U.S. space program."

Doubling mileage in the sky

A proposed research program aimed at reducing commercial aircraft fuel consumption by 40 to 50 percent has been developed by a group of researchers from NASA, the Department of Transportation, the Federal Aviation Administration, the Defense Department and private industry. Prepared at the request of Senators Frank Moss (D-Utah) and Barry Goldwater (R-Ariz.) of the Senate Committee on Aeronautical and Space Sciences, the program, which would be conducted by NASA, would cost an estimated $670 million over a 10-year period.

There are six major areas in the study, three of them evolutionary improvements in existing technology: Development of engine components that would reduce performance degradation over time is estimated to offer a five-percent improvement in fuel consumption; higher thermodynamic engine efficiency promises another 10 percent, while aerodynamic advances such as higher-aspect-ratio wings could offer 15 to 20 percent.

The other three areas would require development of "radically different" technology. A gain of 15 to 20 percent might be expected from more efficient propellers for turboprop aircraft; lightweight, composite structural materials could add 10 to 15 percent more, and laminar flow control—minimizing the turbulence caused by separation between the air flow and aircraft surfaces—promises a whopping 20 to 40 percent.

Another spaceman gone

The post-Apollo exodus continues. Astronaut Charles M. Duke Jr., who piloted the lunar module and walked on the moon with John Young during the Apollo 16 mission, will leave the National Aeronautics and Space Administration on Jan. 1, 1976. His departure, to become—are you ready for this?—the San Antonio distributor for Coors beer, will reduce the astronaut corps to 29 men, if no one else leaves before then.