

Relax and remember more

Elderly persons who combine relaxation training with mnemonic (memory aiding) exercises can substantially improve their memories, according to a report in the June *AMERICAN JOURNAL OF PSYCHIATRY*.

Many elderly persons become anxious over normal losses of memory, says Stanford University psychiatrist Jerome A. Yesavage. Healthy older persons score up to 30 percent lower on memory tests than younger persons, he explains. Anxiety over these losses often leads to further memory impairment.

Relaxation techniques can reverse this trend and are safer than tranquilizers, says Yesavage. In a study of 39 healthy elderly persons who learned a standard memory-enhancing technique, he finds that relaxation exercises reduce test anxiety and result in an improved ability to remember names and faces. Subjects' ages ranged from 62 to 83.

About half of them received relaxation training before mnemonic instruction; the rest were given only general information to improve attitudes about aging.

Performance on a name and face recall test improved significantly more in the group with relaxation training. Their scores were also closely associated with lower anxiety levels just before taking the test.

Catching Zs with greater ease

Sleep-inducing drugs that are quickly eliminated from the body can effectively treat the insomnia and daytime sluggishness that afflict shift workers and world travelers, say researchers at the Stanford University Medical Center in California and Henry Ford Hospital in Detroit. Sleeping pills that remain active for several days, however, cause a loss of mental function and alertness on waking when used after a sudden sleep-schedule change.

The report, in the June 15 *SCIENCE*, confirms that sleep patterns and daytime alertness are impaired for at least three days after a person's sleep schedule is shifted by 12 hours.

Both long-acting and short-acting sleeping pills help to eliminate the insomnia caused by a topsy-turvy sleep schedule, but long-lasting pills leave people worse off the next day, note the investigators.

The study consisted of 24 volunteers with normal sleep patterns. After two nights of sleep from midnight to 8 a.m., they were shifted to a noon bedtime for three days.

Before retiring at the new bedtime, eight subjects were given the short-acting sleeping pill triazolam, eight received the long-acting medication flurazepam, and the remaining volunteers were given a placebo pill.

Triazolam is eliminated from the body in three to four hours, while flurazepam, the most commonly prescribed sleeping pill in the world (under the trade name Dalmane), remains in the system for from 40 to 100 hours.

Subjects given the short-acting pill slept longer than the others, were more alert the next day and performed better on several tests of mental function. Volunteers receiving flurazepam at the usually recommended dose were able to sleep but their daytime alertness and functioning were significantly worse than that of triazolam and placebo users.

Because of these "day after" effects, shift workers and people traveling across time zones should take triazolam if they suffer from temporary insomnia, says Stanford sleep researcher and study director Wesley F. Seidel.

Long-lasting medication is useful to help hospitalized patients get to sleep the night before surgery or to treat people with sleeping problems and anxiety, adds Seidel.

The researchers are now testing subjects on low doses of flurazepam to see if the drug can ease insomnia without subsequent drowsiness.

Smoke puffs for sexual communication

The female moth ready for a mate does not just envelop herself in a cloud of sex hormones. She rhythmically releases puffs of pheromone at rates ranging from 60 to 140 pulses per minute, reports William E. Conner of Duke University in Durham, N.C. Conner has examined moths of the Arctiidae family, including tiger moths, to determine the biological relevance of such pulsed chemical communication.

Pulse frequency is not a means of species separation; closely related species have similar frequencies, he finds. One moth he observed even varies its pulse rate from 60 to 150 pulses per minute depending on wind speed. Conner has used puffs of powder to examine the stability of the pulses in air turbulence. He finds that under most conditions, pulses are maintained for more than one meter, which he points out is a distance of many body lengths of a moth. Conner speculates that a male moth may sense a steady pheromone level at a distance, and then use the presence of pulses as a sign that he has come into close range of his target.

In each case examined, the male antennae that sense the pheromone send to his brain an electric signal of a frequency matching the pulses of pheromone the female releases. Conner reported in Bethesda, Md., at a recent conference on "Molecular Messengers in Nature." The pulsations might prevent acclimatization from decreasing the male's sensitivity. In addition it might allow the female to economize on material.

Alice reasoned wrongly on March Hare

While in Wonderland, Alice chose to visit the March Hare instead of the Mad Hatter because "...perhaps, as this is May, it [the March Hare] won't be raving mad—at least not so mad as it was in March." Now two British scientists take author Lewis Carroll to task in the June 7 *NATURE*. After observing the brown hare for 1,500 hours, Anthony J. F. Holley of Somerset and Paul J. Greenwood of the University of Durham conclude that the hare's "mad" behavior of chasing and boxing is continuous January to August, the entire mating season. Holley and Greenwood also debunk the widespread view that the boxing is a form of competition between males. In each of 17 observed bouts in which they knew the sex of the participants, and in 15 bouts reported in an independent unpublished study, boxing occurred between a male and a female. The observers speculate the female boxes to prevent a particular male from mating with her, noting that females are generally larger and stronger than males, and males frequently have injury-scarred ears. Holley and Greenwood conclude, "With apologies to Lewis Carroll, the March hare is a myth."

Split gene in a bacterial virus

The genes of plants and animals and their viruses are commonly interrupted by stretches of apparently unrelated DNA called intervening sequences or introns. But genes of bacteria and their viruses have been thought to be continuous. This difference has been taken as molecular evidence of the grand taxonomic division of organisms into eukaryotes—those like plants and animals with true nuclei in their cells—and the prokaryotes—bacteria, which lack cell nuclei. Frederick K. Chu and colleagues at the New York State Department of Health in Albany now report an interruption, more than 1,000 subunits long, in the sequence of a gene of a bacterial virus called bacteriophage T4. This gene's product, the protein thymidylate synthase, is both a structural component of the bacteriophage and an active catalyst, Chu says in the May *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES* (No. 10). Intervening sequences had previously been reported in microorganisms called archaeobacteria, which possess features of both eukaryotes and prokaryotes.