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**SCIENCE & TECHNOLOGY**

served the moon's similar monthly cycle. These they eventually marked with permanent reference points at Stonehenge and elsewhere on the British Isles. But some scientists, chiefly British engineer Alexander Thom, claim that the builders of Stonehenge could accurately *predict* solar and lunar movements and that they had discovered the moon's orbital "wobble," enabling them to forecast lunar eclipses.

Each lunar wobble—caused by the sun's pull at different points along the moon's path—takes 173.3 days to complete. This perturbation is in turn part of an 18.6 year "in-out" lunar oscillation perpendicular to the moon's orbit. England's chronically cloudy weather, argues Ellegård, would have prevented enough sightings to firmly establish the wobble's regularity. The region, although dryer and 2°C warmer 5,000 years ago, probably enjoyed only one clear day out of every two or three. Further, roughly one-third of all moonrises are invisible to the naked eye, occurring by day and at a phase when the illuminated portion of the moon is small. Stone Age astronomers could have seen no more than one moonrise out of six, Ellegård reckons. And the distortion of moonlight by the Earth's atmosphere would have prevented accurate "readings" of what they did see.

The ancient Babylonians were ignorant of the wobble, but they were able to predict eclipses by referring to meticulous archives. The ancient Britons were "observers," concludes Ellegård, but "we have no evidence that they were really calculators"—and by extension, genuine scientists.

### *Senility Virus*

"The Senility Virus" by Richard Trubo, in *Science Digest* (Aug. 1981), 224 West 57th St., New York, N.Y. 10019.

Senility is widely viewed as a natural, though by no means inevitable, consequence of aging. But most cases may be triggered by a slow-acting, infectious virus, reports Trubo, a free-lance medical journalist.

Senility has many causes, including arteriosclerosis, which blocks the flow of blood to brain tissue. The chief villain, however, is a "degenerative neurological disorder" called Alzheimer's disease. Over one million Americans age 45 and older are afflicted with Alzheimer's (representing 50 to 60 percent of all senility cases). An untreatable disorder, it may be the fourth-leading killer in the United States today. Alzheimer victims usually survive a few years after severe mental deterioration sets in; its early symptoms often emerge gradually, as words are occasionally mispronounced and acquaintances' names forgotten. Impaired judgment and substantial memory loss follow, with disorientation and temper tantrums signaling the disease's final phase.

Alzheimer's symptoms resemble closely those of Creutzfeldt-Jakob disease, a rare form of senility that scientists have proved is caused by a slow-acting virus. Several instances of person-to-person infections of Creutzfeldt-Jakob senility have been documented. And autopsies on the brains of Creutzfeldt-Jakob victims reveal twisted filaments of nerve

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**SCIENCE & TECHNOLOGY**


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cells strikingly similar to those found in Alzheimer patients. Researchers are fairly certain that Alzheimer's, too, is caused by a virus but have been unable to isolate it.

If scientists do locate the Alzheimer virus, their task will have only just begun, notes Trubo. What will they do with it? The Creutzfeldt-Jakob virus, for example, does not trigger an immune reaction from the body—a prerequisite for manufacturing antigens.

"It could be that all of us are infected sometime during our lives" with Alzheimer's virus, suggests Dr. David Kingsburg, a virologist at the University of California, Irvine. Yet some people succumb sooner than others. Susceptibility seems to be influenced—but not determined—by heredity. If researchers can find a way to prolong the virus's incubation time past the human life span, the infection called senility will no longer pose a problem.

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**RESOURCES & ENVIRONMENT**


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### *Of Dams and Snail Darters*

"The Endangered Species Act and the Search for Balance" by Winston Harrington, in *Natural Resources Journal* (Jan. 1981), School of Law, University of New Mexico, Albuquerque, N.M. 87131.

In 1978, federal officials trying to save the tiny snail darter from extinction barred the Tennessee Valley Authority from damming the Tellico River. U.S. Senator Jake Garn (R.-Utah) complained that "there are enough obscure species of plants and animals to guarantee that nothing at all will happen in this country."

Congress quickly granted the TVA an exemption to the 1973 Endangered Species Act and in 1978 amended the law. But Harrington, a researcher at Resources for the Future, argues that the legislators ignored the real issue: Who will pay the local costs of protecting vanishing species from threatening economic development projects?

The 1973 law, which protects some 200 kinds of plants and animals, empowered the U.S. Secretary of the Interior to designate certain regions as "critical habitats" for certain endangered species, ranging from the grizzly bear to the furbish lousewort (a flower). The department could ban or require changes in most projects that might alter the habitat. Alterations or cancellations were required *regardless of cost*.

Harrington praises Congress's initial decision to ignore "cost-benefit" considerations. While the financial burden of saving a species is always clear, the benefits are often unknowable (as in the case of miracle drugs that future scientists may derive from wild plants) or intangible (i.e., the psychic satisfaction given to nature lovers). As it happened, the act's overall economic impact has so far been minor. Of 20,000 controversial projects referred to the Interior Department, only a handful pro-