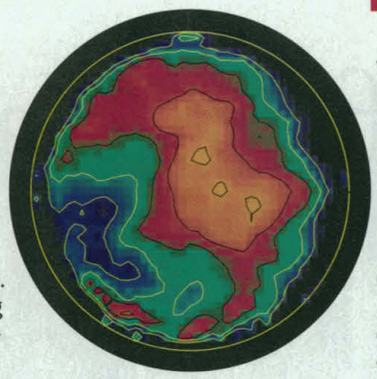
A Wine-Dark Sea for Titan?

Astronomers peering through the miasmal haze of Titan, the planet-size moon of Saturn, may have glimpsed the first liquid ocean beyond Earth. Don't even think about playing in the waves, though. If the exceptionally dark region is indeed liquid, the "water" will likely resemble liquefied natural gas chilled to –180°C.

Cosmochemists have long predicted that the 5150-kilometer Titan might feature methane rains, hydrocarbon oceans, and icy continents, all drizzled in an organic goo that could resemble the chemical soup that preceded life on Earth. But the haze shrouding the moon permitted only the fuzziest glimpses of the surface.



Bright land by a dark sea?

Now planetary scientist Seran Gibbard of Lawrence Livermore National Laboratory in California and her colleagues have sharpened the view using the resolving power of the world's largest telescope—the 10-meter W. M. Keck Telescope in Hawaii. Observing in the haze-piercing infrared, the team confirmed the previously reported existence of a bright area the size of Australia probably made of water ice, they report in the June issue of *Icarus*. But they also found an exceptionally dark area that could be infrared-absorbing organic matter or an ocean of methane, ethane, and other liquid hydrocarbons.

"We're not sure yet," says Gibbard, but "at this point, [an ocean] seems like a strong possibility." Cosmochemist Jonathan Lunine of the University of Arizona, Tucson, goes a little further. "My bias is that some of these dark areas are liquid," he says. Confirmation may have to await the arrival of the Cassini spacecraft in 2004, when it will drop a probe to Titan's surface.

The Brains Behind Aging

The smarter a woman is during childhood, the more likely she will begin menopause later in life, researchers say. The finding, reported in the 22 July issue of *Neurology*, suggests that the link between hormones and brain development might be stronger than researchers suspected.

Since 1946, the U.K. Medical Research Council has collected medical, psychological, and demographic data on more than 5000 people as part of a National Survey of Health and Development. Five times in the last half-century the volunteers have taken tests on everything from verbal and nonverbal reasoning to algebra and visual memory.

Tapping into this database, psychologist Marcus Richards of University College London and his colleagues persuaded 1572 female participants to answer yearly questionnaires—starting at age 47—on their menstrual cycles. After collecting 4 years of data, Richards and his group plotted the women's test scores against their age at menopause. After adjusting for factors such as education, number of children, and socioeconomic status, they found that higher cognitive scores correlated with later menopause. The relationship was strongest with test scores at ages 8 and 11.

Other research has shown that hormones, including estrogen, can influence both brain development and reproductive aging. This study pushes the connection back to an earlier age than researchers had suspected, says Susan Resnick, a psychologist at the National Institute on Aging in Bethesda, Maryland.

Requiem for the Mozart Effect?

A popular theory that listening to Mozart will improve your reasoning skills has taken a hit. After trying to replicate the original research on which the theory was based, researchers have concluded that the music has no effect on the way students answer typical IQ test questions.

Ever since researchers reported in 1993 that college students did better on spatial reasoning tests immediately after listening to Mozart's *Sonata for Two Pianos in D Major*, the so-called "Mozart effect" has enjoyed a spectacular career as pop science. Governor Zell Miller of Georgia promoted buying classical music for every infant in the state, and record stores touted CDs that were "scientifically proven" to boost brainpower.

But other scientists, using various protocols, had trouble finding a significant effect. And some argued any effect might be explained by a positive mood induced by Mozart. To sort these issues out, psychologist Kenneth Steele of Appalachian State University in Boone, North Carolina, went back to the original protocol used by psychologist Frances Rauscher of the University of Wisconsin, Oshkosh, and her colleagues. Steele gave the spatial reasoning test to 125 college students. Two days later, he retested them, priming some students with the Mozart piece, while others got silence, and a third group heard music by Philip Glass.

The improvement was essentially the same for all three groups, Steele reports in the July issue of *Psychological Science*. "I was very surprised when I did not get the effect at all," he says.

But Lois Hetland, a cognitive psychologist at Harvard University, believes the jury is still out. She says it remains to be explained why 26 of 27 studies, including Steele's own, have found some benefit to listening to Mozart—although in many cases the difference was not statistically significant. The researchers agree, though, that the public reaction has been overblown. "It's premature at best for policy decisions to be made on the Mozart effect," says Rauscher.

Still Going Strong

Astronomer Fred Whipple, at age 92, has joined the team planning NASA's Contour mission, which will rendezvous with several comets early next century. In the 1950s Whipple proved that comets must have solid blobs of rock and ice at their cores. Since his first retirement—in 1973—he's published more than 100 scientific papers. "I hope I live long enough to be around when they get the first results back" in 2003, he says. "But this may be my swan song."

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