RANDOM SAMPLES

edited by CONSTANCE HOLDEN

The First Gene Marker for IQ?

After 5 years of winnowing through genetic data on groups of normal and gifted children, scientists have identified the first marker for a gene that may influence what psychologists call "g," or general intelligence—the essence of what intelligence quotient (IQ) tests measure. It only accounts for a tiny portion of cognitive ability, but the researchers say it's a step toward the goal of tracing the biochemical pathways between genes and learning.

The researchers, led by psychologist Robert Plomin of the London Institute of Psychiatry, launched their hunt on chromosome 6. They used DNA from 51 children whose IQs averaged 103 and 51 children with a mean IQ of 136. Of the 37 markers looked at, one stood out: a stretch of DNA in *IGF2R*, an insulin-like growth factor receptor gene. Almost all the subjects had one or both of the most common versions of the gene, allele 4 and allele 5. But almost half of the high-IQ group had at least one copy of allele 5, a rate twice as high as in the average group. The finding was replicated in 102 other children, half of them with a superhigh IQ average of 160.

The researchers concluded that a gene very close to this marker, which itself is believed to be nonfunctional, could account for about 2% of the variance in IQ, or about 4 IQ points. The finding is published in the 1 May issue of the American Psychological Society journal *Psychological Science*.

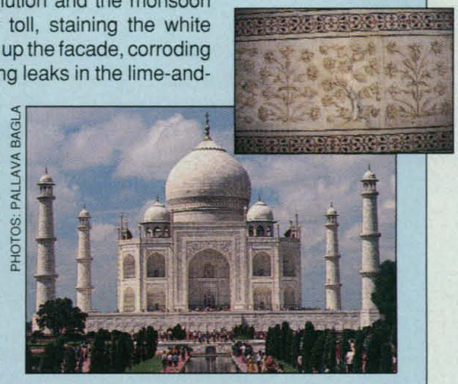
Plomin notes that seeking genes for normal behavioral traits is a hard slog, because unlike with most diseases, these are complex traits involving a great many genes. But he believes the approach, looking for quantitative trait loci (QTL), will eventually yield far more genes associated with g.

Plomin believes that although twin and adoption research has repeatedly demonstrated high heritability (at least 50%) for IQ, "only finding specific genes will convince" skeptics. But, he says, the real value of the work is in furthering "understanding how the brain works. ... IQ QTLs will open discrete windows through which we can view neurophysiological pathways between genes and learning." Nathan Brody, a psychologist at Wesleyan University in Middletown, Connecticut, sees the study as "the first step" toward making connections between biochemistry and cognition. "There are not even any real theories about what are the biological influences" in intelligence, he says. "I think this is very exciting."

Taj Mahal Rehab

Mughal Emperor Shah Jahan's love for his favorite wife, Mumtaz Mahal, has stood the test of time: The Taj Mahal, his monument to her, remains a stunning feat of architecture since construction was completed in 1653. But pollution and the monsoon rains have taken their toll, staining the white marble slabs that make up the facade, corroding metal braces, and drilling leaks in the lime-and-mortar terrace.

Now the Archaeological Survey of India, with help from UNESCO and the Rhône-Poulenc Rorer Foundation of Paris, has embarked on a 3-year, $237,000 project to ensure that the masterpiece of Indo-Islamic architecture will hold up at least a few more centuries. The project will include training four Indian scientists in Rhône-Poulenc's preservation lab in Lyons as well as at the Institute of Geology in Strasbourg. A lab will also be set up in the adjoining Agra Fort to monitor pollution and do research on better ways to conserve the Taj.



PHOTOS: PALLAVA BAGLA

Stained beauty. Taj Mahal, frieze *(inset)*.

Solar Tornadoes

Vast superhot tornadoes, big enough to span the Pacific Ocean, are ravaging the sun's poles at speeds of up to 200,000 kilometers an hour, astronomers reported this week at a meeting at Rutherford Appleton Laboratory (RAL) near Oxford, U.K. They said these storms may help explain how heat gets funneled into the sun's atmosphere as well as how the solar wind is generated. "It's really quite a discovery," says Eric Priest of the University of St. Andrews in Scotland.

The sun's atmosphere is a hot, turbulent gas of charged particles that streams off from its poles as the solar wind, which pervades the solar system and can wreak havoc on satellites and earthly power grids. Using the Solar and Heliospheric Observatory satellite, David Pike of RAL and colleague Helen Mason from the University of Cambridge have been looking for clues as to what drives the solar wind.

Training their sights on spurts of material, or microspicules, rising from the sun's poles, the duo discovered from light-spectrum measurements that the spurts were rotating—"swirling around much like a tornado," says Pike. The tornadoes may be unleashed when churning hot gases caged by the sun's magnetic field escape and erupt in a vortex. That, in turn, is helping to power the solar wind.

Another surprise is the extreme heat of the material in the tornadoes, about 250,000°C, far above the 6000°C of the sun's surface. With the outer reaches of the sun's atmosphere attaining millions of degrees, tornadoes might offer "an important clue" to how the solar atmosphere is heated, says Priest.

Ruffled Deans and Tenured Drones

Pulling no punches, a new report from the Carnegie Foundation has raised hackles among university administrators by assailing research universities for mostly ignoring undergraduates.

The report, "Reinventing Undergraduate Education: A Blueprint for America's Research Universities" (www.sunysb.edu/boyerreport), says "baccalaureate students are the second-class citizens who are allowed to pay taxes but are barred from voting, the guests at the banquet who pay their share of the tab but are given leftovers." The curriculum for freshmen, it says, is often "a bore"; and too many teachers are either raw grad students or "tenured drones" lecturing from "yellowed notes."

The panel recommends that research universities better train teaching assistants, get undergrads more involved in research and contacts with senior faculty members, and create a sense of "community." It also says research universities have no business offering remedial instruction.

The report, says panel chair Shirley Strum Kenny, president of the State University of New York at Stony Brook, is "a call to arms." But many, including the Association of American Universities (AAU), call it an insult. In a 22 April letter to *The New York Times*, AAU President Cornelius Pings wrote that the commission presented a "distorted picture." For example, he wrote, contrary to what the panel indicated, "one would be hard-pressed today to find a major research university that does not offer undergraduates a rich variety of research experiences, including the opportunity to work with senior faculty."