

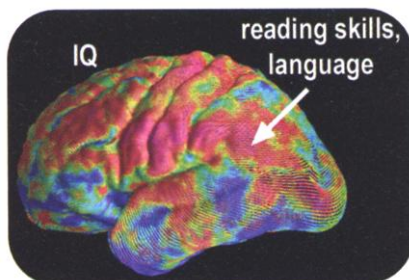
RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Mapping Gene Effects on the Brain

Scientists in California and Finland have done what may be the first study that provides estimates of the strength of genetic influences on the size and shape of different parts of the brain. The study, which compared brain images of identical and fraternal twins, shows very high heritability for areas associated with IQ and verbal skills. Cognitive tests also showed a "highly significant" relation between IQ and gray matter volume in the frontal cortex.

"This is the first time images have been made showing the degree to which brain structure depends on our genes," says Paul Thompson of the Laboratory of



Red shows where identical twins are most similar on brain scans, thus indicating which brain areas are under the tightest genetic control.

Neuro Imaging at the University of California, Los Angeles. His team did brain scans of 20 pairs of adult twins, half of them identical twins. They found that the volume of gray matter (which contains the nerve cell bodies—as opposed to white matter,

which is the axons) in frontal lobes and in the language areas of the temporal lobes was virtually the same in the identical twins but differed substantially in fraternal pairs, meaning that it is largely governed by genetic factors, the scientists report in the December *Nature Neuroscience*.

The researchers say the work will help them understand the genetics of brain diseases, such as schizophrenia, that affect the cortex. "Finding which structures are under greatest genetic control provides keys to where to look for degeneration," says Thompson. For example,

family members of schizophrenics have frontal cortex deficits, but without a clearer understanding of how genes normally influence the structure, he says, "we still don't know if that is an 'at risk' structure or just the common familial structure."

Brain researcher Sandra Witelson of McMaster University in Ontario says, "To my knowledge this is the first study reporting a heritability estimate for gray matter volume and gyral patterns." Witelson, who has been studying Einstein's brain, says that language and spatial areas identified as under stringent genetic control are the same areas that have a "unique" configuration in Einstein's cortex, suggesting he inherited his unusual talents.



Jumbo Cockroach Fossil

Paleontologists have found the world's largest fossil cockroach, which predates the first can of Raid by 300 million years. The as-yet-unnamed species has a 78.8-mm forewing, just 1.2 mm shorter than the largest living roach, says Cary Easterday, a graduate student at Ohio State University in Columbus.

The fossils come from a coal mine in eastern Ohio, which turned out to be a Paleozoic roach motel. Cockroaches comprise 65% of the animal specimens found there, the rest being other arthropods such as centipedes, millipedes, and spiders, Easterday told the meeting of the Geological Society of America in Boston last week.

Warming Up Wind Chill

For many a winter Randall Oszcewski has been treating friends to tirades about the phoniness of the wind-chill index, which supposedly tells you how cold your face really gets when the wind is blowing. Now Oszcewski, a self-described "defense scientist" at the Toronto-based Defence and Civil Institute of Environmental Medicine, and engineer Maurice Bluestein of Indiana University—Purdue University in Indianapolis have done something about their pet peeve: They've crafted a new wind-chill index that was adopted this month by the Canadian and American weather services.

It turns out the index is based on amateurish experiments that measured how long it took to freeze water in a plastic baby bottle exposed to various temperatures and wind speeds. But that system overrated the effect of wind on bodily heat loss, says Bluestein. For one, it didn't account for the fact that once the wind has swept off the insulating layer of air next to the skin, it doesn't

matter much how fast it's blowing. "Beyond around 10 miles per hour, there's not a great deal more cooling power," says Bluestein.

The new index was developed using 12 volunteers on a treadmill in a refrigerated wind tunnel. They walked for 30 minutes in different temperatures and wind speeds, while face and mouth sensors measured heat loss. In one trial, the volunteers were sprayed with water every 15 seconds to determine whether that affected their frostbite thresholds.

The upshot: Now, if it's -20°C and the wind is blowing at 20 kilometers per hour, the wind chill is -30° . Under the old formula it was -34° . "It's gonna feel as cold as it did before," notes Oszcewski. "It just won't sound so frightening."

Science's Vanity Fair

Seed, a magazine of "science couture," burst upon the planet this month. Apparently aimed at glamorous young rich people with good eyesight and short attention spans, the first issue of this glossy visual extravaganza features quirky caption-length essays on chocolate, birth, planetary orbits, and so forth, as well as an article on primates by science writer Matt Ridley and photos by MIT artist-in-residence Felice Frankel. It is the brainchild of 20-year-old Montreal native Adam Bly, who last year won the grand prize in biochemistry at the International Science and Engineering Fair 2000. The new bimonthly, backed by a number of private industrial investors, "is a carnet [*sic*] of sequential epiphanies," says Bly in an editorial—"A book that reinvents science as a lifestyle."

