ENTOMOLOGY

Buzz Off, Heat

Hornets may chill out with a bit of electricity, say a group of biologists and physicists from Tel Aviv University. Infrared images of hornets anesthetized in their nest revealed that the cuticle around body parts such as the abdomen could be up to 3 degrees Celsius cooler than the nest material. Evaporation from the mouth cannot account for the abdominal cooling; rather the researchers assert that the hornets' cuticles may be thermoelectric. Such materials change temperature when an electric current passes through them. But insect physiologist Allen Gibbs of the University of Arizona thinks that evaporative cooling could in fact do the trick and that the measurements may be misleading because of differences in air and nest temperature. Until studies of the cuticle's thermal and electrical conductivity and the hornets' water loss and metabolic activity come in, he says, "put me down as a skeptic." The paper scorches the pages of the May 30 *Physical Review Letters*.

—JR Minkel

ORIENTAL HORNETS (*Vespa orientalis*), shown here munching raw meat, may stay cool with electricity.

ENVIRONMENT

Not So Friendly Hydrogen

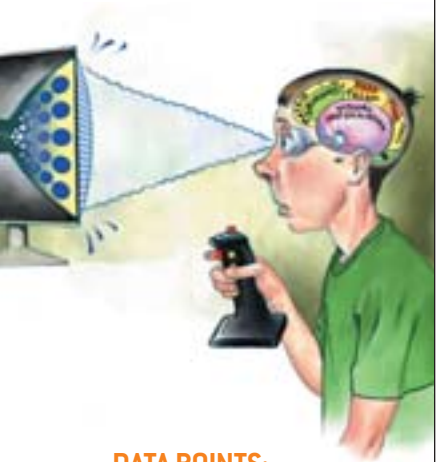
Burning oil and gas can lead to smog, acid rain and global warming, whereas burned hydrogen generates only water. But hydrogen engines may not prove as environmentally friendly as thought. Current systems are leaky, with 10 percent or more of hydrogen escaping uncombusted. California Institute of Technology researchers calculate that if hydrogen fuel cells replaced all oil- and gas-burning technologies, people would release four to eight times more hydrogen into the atmosphere than they do now. The hydrogen would oxidize and form water, clouding the overlying stratosphere, and the resulting cooling would encourage ozone-destroying chemical reactions. The investigators say that preventing hydrogen seepage could offset this damage, as could decreases in ozone-eating chlorofluorocarbons over time and better-than-expected hydrogen absorption by soil. Their report appears in the June 13 *Science*. *—Charles Choi*

VISUAL RECOGNITION

If U Cn Rd Ths . . .

FEATURES on letters help enable reading.

Despite having read 100 million words or more by age 25, the average literate person does not have an easier time identifying common words compared with any word of the same length. Researchers asked volunteers to make out familiar English words or letters hidden in various levels of contrast. Reading efficiency was linked not to how common a word was but to how many letters it had: four-letter words were twice as hard to recognize as two-letter ones, for instance. Furthermore, words proved unreadable unless tiny features of each letter are recognizable, demonstrating severe limitations on the brain's ability to process visual patterns, the researchers say. Such handicaps may have arisen to suppress reflexive attempts to recognize a deluge of inconsequential details. The findings appear in the June 12 *Nature*. *—Charles Choi*



DATA POINTS: TRIGGER HAPPY

Fans of shoot-'em-up video games process visual information better than nongamers. C. Shawn Green and Daphne Bavelier of the University of Rochester tested subjects on various tasks, such as recognizing an object in a sequence and counting several items at once. Practice with action games enabled nonplayers to improve their visual attention skills—useful perhaps in driving and in combat training.

Number of items flashed that game players could see: 4.9

Number that nongame players could see: 3.3

Accuracy of game players: 78

Accuracy of nongame players: 65

Increase in flashed items seen among those trained on action game Medal of Honor: 1.7

Increase in those trained on puzzle game Tetris: 0

Daily training time: 1 hour

Number of training days: 10

KRIS MERCER (*top*); PETE McARTHUR (*bottom*); ILLUSTRATION BY MATT COLLINS

ECOLOGY

Fueling Predictions

BETTER FORECASTS may prevent blazes such as this one last year in California's Anza-Borrego Desert State Park.

Wildfire predictions rely heavily on summer weather forecasts, alerting fire crews only a few weeks in advance. But warnings might be extended by a year or more, because long-term climate can have an even greater influence than short-term weather. Anthony L. Westerling of the Scripps Institution of Oceanography and his colleagues correlated more than 20 years of climate and vegetation records with wildfire statistics. Their analysis reveals that the flammability of nonforested regions—home to more than half of U.S. wildfires—depends most on rainfall during previous summers. If persistent drought kills off grasses and shrubs, then the next year's fire season will be less severe. In forests, the opposite is often true; although dry spells diminish kindling, they also make vegetation more combustible. The findings, in the May *Bulletin of the American Meteorological Society,* could help douse blazing costs: U.S. agencies spent more than $1 billion fighting the fires that ravaged some 6.4 million acres last year. *—Sarah Simpson*

PHYSICS

Forced Attraction

Opposites attract and like repels, at least when it comes to electricity and magnetism. Now physicists suggest that it could be possible to bind positive charges to other positive charges. The result could be otherwise impossible "molecules," in which proton-loaded atomic nuclei stick together without electrons. The trick: high-power lasers, which could push atomic nuclei and keep them spinning around one another instead of exploding apart. Sufficiently intense laser pulses could then slam the nuclei together. Such experiments could boost understanding about nuclear activity in stars and improve laser-driven fusion reactor design. The hope is that tabletop equipment could generate fast enough laser pulses for nuclei confinement or collision. The team at the National Research Council Canada in Ottawa presents its findings in the June 20 *Physical Review Letters.* *—Charles Choi*

BIOLOGY

See under the Sea

Clear vision certainly helps get the job done. For the Moken people, who live along the coasts of Myanmar and Thailand, that means being able to spot clams, sea cucumbers and other food on the ocean bottom. But as any swimmer knows, blurriness rules underwater. Anna Gislén of Lund University in Sweden and her colleagues have uncovered an unusual adaptation: unlike European kids, Moken children "accommodate," or focus on objects, when they are underwater. Moreover, the Moken reduce the size of their pupils, a reflex resulting from accommodation and perhaps from a physiological response to diving. Like a pinhole camera, an eye with a smaller pupil produces sharper images. The adaptations enable the Moken to see twice as well underwater as landlubbers do. Gislén is testing Swedish children to determine if underwater focusing can be learned. "Preliminary data suggest this ability is very much trainable," she remarks. The May 13 *Current Biology* contains the report. *—Philip Yam*

CONSTRICTED PUPILS show that the Moken can focus underwater.

DAVID McNEW *Getty (top)*; PIERRE PERRIN *Corbis Sygma (bottom)*

BRIEF POINTS

- **A common gene therapy vector, a leukemia retrovirus, integrates its genes near active genes, possibly disrupting them. Researchers previously thought that the integration occurred randomly and thus did not pose a hazard to a patient's genes. The finding may explain recent failed trials in which patients developed leukemia.**

  Science, June 13, 2003

- **Keep the mystique: Rather than wearing casual clothing such as jeans and sneakers, physicians are better off donning white lab coats with name tags. Patients feel that such attire projects confidence and inspires trust.**

  Archives of Internal Medicine, June 9, 2003

- **A noise thermometer can go from near absolute zero to room temperature. Made of metal strips around an insulator, it depends on the tunneling of electrons, which creates temperature-dependent "shot" noise.**

  Science, June 20, 2003

- **Saturn's winds have died down from 1,700 kilometers per hour in the early 1980s to a current speed of 1,000 kph—a result perhaps of the planet's long seasonal cycles and equatorial shadows cast by its rings.**

  Nature, June 5, 2003