

SCIENCE ILLUSTRATED

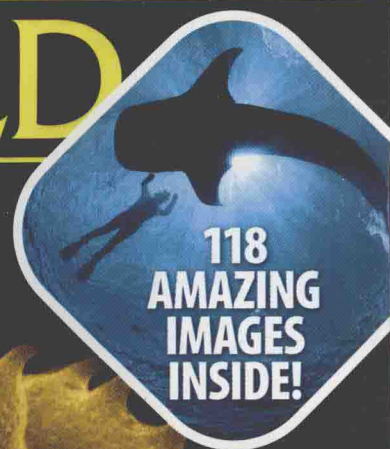
CSI: POLLEN

**The Brilliant
Forensics Tool That's
Catching Criminals
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Surviving Death Valley

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Using NASA Tech to Track Whale S

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Harnessing the Power of the Seas



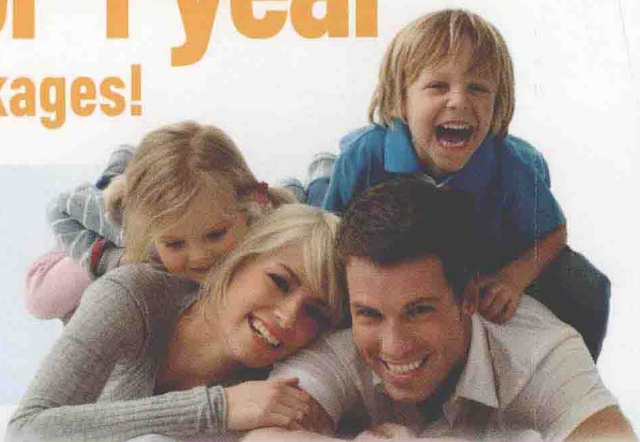


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~Dr. Patrick Adu-Peasah

Agriculture Sciences

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It Pays to Know Your Planet

Geology, the study of Earth's physical structure and resources, is a fascinating subject you can participate in every day. **The Nature of Earth: An Introduction to Geology** presents this scientific field in all its richness. In this course, you learn how the rocks under your feet are formed, how to recognize a killer volcano, how groundwater is produced, and what plate tectonics reveals about why natural phenomena occur where they do.

But geology is also about everyday human issues, including the fluctuation of gas prices and what to do when a well runs dry. Taught by award-winning Professor John J. Renton—an educator who has taught introductory geology for over 35 years—these 36 lectures reveal the wonders of geology. They also teach you how to find the history and meaning hidden in the many pieces of Earth.

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| 4. Plate Tectonics | 22. Ice Sculpts the Final Scene |
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| 12. Phases of Volcanic Activity | 30. Earthquakes |
| 13. The Hawaiian Islands and Yellowstone Park | 31. Damage from Earthquakes |
| 14. Mass Wasting—Gravity at Work | 32. Seismology |
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TOOLS + TECHNIQUES

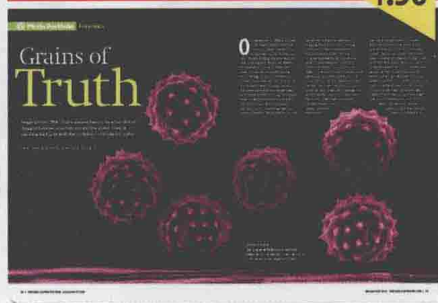
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How astronomers measure the mass of the sun and more-distant stars.

FORENSICS

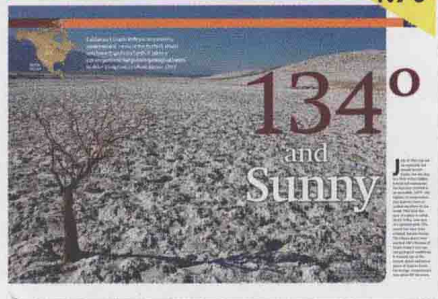
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Pollen does more than make you sneeze—it's also a cutting-edge crime-fighting tool.

ECOLOGY

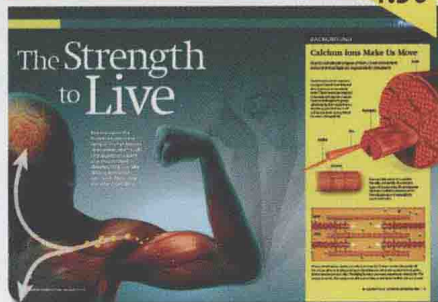
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What makes California's Death Valley one of the hottest, driest places on Earth?

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Scientists pinpoint disease-fighting compounds released during exercise.

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From feast to famine—the ingenious ways animals survive during times of scarcity.

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Tracking the world's biggest fish, whale sharks, with star-mapping software.

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Next-generation hydroelectricity: Tide- and wave-power research makes strides.

"Suspended in clouds, fossilized inside ancient rocks, hidden in the lint in your pants pockets—pollen is everywhere."

P.36



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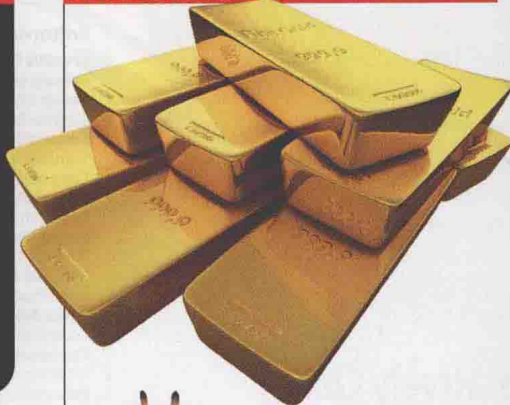
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This month's gallery of amazing images: a neuron close-up, dragonfly eyes, a Roman artifact and a solar-powered prototype.

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Good news for giraffes, long-lost cityscapes, better-fitting dentures, sailing into space, Stone Age cannibals and a robot fish.

Ask Us p.27

You asked, we answered: What's a galactic collision like? How do birds get their colors? What's the biggest predatory land mammal?

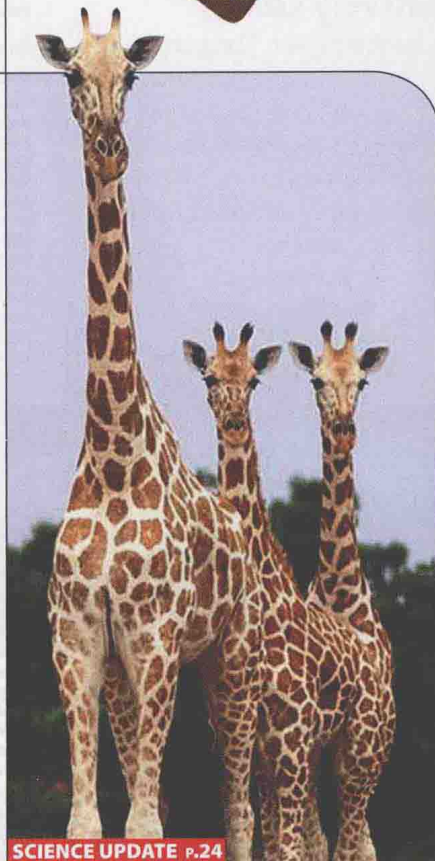
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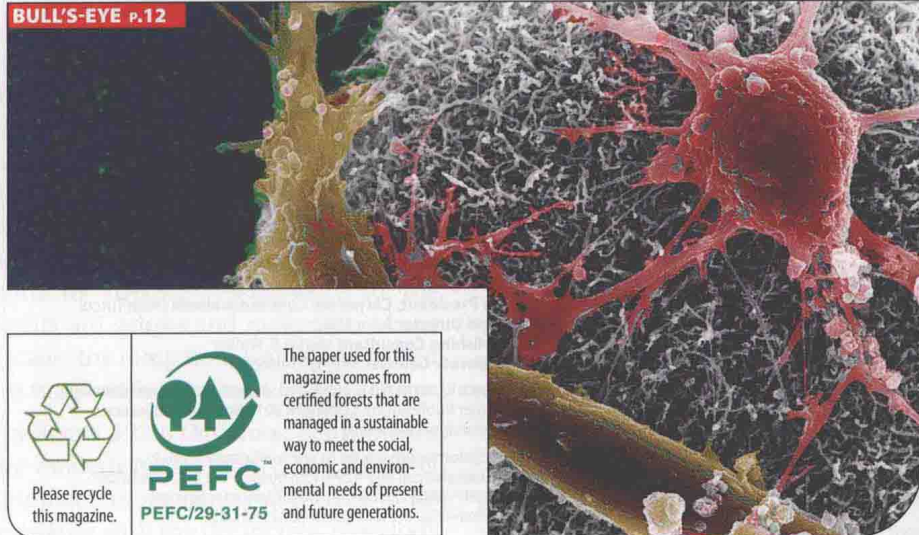
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Please recycle
this magazine.



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The paper used for this magazine comes from certified forests that are managed in a sustainable way to meet the social, economic and environmental needs of present and future generations.

To see results like that
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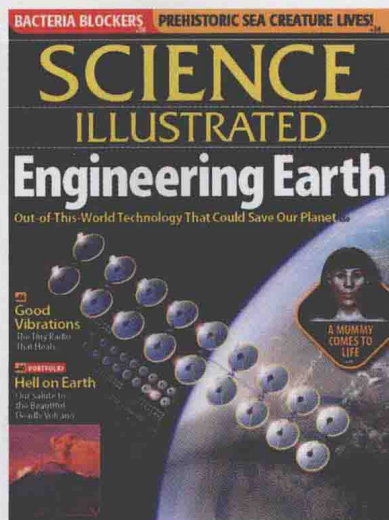


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Heated Debate

In "Reengineering Earth" [May/June], you discuss biochar production, a process I research, in which decaying plant material, which produces CO_2 , is partially burned and the remains plowed back into the soil. Contrary to your story, there is enormous potential for biochar carbon sequestration without any need to produce additional crops that compete with food production.

Christoph Steiner Via e-mail
University of Georgia

Tricky Figures

You state that humans emit 600 million tons of CO_2 into the air every week ["Reengineering Earth"]. This is equal to 31.2 billion tons a year, which is four times the actual amount.

Ruben Behnke Via e-mail

EDITORS: Our statistic was based on figures published by the U.S. Department of Energy's Energy Information

Administration and the Intergovernmental Panel on Climate Change, both of which use the mass of CO_2 to measure emissions. Other sources measure emissions using the mass of carbon, which gives lower numbers. If you convert the carbon figures to CO_2 , the emission amounts are roughly as stated in the article.

Relatively Close

I was surprised that "Long Live the Horseshoe Crab" [May/June] didn't mention that the animals are believed to be descendants of trilobites, extinct marine invertebrates that were dominant around 540 million years ago.

David Bartolic Via e-mail

EDS: We asked John Tanacredi, a marine scientist at Dowling College, to weigh in: "Horseshoe crabs have evolved from a similar body plan as trilobites and probably shared the same marine environment as them several hundred million years ago," he explains. "Some believe they are direct descendants, but the majority of scientists think we don't know definitively."

Life As We Know It

Although bacteria are numerous in the Antarctic Dry Valleys, they are not the sole inhabitants of this region ["Contrast," March/April]. Our research team has found thousands of metazoans (i.e. nematodes, tardigrades, rotifers, springtails and mites) living in soil and water sampled from this environment.

Adam Clayton Via e-mail
Brigham Young University

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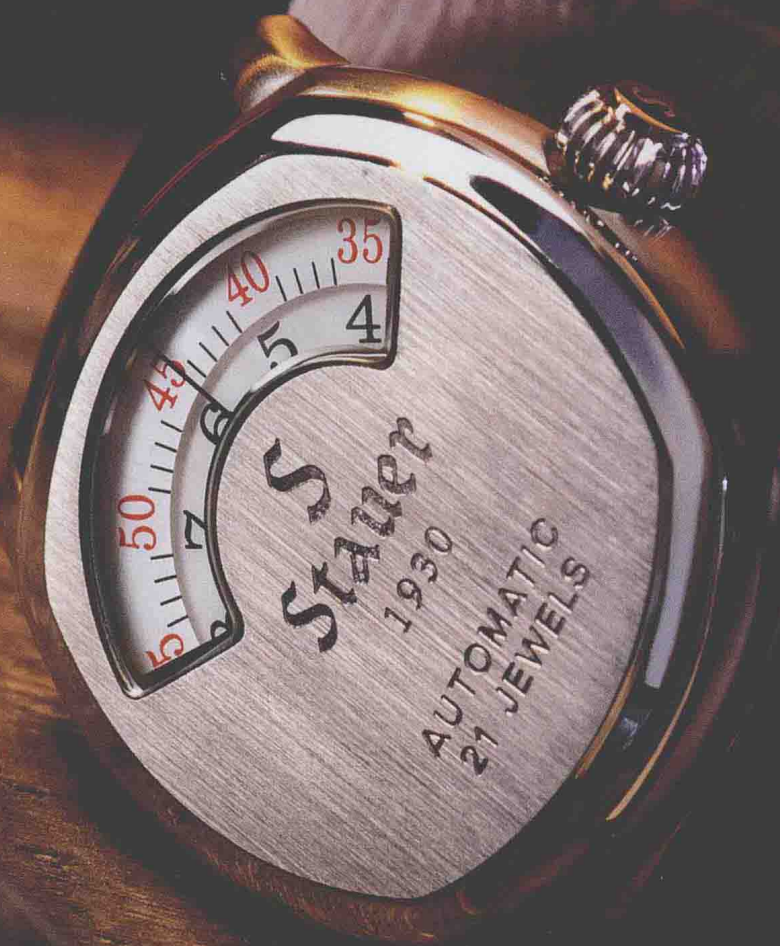
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Truly Unique



Time travel at the speed of a 1935 Speedster?

The 1930s brought unprecedented innovation in machine-age technology and materials. Industrial designers from the auto industry translated the principles of aerodynamics and streamlining into everyday objects like radios and toasters. It was also a decade when an unequaled variety of watch cases and movements came into being. In lieu of hands to tell time, one such complication, called a jumping mechanism, utilized numerals on a disc viewed through a window. With its striking resemblance to the dashboard gauges and radio dials of the decade, the jump hour watch was indeed "in tune" with the times!

The Stauer 1930s Dashtronic deftly blends the modern functionality of a 21-jewel automatic movement and 3-ATM water resistance with the distinctive, retro look of a jumping display (not an actual



True to Machine Art esthetics, the sleek brushed stainless steel case is clear on the back, allowing a peek at the inner workings.

jumping complication). The stainless steel 1 1/2" case is complemented with a black alligator-embossed leather band. The band is 9 1/2" long and will fit a 7-8 1/2" wrist.

Try the Stauer 1930s Dashtronic Watch for 30 days and if you are not receiving compliments, please return the watch for a

full refund of the purchase price. If you have an appreciation for classic design with precision accuracy, the 1930s Dashtronic Watch is built for you. This watch is a limited edition, so please act quickly. Our last two limited edition watches are totally sold out!

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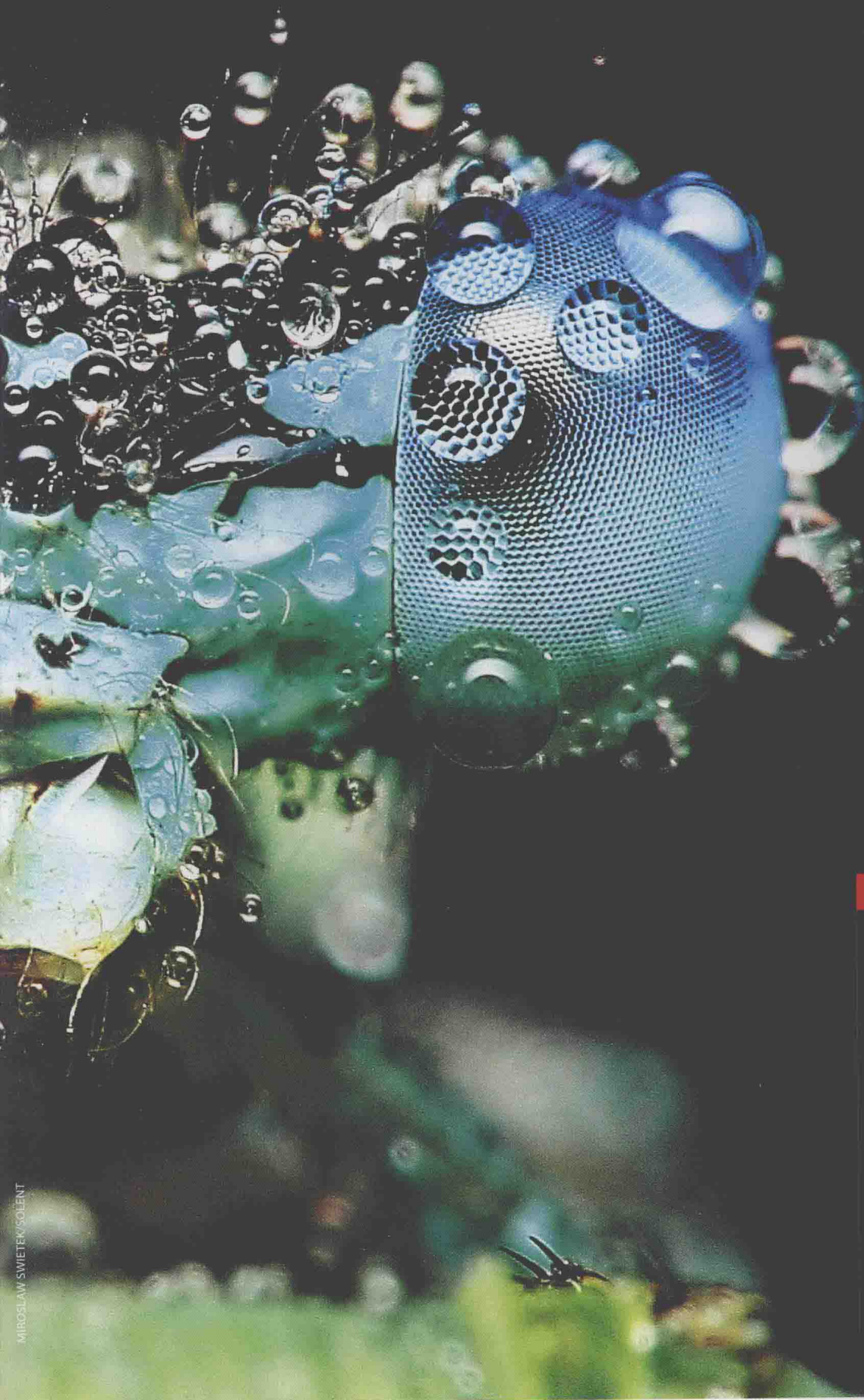
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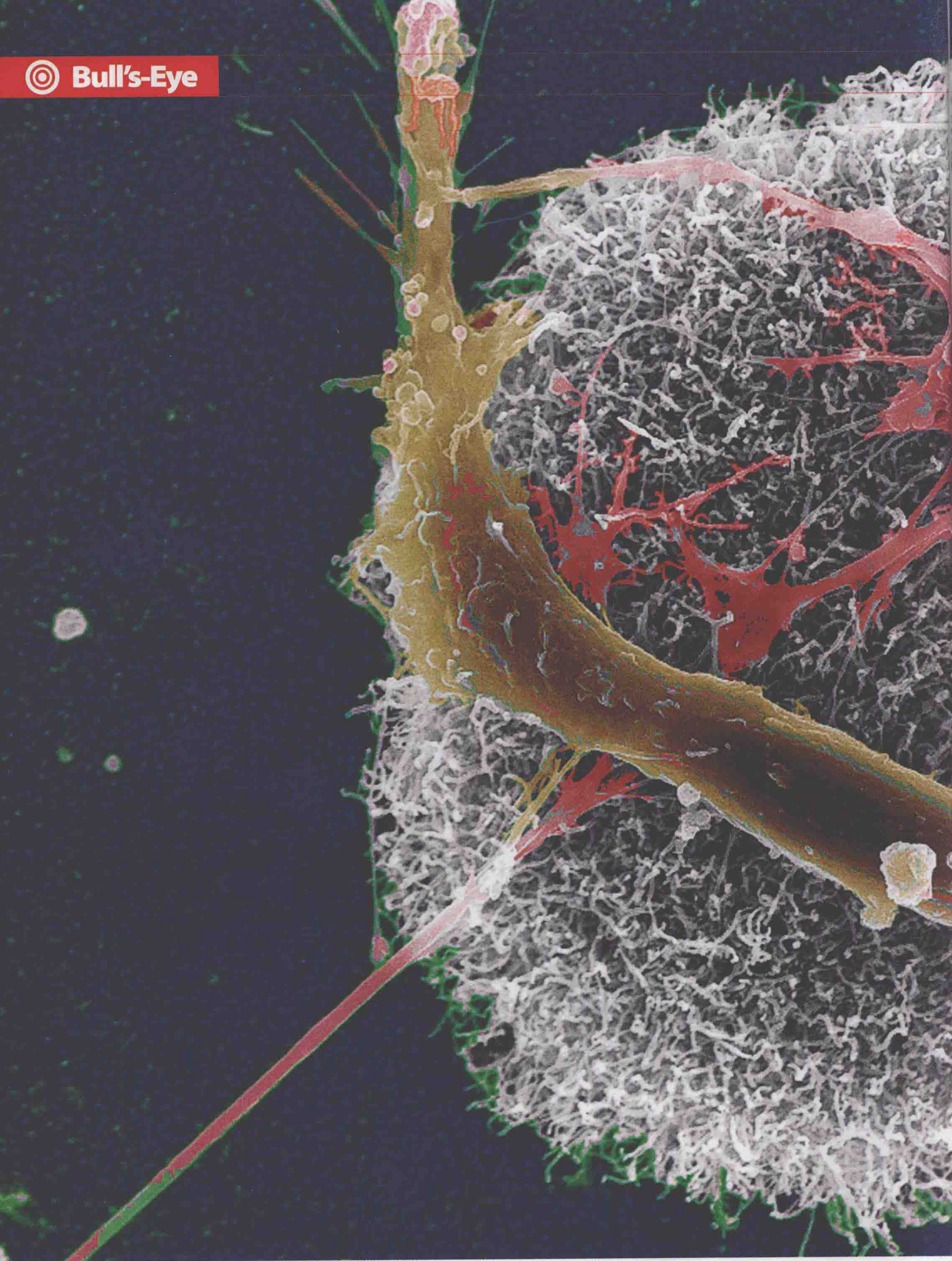
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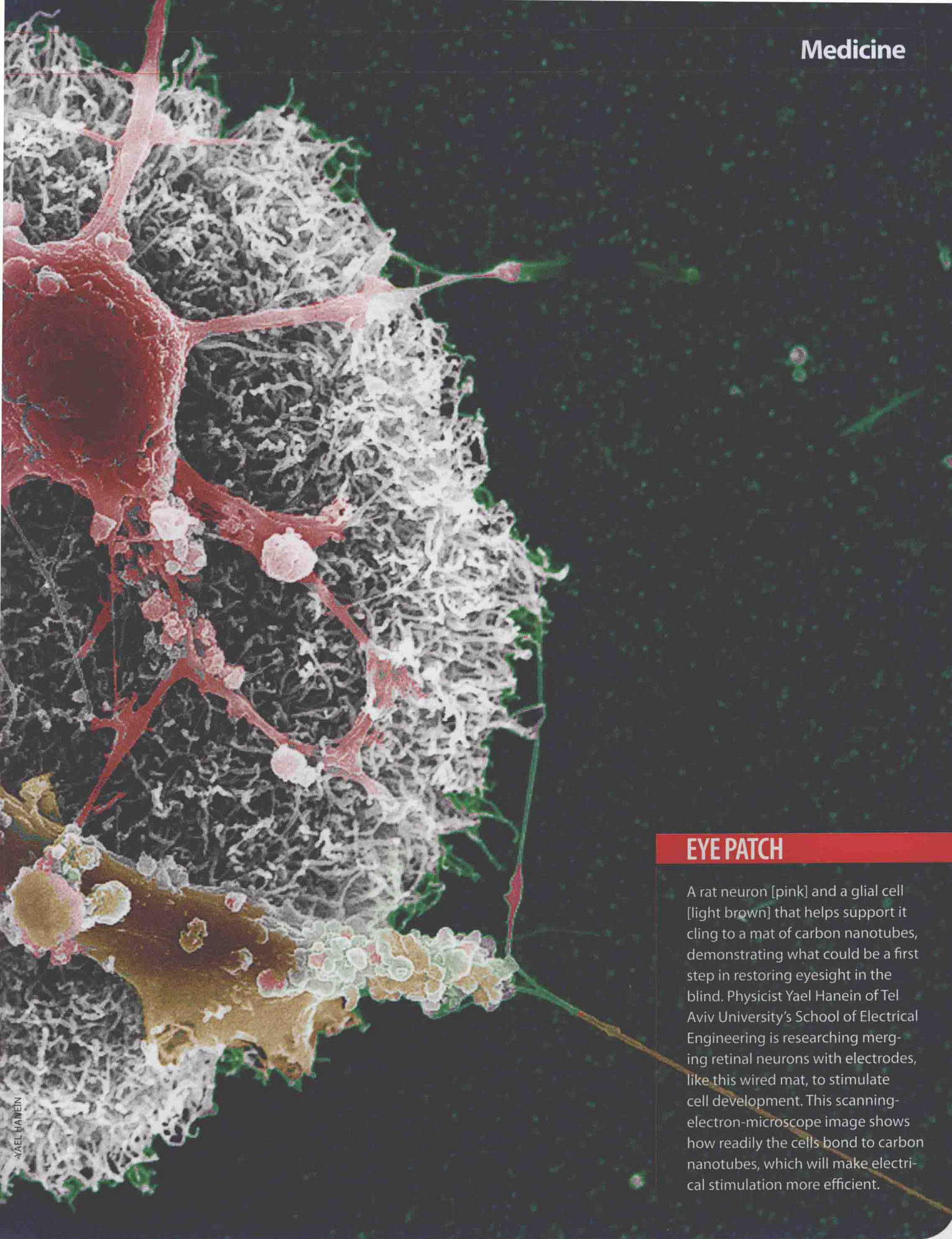
Early-morning dew glistens on a sleeping dragonfly, captured here by amateur photographer Mirosław Świętek in a forest near the town of Mikoszowa in southwestern Poland. The jewellike beads of water magnify the insect's eye facets, or ommatidia, which work together to give the bug a spherical field of vision. Dragonflies can have as many as 30,000 eye facets, the highest number yet found in nature.

GOLDEN STEED

Archaeologists in Hessen, Germany, prepare a 2,000-year-old bronze horse head for restoration. The artifact, which is covered in gold, is believed to be part of a life-size statue of the Roman emperor Augustus astride a horse. Two similar bronze equestrian statues have been found in Italy, and all date back to when the areas were occupied by the Romans. The head was discovered in an ancient well during excavations at Waldgirmes, about 30 miles north of Frankfurt, at a site now thought to have been a planned Roman city. Researchers also found what they believe is the heel of the rider and hundreds of other fragments scattered across the site. The settlement was abandoned sometime between A.D. 9 and 16.







EYE PATCH

A rat neuron [pink] and a glial cell [light brown] that helps support it cling to a mat of carbon nanotubes, demonstrating what could be a first step in restoring eyesight in the blind. Physicist Yael Hanein of Tel Aviv University's School of Electrical Engineering is researching merging retinal neurons with electrodes, like this wired mat, to stimulate cell development. This scanning-electron-microscope image shows how readily the cells bond to carbon nanotubes, which will make electrical stimulation more efficient.

Yael Hanein



BRIGHT FLIGHT

After seven years of research and development, the solar-powered HB-SIA aircraft took its premiere test flight over the Swiss countryside in April. The prototype is the first to come out of the Solar Impulse project spearheaded by Swiss adventurer Bertrand Piccard, who is aiming for completely solar-powered circumnavigation of the globe by 2013. For this 87-minute test run, which proved that the craft could fly as well as it did in simulations, the HB-SIA ran on four batteries charged by electrical-grid power. In future runs, including night flights, the craft will be powered purely by battery-stored solar energy collected from 11,000-plus photovoltaic solar cells that cover the plane's wings and the horizontal stabilizer on the tail.