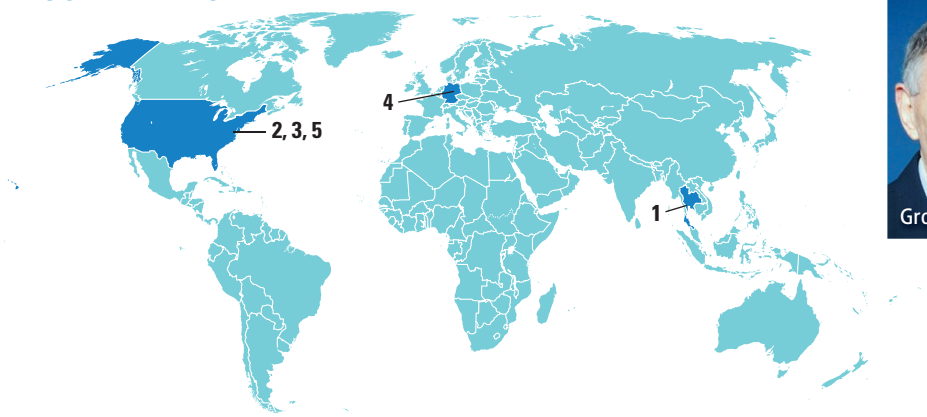
AROUND THE WORLD



Ratchaburi Province, Thailand **1**

Dengue Vaccine Shows Promise

A vaccine against dengue—a debilitating and sometimes fatal viral disease that's widespread in the world's tropical regions—has shown promise in its first phase III trial, although it hasn't entirely fulfilled the hopes of its producer, French vaccine manufacturer Sanofi. In a trial among 4002 children aged 4 to 11 years in Ratchaburi Province in Thailand, the vaccine proved safe and effective against three of the four circulating dengue strains, the company said in a press release on 25 July. The vaccine was designed to protect against all four strains, which dengue experts say is the ideal.

Sanofi declined to issue details of the study; they will be submitted for publication soon, a spokesperson says. A vaccine that protects against only three strains "might slow down licensure a bit," says Duane Gubler, a dengue expert at the Duke University–National University of Singapore Graduate Medical School Singapore, but would still "be very important from a public health point of view." Because of cross-protection from the other strains, vaccinated people would be unlikely to develop the most severe—and often fatal form—of the disease, called dengue hemorrhagic fever, Gubler says. At least five other dengue vaccines are in clinical trials.

Spray-off. A Thai Disease Control officer sprays a chemical to kill dengue-spreading mosquitoes.

Washington, D.C. **2**

U.S. Court Says Stem Cells Are Drugs

A U.S. federal court has found that a stem cell therapy offered by a Colorado clinic is a regulated drug. The ruling could spur a U.S. Food and Drug Administration (FDA) crackdown on other clinics offering untested adult stem cell treatments.

Regenerative Sciences Inc. in Broomfield, Colorado, uses stem cells extracted from a patient's own bone marrow to treat bone and joint injuries. The company calls its treatment a medical procedure. But in a 2010 suit, FDA argued that because the stem cells are more than "minimally manipulated" and the procedure uses reagents that cross state lines, the cells are an FDA-regulated biological drug. On 23 July, the U.S. District Court for the District of Columbia in Washington, D.C., granted FDA an injunction, agreeing that "the cultured cell product is a drug" according to federal law.

University of Minnesota bioethicist Leigh Turner says the ruling "is particularly important given … the proliferation of [U.S.] clinics marketing stem cell procedures," many of which "appear to be pushing stem cell quackery." Regenerative Sciences plans to appeal.

Washington, D.C. **3**

Fracking Report Under Scrutiny

A controversial study of hydraulic fracking released in February will be reviewed by an independent panel of experts. The study was criticized last week when an advocacy group highlighted the financial ties of geologist Charles "Chip" Groat, the lead author of the study, to an energy company.

The report analyzed the risks and benefits of hydraulic fracturing, or fracking, a type of drilling used to extract natural gas from shale. It found that fracking hasn't contaminated ground water.

But Groat, former head of the U.S. Geological Survey and now associate director of the Energy Institute at the University of Texas, Austin, didn't disclose a potential conflict of interest: He serves on the board of Plains Exploration & Production Co., which conducts fracking in the United States.

Groat says he thought his board membership wasn't relevant to the project and he didn't have an actual conflict of interest. In a statement released on 24 July, Steven Leslie, provost and executive vice president of the University of Texas, Austin, said he hoped to have the independent review of the study completed in a few weeks.

http://scim.ag/Groatfrack

Halle, Germany **4**

Poor Review for Biofuels

Germany's National Academy of Sciences Leopoldina has come down firmly against the use of crops for energy. In a report issued on 26 July from a panel of more than 20 experts who have been working together

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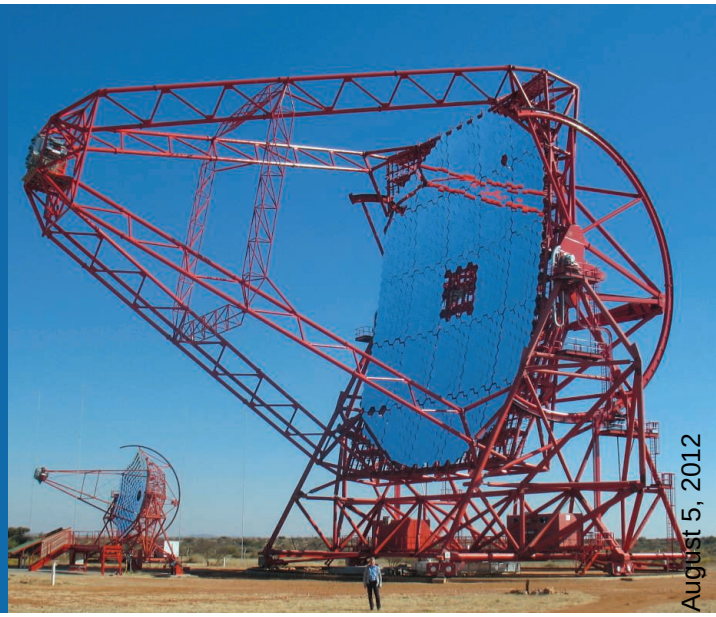
First Light for HESS II

The world's largest telescope to observe the highest energy photons from space saw its first light in Namibia last week. Paradoxically, the HESS II telescope—with a dish the size of two tennis courts—does not direct its gaze out into space, but inside Earth's atmosphere.

High-energy gamma rays are immune to conventional optics and don't penetrate the atmosphere. So HESS II looks out for flashes of blue light, known as Cherenkov radiation, emitted by the cascade of particles that ensue when a gamma ray hits the upper atmosphere. Its ultrafast snapshots can tell astronomers the incoming particle's energy and direction. HESS II "resolves the cascade images at unprecedented detail, with four times more pixels per sky area compared to the smaller telescopes," says Pascal Vincent of France's National Institute for Nuclear and Particle Physics.

Astrophysicists think the gamma rays come from cosmic particle accelerators such as supermassive black holes, supernovae, and pulsars. HESS II, an addition to the four smaller dishes of HESS I that have operated at the site since 2004 (*Science*, 3 September 2004, p. 1393), will give them unrivaled information about such objects.



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since 2010, the academy concludes that biofuels should play only a small part in the move toward sustainable sources of energy.

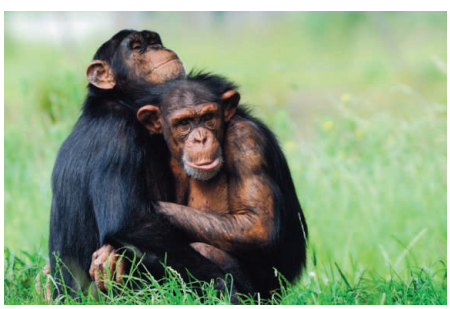
Biofuels use more land area, generate more greenhouse gas emissions, and have a greater impact on the environment than other alternative energy sources such as photovoltaic solar energy, solar thermal energy, or wind power. Biofuel crops may also find themselves competing with food crops for valuable land.

Washington, D.C. **5**

Ape Research Ban Moves Forward in Senate

A Senate panel last week approved a bill that would ban invasive research on great apes in the United States. The Great Ape Protection and Cost Savings Act of 2011, sponsored by Senator Maria Cantwell (D–WA), would ban research that may kill, injure, or cause fear, pain, distress, or trauma to a great ape—defined as a chimpanzee, bonobo, gorilla, orangutan, or gibbon. It would also require that the more than 900 chimpanzees now being used in invasive research in the United States be retired. An amendment adopted during markup by the Senate Committee on Environment and Public Works would set up a federal task force to approve exemptions after consulting with the public.

Research advocacy groups say the bill conflicts with a 2011 Institute of Medicine report recommending that chimp research continue under specific circumstances. The



Federation of American Societies for Experimental Biology protested that the bill would make it difficult to start a research program quickly to study an emerging disease. A House of Representatives version of the bill is awaiting action by the House Energy and Commerce Committee health subcommittee; some onlookers say a final bill is unlikely to be approved by the full House and Senate this year.

NEWSMAKERS

Three Q's

Paleobotanist **Kirk Johnson** was named the new director of the Smithsonian Institution National Museum of Natural History last week. Chief curator at the Denver Museum of Nature & Science, Johnson, 51, will start on 29 October, replacing Cristián Samper, who on 1 August took over the Wildlife Conservation Society in New York City.

Q: How do you want to influence the community?

The museum is the urban touchpoint to the natural world. You have all these scientists making all these discoveries one wall away from 7.4 million visitors. I will be exploring ways to use social media, innovative exhibitry, and the Internet to make what happens at the museum more accessible.

Q: What challenges does the Smithsonian natural history museum face?

There's a tremendous amount of confusion in this country about what science is and how science accrues knowledge for the betterment of the community. Connecting the content and the joy of science to the public is something that can be done better here than any place else in the country.

Q: Do you have any innovative ideas for the renovation of the dinosaur hall?

When people go to a museum, they see dusty dinosaurs; they don't realize that new dinosaurs are being discovered at an incredible rate every year. My thought is: How do you make this exhibit something that demonstrates the vitality of paleontology? It's also a science that has tremendous information about how the planet has changed through time. To realize that the polar regions have been forested for most of our history, not just covered by ice … is a very amazing thing [about which] most people in the street have no idea. But that's paleontology 101.

CREDITS (TOP TO BOTTOM): H.E.S.S. COLLABORATION, STEFAN SCHWARZBURG; ISTOCKPHOTO.COM; FORREST GIBSON/DENVER MUSEUM OF NATURE & SCIENCE

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Random Sample

Raindrops Keep Falling on My …

Birds do it. Bees do it. Even raindrops do it—pollinate flowers, that is. In China, researchers were puzzled by the high reproductive rates of an orchid called *Acampe rigida*. As flowers go, *A. rigida* doesn't have much going for it: It has an attractive odor but offers no nectar reward to would-be pollinators, and such "deceptive" species tend to produce few fruits. Furthermore, it flowers during the rainy season, when visits by insects tend be rare. Nor do its flowers seem designed for self-pollination. So plant reproductive biologist Jiang-Yun Gao from the Chinese Academy of Sciences Xishuangbanna Tropical Botanical Garden and his colleagues spent 4 years studying this orchid in the wild and in the lab.

The researchers filmed the flowers during a rain shower (as well as under an actual showerhead), and discovered a curious effect: When rain splashes on the orchid's male sexual organs, it flicks a tethered, pollen-laden bundle upward. As the bundle bounces back on the tether, it lands exactly where it needs to be to pollinate the flower. Plants shielded from rain, on the other hand, produce no fruit, Gao's team reports this week in *Annals of Botany*.

A few other plants can be pollinated in the rain, but *A. rigida* seems to be the first discovered that really depends on rain to do this job. "I think it is likely to make plant reproductive biologists appreciate that rain is not always detrimental for flowers, causing damage, but in some cases can actually aid in promoting reproductive success," says co-author Spencer Barrett, a botanist at the University of Toronto, St. George, in Canada.

BY THE NUMBERS

15.4 Percentage of men who have sex with men in the United States who are infected with HIV, according to a study published online 20 July in *The Lancet*.

53 Number of low-income countries that are projected to move to middle-income status by 2020, according to Bernhard Schwartländer, director for evidence, strategy, and results at UNAIDS.

104 Kilometers per hour that a cheetah can run, or a duck can fly—still almost twice as fast as even the fastest Olympic athlete can run, notes a study published 28 July in *Veterinary Record*.

FINDINGS

Earth Keeps Sucking Up Greenhouse Gases

Earth's oceans, plants, and soils suck up about half of the carbon dioxide humans put in the atmosphere by burning fossil fuels. Without these carbon sinks operating at their usual pace, the additional greenhouse gas would make global warming even stronger. But the warming itself could be throwing a monkey wrench in the works by stressing plants and slowing their uptake of carbon dioxide. Some researchers have in fact reported a worrying slowing of carbon dioxide uptake in one part of the globe or another.

In this week's issue of *Nature*, however, a group reports that the planet's carbon sinks are on the whole doing just fine. The researchers calculated how much carbon has been going into sinks by subtracting the amount remaining in the atmosphere from the amount emitted over the past 50 years. In that time, global carbon uptake doubled to 5 billion tons per year—keeping pace with humans' growing input—so that about 55% of emissions continues to be stored. That's reassuring but says nothing about the future vitality of the world's carbon sinks.

Flushing Out Drug Users

During one week in March 2011, Kevin Thomas, a toxicologist at the Norwegian Institute for Water Research in Oslo, and colleagues collected daily samples representing 24 hours of sewage flow from 21 sewage treatment plants in 19 cities across Europe in order to find out how much of certain illicit drugs people in those cities consume. The samples were analyzed for traces of five different drugs.

In the study, published in *Science of the Total Environment*, the researchers found that while cannabis consumption appeared to be similar throughout Europe, cocaine use per capita was highest in Belgium and other parts of west and central Europe, while methamphetamine levels per capita were highest in Scandinavian cities and Budweis in the Czech Republic.

Some of the peaks may be due to drug production rather than consumption, Thomas cautions. Another source of uncertainty is that much is still unclear about drug metabolism in the body, says Fritz Sörgel, head of the Institute for Biomedical and Pharmaceutical Research in Nuremberg, Germany, who was not involved in the work. The authors assumed that on average, 38% of a cocaine dose is excreted. "How good that value really is still needs to be shown," Sörgel says.

http://scim.ag/flushdrugs

Science LIVE

*Science*LIVE is on hiatus. We will return at 3 p.m. EDT on Thursday, 6 September, with a chat on **head trauma in soldiers**.

CREDITS (TOP TO BOTTOM): JIANG-YUN GAO; MICHAL CIZEK/AFP/GETTY IMAGES/VIA NEWSCOM

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