

## Did hurricanes blow dinosaurs away?

Pity the poor dinosaurs. Though the immense saurians and many of their neighbors disappeared from the planet 65 million years ago, scientists never tire of dreaming up ways to kill off the beasts.

The newest theory, proposed by Massachusetts Institute of Technology atmospheric scientist Kerry A. Emanuel and his colleagues, revolves around monster hurricanes called hypercanes. While studying factors that limit hurricane size, Emanuel recognized that tropical storms could, in theory, grow much larger than they do at present if ocean water warmed to 50°C, almost double current temperatures in the tropics. Ocean water does not get that warm under normal conditions, but a large meteorite impact into the ocean or a major volcanic eruption in shallow water could drive temperatures into the hypercane zone, according to simulations done with a computer model of the atmosphere, the scientists report in the July 20 *JOURNAL OF GEOPHYSICAL RESEARCH*.

Therein lies the dinosaur connection. Emerging evidence suggests that a large extraterrestrial body hit the Gulf of Mexico at the end of the Cretaceous period, about the same time as the mass extinction recorded in the fossil record. The crash could have warmed water enough to spark a series of hypercanes that reached altitudes of 45 kilometers, well up into the stratosphere. Normal hurricanes top out at the base of the stratosphere, about 19 kilometers up.

Because of their height, the storms could have transported water vapor, ice particles, and dust into the stratosphere, where they would block out sunlight and decimate the life-protecting ozone layer, speculate the researchers. "The idea is a little far-fetched," admits Emanuel. "But I don't think it's so far-fetched as to be outrageously unlikely."

## Missing carbon traced to northern lands

Like a vast sponge, the temperate forests of Asia, North America, and Europe are sopping up roughly half of the carbon dioxide pollution emitted to the atmosphere each year, according to a study in the Aug. 25 *SCIENCE*.

Through cars and power plants, humans pump about 6 billion tons of carbon into the air annually, yet only a fraction stays in the atmosphere. Climate scientists have long thought that the oceans absorb most of the missing carbon, but the new study suggests that land areas have started taking up major amounts of the greenhouse gas.

Philippe Ciais of the National Oceanic and Atmospheric Administration in Boulder, Colo., and his colleagues tracked carbon dioxide by measuring the ratio between two isotopes—carbon-13 and carbon-12—at 43 stations around the globe. The oceans take up both isotopes in equal amounts, but plants on land preferentially absorb carbon-12. This information, along with measurements of carbon dioxide concentration, enabled the scientists to calculate which parts of the world actively sequester the greenhouse gas.

In 1992 and 1993, land areas between 30°N and 60°N soaked up about 3.5 billion tons of carbon each year, or double the amount absorbed by the oceans, the scientists report. Ciais and his coworkers suggest that regrowth of previously cleared areas in North America might account for some of the dramatic absorption. Extra carbon dioxide in the atmosphere might also have fertilized forests across the north, causing them to grow faster than they have previously, the scientists speculate.

Charles D. Keeling of the Scripps Institution of Oceanography in La Jolla, Calif., finds similar trends for the northern land areas during 1992 and 1993. "The carbon cycle is not just doing the same thing all the time, so we have to watch it," he says.

## R&D budget bargaining: Hot and heavy

On Sept. 5, Congress returned from its summer recess to complete work on a host of budget bills that will affect science in the 1996 fiscal year, beginning Oct. 1. These legislative measures propose nondefense cuts unprecedented in recent times. But Congress has no plan to mete out its cuts evenly. As a new 44-page analysis points out, although the House approved cuts in nondefense programs for FY 1996 totaling 5.2 percent, it would actually halve commerce-related research and development and slim by 20 percent the federal budget for natural resource and environmental R&D. Meanwhile, overall health spending would actually climb—by 6.2 percent at the National Institutes of Health, for instance.

In its new analysis, much of it in 17 pages of charts, the budget and policy project of the American Association for the Advancement of Science gives a rundown of what the House and its committees have drafted. Description of action by the Senate—which is only now tackling budget legislation for many R&D agencies—was necessarily cursory.

Propelling many of these proposed changes is a resolution, passed in June, to balance the federal budget over the next 7 years. Indeed, the AAAS report notes, this resolution assumes cuts that would, after adjusting for inflation, cut nondefense R&D by one-third over that period.

Toward that end, Congress immediately began whittling this year's budget, the analysis notes, revoking \$2 billion in R&D spending commitments—or 2.7 percent of what had been approved. That brought FY 1995 R&D spending to within 0.1 percent of the previous year's, a drop equal to almost 3 percent after inflation. Proportionately, the Interior Department's National Biological Service took one of the biggest hits; its \$14.5 million rescission limits it to spending 7.5 percent less than it did last year—with inflation, about 10.5 percent less.

The House and Senate have different R&D agendas, as evidenced by the way they're apportioning money in their respective budget bills. This suggests that there could be serious haggling ahead when representatives of both houses convene to reconcile those differences into a common bill they can send the President.

The AAAS continues to chart changes in these proposals—as they occur in full committees or in floor votes by the House and Senate—and posts them within a day or so on the Internet at its World Wide Web site (<http://www.aaas.org>).

## Will Congress keep a nest for NIST?

While Congress considers abolishing the Department of Commerce, the threat to one of DOC's tiny research agencies, the National Institute of Standards and Technology (NIST), has galvanized scientists into action. Last week, 25 Nobelists in physics and the presidents of 18 research societies petitioned Congress to preserve NIST as a "national treasure" and a "crucial component of the nation's long-term basic research."

Pending legislation places most of NIST's R&D and 1,300 employees in limbo. One pair of House and Senate bills would offer to sell the institute's two labs to private industry. An alternative bill would transfer NIST's standards-setting functions to a new patent, trademark, and standards agency.

At a press conference last week, research leaders pointed out NIST's preeminent position in developing technologies to measure precisely everything from time to environmental contaminants. They also noted that the connectability and interoperability of computer systems trace to NIST-developed standards. Moreover, noted Richard Herman of the University of Maryland at College Park, NIST is the only civilian federal agency working on computer security—an ever more vital function as society increases its reliance on computers for carrying out business and financial transactions.