

## NEWS

# Mashups mix data into global service

Will 2006 be the year of the mashup? Originally used to describe the mixing together of musical tracks, the term now refers to websites that weave data from different sources into a new service. They are becoming increasingly popular, especially for plotting data on maps, covering anything from cafés offering wireless Internet access to traffic conditions. And advocates say they could fundamentally change many areas of science — if researchers can be persuaded to share their data.

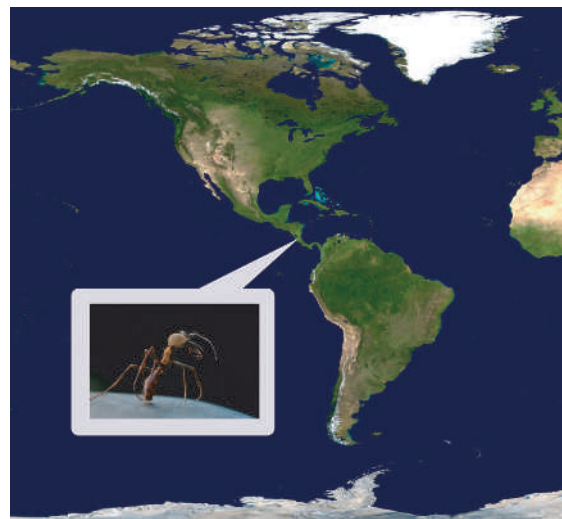
Some disciplines already have software that allows data from different sources to be combined seamlessly. For example, a bioinformatician can get a gene sequence from the GenBank database, its homologues using the BLAST alignment service, and the resulting protein structures from the Swiss-Model site in one step. And an astronomer can automatically collate all available data for an object, taken by different telescopes at various wavelengths, into one place, rather than having to check each source individually.

So far, only researchers with advanced

programming skills, working in fields organized enough to have data online and tagged appropriately, have been able to do this. But simpler computer languages and tools are helping.

Google's maps database, for example, allows users to integrate data into it using just ten lines of code ([www.google.com/apis/maps](http://www.google.com/apis/maps)). UniProt, the world's largest protein database, is developing its existing public interfaces to protein sequence data to encourage outside users to access and reuse its data.

The biodiversity community is one group working to develop such services. To demonstrate the principle, Roderic Page of the University of Glasgow, UK, built what he describes as a "toy" — a mashup called Ispecies.org (<http://darwin.zoology.gla.ac.uk/~rpage/isppecies>). If you type in a species name it builds a web page for it showing sequence data from GenBank, literature from Google Scholar and photos from a Yahoo image search. If you could pool data from every museum or lab in the world, "you could do amazing things", says Page.



**Web crawling:** ant researchers are bringing together information from a variety of sources.

M. DOHRN/K. TAYLOR/NATUREPL/NASA

Donat Agosti of the Natural History Museum in Bern, Switzerland, is working on this. He is one of the driving forces behind AntBase and AntWeb, which bring together data on some 12,000 ant species. He hopes that, as well as searching, people will reuse the data to create phylogenetic trees or models of geographic distribution.

This would provide the means for a real-time, worldwide collaboration of systematists, says Norman Johnson, an entomologist

## Intelligent design verdict set to sway other cases

### WASHINGTON DC

A high-profile trial centred on the teaching of evolution is over. High-school students in Dover, Pennsylvania, will not now hear an announcement promoting intelligent design — the idea that an intelligent creator shaped today's organisms — before taking lessons on evolution. On 20 December, federal judge John Jones struck down a local school-board decision in a scathing 139-page rebuke to the intelligent-design movement. But other challenges to evolution are simmering across the country — and the Dover decision could influence their outcome, some say.

Such fights usually originate at the state level — in the form of legislation or the setting of state-wide education standards — or at the school-district level, where local standards and curricula are generally set.

A recent study from the Washington-based Thomas B. Fordham Institute into science curriculum standards gave failing grades to 15 states (see map). Alabama students, for

instance, learn from biology textbooks adorned with a sticker describing evolution as "controversial". But in Ohio, which passed, some students are taught from a state-approved lesson plan called "critical analysis of evolution", in which they research and present pro- and anti-evolution viewpoints.

Robin Hovis, a member of the Ohio state board of education, says the Dover case may affect the future of the lesson plan. "It certainly gave those of us on the board who objected renewed hope," he adds. In Cobb County, Georgia, an appeals court is set to rule on a lower-court judgement deeming similar stickers unconstitutional.

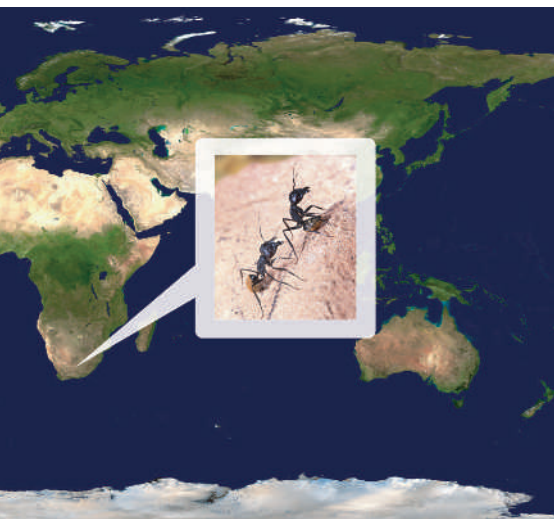
And in Kansas, a school-board primary election next August could reshape the state's educational landscape. Board members who edited the education standards to include "scientific criticisms" of evolution face challenges by moderate Republicans who want such language weeded out (see *Nature* 438, 267; 2005).

In another twist, a group of Christian schools is suing the University of California for refusing to recognize certain high-school courses, including biology classes that use textbooks taking an anti-evolution view. The university has filed for dismissal, and expects to hear from the judge in a few months. "The Dover verdict says schools can't teach these non-scientific ideas as science, so that supports us," says Christopher Patti, a lawyer with the university.

Legislation promoting intelligent design or similar anti-evolution ideas was introduced in more than a dozen states in 2005. Most died a hasty death, according to Nick Matzke, spokesman for the National Center for Science Education, a California-based non-profit organization that fights for evolution education. He and others hope that the Dover decision will help quash the promotion of intelligent design, which they say is a legal strategy for introducing religion into the classroom. "Court decisions



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at Ohio State University in Columbus. “It has the potential to fundamentally change and improve the way that basic systematic research is conducted.”

A major limiting factor is the availability of data in formats that computers can manipulate. To develop AntWeb further, Agosti aims to convert 4,000 papers into machine-readable online descriptions. Another problem is the reluctance of many labs and agencies to share data.

But this is changing. A spokesman for the Global Health Atlas from the World Health Organization (WHO), for example, a huge infectious-disease database, says there are plans

to make access easier. The Global Biodiversity Information Facility (GBIF) has linked up more than 80 million records in nearly 600 databases in 31 countries. And last month saw the launch of the International Neuroinformatics Coordinating Facility.

But such initiatives are hampered by restrictive data-access agreements. The museums and labs that provide the GBIF with data, for example, often require outside researchers to sign online agreements to download individual data sets, making real-time computing of data from multiple sources almost impossible.

*Nature* has created its own mashup, which integrates data on avian-flu outbreaks from the WHO and the UN Food and Agriculture Organization into Google Earth ([www.nature.com/nature/googleearth/avianflu1.kml](http://www.nature.com/nature/googleearth/avianflu1.kml)). The result is a useful snapshot, but illustrates the problem. As the data are not in public databases that can be directly accessed by software, we had to request them from the relevant agencies, construct a database and compute them into Google Earth. If the data were available in a machine-readable format, the mashup could search the databases automatically and update the maps as outbreaks occur. Other researchers could also mix the data with their own data sets.

Page and Agosti hope that researchers will soon become more enthusiastic about sharing. “Once scientists see the value of freeing-up data, mashups will explode,” says Page. ■

**Declan Butler**

## Croatian scientists call for openness over funding

More than 250 scientists inside and outside Croatia have signed a petition calling for more transparency in the country’s funding of science and technology.

In particular, the petition calls for an investigation into a technology-development grant issued two years ago to Dragan Primorac, now the country’s science minister.

The scientists allege “irregularities” and possible conflicts of interest in the operation and funding of the €1-million (US\$1.2-million) project to establish a forensic and molecular-genetics laboratory — accusations Primorac denies. Primorac won the grant in December 2003, when he was director of a clinic at the Holy Spirit Hospital in Zagreb. He was appointed minister four days later.

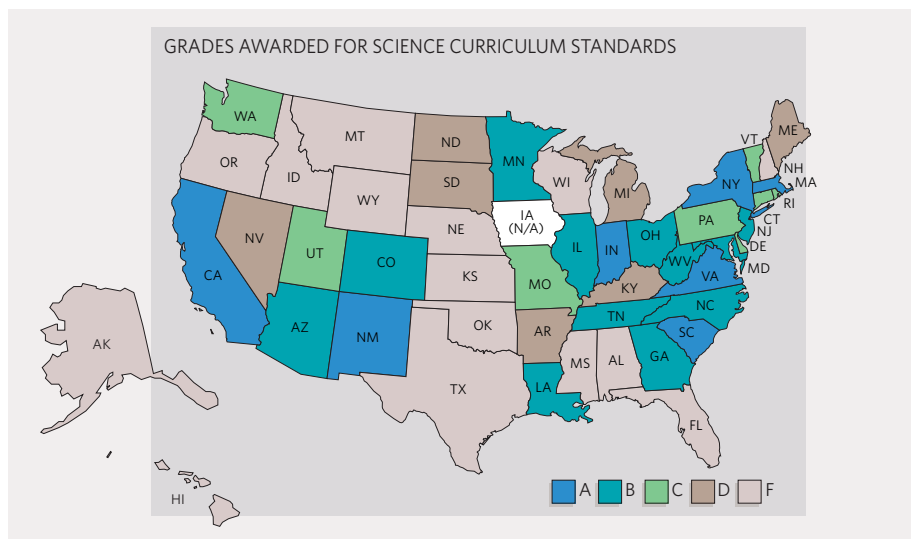
The petition was prompted by some scientists’ unhappiness that, over a few months, the lab’s grant money was transferred between several different institutes in Zagreb. They also want to know how Primorac resolved potential conflicts of interest relating to the grant — for example, he was a member of the technology council that evaluated and approved his own grant.

Vlatko Silobrcic, former director of the Institute of Immunology in Zagreb and a member of the Croatian Academy of Sciences, was one of the petition’s 15 original signatories. He says that the episode is symptomatic of a general lack of openness in the way science money is allocated in the country. “The action was started to get answers to issues that we think are important for the science system in Croatia,” he says. “It is legitimate to ask questions about possible conflicts of interest.”

Krešimir Pavelić, director of molecular medicine at the Rudjer Bošković Institute, Croatia’s largest research institute, is currently in sole charge of the project. An institute spokesman says that the moves were largely an attempt to find enough lab space.

Meanwhile, Primorac told *Nature* that he has always been open about the moves, and that concerns about conflicts of interest are unfounded. “I have nothing to hide,” he says, adding that the criticisms are part of a “relentless campaign” against him. ■  
**Alison Abbott**

THOMAS B. FORD/HAM INST.



never resolve social issues, and it won’t here,” says Matzke. “But it will give us a little breathing space. Intelligent design as a strategy is probably toast.”

Naturally, proponents of the theory disagree. Casey Luskin, a lawyer at the

Discovery Institute, an intelligent-design think-tank in Seattle, Washington, says the Dover decision will have a “negligible effect”. “You cannot change the facts of biology through a judicial ruling,” he argues. ■  
**Emma Marris**