Geologists seek to put an end to blind dates

Tom Clarke

Earth scientists have decided it is time to talk time. At a meeting in Washington DC last week, experts in mass extinctions, ancient climate and the art of dating rocks got together to work out plans for a more accurate and complete geological timescale.

The researchers plan to establish an international network of laboratories that would use agreed standard procedures for dating rocks, and to which all Earth scientists would send samples of agreed quality from important sites. Over time, that would establish a database of reproducibly accurate dates for everything recorded in the Earth's rocks, from the evolution of ancient life to rapid climate-change events.

The project could take 15 years, and could fill in many gaps in our knowledge of Earth's history, says Samuel Bowring, a geochronologist from the Massachusetts Institute of Technology in Cambridge and one of the meeting's organizers. "The record is hopelessly incomplete," he says.

That is partly because the most accurate techniques for dating are work-intensive and require more skill and money than most labs can spare. So researchers often simply estimate rock ages by comparing the fossils found in one stripe of rock to another of known age.

What's more, many historically important layers of rock were dated before the more accurate techniques were invented. Until recently, for example, the Cambrian explosion, from which most animal species emerged, was thought to have occurred some 575 million years ago over an unknown period of time. But the use of highly accurate uranium–lead isotope measurements allowed Bowring's lab to show that it actually began 544 million years ago and lasted just a few million years (*Science* 261, 1293–1298; 1993). Such information is crucial for

B. EDMAIER/SPL

A boulder move: researchers are planning to revolutionize the geological dating of rocks.

palaeontologists — determining exactly when extinction events began and ended can help to establish whether they were caused by a single catastrophic event or a slow change in the environment.

Geologists now want to repeat that process for other key events in the Earth's history. Last week's meeting, sponsored by the National Science Foundation (NSF), was held to start figuring out how to do this. The data would complement other NSF-funded geoinformatics projects already under way, including Chronos, which aims to match different layers of rock of the same age from around the world, and the Paleobiology Database (see *Nature* 424, 482–483; 2003), which looks at fossil finds.

Researchers are now putting together a proposal for how this project can be tackled. Bowring believes that three new US labs will be required, at a cost of around $6 million and with annual operating costs of between $2 million and $3 million.

"It's in everyone's best interest, so there's no reason why we shouldn't be able to get agreement," says Tony Fallick, who heads isotope dating at the Scottish Universities Research and Reactor Centre in Glasgow. Although the initiative is US-led, the lab work and results would be shared internationally.

The NSF has a new funding stream dedicated to efforts too big for one lab to handle. Geoinformatics is one such area, says Walter Snyder, section head for research grants in the NSF's Earth science division. "The burden is now on the community to agree on a common approach," he says. ■