

Quaternary geologists win timescale vote

Redefinition rescues once-threatened terminology from extinction.

In 2006, astronomers reached a decision on the planetary status of Pluto; now, geologists may have done the same for the status of the Quaternary, the time period in which humans evolved and live today. But, as was the case with Pluto, resolving this long-standing controversy has left some researchers feeling alienated.

The International Commission on Stratigraphy (ICS) has elected to formally define the base of the Quaternary at 2.6 million years before present, and also to lower the base of the Pleistocene — an epoch that encompasses the most recent glaciations — from its historical position at 1.8 million years to 2.6 million years ago. The decision, finalized on 21 May, will now be passed to the executive committee of the International Union of Geological Sciences (IUGS) for ratification, which is expected in the next month or two.

The vote shifts an 800,000-year slice, formerly part of the Pliocene epoch, into the Pleistocene. “It’s kind of a land grab,” says Philip Gibbard, a geologist at the University of Cambridge, UK, who has fought for the redefinition since 2001. “But we see it as just putting straight a mistake that was made 25–30 years ago.”

In 1985, the beginning of the Pleistocene was defined at 1.8 million years ago, calibrated to an outcropping of marine strata in southern Italy. But some geologists have long felt that was a localized, arbitrary boundary that did not reflect worldwide changes — and argued instead for the 2.6-million-year mark, when the entire planet cooled.

The term Quaternary was adopted in the early 1800s, when geologists divided up fossil records of Earth’s history into four periods: the Primary, Secondary, Tertiary and Quaternary. The first two terms were discarded long ago, and although Tertiary is still sometimes used, in recent decades some geologists came to consider the Quaternary an outmoded relic. In 2004, a major publication left the Quaternary out of the ICS timescale altogether, making it vulnerable to extinction from scientific nomenclature. In place of the Quaternary, it extended the prior ‘Neogene’, which began 23 million years ago, up to the present. The Quaternary



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community went into open revolt.

“The geologic timescale is fundamental for expressing the history of the Earth,” says Stan Finney, a geologist at California State University in Long Beach and chair of the ICS. “This is our clock — we need the units of our timescale and their boundaries to be precisely defined.”

Finney inherited the debate when he took his post at the ICS in 2008, and he vowed to come up with a democratic process to resolve it. After several months of open discussions and formal proposals from the Quaternary and Neogene communities, two rounds of voting took place, in April and May. The redefinition

proposal passed with approval from 16 of the 18 voting members.

Although for some the debate is settled, others are not pleased. “We don’t take a metre stick in Paris and add a foot-and-a-half to it,” says Lucy Edwards, a marine geologist with the US Geological Survey in Reston, Virginia. “You can redefine it by being more precise, but you don’t increase its size by 40%.” Edwards has practical concerns as well: in the 1980s, the USGS reworked all of its maps and terminology to reflect the decision to place the Pleistocene at 1.8 million years ago. Now that the international standards have changed, it will have to do so again.

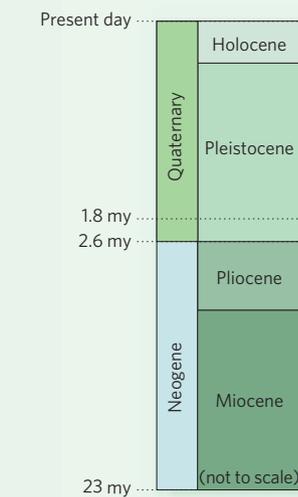
Marie-Pierre Aubry of Rutgers University in Piscataway, New Jersey, who lobbied against the change, says that the rules of science are being violated. Whereas other major boundaries in Earth’s history are associated with faunal extinctions and turnover, she says, “you come to the Neogene–Quaternary boundary, and there is nothing there”. She notes that the term Neogene, not Quaternary, is used widely in textbooks to describe the current period. The Neogene community has already responded by petitioning the IUGS to suspend the vote.

Others are moving on. “In the end, it is only a shift in nomenclature,” says Martin Van Kranendonk, a geologist at the Geological Survey of Western Australia in East Perth, and one of the two voting members who voted against the Quaternary proposal. “The rocks and time itself haven’t changed,” he says. “It’s just what we have chosen to call them.”

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REDRAWING GEOLOGICAL TIME

The new definition of the Quaternary, as approved by the International Commission on Stratigraphy.



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