

may experience a temporary loss in productivity. Both universities and granting agencies need to find ways to offset this.

Another important area that was discussed was that of mentors. All of us independently noted the role our mothers played in supporting us in our career decisions and in setting an example for us to follow early in life. We also talked about the crucial role that past and present mentors, both male and female, have had in teaching us how to be effective scientists, encouraging us to continue on and actively helping us to advance. We cannot emphasize enough the importance of these individuals in shaping our paths and the debt that we owe them.

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Bottleneck in Human Evolution and the Toba Eruption

Ann Gibbons' Research News article "Pleistocene population explosions" (1 Oct., p. 27) discusses an apparent bottleneck in human evolution in the period before about 50,000 years ago and a possible link to climate cooling related to the massive Toba volcanic eruption in Sumatra 73,500 years ago. In a recent study of the possible effects of the Toba eruption (1), we calculated that climate cooling for 1 or 2 years after the eruption could have been quite severe, representing "volcanic winter" conditions similar to those proposed in scenarios of nuclear winter following a major nuclear exchange (2). Land temperatures in the latitude zone from 30° to 70°N may have ranged from about 5° to 15°C colder than normal, with widespread hard freezes in mid-latitudes and very low summer temperatures. Hemispheric temperature decreases of 3° to 5°C may have persisted for several years. Increased snow cover and sea ice and perturbed sea-surface temperatures could have led to longer term (decadal) cooling.

The Toba eruption occurred at a prominent transition from warm to cold climates in the last glacial cycle, at a time of abrupt ice-sheet growth and sea-level fall and when Milankovitch insolation parameters were such as to favor the growth of Northern Hemisphere ice sheets. Because climate cooling was already under way when Toba erupted, it may be that sea-level fall related to the cooling had some role in triggering the eruption from an unstable magma chamber (1, 3). Calculations suggest that the brief cooling related to the dust and

aerosols from the Toba eruption may have been a contributing factor in the rapid climatic switch.

Toba was apparently the largest explosive eruption of the last few 100,000 years and it may have been connected to a possibly unique Late Pleistocene bottleneck in human evolution. More accurate dating of the eruption, and a record of its short-term effects on climate could come from the detailed archive of the newly drilled GISP2 and GRIP ice cores in Greenland.

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References

1. M. R. Rampino and S. Self, *Nature* **359**, 50 (1992).
2. R. P. Turco, O. B. Toon, T. P. Ackerman, J. B. Pollack, C. Sagan, *Science* **247**, 166 (1990).
3. M. R. Rampino and S. Self, *Quat. Res.* **40**, 269 (1993).

The Baucus Bill

The ScienceScope item regarding proposed legislation (the Baucus Bill) to protect fossil vertebrates on federal lands (15 Oct., p. 323) is a somewhat downbeat recitation of the situation. In fact, neither commercial nor amateur collectors can legally collect fossil vertebrates from federal lands at the present time. Thus, commercial collectors who take fossils from federal lands are already (would not be "put") "on the wrong side of the law." The Baucus Bill recognizes the valuable contributions made in the past by amateur collectors and attempts, for the first time, to develop ways in which the amateurs can apply for a permit to collect fossils. As already in effect with permits to scientific or academic institutions, the permits would specify that an arrangement had been made to curate the scientifically significant specimens with a suitable institution where they would be conserved (along with associated contextual data) for the citizens of the United States.

Regardless of what museums or institutions may think is the case, none actually "has title" to the federal fossils under its jurisdiction, and the Baucus Bill emphasizes that any person collecting fossil vertebrates from federal land has responsibility for *stewarding* these fossils on behalf of the

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