# LETTERS

## Longitude and longevity

**In the wake of a special section about "tropospheric processes," readers discuss the influences of natural events and human activity. Researchers produce data that might "decrease the anxiety" of fathers who sire children before the age of 45. Biologists review the status of "a national biodiversity inventory" in Costa Rica. Scientists revisit the challenge of conducting "expensive, long-term" therapeutic drug research and development. And "the reality" of science administration in Britain is explicated.**

### Greenhouse Effect—Clouds and Sunshine

In the article "Greenhouse forecasting still cloudy" (News, Tropospheric Processes, 16 May, p. 1040), Richard A. Kerr discusses the uncertainties related to anthropogenic increase of the greenhouse effect interpreted by some of the leading researchers from dominating climate modeling centers in the United States and Europe.

Kerr's news article is succeeded by seven research review articles on atmospheric processes related to the climate issue. None of these contributions refers to the striking correlation between global temperature and solar activity over the last 130 years that was presented previously by E. Friis-Christensen and K. Lassen (Reports, 1 Nov. 1991, p. 698) or to the succeeding paper that extended this relationship several hundred years back in time to the "Little Ice Age" (*1*).

A recent study "Variation of cosmic ray flux and global cloud coverage: A missing link in solar-climate relationships" (*2*) suggests that a physical relation might explain the high correlation between solar activity and global climate. The review article by M. B. Baker "Cloud microphysics and climate" (Articles, Tropospheric Processes, 16 May, p. 1072) demonstrates the high sensitivity of the global radiation balance as a function of cloud parameterization, although Baker does not fully discuss cloud microphysics relations with cosmic radiation and ionization.

Improved understanding of the anthropogenic greenhouse effect might thus be obtained by better understanding of the natural climate variations related to solar variation, its influence on cosmic rays, and the possible change in cloud cover.

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**References**

1. K. Lassen and E. Friis-Christensen, *J. Atm. Terr. Phys.* **59** (no. 8), 835 (1995).
2. H. Svensmark and E. Friis-Christensen, *ibid.* **59** (no. 11), 1225 (1997).

Reading the meeting brief "Contrails may alter climate" by Richard A. Kerr (Research News, 13 June, p. 1649), I was reminded of a personal observation of contrail persistence. Growing up in Germany in the spring of 1945, I watched the daily procession of U.S. bomber formations proceeding to and from their targets. Frequently, these formations would leave massive contrails that sometimes formed into persistent clouds covering a good fraction of the sky. To be sure, we are talking here about many planes—I estimate that at times more than 300 bombers might have been in my view at a time, flying at altitudes between 6000 and 9000 meters. The clouds so formed looked like thick cirrus.

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### When Fatherhood Should Stop?

Constance Holden's piece "The perils of late-age procreation" (Random Samples, 6 June, p. 1503), about our recent finding that daughters of older fathers live shorter lives, has stimulated us to return to this problem and to reanalyze the data for different ranges of paternal ages at reproduction.

Our previous analysis, based on a multiple linear regression model, has demonstrated that in the range of paternal ages of 35 to 55 years, the mean loss in daughters' life span is 0.16 ± 0.06 years per each additional year of paternal age (sample size, $n = 2159$; Student's test, $t = 2.43$; $P = 0.02$). It turned out, however, that for the subgroup of younger fathers (35 to 45 years) the mean loss of daughters' life span is small (0.02 ± 0.12 years per each additional year of paternal age) and statistically insignificant ($n = 1651$; $t = 0.16$; $P = 0.87$), while for older fathers (45 to 55 years) this loss is particularly high (0.48 ± 0.21 years per each additional year of paternal age) and significant ($n = 598$; $t = 2.34$; $P = 0.02$).

These results are consistent with the general conclusion of James Crow on the nonlinear accelerating increase of mutation rates with paternal age (*1*) and could decrease the anxiety among the majority of fathers who reproduce before 45 years.

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1. J. Crow, *J. Environ. Mol. Mutagenesis* **21**, 122 (1993); *J. Exp. Clin. Immunogenet.* **12**, 121 (1995).

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## Costa Rican All-Taxa Survey

We wish to clarify some concepts in the recent article "Unique, all-taxa survey in Costa Rica 'self-destructs' " (News, 9 May, p. 893) by Jocelyn Kaiser.

The funding opportunity generated by the All-Taxa Biological Inventory (ATBI) was indeed restructured into a new set of national inventory actions within a broader initiative that we term Sustainable Biodiversity Development. This was agreed upon by Costa Rica's National System of Conservation Areas (SINAC) (which includes the Guanacaste Conservation Area) and the Costa Rican National Institute for Biodiversity (INBio) on the following basis.

SINAC, INBio, and the taxonomic community dedicated significant time and resources to the ATBI during its planning phase, yet the initiative was not able to find the sizable economic support required to start the project as originally conceived. The ATBI was envisioned by all of us as a total inventory in a specific area containing different major ecosystems. However, economic, scientific, and social considerations have led INBio and SINAC to the decision to focus the inventory part of the Sustainable Biodiversity Development initiative on key taxonomic groups (at least vertebrates, plants, molluscs, nematodes, Lepidoptera, Hymenoptera, Coleoptera, fungi, and Diptera) and in five conservation areas (Amistad Caribe, Amistad Pacifico, Guanacaste, Arenal, and Osa).

The search for economic resources for this project with the support of the government of Costa Rica is ongoing. Except for the funds available for the planning stage, none of the funds mentioned in the article have been disbursed. As in every project carried out in INBio, any funds received will be subjected to internationally accepted auditing procedures. INBio is negotiating with agencies and governments the details of the new initiative that will contribute to the sustainability of the entire National System of Conservation Areas and INBio.

The fact that SINAC and INBio decided to reformulate the ATBI initiative does not mean that INBio's enthusiasm for a national biodiversity inventory has been altered in any way. INBio's inventory process continues today with as much vitality and