ing instead on traits variable within species. These distinct areas of science have been confounded since the neo-Darwinians of the 1940s (*2*).

This confusion has resulted in a proliferation of species concepts, each tied to this or that favored process of speciation. Most of this conceptual controversy disappears when species are seen as statements of evolutionary history and restricted to the (hypothesized) instances of completed speciation. The fundamentals of such a historical species concept have their roots in the 17th-century writings of John Ray and are restated in the modern Phylogenetic Species Concept (*3*, *4*). Every collected specimen, newly sampled population, or discovered character is an opportunity to critically test the evidential basis of our theories of species. This is a desirable source of controversy that will exist as long as species are scientific hypotheses and we continue to test them. The goal of taxonomists is not to arrive at an objective definition of species uniformly agreed upon by all, but rather to make species descriptions predictive hypotheses about the distributions of characters such that each is rigorously testable. Species descriptions are thus rejected or modified, like any other scientific theory, to fit available evidence, which is precisely why they are not "merely descriptive."

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3. J. Ray, *Historia Plantarum* (Maria Clark, London, 1686).
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Response

I AGREE WITH WHEELER THAT "THE GOAL OF taxonomists is not to arrive at an objective definition of species uniformly agreed upon by all," yet I doubt that everyone who uses specific names would agree that testing our theories of species is the only (or even the main) goal of classification, any more than chemists ordering the raw materials for an experiment are testing our definitions of "elements." In many cases, the main product of a classification is simply a set of names. Ideally, these should be stable, easy to remember, and able to encapsulate useful information about the things they name, but they need not be. The widespread resistance to radical taxonomic changes (such as that embodied in the Phylocode proposal) seems to reinforce the point I made in my Review: Classifications are products of the particular needs of those who devise and use them.

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Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 3 months or issues of general interest. They can be submitted through the Web (www.submit2science.org) or by regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.

TECHNICAL COMMENT ABSTRACTS

Comment on "Unexpected Epoxide Formation in the Gas-Phase Photooxidation of Isoprene"

Magda Claeys

Paulot *et al*. (Reports, 7 August 2009, p. 730) reported that the photooxidation of isoprene under low–nitrogen oxides (NO_x) conditions produces epoxides that can facilitate the formation of secondary organic aerosol (SOA). However, another pathway involving the formation of methyl-butenediol intermediates can also lead to isoprene-derived SOA formation. Further research is needed to clarify the fate of isoprene in the atmosphere.

Full text at www.sciencemag.org/cgi/content/full/327/5966/644-b

Response to Comment on "Unexpected Epoxide Formation in the Gas-Phase Photooxidation of Isoprene"

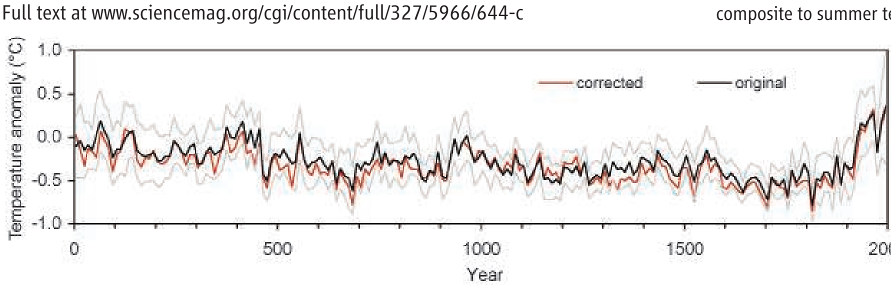
Fabien Paulot, John D. Crounse, Henrik G. Kjaergaard, Andreas Kürten, Jason M. St. Clair, John H. Seinfeld, Paul O. Wennberg

Claeys questions whether gaseous epoxydiol is formed from the oxidation of isoprene and whether it is relevant to the formation of isoprene-derived secondary organic aerosol (iSOA). We argue that the alternative mechanism she proposes for iSOA applies primarily to chamber studies with high isoprene and is not as important in the atmosphere, where isoprene concentrations are much lower.

Full text at www.sciencemag.org/cgi/content/full/327/5966/644-c

CORRECTIONS AND CLARIFICATIONS

Reports: "Recent warming reverses long-term Arctic cooling" by D. S. Kaufman *et al*. (4 September 2009, p. 1236). Of the 23 previously published proxy temperature records included in the synthesis, 4 were corrected to conform to the interpretations of the original authors, and one was updated by omitting the high-pass filter. The 10-year mean proxy values are now corrected in the supporting online material (table S2) and at www.ncdc.noaa.gov/paleo/pubs/kaufman2009. The primary trends of the Arctic temperature reconstruction, however, are not changed, including the millennial-scale summer cooling that was reversed by strong warming during the 20th century and (on the basis of the instrumental record) continued through the last decade. Two of the corrected records (Lake Korttajärvi, Lake Lehmilampi) were not included in the calibration of proxy values to mean summer temperature, but the other three (DYE-3, Hallet Lake, and Haukadalsvatn) were. The supporting material now includes the corrected version of the calibration equation ($r^2 = 0.76$, $P < 0.05$). The resulting corrected temperature reconstruction is shown below, along with the original version taken from Fig. 3C. The corrected temperature trend through 1900 (green line in Fig. 3C) is –0.21° ± 0.06°C per 1000 years rather than –0.22° ± 0.06°C per 1000 years as originally reported. The corrected regional sensitivity of summer (JJA) temperature to orbital forcing inferred from the proxy-based reconstruction is 0.06° ± 0.03°C per W m^{-2} rather than 0.07° ± 0.02°C per W m^{-2} as originally reported (Fig. 4A; revised regression: $y = 0.0643x - 27.595$, $r^2 = 0.73$). The leading principal component of the corrected time series explains 16% of the variance of all records rather than 17% as originally reported, and the strength of its correlation with the simple composite decreases to $r^2 = 0.67$ ($P < 0.001$), compared to $r^2 = 0.84$. The correlation (r value) between the first principal component (PC1) and each record has been corrected in table S1. In addition, the supporting material now includes an expanded discussion of the calibration of the proxy composite to summer temperature (Note D) and a correction and clarification of the statistical tests (Note E). These and any future revisions are posted on the project Web site: www.arcus.org/synthesis2k. We thank H. McCulloch and others who have pointed out errors and have offered suggestions. The original conclusions of the paper have been strengthened as a result.



Mean of all proxy climate records transformed to summer temperature anomaly relative to the 1961–1990 reference period, showing the original reconstruction (black line; gray lines encompass ±2 standard errors of the proxy values) and the corrected version (red line).