site specific and most likely vary by sediment layer and location. Their range and potential influence on a paleobiological isotopic signature remains largely unknown. Until that situation changes, the potential alteration of stable isotope values in fossil shells, bones, and teeth prevents the rejection of the null hypothesis that all fossil material is altered.

Beauty is in the eye of the beholder, and exceptional fossil preservation, even at the micron level, does not guarantee pristine chemistry.

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PEARSON COMMENTS: Mark Goodwin is right, of course, that we cannot guarantee, on textural evidence alone, that any given fossil is chemically pristine. In our studies of the calcite shells of marine microfossils, we have combined detailed morphological study with a range of chemical and isotopic analyses. We find that texturally pristine fossils always have a wider range of interspecies isotopic differences than more recrystallized ones, and infer that the data more nearly reflect differences in the original chemistry at the time the various organisms lived. However, we can never rule out the possibility of secondary alteration.

Bone is especially problematic because its porous and intricately sculpted apatite structure makes it prone to rapid recrystallization. Bone quickly acquires a chemical signal from its environment after burial.[1] In our foraminifer shells, recrystallization is undoubtedly slower, and by focusing our studies on carbon and oxygen isotopes (major constituents of calcium carbonate), we are less apt to isolate a secondary signal than we would be if, for example, we analyzed just the trace elements that are abundant in the surrounding sediment.

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Heitler, Herzberg Observed that Nitrogen Nuclei Obey Bose

In their historical article "Enrico Fermi in Rome, 1931–32" (PHYSICS TODAY, June 2002, page 28), authors Hans A. Bethe and Henry Bethe state, "One of Fermi's colleagues observed the band spectrum of gaseous nitrogen and found that nitrogen nuclei obey Bose statistics." I offer a clarification. Indeed, Franco Rasetti observed the rotational Raman spectrum of gaseous N_2 in 1929. However, Walter Heitler and Gerhard Herzberg were the ones who recognized the difference in intensity alternation of rotational lines from that in H_2: Even-numbered lines were more intense than the odd-numbered lines. Heitler and Herzberg therefore concluded that N nuclei obey Bose statistics.[1] The explanation was, of course, only clarified after the discovery of the neutron three years later.

Reference

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Alan Cromer Is Alive

In our letter "Experience is Best Teacher for Scientists in the Classroom" (PHYSICS TODAY, July 2002, page 10), we incorrectly referred to one of the cofounders of Northeastern University's SEED and RESEED programs as the "late Alan Cromer." Christos Zahopoulos tells us that Alan Cromer is alive. Four years ago Alan suffered a cardiac arrest; he remains in recovery.

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Correction

October 2002, page 76—The Web address at the end of the letter by Daniel M. Boye, Shila Garg, and Gerald A. Goldin should be http://www.phy.davidson.edu/NSFGRF.htm. ■

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