Response

KLIRONOMOS MAKES A VALID AND IMPORTANT point. It is, however, a bit odd for him to be "disappointed" in our analysis. We did not explicitly include microorganisms in our analysis of the literature on conservation biology because, as Klironomos shows, such studies at present constitute a negligible fraction. We nevertheless agree that the paucity of literature in this area is not a good thing.

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Revisiting an Archean Impact Layer

G. R. BYERLY *ET AL.*'S REPORT, "AN ARCHEAN impact layer from the Pilbara and Kaapvaal cratons" (23 Aug., p. 1325), is an important addition to the growing literature on early Precambrian impact ejecta. Their zircon data provide compelling evidence that spherule layers in Australia and South Africa were formed simultaneously by a single impact about 3.47 billion years ago. The size and abundance of the spherules strongly suggest that they are part of a layer that was dispersed globally. We concur with Byerly *et al.*'s assessment that "zircons from both the South African and Australian layers are best interpreted as locally derived detritus" (p. 1326). However, the presence of two identical populations of unshocked zircons in both regions does not support a large separation distance between the Pilbara and Kaapvaal cratons at the time of impact. The two suites of zircon crystals are so similar that we believe they were eroded from the same source rocks, which implies that these strata were deposited close to one another in a global context. On the basis of stratigraphic and geochronologic similarities, various workers [discussed in (*1*)] have already argued that the Pilbara and Kaapvaal cratons formed in close proximity to one another. Byerly *et al.*'s data provide some of the strongest evidence yet in support of this theory. Their study demonstrates the potential for using impact spherule layers to constrain Archean paleogeographic reconstructions, as well as for high-precision time-stratigraphic correlation between Precambrian successions on different continents.

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Reference

1. D. R. Nelson, A. F. Trendall, W. Altermann, *Precambr. Res.* **97**, 165 (1999).

Response

WE THANK SIMONSON AND HASSLER FOR their endorsement of our interpretations of the origin and ages of Archean impact layers in the Pilbara and Kaapvaal cratons. The question they raise concerning the distance between these two areas and the possibility of a conjoined Pilbara-Kaapvaal Craton at the time of impact was addressed in our original submission, but suggestions by editors and reviewers required its removal. We have demonstrated (*1*) that the spherule layers document impacts with energies appropriate for both global dispersal of impact materials and generation of large tsunamis. Identical detrital zircon suites in the impact layers would suggest proximity of these cratons only if potential source rocks for the zircons were present on only one of the cratons, which would presumably have been located closer to the impact site and served as a zircon source for both areas. This is not the case. Sampled areas on both cratons contain preimpact felsic volcanic

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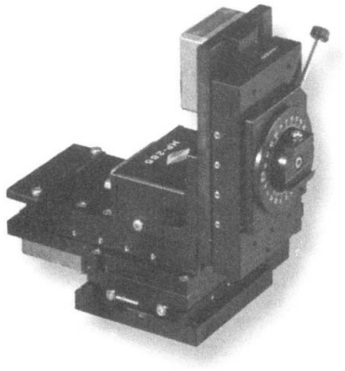

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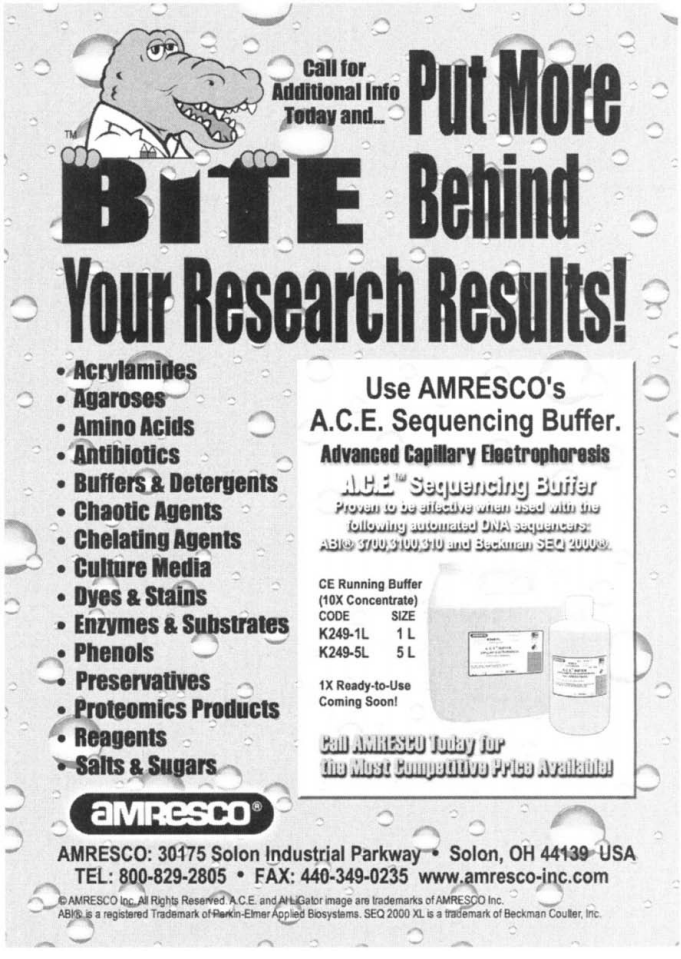

rocks that, if subject to erosion, would have yielded age suites of zircons like those in the impact layers. Hence, the similar detrital zircon suites are not relevant at this stage to evaluating how close or distant these cratons were at the time of the impact. The similarity of stratigraphic sequences and ages provides much more substantial evidence that the Pilbara and Kaapvaal cratons may have been conjoined during the Archean (*2*, *3*).

Our study was designed only to determine the age and equivalence of the oldest impact layers in these areas. Future, more detailed U/Pb studies might support a single conjoined Archean landmass but would require examination of many hundreds of zircons from each impact layer, with the aim of identifying populations of grains in both areas that could have been sourced by rocks in only one area.

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1. D. R. Lowe *et al.*, *Astrobiology*, in press.
2. A. H. Hickman, *West. Aust. Geol. Surv. Bull.* **127**, 268 (1983).
3. A. Kroner, G. R. Byerly, D. R. Lowe, *Earth Planet. Sci. Lett.* **103**, 41 (1991).

Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 6 months or issues of general interest. They can be submitted by e-mail (science_letters@aaas.org), the Web (www.letter2science.org), or 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.

CORRECTIONS AND CLARIFICATIONS

EDITORS' CHOICE: "Snake vine and Munumbi Miller" (20 Sept., p. 1961). Gary Strobel was incorrectly identified as the discoverer of taxol. Strobel discovered fungal taxol. Taxol was discovered by M. Wall, M. C. Wani, and co-workers [M. C. Wani *et al.*, *J. Am. Chem. Soc.* **93**, 2325 (1971)].

BREVIA: "*BLM* heterozygosity and the risk of colorectal cancer" by S. B. Gruber *et al.* (20 Sept., p. 2013). The order of the authors was incorrect. The correct order is Stephen B. Gruber, Nathan A. Ellis, Karen K. Scott, Ronit Almog, Prema Kolachana, Joseph D. Bonner, Tomas Kirchhoff, Lynn P. Tomsho, Khedoudja Nafa, Heather Pierce, Marcelo Low, Jaya Satagopan, Hedy Rennert, Helen Huang, Joel K. Greenson, Joanna Groden, Beth Rapaport, Jinru Shia, Stephen Johnson, Peter K. Gregersen, Curtis C. Harris, Jeff Boyd, Gad Rennert, Kenneth Offit.

RESEARCH ARTICLES: "Super ENSO and global climate oscillations at millennial time scales" by L. Stott *et al.* (12 July, p. 222). The second sentence of the second paragraph on page 226, which reads, "At times of cooling at high latitudes, the tropical Pacific was experiencing either less-frequent or less-persistent El Niños" is incorrect. It should read, "At times of cooling at high latitudes, the tropical Pacific was experiencing either more-frequent or more-persistent El Niños."

SCIENCESCOPE: "Next up" (17 May, p. 1219). The new interim Under Secretary for Science of the Smithsonian was incorrectly identified as Ira Shapiro. His name is Irwin Shapiro.