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Cover: When a pair of asteroids plowed into Earth 290 million years ago, they punched out side-by-side craters in northern Quebec. While most scientists believe that such impacts occur at random sites around the globe, a controversial new theory holds that asteroids and comets are aimed at specific locations by Earth itself. (Photo: NASA shuttle photograph/courtesy Richard Grieve, Geological Survey of Canada)



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Science Service, which publishes SCIENCE NEWS, is a nonprofit corporation founded in 1921. It gratefully accepts tax-deductible contributions and bequests to assist its efforts to increase the public understanding of science, with special emphasis on young people. More recently, it has included in its mission increasing scientific literacy among members of underrepresented groups. Through its Youth Programs it administers the International Science and Engineering Fair, the Science Talent Search for the Westinghouse Science Scholarships, and publishes and distributes the *Directory of Student Science Training Programs for Precollege Students*.

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## Letters

### Carbon-14 dating: Under a cloud?

"Finding a place for the sun in a cloud" (SN: 9/3/94, p.148) states that the solar system entered a cloud "just a few thousand years ago" and that its geometry is being measured, among other ways, by cosmic rays.

If this cloud discovery is true and most or all of the cosmic rays originate in the cloud, would not all carbon-14 dating of ancient artifacts reveal a maximum age of about 2,000 to 8,000 years ago?

Wouldn't carbon-14 dating flag the entry of the solar system into the cloud rather than the age of the sample under test?

John M. Rankin  
Round Hill, Va.

*Carbon-14 is formed in our atmosphere by events resulting from cosmic-ray interactions at the top of the atmosphere. Short-term variations in the carbon-14 spectrum, on time scales of less than 1,000 years, are generally attributed to solar*

*modulation of the incident cosmic-ray flux. One manifestation of this is that Maunderlike sunspot minima correspond to maxima in the atmospheric concentrations of carbon-14. Over longer time scales, the geomagnetic field dipole moment modulates carbon-14 production.*

*Our encounter with the interstellar cloud currently surrounding the solar system would also have modulated the extent and properties of the heliosphere and hence the ability of the solar wind to modulate the incident cosmic-ray flux. However, the direction this effect would take (i.e., more versus less carbon-14) depends on the density, fractional ionization, and other properties of the region from which we recently emerged, which are unknown at this time.*

*If Mr. Rankin's suggestion is correct, the apparent increase in carbon-14 concentrations from 10,000 to 40,000 years ago would suggest that either the interstellar cloud we were immersed in over 10,000 years ago contained a greater cosmic-ray flux than the present cloud or that heliospheric modulation of the interstellar cosmic-ray fluxes was reduced, perhaps by decreased quantities of ions with*

*an interstellar origin within the heliosphere.*

— Priscilla C. Frisch  
University of Chicago

### Radon in concrete: Clearing the air

"Radon: Some concrete issues" (SN: 9/17/94, p.191) mentions a Dutch finding that concrete is itself a source of radon.

This was also found in 1971 in the western United States in buildings constructed on concrete foundations made from uranium mining tailings (New York Times: 9/27/71). Some years earlier, the Atomic Energy Commission had authorized mining companies to supply the material to building contractors, who appreciated the structural properties it bestowed on the concrete.

In one case in Grand Junction, Colo., the custodian of an elementary school would activate a fan every morning and keep the children waiting outside until his Geiger counter readings showed that radiation had dropped to an acceptable level.

Karl H. Raab  
Nancy, France

JANUARY 28, 1995

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