

# SCIENCE NEWS®

The Weekly Newsmagazine of Science

Science Service Publication  
Volume 145, No. 13, March 26, 1994

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SCIENCE NEWS (ISSN 0036-8423) is published weekly on Saturday, except the last week in December, for \$39.50 for 1 year or \$68.00 for 2 years (foreign postage \$6.00 additional per year) by Science Service, Inc., 1719 N Street, N.W., Washington, DC, 20036. Second-class postage paid at Washington, DC and additional mailing office. POSTMASTER: Send address changes to SCIENCE NEWS, P.O. Box 1925, Marion, OH 43305. Change of address: Four to six weeks' notice is required — old and new addresses, including zip codes, must be provided.

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1719 N St., N.W., Washington, DC 20036  
(202-785-2255)

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#### Subscription Department:

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## Letters

### Youthful perspective

Since the Crab Nebula, the remnant of a supernova observed in 1054, is about 5,000 light-years from Earth (and is thus only about 6,000 years old), how can Cassiopeia A, about 9,000 light-years from Earth (and thus at least 9,000 years old), be "the youngest known [supernova] remnant in the Milky Way" ("Topsy-turvy world of Cassiopeia A," SN: 1/29/94, p.77)?

C. G. Justus  
Huntsville, Ala.

Astronomers date supernovas according to the time at which their birth would have been witnessed from Earth. That way, a supernova that astronomers are observing in its youth is actually labeled young. If supernovas were dated according to the actual time of their explosive birth in their home galaxy, a supernova that appears young to us might be labeled elderly.

— R. Cowen

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Cover: Before the sun takes its final bow more than 8 billion years from now, it will temporarily grow thousands of times more luminous and swell to 166 times its current size. While astrophysicists have known about this evolutionary journey for decades, researchers have now laid out the full details of the sun's fate — including its impact on Earth — in one comprehensive study. (Photo: Chris Butcher)



### Departments

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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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### One small misstep

In "Fossil Whale Feet: A Step in Evolution" (SN: 1/15/94, p.36), you made one tiny error. One of the researchers suggested that *Ambulocetus*, the recently discovered four-footed whale, "may have walked by dragging its body as sea lions do." I think he meant as seals do. Sea lions really do walk.

Granted, compared to the casual, insouciant trot of a coyote, a sea lion's progress is pretty laughable. But sea lions do manage to get the job done.

This is a minor matter, I know. However, I am a frequent hobnobber with pinnipeds, and I feel it is my duty to make sure they are not misrepresented.

Matt Hinton  
Trinidad, Calif.

In discussing the process of evolution, you appear to have reversed the cause and effect of this natural process.

It is not accurate to say that a species or population of a species was "forcing their

bodies to undergo a profound evolutionary transformation." This implies a collective awareness and understanding of the evolutionary process and an ability to control it in order to pursue a collective goal. I doubt that even humans could achieve that!

The reverse of what the article implies is what actually transformed land mammals into whales. Their bodies underwent an evolutionary change that forced these carnivores to give up their dry lifestyle. That change presumably resulted from pressure from contemporary species that occupied a similar ecological niche and the elimination of carnivorous aquatic reptiles a few million years earlier.

Over time, the terrestrial competition and the vacancy in the aquatic carnivorous niche favored random mutations that made possible a more aquatic lifestyle. Individuals with aquatic traits now had a survival advantage, which was reinforced by the ecological feedback.

Harold Moritz  
Middletown, Conn.

MARCH 26, 1994

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