

Object 50: A stellar quick-change artist

The dark clouds in the constellation Orion are one of astronomers' favorite places to look for stars that are just beginning to form. In recent years, a very swiftly varying nebula has appeared there. Known as Object 50, it seems to be associated with a still-invisible and very young star. According to one of its discoverers, John Bally of AT&T Bell Laboratories in Crawford Hill, N.J., no other known nebula shows such large changes on such a short time scale. It may represent a particularly swift course of stellar evolution.

The nebula wasn't there as recently as 1955, when the Palomar Sky Survey made photographic plates of the region. In 1979 Bo Reipurth of the Copenhagen University Observatory noticed it on plates from a Schmidt camera survey. Three years later he took another view of the same area with a charge-coupled device (CCD) camera. The nebula had changed substantially. The fast changes, which may indicate that this object is doing in decades what others of its ilk do in centuries or millennia, provoked a search for further information and a continuing watch by Reipurth and Bally. The results of that watch, including some particularly interesting things that happened in

1985, are contained in their article in the March 27 NATURE.

Object 50's location is about 1,500 light-years from us, so the events described were actually happening while the Goths were destroying the last vestiges of the Roman Empire in the West. After making his 1982 CCD images, Reipurth searched for an infrared source near the nebula and found one that radiates infrared around 2 microns wavelength. Very young stars that are just beginning their nuclear fusion processes radiate in the infrared before they become visible. From its first appearance the astronomers had suspected that Object 50 was related to a very young star.

Using radiotelescopes at Crawford Hill, Bally surveyed the area for radio emanations at 115 gigahertz frequency, looking for emissions of carbon monoxide. Mapping the carbon monoxide, he found that the infrared source is the center of a bipolar outflow of matter amounting to something between 1 and 10 times the mass of the sun per year. This is another characteristic of very young stars, he told SCIENCE NEWS.


Taking a visible-light observation in January 1985 from the European Southern Observatory at Cerro La Silla, Chile,

Reipurth found a completely new phenomenon, a shaft of light at the infrared source. By September 1985 this jetlike burst of light had disappeared. This leads the astronomers to think that the star may be emitting periodic bursts of visible light. Such outbursts could come from the beginnings of nuclear burning or from recurrent frictional heating of matter that surrounds the star and is gradually falling into it. The nebula is a triangular object that seems to be illuminated by such light from the star and to be reflecting the light. The spectrum of light from the nebula indicates that it is in fact reflected light, Bally says.

Searching the catalog of infrared sources made by the Infrared Astronomy Satellite, they found that their 2-micron source corresponds to one of the brightest infrared sources in the Orion cloud, which has an infrared luminosity between 250 and 300 times that of the sun. They think they have a very young star here, but they are not sure what type. T Tauri stars show outbursts of this kind, and so do FU Orionis stars, but FU Orionis spectra show absorption of light by calcium, whereas Object 50 shows emission by calcium. The program will continue with frequent observations, particularly for more outbursts and how they may illuminate the young star and the region around it.

— D.E. Thomsen

Collect Authentic Dinosaur Models from the British Museum of Natural History



**THE COMPLETE SET
\$14.95** BY MAIL ONLY

These are not toys.

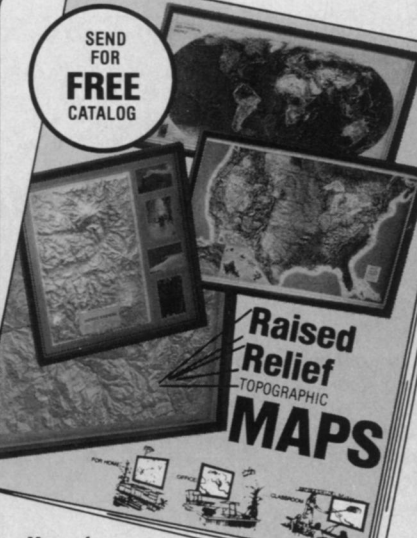
You are looking at four authentic dinosaur models designed by the curators of the British Museum of Natural History. Each was sculptured to scale (1:45) by the craftsmen of the Museum duplicating the original down to the skin texture! They have been beautifully reproduced in solid, unbreakable, self-colored plastic in sizes as large as 19½ inches! Thousands of these fascinating and educational, life-like models have been sold by Museums throughout the world. We are proud to offer them to collectors for the very first time through this advertisement.

Set includes Diplodocus, 19½"; Tyrannosaurus, 10"; Triceratops, 6"; Stegosaurus, 5". Only \$14.95 for all four, including a detailed description and history of each. Sold with an unconditional 30 day moneyback guarantee.

FOR FAST SERVICE
Credit Card Customers call **1-800-228-3535**
Toll Free - 24 hours - 7 days a week **IN NEBRASKA 1-800-642-9606**

© 1985 Barnes & Noble Bookstores, Inc. Offer good only in continental U.S.A.

SEND FOR
FREE
CATALOG



Raised Relief TOPOGRAPHIC MAPS

Maps of—

- U.S. and World
- Great Trip Planner
- National Parks
- Ideal Gift
- 250 Regions of U.S.
- Exquisite Wall Decoration
- Excellent Reference
- Vacation Keepsake

Full Color — Raised Relief
Framed/PhotoFramed/Unframed

HUBBARD P.O. Box 104, Northbrook, IL 60062

Please send FREE Map Catalog (SN)

Name _____

Address _____

City _____ State _____ Zip _____