

Home on the Grain

Minuscule and precocious, newly found species of aquatic invertebrates offer a delightful solution to a deep sea mystery

By DIANE D. EDWARDS

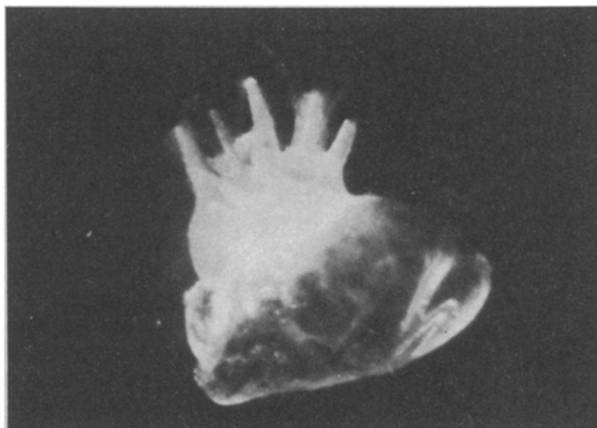
They live fast and die young. They leave not their footprints, but their skeletons, affixed to single grains of the sea's shifting sand. For the newly found species of bryozoan invertebrates that colonize sand grains, it's a small, small world indeed.

Most of the more than 5,000 described species of bryozoans cluster in colonies resembling lichens that comprise hundreds or thousands of individuals. They encrust boats, dock pilings, old cans and shells and rocks. An entire phylum of invertebrates, the bryozoans are found in fresh and salt water areas throughout the world. "They are like little calcified boxes, each with a little orifice that it sticks its tentacles through. And there's almost nowhere you can go, where you can't find them," says Judith Winston, associate curator in the Department of Invertebrates at New York's American Museum of Natural History.

Despite the bryozoans' adaptability, marine biologists have puzzled over how the small creatures spread across the sand from seashell to rusty can, from a beached log to rocks in the bottom of the bay — the short-lived motile form in the bryozoan life cycle is not a long-distance swimmer. But now clues to the mystery have been found, wrapped within recent discoveries off the Atlantic coast of Florida by Winston and Eckart Håkansson from the University of Copenhagen.

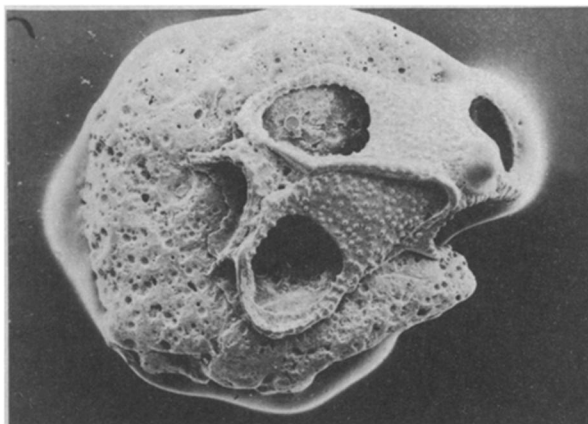
Winston and Håkansson describe in the Dec. 18 *NOVITATES* their taxonomic names for nine new species of bryozoans they collected between 1983 and 1985, plus 24 earlier-described species — all capable of establishing colonies on single grains of sand. These sand-encrusting species, because they have no room to build "cities" of hundreds or thousands of bony boxes, exhibit an accelerated reproductive cycle and do not expend energy to produce protective soldier-type members like other bryozoans.

Although most bryozoans live many years, the new species apparently die within a year. But their explorations on a tiny scale leave a mark on a watery world. "It is a way of getting [bryozoans] distributed across wide sandy areas," says Winston. "If they just have to make it to the next grain, it explains how you could have the species so widely spread." □



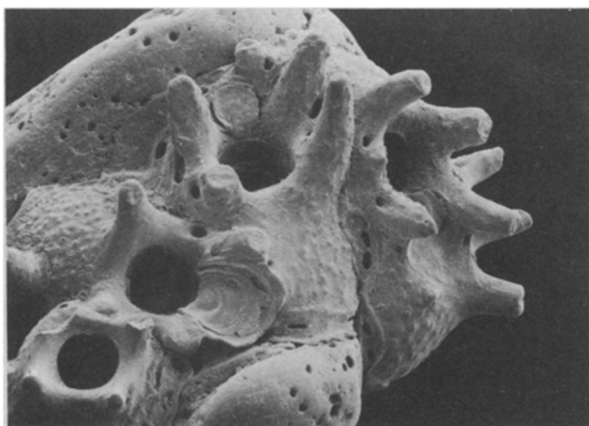
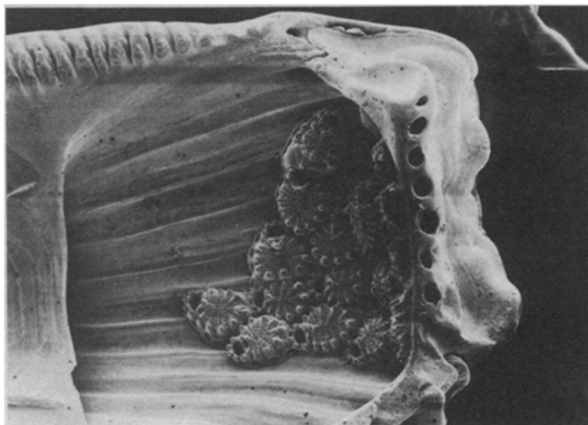
A live colony of *Trematoecia psammophila* perches atop a single grain of quartz about 1 millimeter across. The new species' name means "sand lover," and, unlike most sand grain species, it colonizes rounded surfaces of grains, rather than crevices.

The naming of new species is based on "skeletons" — such as these of *Cribrilaria parva* seen through a scanning electron microscope. *Parva* means "small": individuals of this species range in length from about 0.1 to 0.3 mm.



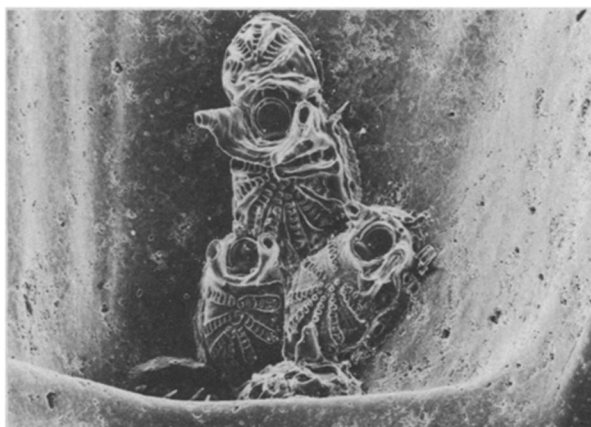
A colony of *Membranipora triangularis* encrusts a single grain of sand. This new species is capable of "jumping" from grain to grain via tubular connections.

Although the species *Cribrilaria innominata* had been previously described as encrusting pieces of shell, it is one of the few species also capable of colonizing sand-size grains.



A skeletal colony of *T. psammophila* on the edge of a grain shows developing ovicells, the brood chambers where embryos change into swimming larvae.

Double spines, one on each side of the oral cavity, are evident in the species *Bellulopora bellula*, previously described on other surfaces. However, only when this species encrusts larger surfaces in larger colonies are the spines part of its defense.



Books

Books is an editorial service for readers' information. To order any book listed or any U.S. book in print please remit retail price, plus \$1.00 handling charge for each book, to **Science News Books**, 1719 N Street, NW, Washington, DC 20036. All books sent postpaid. Domestic orders only.

Ceremony: An Anthropologist's Misadventures in the African Bush — Nigel Barley. A readable account of the author's return to the mountains of northern Cameroon, where he is studying the customs of the Dowayo tribe. Holt, 1986, 159 p., illus., \$15.95.

Dinosaurs in the Attic: An Excursion into the American Museum of Natural History. Douglas J. Preston. The first part of this book focuses on the explorers, scientists and collectors who accumulated much of the museum's vast collections. The second part is a ramble through the museum, talking with curators, exploring vaults and storage rooms and selecting some unusual objects and learning their histories. St. Martin, 1986, 244 p., illus., \$18.95.

A Hundred Billion Stars — Mario Rigutti, translated by Mirella Giacconi. For the general reader interested in astronomical research, its methods and its findings, this book tells what is known about our galaxy. Originally published in Italy in 1978; English translation published in hardback in 1984. MIT Pr, 1986, 285 p., color/b&w illus., paper, \$9.95.

Meltdown — Daniel Ford. The main story in this book, according to the preface, is the years of effort by government scientists to analyze the danger of meltdown accidents and the Atomic Energy Commission's suppression of their findings. This is a revised and updated edition of *The Cult of the Atom*. Ford is the former director of the Union of Concerned Scientists. S&S, 1986, 307 p., illus., paper, \$6.95.

Origins: A Skeptic's Guide to the Creation of Life on Earth — Robert Shapiro. This readable book begins by pointing up the great diversity of ideas that have been proposed for the origin of life. Goes on to distinguish mythological and scientific approaches to the problem, focusing on the important criteria that a satisfactory scientific answer must meet. Describes the principal features of life at the cellular and molecular levels and considers the earlier history of life on this planet as deduced from the fossil record and radioactive dating. Current theories of life's origin are explored. Originally published in hardback by S&S in 1986. Bantam, 1987, 332 p., paper, \$9.95.

State of the World 1987 — Lester R. Brown et al. The fourth in Worldwatch's annual series analyzes such issues as the ecology and economics of urbanization, thresholds of change for many natural systems, the future of nuclear power, new approaches to recycling solid wastes, electrifying the Third World and raising agricultural productivity. Norton, 1987, 268 p., charts & graphs, \$18.95, paper, \$9.95. See p.153

The Unexpected Hanging: And Other Mathematical Diversions — Martin Gardner. A collection of puzzles and brain teasers from the author's SCIENTIFIC AMERICAN column, "Mathematical Games." In this book, originally published in 1969, each column has been expanded and selected references are included that will provide the reader with more information on such topics as geometric dissections and the church of the fourth dimension. S&S, 1986, 255 p., illus., paper, \$7.95.

Photos: Courtesy of Judith Winston, Am. Mus. of Natural History