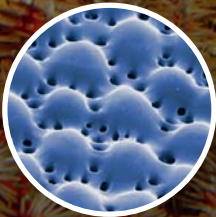




The “Seeing” Skeleton of the Brittle Star



Crystalline bumps on the skeleton serve as high-quality microlenses

Brittle star: © Fotosearch.com; Inset: Courtesy Professor Joanna Aizenberg, Harvard

THE reef-dwelling brittle star has an amazing form of armor on its upper surface. This part of its skeleton is studded with microscopic lenses that turn the animal’s armor into a compound eye.

Consider: When scientists examined the skeletal plates of the brittle star, they saw “an unusual pattern of densely packed, crystal-clear bumps, each thinner than a human hair,” says the magazine *Natural History*. These crystalline bumps, made of calcium carbonate (calcite), proved to be high-quality microlenses that focus light onto what seem to be photosensitive nerves just below the plates. Moreover, the lenses have the exact shape needed to produce the desired image.

According to chemist Joanna Aizenberg, the brittle star’s dual-purpose shell “demonstrates an important principle: in biology, materials are often optimized for multiple functions.”

Taking a lesson from the biology of the brittle star, researchers have devised a simple, low-cost method of producing arrays of microlenses made of calcium carbonate. The many applications of these arrays include telecommunications, where they are used to conduct light signals through optical fibers.

What do you think? Did the “seeing” skeleton of the brittle star come about by evolution? Or was it designed? ■

