Coral Yields Antisunburn Secret

With the southern sun beating down through clear waters, tropical corals need something to protect their delicate tissues from damaging doses of ultraviolet (UV) radiation. Soon their secret shield may show up on drugstore shelves: Researchers at the Australian Institute of Marine Science (AIMS) in Townsville have developed a new sunscreen for humans based on that used by corals.

In the early 1970s, researchers in Japan and Hawaii noticed that corals produce a UV-absorbing substance, a fringe benefit provided by the symbiotic algae living in their tissue. A decade later, photochemist Walt Dunlap at AIMS identified the substance as a member of a family of compounds found in fungi—the mycosporine-like amino acids (MAA). Test tube studies showed that MAA is a highly efficient sunscreen, absorbing and dissipating UV energy. But MAA is a tricky molecule to work with because it's highly unstable in water. "Stabilizing the molecule and making it insoluble has taken us the best part of 10 years," says Dunlap. Scientists, in collaboration with ICI Australia, experimented with hundreds of versions of the MAA molecule, knocking off water-soluble groups and adding others to reinforce the light-absorbing part of the molecule.

Burn-proof coral at low tide on Australia's Great Barrier Reef.

Now the researchers have a financial backer, Sunscreen Technologies Pty. Ltd., which plans to run clinical trials. Dunlap says the coral byproduct is chemically simpler than the aromatic ring molecules on which commercial sunscreens are based, and is less likely to trigger allergic responses. A coral sunscreen should appeal to people looking for "natural" products, adds Gavin Greenoak of the Australian Photobiology Testing Facility in Sydney: "After all, coral has been using it for millennia."

Burned by History

Even with the flames licking his feet, Giordano Bruno refused to recant. Last month, on the 400th anniversary of Bruno's auto-da-fé at the hands of the Inquisition in Rome, the Catholic Church, in line with its 1992 act of contrition over the Galileo affair, declared the heretic's execution to be a "sad episode."

Bruno, a Dominican friar born in 1548, was an across-the-board heretic who dabbled in magic and denied the divinity of Christ. What endears him to scientists is that he not only embraced Copernicus's heliocentric model of the solar system but declared that Earth might be only one of an infinite number of worlds inhabited by beings entirely foreign to humans. After a long imprisonment, Bruno was burned at the stake in 1600.

On the 17 February anniversary of the execution, Cardinal Angelo Sodano, the second-ranking cleric in the Catholic Church, called the incident an "atrocious death." However, he noted that the Inquisition had tried and condemned Bruno with then-common methods. And they had their reasons: "[They] had the desire to serve freedom and promote the common good and did everything possible to save his life."

Heretical ideas put Bruno's life at stake.

Pluto to the Doghouse

After dodging exile from the family of planets last year, tiny Pluto suddenly finds itself deprived of its planethood by a leading astronomical institution, New York's Hayden Planetarium. Last year astronomers debated whether to demote Pluto from planet to mere "object," but decided not to (*Science*, 5 February 1999, p. 769). Pluto makes the planet grade because it's large enough to pull itself into a sphere and it orbits the sun rather than another planet, says Alan Stern of the Southwest Research Institute in Boulder, Colorado.

Nonetheless, when the newly rebuilt planetarium opened last month, the traditional ninth planet was grouped with the myriad bits of rock and ice that form the Kuiper Belt far beyond Neptune. As there is no universal definition of a planet, Hayden decided "to present the solar system the way it presents itself to us," said Hayden astrophysicist Charles Liu last month on the radio show *Science Friday*.

Gimme That E.T. Religion

Has the mission to communicate with alien civilizations taken on a missionary tinge? A social scientist at the SETI [Search for Extraterrestrial Intelligence] Institute is working on a way to communicate spiritual principles to extraterrestrials, should the need arise.

Past attempts to send messages to aliens, such as the plaques sent on the Voyager missions, have steered clear of such controversial topics as theology, says Douglas Vakoch, a psychologist at the institute in Mountain View, California. "The problem is [that] if we want to go beyond information that we already have in common, we have to get into topics where we don't have a consensus."

In a bid to identify widely accepted spiritual principles, Vakoch assembled 10 people from a variety of religions and asked them to classify 66 statements, such as "No one's education is ever complete." The exercise enabled Vakoch to create an experimental "taxonomy" of spirituality which, he hopes, will eventually make it easier to turn a few basic, fuzzy principles into concrete, alien-friendly terms.

The work is "a step in the right direction," believes Carl DeVito, a mathematician at the University of Arizona, Tucson. But he notes that his own efforts to create a synthetic language for aliens "ran headlong into difficulties when we tried to get beyond the technical." When it comes to moral concepts, he adds, "it's almost impossible to define your terms."

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