

Providing the data to protect biodiversity

The United Nations this week released its 1,140-page *Global Biodiversity Assessment*, a tome that describes the global patterns and importance of biodiversity and the causes and dangers of its decline.

"It is easily the most comprehensive report that has ever been done on biodiversity," asserts Nels C. Johnson of the World Resources Institute in Washington, D.C., who along with many others helped prepare the assessment.

More than 126 countries, but not the United States, have ratified the Convention on Biological Diversity, an international environmental protection treaty negotiated in 1992 (SN: 5/8/93, p.303). The U.N. released the report Tuesday at a biodiversity conference it sponsored in Jakarta, Indonesia. The meeting began Nov. 6 and ended Nov. 17. Over 1,000 participants, including government representatives and environmental experts, discussed ways of helping countries implement the treaty.

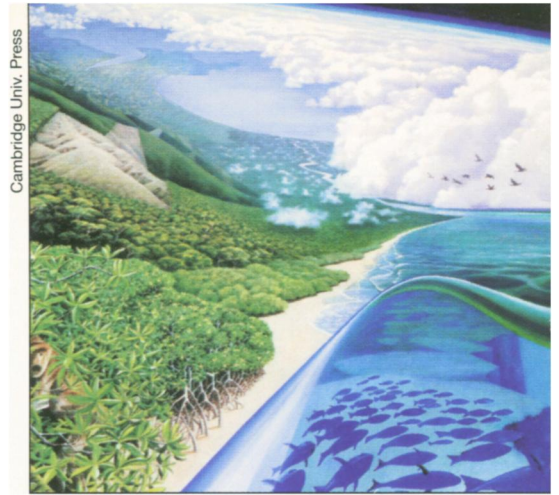
Among the report's numerous authors,

"there was a lot of controversy about certain topics," particularly the number of species that currently exist and the rate at which they are disappearing, says Jane Lubchenco of Oregon State University in Corvallis, also a report coordinator.

The assessment concludes that 5,366 animal and 26,106 plant species stand "at significant risk of extinction in the foreseeable future," almost entirely because of human activities. Since the 1600s, scientists have documented 484 animal and 654 plant species extinctions.

However, the authors suspect that, because of habitat loss, many more extinctions have actually occurred.

They avoid discussing how to protect individual species, instead urging researchers and policy makers to focus on guarding the genetic diversity within species. Although some members of a genetically diverse species may fail to withstand a major environmental change, such as global warming, other members with a slightly different genetic makeup



may carry on.

Biodiversity helps people as well as ecosystems, the report points out. Ecosystems with a wide variety of species appear better able to withstand or recover from environmental disturbances. Humans need a host of creatures to perform such services as pollinating plants, creating soil, and detoxifying pollutants.

— T. Adler

Cosmic rays: ASCA finds a super origin

Of all the particles that bombard Earth, only cosmic rays provide a direct sample of matter from beyond the solar system. Moreover, these charged particles—electrons and ions that travel at nearly the speed of light—rank as the most energetic known in the universe.

For decades, astronomers have pondered how cosmic rays acquire their enormous energies, which can exceed 1,000 trillion electron-volts, far outstripping the energy produced by any particle accelerator on Earth. Researchers have suspected that the shock wave hurled into space when a massive star explodes as a supernova could provide sufficient acceleration, but they've lacked proof. No one had ever found direct evidence of any but low-energy cosmic rays in the rapidly expanding shell of debris that forms a typical supernova remnant.

Now, high-resolution X-ray observations of the supernova remnant SN 1006, described in the Nov. 16 *NATURE*, indicate

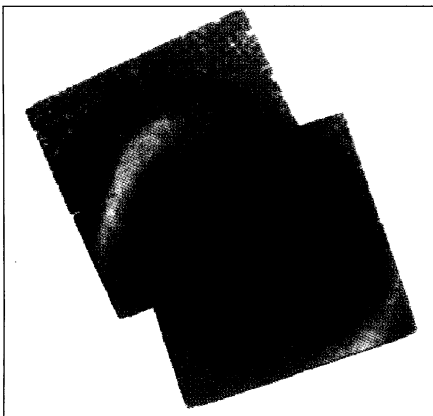
that high-energy electrons do originate in the remnant. Two bright regions on opposite sides of the remnant emit X rays in a pattern called synchrotron radiation, which is characteristic of high-speed electrons moving through an interstellar magnetic field. This X-ray signature contrasts with the thermal radiation emitted by hot gases elsewhere in the remnant.

Katsuji Koyama of Kyoto University in Japan, Robert Petre of NASA's Goddard Space Flight Center in Greenbelt, Md., and their colleagues gathered data with the Japanese-U.S. satellite ASCA (Advanced Satellite for Cosmology and Astrophysics). The finding "provides the first strong observational evidence that very high energy cosmic rays are produced in supernova remnant shocks," the team writes.

The shock wave conspires with interstellar magnetic fields to accelerate charged particles. The particles spiral along a magnetic field, but a kink in the field can send them hurtling backward. The particles then bounce like Ping-Pong balls between the field and the shock wave racing up from behind, gaining energy with each bounce.

Confirmation of the ASCA findings may come when the X-ray Timing Explorer, scheduled for launch next month, examines emissions from SN 1006 at higher energies, notes Stephen P. Reynolds of North Carolina State University in Raleigh. Already, the ASCA study "has gone far towards solving at least part of the mystery of cosmic rays," he adds. — R. Cowen

X-ray view of SN 1006. Orange denotes highest intensity.



Koyama, E.V. Goethelf, et al./NATURE

Keeping the heart healthy

A lipid-lowering drug normally given only to heart disease patients dramatically reduces the incidence of heart attacks in men with high cholesterol but no history of heart attacks, a new study reveals.

Compared to an equal number of men taking a placebo, men given the drug pravastatin had about 30 percent less chance of a fatal or nonfatal heart attack during the 5-year study, James Shepherd of the University of Glasgow and Royal Infirmary in Scotland and his colleagues report in the Nov. 16 *NEW ENGLAND JOURNAL OF MEDICINE*.

Despite some researchers' fears that people taking cholesterol-lowering drugs are more apt to have fatal accidents or commit suicide, the treatment group had a 22 percent lower risk of dying from any cause.

The study involved 6,595 men age 45 to 64 with an initial mean cholesterol concentration of 272 milligrams per deciliter of blood. During the study, 174 of the volunteers taking the drug and 248 on the placebo either suffered a nonfatal heart attack or died of coronary heart disease.

The treated group had, on average, a 20 percent drop in cholesterol concentrations, a 26 percent decline in low-density lipoprotein cholesterol concentrations, and a 5 percent increase in the beneficial, high-density lipoproteins. Placebo recipients had no overall change.

Simvastatin, a similar drug, protects patients with a history of heart attack or angina from fatal coronary heart disease (SN: 11/26/94, p.357). — T. Adler