

Dramatic drop in global ozone layer

While atmospheric scientists have been reporting for years that the global layer of life-protecting ozone is disappearing right before our eyes, these statements have attracted considerable criticism from other experts who say such claims are inaccurate. But an international panel of more than 100 experts released a long-awaited report this week that may put to rest many debates concerning the disappearing ozone phenomenon. And by coincidence, on the day before this report's release the United States became the second country to ratify an international treaty designed to protect the ozone layer.

After a year and a half spent reanalyzing almost all the available ozone data, the scientific panel concluded that global levels of stratospheric ozone have dropped by 2.5 percent between 1978 and 1985 as a result of both human pollution and natural patterns. The panel also predicted a solar-cycle-induced global ozone increase for the next few years.

The recent decrease is significantly smaller than those described in previous reports, which were based on satellite data that are suspect because of equipment problems (SN: 1/9/88, p.20). "The very large trends reported using the satellite data alone were incorrect," says Robert Watson of NASA, who chaired the Ozone Trends Panel. "The reason is that there is an optical component called the diffuser plate that both satellite [instruments] use to measure ozone. This optical plate degrades with time."

The panel based its conclusions on ground-based instruments called Dobson meters, which have been measuring ozone levels at certain stations for 30 years. By comparing the Dobson measurements to those taken with instruments aboard the Nimbus 7 satellite, the scientists could correct for the degrading diffuser plate on the satellite.

Although the newer estimates of ozone losses were smaller than those in previous reports, the panel found that the decreases are much greater than those predicted by theoretical models, which the scientists say do not account for certain "unusual" atmospheric chemical reactions. "Theory would predict that in response to trace gases, ozone should have changed between 1 and 2 percent between 1969 and 1986; the observed changes in the wintertime reach 6 percent," says Watson.

The Antarctic has received much attention because of its unexpected ozone loss in early springtime. But the panel also found that high northern latitudes experienced unusually heavy loss during the study period.

During an experiment in Antarctica

Aye-aye, primate . . . stateside at last

Considered bad luck and fair game in its native Madagascar, the cat-sized primate called aye-aye not only suffers from a bad image, but also is in danger of becoming extinct. To save the unusual-looking animal, scientists are hoping that a captive breeding program will produce offspring safe from hunters and disappearing forests.

Announcing plans for the first aye-aye colony to be established in the United States, researchers said recently that two of the animals (one of which is shown above) have arrived safely at the Duke University Primate Center in Durham, N.C. Despite a few glitches — like the fact that both animals are male, and that almost nothing is known about aye-aye breeding habits — primate experts at the center say they are optimistic.

In Madagascar, legend says that you will die if an aye-aye points its bony third finger in your direction. Those thin fingers are used to spear grubs, which the aye-aye's large ears can hear gnawing under bark that is ripped away by the animal's sharp teeth.

Specimen collectors had permits to



Jim Wallace/Duke Univ.

capture four of the animals in January, but an illegal aye-aye hunt by area residents shortly before they arrived left only two males alive, Elwyn Simons, director of the primate center, told SCIENCE NEWS. Simons says a female-seeking expedition is scheduled this spring. The two males at Duke, along with two females and one young male at the

Zoo in Vincennes, are the only aye-ayes in captivity — and the only ones allowed to leave Madagascar since 1930. Simons says the two countries have discussed conjugal visits.

Officially called Daubentonia madagascariensis, the nocturnal aye-aye is the only living representative of its taxonomic family. With perhaps "a few hundred" aye-ayes left in the wild, says Simons, this type of lemur may not be the rarest primate — but local attitudes make it "probably the world's most endangered primate species."

"The aye-aye is attracted to villages to eat sugar cane and coconuts, so it's like the skunk in the henhouse and killed as vermin," says Simons.

last year, researchers concluded that ice particles in the stratosphere play an integral role in the chemical destruction of ozone (SN: 10/10/87, p.230). Although these particles are less prevalent in the north, Watson suspects that they may be playing a similar but less pronounced role in the north. Computer models cannot yet account for this chemistry, and that may be why these models underestimate ozone loss for winter, when the atmospheric ice particles form.

Ozone loss was greatest over the polar regions and slightly less severe over the midlatitudes, where much of the world's human population lives. These losses concern scientists, since ozone ordinarily filters out ultraviolet rays that can harm animal and plant life.

Human pollution, most notably chlorofluorocarbon (CFC) gases, is responsible for at least part of the ozone disappearance, the panel concluded. But the ozone levels are also responding to natural events, such as the 11-year solar cycle, upper-atmosphere wind patterns and volcanic eruptions.

The solar cycle — a natural waxing and

waning in the sun's radiation — appears to have a strong effect on ozone concentrations. From 1979 through 1986, the ultraviolet radiation coming from the sun has been weakening. Since ultraviolet radiation creates ozone, this weakening has compounded CFCs' action in the stratosphere, and ozone levels have dropped.

In 1986 the solar cycle shifted, and it is currently building toward a maximum expected around 1991. "So for the next five or six years we may expect an increase in ozone globally rather than a decrease. However, once we pass 1991 . . . we would then expect to see a decrease in ozone," says Watson.

Although ozone levels rise and fall with the solar cycle, the long-term average level is decreasing because CFCs are building up in the stratosphere, he says.

Last September, 31 nations signed a treaty to protect ozone by cutting CFC production. Senate approval of the treaty made the United States the second country — behind Mexico — to ratify the accord.

— R. Monastersky

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