Sulfur-climate link called insignificant

People have speculated that gaseous sulfur produced by one-celled marine plants might help counter human-induced global warming. The idea emerged after researchers suggested last year that these emissions might partially regulate Earth's temperature (SN: 12/5/87, p.362). Then an August 1988 report suggested the gas from plankton might actually intensify the greenhouse effect. Now chemist Steven E. Schwartz says the plankton probably don't play any role in controlling global temperature.

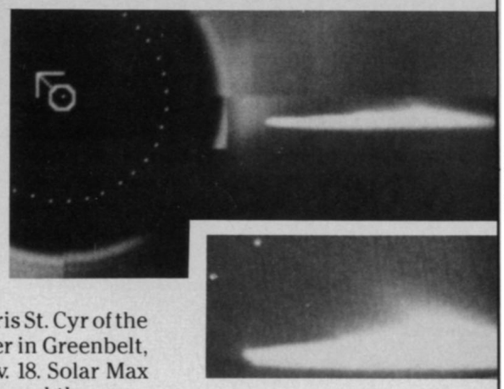
Moreover, in the Dec. 1 NATURE, Schwartz contends gaseous sulfur *in general* does not significantly influence global temperature. He says comparing historical temperature trends with recent atmospheric-sulfur measurements shows that sulfur dioxide from fossil-fuel burning, the single largest source of gaseous atmospheric sulfur, has not controlled world temperature. Therefore, Schwartz says, neither plankton-produced dimethylsulfide nor any other gaseous sulfur compound is affecting greenhouse warming. Fossil-fuel combustion accounts for about half the sulfur gas released into the atmosphere, while dimethylsulfide from plankton amounts to less than one-fourth, he adds.

Schwartz, of Brookhaven National Laboratory in Upton, N.Y., says that even though most fossil-fuel burning occurs north of the equator, average temperature trends have varied little across that boundary. "It looks like the Northern Hemisphere has 1 ½ times as much sulfur aerosol as the Southern Hemisphere, but average temperature in both hemispheres has increased the same amount – 0.5°C to 0.6°C – during the past 100 years," he says. "We're left with a puzzle: Why isn't the Earth responding to the difference in these emissions?"

Robert J. Charlson of the University of Washington in Seattle, one of four scientists who proposed the plankton-climate connection in the April 16, 1987, NATURE, reported with two co-workers in the Aug. 4, 1988, NATURE a test of the theory. The results suggest that if plankton emissions react at all to global warming, they might enhance it.

Charlson does not believe Schwartz's study rules out a plankton-climate connection. He says the only way to test for such a link is to examine individually each hypothesized step. First, he says, dimethylsulfide emissions would increase the concentration of cloud-forming particles; next, those particles would make clouds whiter; finally, whiter clouds would change world temperature. Schwartz says the first two steps seem reasonable but could exert local, rather than global, influences. – *C. Knox*

Solar Max spots sixth sun-grazing comet



HAO/NCAR

The number of "sun-grazing" comets discovered by the Solar Maximum Mission satellite's coronagraph now totals six. These comets' orbits carry them so close to the sun that most apparently are destroyed during the passage. Astronomers have found no sign that any of Solar Max's six comets emerged on the other side of the solar disk.

The most recent, designated SMM-6 on Dec. 3, was found by Chris St. Cyr of the NASA Goddard Space Flight Center in Greenbelt, Md., in photographs made on Nov. 18. Solar Max was not designed to hunt comets, and the coronagraph does not show the sun itself, which is masked out by a disk.

By far the most striking sun-grazer, however, is SMM-5, which St. Cyr spotted in photos (above) taken on Oct. 11. "It has the longest tail and is the brightest comet" seen by the instrument, he says. Setting it apart from other known sun-grazers is "a conspicuous bulge, almost doubling the width of the tail, on the northern side, about halfway along its length." In addition, the photos show "a wispy structure extending further north and sunward from this bulge."

Among sun-grazing comets, says Malcolm B. Niedner of Goddard, "I have never seen anything quite like that before." The bright streak heading away from the sun is probably the dust portion of the comet's tail, while the wispy feature (inset) may consist of molecules released from the comet's melting nucleus, ionized by the sun's ultraviolet light and drawn sunward along a line of the sun's magnetic field, Niedner says. – *J. Eberhart*

Tretinoin: Lasting results, lingering doubts

The latest study of tretinoin (Retin-A) shows the drug continues to reduce wrinkles, age spots and roughness for at least 22 months in patients with sun-damaged skin. Yet despite the good reviews, scientists still voice skepticism. Tretinoin "is somewhat controversial," says Edgar B. Smith, president-elect of the American Academy of Dermatology. He and others worry that doctors and patients are rushing to embrace the drug without waiting for the long-term research needed to prove its safety and efficacy.

In a follow-up study of 21 patients, John J. Voorhees and his colleagues at the University of Michigan Medical Center in Ann Arbor found sustained skin improvement when patients used the drug for 22 months. "I think the future of this particular agent is substantial," Voorhees said this week at the Academy's 47th annual meeting in Washington, D.C.

The 21 patients were among the original 30 participants in a study conducted by Voorhees, Jonathan S. Weiss and their colleagues, described earlier this year in the Jan. 22/29 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. Patients treated with tretinoin in that study showed dramatic improvements that researchers documented with before-and-after photographs. But many doctors wondered whether these early effects would last (SN: 9/24/88, p.200). The new study suggests the drug continues to improve skin as long as it is used.

Smith, however, says the follow-up study is flawed because the 21 patients knew they were getting tretinoin treatment. He notes that the original study used a double-blind method of assigning patients to a control or treatment group. "If a study is not blinded," he asks, "can you really be objective about your results?"

In addition, some dermatologists have faulted the Michigan team for using photographs to measure tretinoin's efficacy. Many scientists regard pictures as a crude way to show skin improvement.

A new, computerized method of measuring wrinkles may help dispel such criticism. "The system takes some of the subjectivity out of evaluation and gives us, for the first time, an objective method of measuring the drug's effect," says James J. Leyden of the University of Pennsylvania School of Medicine in Philadelphia, who helped develop the technique. Researchers make a rubbery cast of the skin, and a computer compares wrinkle dimensions before and after treatment. Leyden has used the system to analyze skin imprints from 40 people in a double-blind study. Those who received tretinoin for six months showed significant improvement compared with controls who were given a cream without the drug, he says. – *K.A. Fackelmann*