

More rings around Uranus

The rings of Uranus, discovered in March 1977 when they occulted the light from a star, were at first thought to be five in number, including an outermost ring that seemed to be strangely eccentric to the rest. Last October, Cornell University's James Elliot, one of the discoverers, reported at a meeting that further study of the data had revealed a sixth ring, located between the second and third original ones. Last month the rings occulted two other stars, and a group of California researchers now says that there are two or possibly three more rings inside all the rest, thus totaling as many as nine. (They may also show in the Cornell data.)

In addition, they report, the latest observations show the eccentric ring to have precessed around the planet. In March 1977 the ring was farther from the planet on the "inbound" leg of the star's occultation path than on the outbound leg. Last month the situation was reversed. Such precession is expected, says Philip Nicholson of California Institute of Technology,

who analyzed the recent observations, but it was detectable only because the ring is out-of-round.

The actual precession rate has not been determined. Since the eccentric ring also appears to vary considerably in width, however, it is possible that observations of additional occultations will enable the rate to be worked out. This could be valuable to the study of Uranus itself, Nicholson says, since the precession rate could be used to calculate the planet's oblateness, or equatorial bulge. A small bulge would mean that Uranus has most of its mass concentrated toward the center, such as in a planet with a substantial core and deep atmosphere, while a large bulge would imply a more homogeneous overall structure. (Previous attempts to measure the oblateness vary by a factor of nearly 3, says Nicholson, since they depended on the hard-to-measure precession of the nearly round orbits of Uranus's moons.)

The recent observations were made on April 10 by Eric Persson of the Hale Observatories, using the 2.5-meter telescope at Las Campanas Observatory in Chile. Also in the project were Caltech's Keith Matthews, Gerry Neugebauer and Peter Goldreich. □

Skylab maneuver set for June 11

A critical maneuver that could make a potentially life-or-death difference for the Skylab space station in orbit around the earth is now tentatively planned for June 11, according to NASA officials. There have been fears that the nearly-100-ton workshop may reenter the earth's atmosphere — with pieces possibly reaching the ground — before a space shuttle crew can reach it to boost it into a higher, longer-lived orbit. The upcoming maneuver, designed to reorient Skylab into a position with less atmospheric drag, is hoped to add from six months to a year to its present orbital lifetime.

Unoccupied and virtually out of touch with the earth since its final crew of astronauts departed in early 1974, Skylab was reactivated in March by commands radioed from the ground so that engineers could determine whether systems vital to the proposed maneuver were still in working order (SN: 3/18/78, p.167). The facility has turned out to be in surprisingly good shape, with pressurization systems, batteries, computers and other components all apparently ready to go.

Ground controllers will begin setting up the move about June 1, putting a new program into Skylab's on-board computer. Later they will fire up the control gyro system, and then reactivate the guidance system to turn Skylab so that its long axis is parallel to the earth's surface, and the solar panels are facing the sun but edge-on to the line of flight. (The station is currently in a slow roll.)

If the plan succeeds at extending Sky-

lab's time aloft, an early space shuttle flight will carry up a TV-equipped booster rocket, which will be steered from the shuttle by remote control to a docking with the space station. The rocket will then be fired to lift Skylab to a higher orbit. Without the upcoming maneuver, however, the workshop might not be there when the shuttle arrives. Two weeks ago a House subcommittee withheld about \$39 million in appropriations for the remotely controlled booster until it is established that the maneuver was successful.

Meanwhile, delays in the shuttle's development, particularly with its main engine, have caused uncertainty about when the craft will make its first orbital flight. The space agency has been aiming for March 1979, while publicly citing a more conservative prediction of between April and June. A recent official NASA statement, however, concedes that the engine problems "could cause the June date to slip," and one official told SCIENCE NEWS last week that "very officially — unofficially" the agency now expects the first flight to take place in "September at the earliest, probably October."

The Skylab-boosting mission had been scheduled for the third shuttle flight, but the space station's uncertain lifetime has caused planners to consider advancing it to the second flight. This could save as much as three months, but it would mean that the shuttle had only one previous orbital test under its belt. Yet now, says the official, with the delays, "even [flight number] one is a candidate these days." □

Fish sprout nerve spines in schools

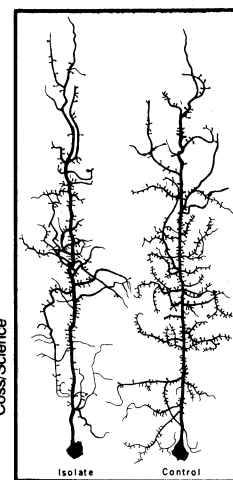
Young jewel fish reared in solitary confinement, patrolled by faceless observers, develop severe behavioral problems. They are fearful of other fish, unskilled in decision making and unable to discriminate among members of their own species. An anatomical difference has been detected between such isolates and normal, community-reared fish. One type of nerve cell has fewer branches and fewer and shorter spines in the deep layers of brains of the isolated fish, Richard G. Coss and Albert Globus report in the May 19 SCIENCE.

The spines on the branches of nerve cells are the sites of most input from other cells. Research in various experimental systems has suggested that the shape of the spines changes with their activity; electrical stimulation causing them to swell, visual deprivation resulting in long, thin stems. Coss suggests that the shape change, which can alter the conduction properties of the spine, may be an immediate response to activity. Growth of additional spines may then expand the system for later contingencies. Coss and Globus found the greatest differences between the isolate and normal fish among the spines close to the cell body (those they suggest are the oldest).

The anatomical studies stemmed from behavioral studies of social isolation. The isolates are confined in compartments where they can smell and hear each other (they growl), but all they can see are faceless cave characins (small tropical fish), which swim in the corridors between the compartments.

One behavioral difference Coss finds is in judgment. Normally, the fish are very accurate at calculating from another fish's size and orientation when it is worthwhile to attack and when it is best to flee. The inexperienced isolates show poor judgment. They usually give a perfunctory display of aggression, then become confused and turn around in the midst of an attack.

Coss finds that the fish's ability to recognize a face is instinctual. The isolate fish respond with unequivocal flight to a



Nerve cell from isolated fish has fewer and thinner protrusions near the cell body. These cells are common in a brain area receiving input from a variety of senses, including touch and sight.

model fish painted with two eyes, but not to a one-, three- or four-eyed shape. However, the isolates seem unable to recognize even their own mating partners. A pair of normal fish together defend their eggs against all intruders. But an isolate will not attack another fish substituted for its partner. Even a pair of female isolates will defend eggs together. Thus, fish reared in an environment lacking a biologically important signal suffer rather specific damage. They know *what* a face is, Coss says, but don't know *whose* it is. □

Alaska lands bill: A mountain to climb

While conservationists rejoice over the 277 to 31 victory of the Alaska lands bill in the House late last week, there is still a tough hurdle ahead. The bill addresses what has been called the century's greatest conservation issue and the year's greatest conservation controversy. At stake is whether and to what extent much of the rugged and majestic terrain will be closed to mineral exploration and development.

The bill that passed the House would set aside more than 100 million acres for new national parks and wildlife refuges and would protect 66 million acres of national land as pristine wilderness. None of this land would be open to mining, with the possible exception of the refuges. But oil, gas and hard-rock mining lobbies have fought for insertion of exceptions that would allow them a lever against permanent exclusion. And they got one in an amendment introduced by Jim Santini (D-Nev.). It requires the U.S. Geological Survey to continue its mineral assessment — which includes core drilling — on all lands; it also requires the President to submit a proposal to Congress by Oct. 1, 1981 that would allow mineral exploration and extraction on all national land if it was "in the national interest."

It's only a lever and the battle is far from over. Both Alaskan senators have threatened to filibuster if the bill hits the floor. And reports say Senate majority leader Robert C. Byrd (D-W. Va.) will try to see it doesn't hit the floor to avoid that filibuster.

Conservationists hope Byrd will change his mind in light of the sweeping House victory. If the bill doesn't pass the Senate and conference committee by year's end, they will have to start from scratch drumming up support for new legislation.

The Alaska coalition, with members from conservation organizations, civic groups and labor unions throughout the 50 states, has put a lot of sweat, money and time into lobbying for the bill, which would double the size of the national park system and preserve America's last frontier. They fear they'll lose the momentum they acquired if the controversy isn't settled. So all sides wait for word from Byrd. □

Potential Nobelists win trip to Sweden



Contestants at the 29th International Science and Engineering Fair receiving the Glenn T. Seaborg Nobel Prize Visit Award: Maryanne Povinelli of Rocky River, Ohio, and Perry J. Damiani of Greendale, Wis., are shown with Seaborg (far left), Nobel laureate and president of the Board of Trustees of Science Service, and Richard L. Terrell (far right), Vice Chairman of General Motors Corp., sponsors of the award.

Cleaner electroplating also reduces wastes

A computer-automated gold-electroplating system that is cleaner, faster, saves energy and reduces raw-material waste, was announced last week by Bell Telephone Laboratories and Western Electric Co. Compared with conventional systems of the same size, the process reduces exhaust gases by 97 percent, chemical waste by 90 percent and gold use by 50 percent. And production is increased because the system is seven times faster, says Don Koontz, one of its developers.

Keys to the system are a faster electroplating chemistry and operation within a totally closed environment. Unlike most conventional electroplating, which is carried out in open vats, each step in the Bell process occurs inside coupled, but independent, cells. The reduction in chemical evaporation and contamination of the plant environment reduces by 85 percent the energy needed to air-condition and treat air. Water is recycled where possible.

Koontz says that although the system was designed for gold electroplating, "we're quite confident that the system is generic," and can be applied to other metal plating. Energy and resource savings would vary, depending on the mate-

rial to be plated and metal used.

Bell's system was designed to plate tapes of telephone-network contacts. The tapes are wound around spools on either end of a 45-foot-long assembly, then drawn at a controlled rate through each chemical-processing cell. Cells can be rearranged to permit combinations of gold, nickel or copper plating, the Bell researchers say. Two platers, installed in a Western Electric plant last year, paid for themselves with reduced costs in only six months, according to George Helgesen, another of the developers. □

Lowering cholesterol

Although elevated levels of cholesterol in the blood have been heavily implicated in heart attacks, especially in the half-million Americans who have inherited raised cholesterol levels, drugs currently available have only been able to lower cholesterol levels by about 25 percent. Now research reported at the recent meeting of the American Society of Clinical Investigation in San Francisco shows that two drugs combined with a low-cholesterol diet can reduce cholesterol levels by 55 percent.

J. P. Kane and his colleagues at the University of California at San Francisco had 49 patients with inherited high-cholesterol levels eat a low-fat diet and take two drugs — colestipol and nicotinic acid — for a year. Ninety percent of the patients' cholesterol levels dropped to normal. Colestipol acts as a chemical sponge, draining cholesterol derivatives from the liver so that they can be disposed of in the intestines. Nicotinic acid appears to block the synthesis of low-density lipoprotein molecules that transport cholesterol through the bloodstream. In the past, colestipol and nicotinic acid have been tested individually as cholesterol-lowering drugs, but with little success. So it is their combined use, along with a low-cholesterol diet, that must do the trick. □

Telephone network contacts electroplated by computer-controlled system (at rear).

