Astronomy

Much ado about Pluto

Three generations of schoolchildren have learned that Pluto is a planet. After considerable uproar over whether this tiny member of the solar system should be called something else, the International Astronomical Union (IAU) has decided to let Pluto retain its noble rank.

Brian G. Marsden says it was never his intent to demote Pluto. But that's not the way many interpreted his proposal last year that this icy orb, discovered in 1930, belongs in a catalog of objects known as the minor planets. The category includes such solar system detritus as asteroids and inactive comets.

Marsden, a planetary scientist at the Smithsonian Astrophysical Observatory in Cambridge, Mass., emphasizes that his proposal would not have stripped Pluto of its planetary status. The classification, he says, simply reflects the fact that Pluto has much in common with denizens of the Kuiper belt, the reservoir of icy objects that lies beyond the orbits of Neptune and Pluto and is thought to be a main source of comets. Although Pluto is 10 times as big as any known member of the Kuiper belt, its composition and orbit are similar to objects in the reservoir.

In contrast, Pluto is an oddball among its eight sister planets. It's the smallest in both size and mass, and has the most elliptical orbit. It moves in a plane tilted markedly away from the other planets' orbits. Moreover, Pluto is the only planet made almost entirely of ice.

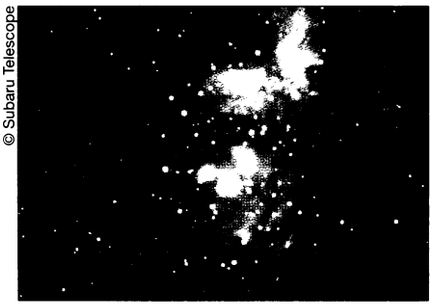
In Marsden's plan, Pluto would have become the largest object in the minor-planet catalog, a title held for 198 years by the asteroid Ceres. In recognition of its special status, Pluto would also have been designated as the catalog's 10,000th member.

"It's a bad idea," says astronomer Richard P. Binzel of the Massachusetts Institute of Technology. "Scientifically and semantically, Pluto can't be a major planet and a minor planet at the same time . . . . How would you like to be known as the 10,000th object? . . . You'd have to rewrite history." IAU rejected Marsden's proposal in a statement Feb. 3.

Arguing that Pluto has characteristics of both planets and the Kuiper belt, Binzel initially suggested a counterproposal: Keep Pluto as a planet but make it the charter member of a new catalog composed exclusively of Kuiper belt objects. In recognition of expanded knowledge of the outer solar system, Binzel still favors creating such a catalog. But after the debate over the orb's fate reached a fevered pitch in January, he now concludes that astronomers should "just leave Pluto alone." —*R.C.*

First light for big telescope

At the windswept summit of Hawaii's Mauna Kea, another eye has opened on the heavens. In late January, Japan's 8.3-meter Subaru Telescope, the world's largest single-mirror telescope, began recording images in visible light and the near-infrared. Although two of Subaru's neighbors on Mauna Kea, the Keck I and Keck II telescopes, sport larger reflecting surfaces—each is 10 m across—their mirrors are composed of individual tiles rather than a single piece. —*R.C.*



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Infrared image of the Milky Way's Orion nebula recorded by the Subaru Telescope. Many stars clustered around the Trapezium, a group of four stars at the center, are embedded within the Orion molecular cloud and can be seen only at infrared wavelengths.

Biology

Making milk easier on the stomach

Next time you're in the grocery store, check out the dairy case. You'll see a large array of milks: chocolate, skim, 1 percent, 2 percent, whole, and even milk without lactose, the sugar that many people have trouble digesting. The last of these is the most expensive variety because of the difficulty of removing lactose. Usually, the milk is treated with enzymes that break apart the molecule into less complex sugars. People who are lactose intolerant make smaller-than-normal amounts of such enzymes in their intestines.

In a step toward having cows make lactose-free milk directly—and therefore more cheaply—scientists have genetically engineered mice to produce lactose-splitting enzymes in their mammary glands. Milk produced by these rodents has 50 to 85 percent less lactose than normal, Bernard Jost of the National Institute of Health and Medical Research in Strasbourg, France, and his colleagues report in the February NATURE BIOTECHNOLOGY.

The milk from the altered mice apparently retains its nutritional value. The protein and fat contents of the lactose-lowered milk resemble those of normal milk, and mouse pups fed the modified milk suffered no ill effects, the researchers note.

"Lactose intolerance effectively limits the use of a valuable nutritional source for many people," says Bruce Whitelaw of the Roslin Institute in Edinburgh in a NATURE BIOTECHNOLOGY commentary. "Here is an example of a transgenic technology modifying product quality to generate healthier food." Applying the same strategy to cows seems feasible, and it's likely that scientists can reduce lactose concentrations considerably more, adds Whitelaw. Further testing must occur to ensure that the modified milk remains safe, tasty, and nutritional, he asserts, and it remains an open question whether society will accept milk from genetically engineered animals. —*J.T.*

Infamous flu virus reveals its past

The virus that caused the flu epidemic of 1918 continues to divulge its secrets. Working with preserved tissue from patients killed by this deadly flu strain, Ann H. Reid of the Armed Forces Institute of Pathology in Washington, D.C., and her colleagues are slowly piecing together the virus' genome.

In the Feb. 16 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, the scientists report that they have now deciphered the full DNA sequence of the gene for hemagglutinin, a surface protein vital to the infectious ability of the virus. Much like their earlier report of a partial sequence of that gene (SN: 3/22/97, p. 172), this effort has not revealed anything unique about the gene that the investigators can connect to the extraordinary virulence of the 1918 flu virus.

After comparing the 1918 version of hemagglutinin with that of other flu strains, Reid's group argues that a milder version of the flu strain may have been evolving in people—or perhaps pigs—in the years before the epidemic broke out. The investigators continue to sequence other genes from the 1918 virus. —*J.T.*

A gas just says NO to a virus

To defend against invaders, cells in the human body can launch a poisonous gas attack. The gas used is often nitric oxide, NO, which is best known as a common air pollutant. Nitric oxide can thwart viruses, bacteria, and other microscopic foes, but scientists don't understand exactly how.

In at least one virus, the gas appears to inactivate a protease, an enzyme that splits large proteins into smaller molecules used in viral replication. Charles J. Lowenstein of the Johns Hopkins Medical Institutions in Baltimore and his colleagues, who report the finding in the January IMMUNITY, note that other viruses, bacteria, and parasites employ similar proteases. Nitric oxide may attack them in the same way, the researchers say. —*J.T.*