

## Yet another moon for Jupiter

Just a year after discovering the 13th moon of Jupiter (SN: 9/28/74, p. 195), astronomer Charles Kowal has found what may be the 14th. The tiny object, detected during a diversion from Kowal's usual target of supernovas, has a photovisual magnitude of 21, making it only a tenth as bright as its barely visible predecessor and tentative new record-holder as the dimmest known moon in the solar system. It was found in photographs taken on Sept. 30, Oct. 1 and Oct. 2 through the 122-centimeter Schmidt telescope at the Hale Observatories on Palomar Mountain (IAU Circular 2845).

It will probably take several weeks to determine that the object is indeed a moon, since observations must be made over a long enough period of time to establish its orbit clearly. But other astronomers, such as J. Derral Mulholland of McDonald Observatory in Texas and Elizabeth Roemer of the University of Arizona, are already on the case.

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J-XIV is an unromantic name for a moon, but that may soon change. The International Astronomical Union this week (IAU Circular 2846), at long last, published tentative official names for the nine of Jupiter's 13 previously discovered satellites that had not been named. Also, Kowal will probably be asked to submit a name for J-XIV when the rest are considered for adoption by the IAU General Assembly in August 1976. German philologist J. Blunck suggested the guideline that direct-orbiting satellites receive names ending in "a," while those in retrograde paths get "e" endings. Blunck also contributed the proposed names for moons J-VI through J-XI.

J-V, innermost of the Jovian moons, has been tentatively assigned its already unofficially adopted name of Amalthea. J-VI through J-XI are, respectively, Himalia, Elara, Pasiphae, Sinope, Lysithea and Carme. Because Blunck's suggestion of Thebe for J-XII sounded too much like Saturn's moon Phoebe, the alternative of Ananke has been proposed, while Kowal's choice, Leda, has been suggested for his discovery, J-XIII. □

## A double-cometeer

Hiroaki Mori had never discovered a new comet before. But on the night of Oct. 5, he became the first person ever to discover two in a single night, according to the SAO's Brian G. Marsden. Comet 1975J was seen at magnitude 11 in the constellation Hydra by Mori and two others, while 1975K, at magnitude 8 or 9, was spotted in Ursa Major by four observers besides Mori. Only 70 minutes separated his dual discoveries. □



NOAA-4 satellite photo on July 28 shows 960-kilometer plume from Tolbachik's flank.

## Predicting volcanoes: A first?

Predicting the eruption of a volcano, presaged by the upwelling of lava from the earth's depths along with other signs, is perhaps not so difficult as foretelling an earthquake from its more subtle indications, but it is less than an established technique. Re-eruptions of existing volcanoes have been predicted by volcanologists at, for example, Hawaii's Kilauea, but anticipating the birth of a new volcano is another matter. On Kilauea, a known active site, tiltmeters monitor changes in the slope of the ground, signalling scientists to install seismometers that track the movements of the migrating lava. At a site with no known active history, however, there are seldom tiltmeters available to serve as an early warning system.

Now there is a Soviet claim of the first prediction of the time and place of a volcanic eruption. But there is a puzzlement.

The eruption in question took place on July 6 on Russia's Kamchatka Peninsula. According to Y.M. Doubik of the Institute of Volcanology in Petropavlovsk, his colleague, P.I. Tokarev, called both time and place beforehand. But is it a new volcano, bursting forth from formerly quiet ground? The last such eruption was that of Paricutin, which exploded in 1943 in Mexico, about 60 kilometers southeast of Guadalajara. The Kamchatka event took place only 18 kilometers from the main cone of Plosky Tolbachik volcano, on what even Doubik terms its south slope.

It was, to be sure, a substantial eruption. Four vents, or fissures, opened and shot ashes eight kilometers into the air, spreading ejecta over 200 square kilometers of the surrounding terrain. The resulting eruption plume, up to 960 kilometers long, has been photographed repeatedly by the NOAA-4 satellite, which can see it readily from an altitude of more than 1,450 kilometers. Within a month of the eruption, a volcanic cone some 250 meters high and 1.2 kilometers across had formed on the site, including a kilometer-long flank-fissure of its own.

Although it may not qualify as a "new" volcano, Tokarev's prediction may be a significant one. Juergen Kienle of the

Geophysical Institute of the University of Alaska at Fairbanks points out that in 1971 Tokarev published a set of data curves (BULLETIN VOLCANOLOGIQUE, Vol. 35, No. 1) showing the cumulative strength of tremors preceding each of four eruptions, with the build-up ranging from days to months. "Knowledge of the growth law of cumulative seismic strain-release of volcanic earthquakes prior to eruptions," Tokarev wrote, "allows prediction of the time and energy of expected eruptions." The bursting of Tolbachik's flank seems to have been a proof of Tokarev's pudding.

Also, suggests Kienle, Tolbachik may be a different kind of volcano from those whose re-eruptions have been predicted on Hawaii. If its magma is of a type that flows less freely, perhaps it has a greater tendency to clog the volcano's main vents, thus increasing the likelihood of eruptions along the flanks. □

## 1,900-year-old city linked to the Huns

South of Senta near the Tisza river in northeastern Yugoslavia a 1,900-year-old city has been unearthed. The discovery, made this June as the result of a dam project, may shed some light on the Sarmatians, Huns and other invaders of the Roman Empire. According to the archaeologist in charge of the site, Laszia Szekeres of the Museum of Subotica, there is even a chance of finding the grave of Attila the Hun, who died in the vicinity in 453.

To date, pit dwellings, walls, graneries, pottery shards and human bones have been found at the site, which is believed to have been an important river crossing. The graneries and dwellings suggest that the Sarmatians were a transitional people—less nomadic than the Huns but more primitive than the Romans. The Sarmatians, says Szekeres, were probably pushed west by the Huns into the Balkans and Europe where they survived as a group until the eighth century. The Huns did not last past the sixth century. □