

for cocaine if they receive compounds that mimic or enhance their natural supply of dopamine during the first few weeks of treatment.

"Timing is essential. Giving a dopamine-like drug after the first weeks may not help," she says, because dopamine receptors may have bounced back to normal values by then. Volkow stresses that while such drugs might aid in treatment, they cannot cure the underlying addiction.

Dean Wong of the Johns Hopkins University in Baltimore says he finds Volkow's theory reasonable and awaits further work to verify her preliminary findings. Wong and Godfrey D. Pearlson of Hopkins have begun a more detailed imaging study of postsynaptic dopamine receptors among people receiving cocaine in a nose spray.

For several years now, Charles A. Dackis of Hampton Hospital in Westampton, N.J., has experimentally treated cocaine addicts suffering severe withdrawal symptoms with a dopamine-mimicking compound called bromocriptine. Dackis says it has helped ease withdrawal cravings, and he attributes the effect to bromocriptine's ability to replace the dopamine stimulation once provided by cocaine. In a departure from Volkow's scenario, he suggests his patients respond to bromocriptine because they have developed an excess of postsynaptic receptors. Citing evidence from animal studies, he proposes that this excess arises from the dopamine-starved brain's attempt to capture every drop of the neurotransmitter.

— R. Cowen

## 'Young' volcano near nuclear waste site

New research indicates the Department of Energy significantly overestimated the age of a volcano near Yucca Mountain, Nev., the proposed site for the nation's first high-level nuclear waste dump. The age revision fuels an already heated controversy over the site's suitability as a safe storage place for nuclear power plant wastes, which remain dangerous for 10,000 years.

The volcano, called the Lathrop Wells cone, lies about 20 kilometers from the proposed location for the underground waste repository. Energy Department studies in the mid-1980s indicated the volcano last erupted around 270,000 years ago. But a comparison of Lathrop Wells with another volcano now suggests a much younger age of less than 30,000 years, and probably even less than 20,000, report Stephen G. Wells of the University of New Mexico in Albuquerque and his colleagues.

"What surprised us was the relatively youthful appearance of the volcano," says Wells.

## Hubble: First light with a second eye

Two stars in a cluster known as NGC 188 provided "first light" for an image (far right) taken June 17 by the Hubble Space Telescope's most sensitive eye. Astronomers expect the instrument, called the faint-object camera (FOC), to detect stars and other celestial objects as dim as 28th magnitude — so faint that telescopes on Earth cannot detect them at all.

NGC 188 is 630 times brighter than that, says F. Duccio Macchetto of the European Space Agency in Paris and the Space Telescope Science Institute at Johns Hopkins University in Baltimore. To prevent an overexposure, engineers had to use filters to cut the instrument's sensitivity by about seven magnitudes.

The FOC has such a small field of view that "the whole team . . . broke out the champagne when we saw the very stars we had expected to see in the FOC image," Macchetto says.

The image on the left shows the far more distorted appearance of the same two stars as viewed from the ground through the turbulence of Earth's atmosphere. Astronomers took this

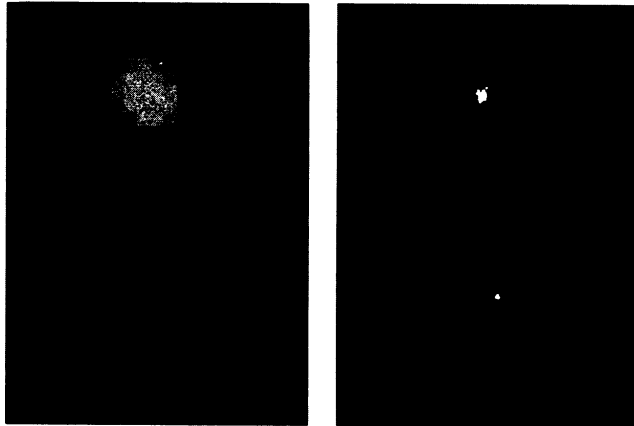


photo using the 2.5-meter Nordic Optical Telescope on the Canary Island of La Palma.

The two stars — imaged as engineers worked to sharpen the Hubble's focus and to reduce the vibrations affecting it — were chosen because astronomers had accurate information on the positions and brightnesses of stars in their cluster. NGC 188, a part of the Milky Way galaxy, is about 5,000 light-years from Earth and located about 4° from the position of the North Star. Astronomers estimate its age at about 12 billion years, nearly that of the Milky Way galaxy.

The space telescope's other imaging instrument, called the wide-field and planetary camera, saw its "first light" on May 20 (SN: 5/26/90, p.325).

— J. Eberhart

Images: NASA/ESA

By studying the extent of erosion and soil development on Lathrop Wells, the researchers compared this volcanic cinder cone with a similar cone in southeastern California, indirectly dated at about 15,000 to 20,000 years old. The comparison suggests the volcanoes are of equal age, they assert in the June *Geology*. Wells says some experimental dating techniques indicate that Lathrop Wells formed as recently as 20,000 years ago.

Other scientists dispute the notion that Lathrop Wells erupted that recently. Brent Turrin of the U.S. Geological Survey in Menlo Park, Calif., has used the radioactive decay of potassium-40 into argon-40 to date lava flows from Lathrop Wells and the California cone. His findings suggest both volcanoes last erupted lava more than 90,000 years ago. While Turrin acknowledges that the volcanoes look young, he says his work raises a question: "What is young when you look at a cinder cone?"

Wells says the age discrepancy may signal a problem with the standard theory that cinder cone eruptions happen all in one shot during a short period of time. Instead, the volcanoes might erupt lava

and then, tens of thousands of years later, create a cinder cone.

Carl A. Johnson, a geologist with the State of Nevada's Agency for Nuclear Projects in Carson City, contends that the new information about Lathrop Wells could constitute a cause for concern. "It is certainly suggesting to us that there's some major questions as to whether the site is a suitable one or not."

Johnson says a volcanic eruption near the repository could trigger changes in the groundwater system, perhaps raising the water table underneath the buried repository. That could enable radioactive elements to escape into the environment faster than the regulations allow.

But Bruce M. Crowe, a coauthor of the *Geology* report, maintains that the young age of Lathrop Wells — and the chance of a future eruption — would not significantly threaten the repository. Crowe, a volcanologist with Los Alamos (N.M.) National Laboratories, heads the Energy Department team assessing volcanic hazards at Yucca Mountain. According to his calculations, the age revision for Lathrop Wells does not justify disqualifying the site. — R. Monastersky