LIGHT POLLUTION

Development Blocked Near Tucson Telescopes

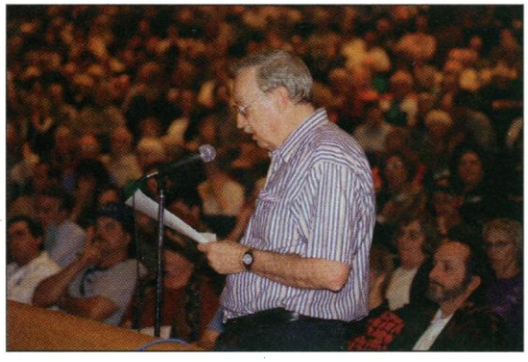
TUCSON, ARIZONA—Astronomers are applauding a decision last week by county officials to reject a $900 million development that could have brightened skies and degraded viewing conditions at three major observatories nearby. By a 4-to-1 vote, the Pima County Board of Supervisors turned down a plan to build 6000 homes and a large commercial district on a former ranch at the foot of the telescope-studded Mount Hopkins, 60 kilometers south of Tucson. Instead of savoring their victory, however, scientists have pledged to work harder to preserve dark skies on the outskirts of this rapidly growing southwestern metropolis.

"We won this time," says Craig Foltz, director of the soon-to-be-reopened 6.5-meter Multiple Mirror Observatory (MMT), the world's fifth-largest telescope, on Mount Hopkins. "But we need to get out there and fight to protect the really good sites in the world." Pima County Supervisor Sharon Bronson agrees. "The astronomers made the difference this time," she says, "and I hope they will provide the impetus to amend our light ordinances to make them even more progressive and protective of the industry."

For 35 years, astronomy and the rapid urbanization of southern Arizona have coexisted peacefully. In 1972 the community created the first outdoor lighting code in a major city to reduce streetlight glare and restrict business and home lighting without damaging residents' standard of living. More recently, the International Dark-Sky Association (IDA), the world's first advocacy group of its kind, has worked to preserve good seeing conditions for Kitt Peak National Observatory, Whipple Observatory, and the University of Arizona binocular telescope being erected atop Mount Graham to the east. "Tucson is the pioneer; it practically invented light sensitivity," observes Frederic Chaffee, director of the W. M. Keck Observatory in Kamuela, Hawaii, and a former director of the Mount Hopkins Observatory. "That's what's so distressing about this blowup."

The dispute burst into flames in December after smoldering for 3 years. Fairfield Homes of Green Valley, Arizona, had asked county officials to rezone 5700 acres of the undeveloped Canoa Ranch near the mountain's base for a residential and commercial development, including four times the number of homes permitted under current zoning plus offices, stores, and an airstrip. In October, a company-backed study requested by the county's Outdoor Lighting Code Committee said the development would produce less light pollution than would haphazard growth and a negligible increase in sky brightness.

That estimate, however, was quickly challenged by astronomers. A study by Foltz and Chris Luginbuhl of the U.S. Naval Observatory in Flagstaff, Arizona, showed a potential 8% to 14% increase in sky brightness. Robert Kirshner, associate director of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, which runs the Whipple Observatory, said such levels would "significantly compromise the usefulness of $220 million of taxpayers' investment" on Mount Hopkins. The developers' attorney, Frank Cassidy, dismissed the scientists' calculations and late last month talked about suing the Smithsonian for $900 million for "improperly" interceding in the zoning process.



Heat over light. Astronomer Dave Crawford addresses an overflow crowd before a vote on the controversial development plan.

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What followed were 2 weeks of heated public debate over how to reconcile rapid development in the Sun Belt with world-class astronomy. As astronomers circulated electronic petitions and faxed letters to county officials, Cassidy complained that the observatory's staff had avoided discussions of how to minimize the amount of light pollution and overstated the bright commercial development. Whipple's spokesperson, Dan Brocious, told a local newspaper that astronomers "have a duty to speak out" about potential actions that jeopardize telescopes like the MMT, now completing a $20 million expansion.

Now that the Canoa fight has died down, both sides seem to be taking the long view. "Nobody wants to hurt the observatory," says David Williamson, president and chief executive officer of Fairfield Homes, who does not rule out resubmitting a scaled-down development plan. And astronomers vow to push for tougher light-emission standards later this year when public officials begin revising the area's pioneering lighting ordinance. "What this controversy revealed was that we need tighter controls in closer to the observatories," says Dave Crawford, a founder of IDA and member of the lighting code committee. But some scientists suspect it's a losing battle. "With all this growth, you realize you can only stay so long in a place," says Foltz. "And that's too bad." **–MARK MURO**

Mark Muro writes from Tucson, Arizona.

CREUTZFELDT-JAKOB DISEASE

Diagnostic Test Scores High Marks in Study

Since 1996, when a new human brain disorder linked to eating beef from cattle infected with "mad cow disease," or BSE, was first identified in the United Kingdom, health officials have been waiting for the other shoe to drop. Although only 34 cases of the disease—called variant Creutzfeldt-Jakob disease (vCJD)—have been confirmed so far in Britain, no one knows if these are isolated occurrences or the first signs of a major epidemic. Getting a handle on this crucial question has been made more difficult by the lack of a diagnostic test for vCJD. Now, help may be at hand: In the 16 January issue of *The Lancet*, a team of U.K. researchers reports that sensitive immunological and molecular tests can detect in tonsil biopsies an abnormal protein linked to vCJD.

Previously, the primary way physicians and researchers have diagnosed cases of vCJD has been through examination of brain biopsies taken from patients in advanced stages of the disease or, more commonly, after they had died. But a team led by neurologist John Collinge of St. Mary's Hospital in London has recently developed a different approach. Their tests seek to identify an abnormal form of a biomolecule called the prion protein (PrP) that is a signature of vCJD. The study shows that the tests can distinguish vCJD not only from normal controls but from other forms of CJD caused by different prion "strains" not linked with BSE, as well as from other prion-caused diseases.

With some reservations, the study is being welcomed by researchers as a first step toward a diagnostic test that could detect vCJD at earlier stages, as well as a tool for epidemiological studies. Britain's Medical Research Council and Department of Health are currently hatching plans to use the new test as part of a mass screening program of previously stored tonsils and appendixes, which might provide better estimates of how big an epidemic the country might be facing (*Science*, 4 September 1998, p. 1422).

The study was inspired by an earlier finding, reported by Collinge's group in 1997, of abnormal PrP in the tonsils of a