the rabies unit at the Canadian Animal Disease Research Institute in Nepean, Ontario. It was based on in vitro experiments and may have nothing to do with real animals, he says. Burrows also cites reports that domestic dogs can survive rabies infections and later pass the virus in their saliva, yet those cases are extremely rare, says Makonnen Fekadu, the CDC rabies specialist who actually discovered those cases in Ethiopia. Burrows's "hypothesis contradicts the traditional pathogenesis of rabies," says Wandeler.

Burrows and his colleagues, however, continue to stand by their hypothesis and offer their own statistical arguments to support the idea that intervention increases mortality. Burrows says the cortisol test only examined short-term effects of stress, not long-term consequences. And he regards the notion of canine distemper as a cause of death as only an "opinion."

The unsettled debate has also unsettled studies of wildlife that involve darting and collaring. For example, a 14-year study of the dwarf mongoose came to an end in 1992 when Rosie Woodroffe, a postdoc at Cambridge University, U.K., was denied a permit by Tanzanian park authorities to handle and mark the animals, ostensibly because the study was not specifically oriented toward conservation. Packer has been unable to collect blood samples from Ngorongoro Crater lions even though the animals have dwindled during the last few years from 100 to less than 50. Although park officials deny any connection with the wild dog controversy (and point out that a radio-collared study of zebra and wildebeest is about to get under way), many scientists think otherwise. "I don't think the parks' officials have ever really liked handling," notes Creel, "so let's just say that they're taking a closer look at it now."

Some biologists concede that a closer look at handling is needed, even if Burrows is wrong. "For 30 years, biologists have been acting like cowboys, shooting darts right and left, figuring it had no real impact on the animals," says George Schaller, a conservation biologist with the Wildlife Conservation Society in New York, who has handled everything from lions to pandas. "It's time the subject was addressed experimentally to see how the effects of handling—capturing, radio-collaring, vaccinating, anesthetizing—vary among species."

That type of study is in the works. "We're putting together a compendium of handling on every species," says Packer, although he notes that "overall, I think handling has been unfairly stigmatized." He notes that handling "gives you information to help you better manage the wildlife. As far as the wild dogs go, it would have been better if they'd been handled more. At least then, we'd have the data and could show what actually killed them."

–Virginia Morell

ASTRONOMY

Naked Quasars Get Dressed

With its peerlessly sharp vision, the Hubble Space Telescope (HST) is supposed to clear up cosmic mysteries. Last January, however, when HST took the closest look ever at the enigmatic cosmic beacons called quasars, it added a new puzzle. Quasars, which shine from the far edges of the universe with the brilliance of millions of stars, are widely believed to be black holes fed by gas and stars from large host galaxies. Many of the Hubble images, however, seemed to show "naked" quasars, shining outside any host galaxy. But astronomers who were spurred to rethink their theories of quasars may want to hold off, for it now seems the quasars may not be naked after all.

Even in the Hubble images, made by John Bahcall of the Institute for Advanced Study in Princeton, New Jersey, and his colleagues, the quasars were little more than bright smudges, leaving them open to interpretation. And when Kim McLeod of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, and George Rieke of Steward Observatory at the University of Arizona reanalyzed the same "naked" quasar images, their clothes came into view. Their analysis, which will appear in the 1 December *Astrophysical Journal Letters*, suggests that a bright young host galaxy surrounds every one of the quasars.

"They've made a plausible case," says Donald Schneider of Pennsylvania State University, who works with Bahcall. Bahcall declined to comment on the work, but Schneider says that he and Bahcall differ with some of the assumptions in McLeod and Rieke's analysis. Still, Bahcall's team may end up agreeing with McLeod and Rieke's conclusion, if not their approach: In new Hubble images of some of the same quasars, Schneider now says they, too, may be seeing clear host galaxies.

When Bahcall unveiled the first 15 HST images early this year, researchers expected them to confirm ground-based observations that show faint, fuzzy light around quasars. But in spite of the much higher resolution of the Hubble, Bahcall could see galaxies around only four of the 15 quasars (*Science*, 27 January, p. 456). Some colleagues thought Bahcall simply needed to analyze his data differently, while others went so far as to wonder if the prevailing picture of quasars was wrong.

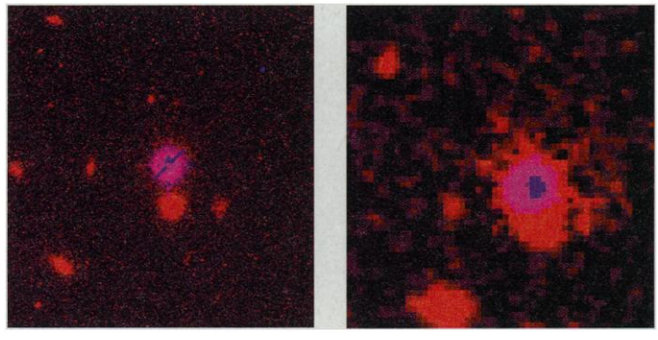
McLeod and Rieke, for their part, wondered if they were mistaken in seeing hints of host galaxies in their own ground-based infrared observations, made while McLeod was a doctoral student at the Steward Observatory. They had found these hints by using a computer to remove the glare of the quasar itself, then fitting various galaxy models to the remaining light. The light profile from "early-type" galaxies, a category that includes elliptical galaxies, worked best. So when Bahcall's group made improved images of the naked quasars, McLeod and Rieke decided to analyze them using the same technique.

To apply the models to the HST smudges, however, they first had to smooth Bahcall's data. McLeod notes that this meant sacrificing the higher resolution of the HST. But she thinks the good fit between the model and the data justifies the procedure. "The results are perfectly consistent with there being bright, early-type galaxies for most of these objects," McLeod says. Agrees quasar expert Robert Williams, director of the Space Telescope Science Institute in Baltimore, "They've come up with something that I think has some validity to it."

Schneider says that while "they have done a careful piece of work," he is cautious about the approach, which assumes a brightness profile and checks its fit instead of simply letting a profile emerge from the residual light. "I'm just a little bit uneasy about doing it that way. You find things that look like what you're looking for," he says.

Even so, Bahcall's team may not be holding out for naked quasars. Schneider says they will present more sensitive HST observations of some of the notorious 11 at the next American Astronomical Society meeting in San Antonio in January that will shed new light on the puzzle. He adds: "I will be surprised if there's a big controversy in 18 months. It'll all be sorted out."

–Jocelyn Kaiser



PHOTOS BY K. MCLEOD

Quasar's apparel? The glow of a possible host galaxy *(red)* is brighter but more blurry in a ground-based image *(right)* than in HST view.