the only ones unhappy with the turn of events. Federal officials say the state ignored national rules requiring the negotiations to be open and transparent. "These were backroom deals in smoke-filled rooms" is how Wilson Tuckey, federal Minister for Conservation and Forestry, describes the process, which he says lays the groundwork for the "rape and pillage" of the northeast forests.

With the failure of science, conservationists have returned to pre-1995 tactics, complete with blockades and protesters chained to bulldozers on land where timber activity had been occurring despite the moratorium. It's the sort of confrontation, says Pugh, that C-Plan was supposed to make obsolete.

–ELIZABETH FINKEL

Elizabeth Finkel writes from Melbourne.

2000 CENSUS

Supreme Court Gets Lesson in Enumeration

The bitter battle over how to conduct the 2000 census has finally landed at the Supreme Court. Last week the justices heard arguments over whether the Census Bureau may use statistical sampling techniques to estimate the U.S. population. The court may choose not to issue an opinion, a decision that would toss the question back to a deadlocked Congress. But if the court does try to undo the tough scientific, legal, and political knot, its ruling will likely decide how the count will be conducted, experts say.

The stage for the high-stakes hearing was set last summer, when the Clinton Administration appealed two U.S. District Court decisions that the bureau's plan for the once-a-decade count violates the Census Act. That plan would use sampling to estimate some 10% of the nation's population, an approach the bureau says will catch millions of people missed in a head count and save $675 million. The scientific community has, for the most part, rallied to sampling's defense (*Science*, 6 February, p. 798). Statisticians "overwhelmingly support" sampling, says Paul Voss, a statistician at the University of Wisconsin, Madison.

But House Republicans and others are demanding a traditional person-by-person tally, arguing that the sampling procedure is subjective and would be prone to error and partisan tampering. It is also, they contend, unconstitutional. The political stakes are high: The numbers are used to divide House seats among the states, parcel out at least $180 billion in federal funds, and carve up states into congressional districts.

The case before the court focuses on whether sampling numbers may be used to divvy up House seats among the states, a procedure called apportionment. The Census Bureau estimates that sampling corrections applied to the 1990 census would have shifted one seat to California. Critics and defenders agree, however, that if sampling data had been used to redraw congressional district lines, it might have changed the electoral outcome in several seats.

Both sides found reason for optimism after the 90-minute court session. Sampling foes were buoyed by an exchange regarding the Constitution's call for an "actual enumeration" to divide up House seats. "Most people would think actual enumeration would mean a count—how do you get around that?" asked Justice Sandra Day O'Connor. Solicitor General Seth Waxman, arguing on behalf of the Census Bureau, replied that the founding fathers had meant a "good faith empirical effort." So, Justice Antonin Scalia asked, "What is excluded? Rolling the dice?"

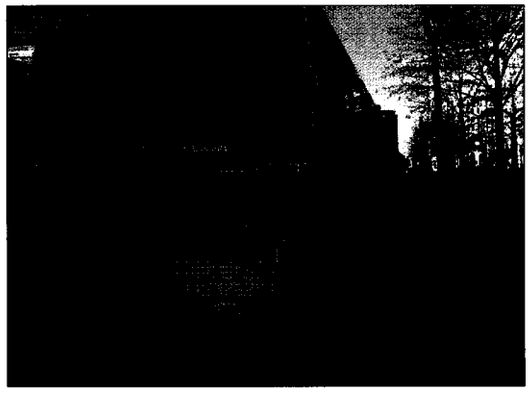
Sampling supporters had reason to smile when Justice John Paul Stevens asked what the bureau should do if it knew an apartment was occupied but no one answered the door. Would the Constitution require census takers to put down zero? "Your honor, they can't guess," said attorney Maureen Mahoney, arguing for the House of Representatives. "Even if the lights go on and off in the evening?" asked Justice Stephen Breyer. At the end of the day, says Tom Hofeller, staff director for the Republican-led census subcommittee, "I don't think anybody could have walked out thinking it went either way."

Even if the court finds the bureau's plan unconstitutional for apportioning House seats, it might still be legal to use sampling to derive a second count for redistricting or divvying up federal funds. One Republican staffer says that redrawing congressional district lines according to sampling numbers in 1990 could have cost the party as many as 10 House seats. Census panel chair Dan Miller (R–FL) asserts that Democrats are keen on sampling only for the sake of such political gains. "That's the reason they want to change things," he says.

Proponents are ready to push the bureau to use sampling to provide more accurate numbers for redistricting and distributing federal dollars. "If we lose in court, we would definitely be moving toward a two-number census," Representative Carolyn Maloney (D–NY) told *Science*. But bureau director Kenneth Prewitt has reservations: "Once you have two numbers, why not three, four, five, six?" Compiling inaccurate tallies, he says, "is like giving up on the scientific underpinnings" of the endeavor. A ruling that sampling is constitutional, on the other hand, would throw enormous weight behind the bureau's plan. "If that happens, the party's over," concedes one Republican staffer. "But I don't think it will."

Alternately, the Supreme Court may rule that the lower courts should have thrown the case out. Waxman argued that neither the House nor the other plaintiffs had been harmed by the bureau's plan and had no right to sue. If the Supreme Court accepts that argument, House members will have to slug it out for themselves. The court is expected to rule by the end of June, but Congress may have to take up the matter sooner. Because of squabbling over the census plan last summer, the Census Bureau's authority to spend 1999 funds is set to expire on 15 June.

–DAVID KESTENBAUM



CREDIT: RICK KOZAK

Mystery job. The bureau is hiring, but census plan is uncertain.

ASTRONOMY

Sky Survey Racks Up Record-Setting Quasars

CHICAGO—Just a few days into its 5 years of scanning the heavens, the Sloan Digital Sky Survey has already begun setting records. Within a narrow strip of sky along the celestial equator, the Sloan's 2.5-meter telescope has bagged three of the four most distant quasars ever seen, including a new record-holder. It also found another nine of these distant beacons, thought to be the cores of young galaxies set ablaze by mysterious central engines, at distances nearly as great. At that rate, the entire Sloan survey is likely to pick out 1000 quasars at distances close to the current record-holder, says Michael Turner, an astrophysicist at the University of Chicago and the Sloan's spokesperson.

"Anybody who had any doubt that the Sloan was going to completely revolutionize quasar studies probably has a lot fewer doubts," says an elated Turner. Patrick Osmer, a quasar hunter at Ohio State University in Columbus, says that the Sloan "is going to be as powerful as we all hoped in this

area," giving astronomers batteries of distant searchlights for probing the layout and makeup of the early universe.

Quasars are not the only quarry. The Sloan survey aims to census about one-quarter of the entire northern sky and selected slices in the south, using an automated telescope at Apache Point Observatory in New Mexico (*Science*, 29 May, p. 1337). From hundreds of millions of celestial objects, special software will cull particularly interesting ones for a follow-up look with the same telescope, which will break their light into spectra, rich in information about the objects' nature and distance. For example, spectra of the million brightest galaxies in the census will determine their "redshift"—a measure of distance. That information will go toward creating a giant three-dimensional map of the sky.

Night hunter. The Sloan survey's automated telescope sweeps the sky for galaxies and distant quasars.

Most of the bright galaxies will be in our neighborhood, cosmically speaking—within a billion light-years or so. But quasars, which appear as bright points of reddish light, remain visible at greater distances, to the very outskirts of the visible universe, and the Sloan organizers hope to find 100,000 of them as well. The telescope's first sweep of the sky, mostly in September, covered just 1% of the area of the final survey. But Sloan collaborators, including Michael Strauss and Xiaohui Fan of Princeton University, have picked out 19 quasar candidates so far by analyzing the five-color images, and follow-up spectra confirmed 12 of them as actual quasars—a 70% success rate.

That far exceeds the 10% success rate typical of quasar hunts, probably because the Sloan's images have more colors than most surveys produce. The farthest of the quasars, at a redshift of 5.00—corresponding roughly to 13 billion light-years away—just edged out the redshift 4.897 quasar reported in 1991 by James Gunn of Princeton University, Donald Schneider of Pennsylvania State University, and Maarten Schmidt of the California Institute of Technology (Caltech). Gunn, however, can take some credit for the new record-holder as well, because he led the team that built the Sloan's sophisticated electronic camera.

Researchers hope to use the thousands of quasars expected from the Sloan as markers of cosmic structure in the early universe and probes of the gases wafting through space over billions of light-years. But they won't start amassing more of them until at least January. Before then, collaborators need to work the kinks out of optics and software and rig the telescope so it can move freely—right now they rely on Earth's rotation to slew the telescope along the equator. And so far, the astronomers have been taking their follow-up spectra one by one with a nearby 3.5-meter telescope rather than with the Sloan telescope itself, which will gobble them up 640 at a time, through holes drilled in pizza-sized aluminum disks.

But the quasar finds—the Sloan's first harvest for science—have other astronomers giving it the thumbs-up. "This is one of the things they wanted to do better than anyone else," says Charles Steidel of Caltech. "It looks very promising." **–JAMES GLANZ**

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PEDIATRIC VACCINES

Gates Launches $100 Million Initiative

The planet's richest individual is donating a portion of his fortune in hopes of buying some of the world's poorest children a priceless gift—good health. Last week Bill Gates, the chair of Microsoft Corp., gave $100 million to create the Bill and Melinda Gates Children's Vaccine Program. The program will enlist existing international health organizations in a battle against four diseases through its support of vaccine trials, public education, and new funding mechanisms. "Our goal is to make the vaccines you and I take for granted available to children no matter where they live," Gates said at a press briefing in New York City.

Cash injection. Bill Gates bankrolls vaccine program.

The donation comes from the William H. Gates Foundation and will be administered by a Seattle-based organization called the Program for Appropriate Technology and Health (PATH). The money, to be given over 10 years, will fund efforts to improve delivery of existing vaccines rather than to develop new ones, says Gordon Perkin, president of PATH. In particular, it is aimed at disseminating vaccines proven effective against:

* *Haemophilus influenzae* type b (Hib), which causes pneumonia and meningitis;

* Rotavirus, which causes severe diarrhea and dehydration;

* Hepatitis B, which causes cirrhosis and liver cancer; and

* *Streptococcus pneumoniae*, which causes ear infections and pneumonia.

About three-fourths of the money is expected to go to the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), and the International Vaccine Institute (IVI). The fledgling IVI, based in Seoul, Korea, has already received $250,000 to supplement drug company funding of a study of the distribution of Hib throughout China, Korea, and Vietnam. "The Korean government got us off the ground, the companies helped us start our first project, and now the PATH grant assures that we are expanding," says immunologist Barry Bloom, chair of IVI's board of trustees and incoming dean of the Harvard School of Public Health in Boston.

PATH has assembled an international advisory panel of seven eminent scientists that will meet in March to recommend ground rules for the new program. But Perkin says that two funding priorities are clear: to coordinate cost-effectiveness studies and trials to improve the vaccines' performance in the developing world, and to explore new ways of financing large-scale childhood immunization efforts, such as interest-free loans from the World Bank. "This $100 million is going to be a catalyst to do the advocacy work, the vaccine trials, and [to improve] the financing mechanisms," says epidemiologist Mark Kane, a WHO veteran who will head the new program.

The Gates program will not pay for the tens of millions of doses that will be needed throughout the world, says Perkin. Even so, says Carol Bellamy, executive director of UNICEF, the donation is certainly welcome. "The bottom line is that this money will keep more children alive." **–DAN FERBER**

Dan Ferber is a writer in Urbana, Illinois.