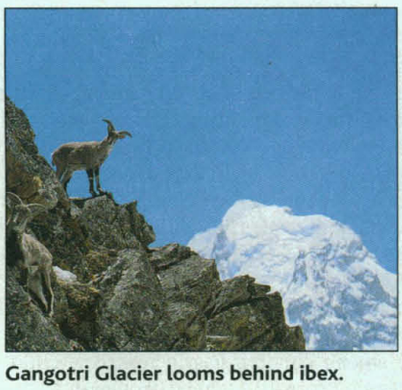
## Himalayan Glacier Backing Off

The Himalayan glaciers that feed the Ganges River appear to be retreating at a surprisingly fast rate. In the long run, scientists say, that could imperil water supplies for the 400 million Indians living in the Ganga Basin.



Gangotri Glacier looms behind ibex.

DIDIER GIVOIS AND ADVENTURE PHOTO & FILM

Scientists had expected the 5-kilometer-long Dokriani Bamak Glacier to grow this year after a severe winter. Instead, they said this month that at the current rate, it will have retreated 20 meters this year, compared to an annual average of 16.5 meters over the past 5 years. "It has been a phenomenal melt rate this year," says Joseph T. Gergan, a geologist at the government-run Wadia Institute of Himalayan Geology (WIHG) at Dehradun, who works at a permanent research station at the glacier's base.

But Dokriani Bamak is just one of several hundred glaciers that feed the Ganges. One major water source for the river, the 26-kilometer-long Gangotri Glacier, has also been retreating, although this year's rate is unknown because there's no permanent monitoring station there. Gergan says that, added to other signs of global glacier melting, the retreats provide evidence that 1998 is shaping up to be Earth's hottest year in a millennium.

The phenomenon "has many long-term ramifications," says WIHG director Vikram Chandra Thakur. He predicts that if the Himalayan glaciers continue to dissolve at their current pace over the next 25 years, the Ganges will swell and then, with the most vulnerable portions of the glaciers gone, get perilously low in summer. Gergan also notes that projects such as the massive Tehri Dam under construction on one of the Ganges main tributaries in Uttar Pradesh are not taking glacier-induced fluctuations in the river's flow into account. More melting means much higher silt loads which reduce the life of dams and reservoirs, he says.

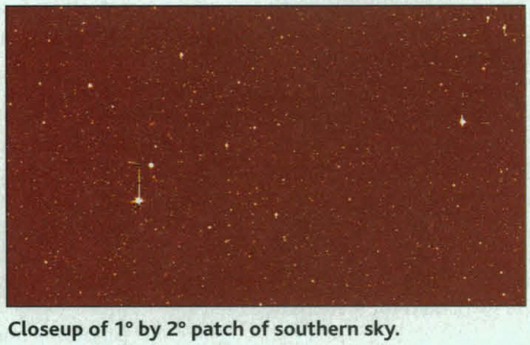
## Into the Deep

When astronomers crank up a huge, powerful optical telescope, they don't just point and shoot. First they must select targets from detailed imaging surveys of chunks of the sky performed by other, wide-field telescopes.

The first of a new generation of optical surveys is now available that, thanks to the use of sensitive electronic cameras, will offer the deepest—the furthest away from Earth in both space and time—and most detailed guide yet for astronomers using the European Southern Observatory's (ESO's) Very Large Telescope (VLT), now being built in northern Chile (*Science*, 1 May, p. 670). The survey will also be useful to other large telescopes in Australia, Chile, and Hawaii.

Last year, ESO astronomers surveyed four patches of southern sky—each 2 degrees by 3 degrees, or 30 times the size of the full moon—in unprecedented detail, using ESO's 3.5-meter New Technology Telescope at La Silla, Chile. The patches yielded an inventory of about 1 million galaxies and 250 distant galaxy clusters, providing a wealth of observation targets for astronomers who will start using the first of the VLT's four identical 8.2-meter telescopes when it comes on line next year.

The ESO Imaging Survey, the results of which were released earlier this month (www.eso.org/eis), is 10 times as sensitive as the 1990 British-Australian survey of the southern sky, called the APM Galaxy Survey, which was based on digitized photographic plates. "Being able to select fainter objects means that you will be able to probe further back into the history of the universe," says APM survey head Steve Maddox of Cambridge University.



Closeup of 1° by 2° patch of southern sky.

ESO

Freud in 1931 at 75.

LIBRARY OF CONGRESS/COURTESY A. W. FREUD *ET AL.*

## Exhibit to Analyze Freud

Two years after it was originally scheduled to open, a big exhibit on Sigmund Freud will be ready for viewing on 15 October at the Library of Congress in Washington, D.C. The exhibit, drawn mainly from the library's 80,000-item Freud archive, got bogged down early on when some scholars complained that it presented too uncritical a picture of the man, who died in 1939. A committee of experts was expanded in response to the complaints, and committee member Hannah Decker, a Freud biographer at the University of Houston, says the show was altered to represent more viewpoints—such as those of women who object to Freud's famous characterization of anatomy as destiny.

Items from the library, including Freud family home movies, will be supplemented by loans from the Sigmund Freud Society in Vienna and the Freud Museum in London. "Sigmund Freud: Conflict and Culture" will run through 16 January.