



scienceSaturday

The glacier sleuths

Geo-junkies are ice guys

By NANCY O'BRIEN
Daily News Writer

FOR MORE THAN 20 years, two detectives have scoured the city in hopes of unraveling a 10,000-year-old mystery. They're not police, they're geology junkies, attempting to solve the riddle of how the city's landscape was shaped.

On their treks, John Sanders, a professor emeritus at Barnard and Columbia Colleges, and Charles Merguerian, a professor at Hofstra University, try to pry open windows to a deep and icy past.

Our area was sculpted by a succession of natural phenomena, some of which, like erosion and wind, continue. But the major force that captures the imagination is the series of glaciers that gouged, scraped and tore their way through here until 10,000 years ago.

Five massive, slow-moving glaciers crept down the continent over thousands of centuries, stopped here and melted. Each time they melted, the sea level rose.

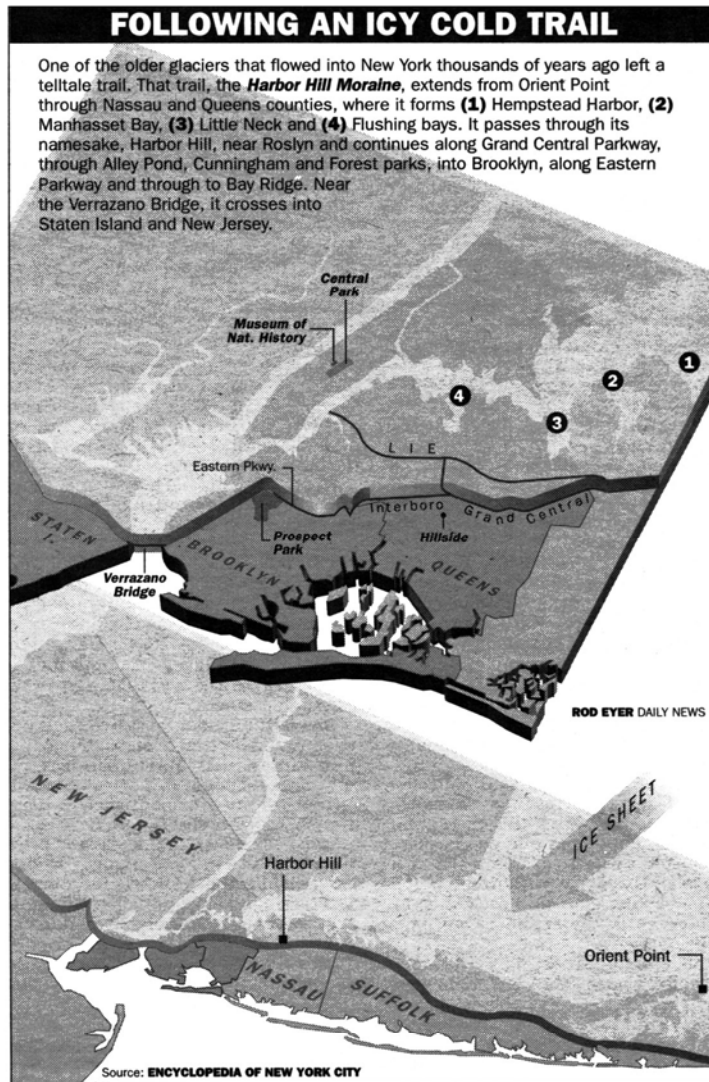
The ice sheets at their peaks were as high as the Empire State Building and covered the city, Sanders says. "Instead of driving to Jones Beach, you'd have to drive . . . about 100 miles out to find the shoreline."

The sands of Jones Beach and the silty soil of the Pine Barrens on Long Island are part of what geologists call the end moraine. When the ice melts, the water drains over an area beyond the actual tip of the glacier, leaving boulders, gravel and sand in layers. The roughest sand is at the edge of the glacier, and the finer sand farther away.

Some of those boulders were delivered here from upstate or from across the Hudson. And as the ice sheets with all their debris crept across our area, they left their marks. For children scaling rocks in Central Park, their footholds could be the jagged edges cut into the bedrock as the glacier moved along. The couple atop those rocks is perched on what's left of peaks of the Earth's crust, scoured smooth by a river of ice that moved slower than a backup at the Queens-Midtown Tunnel.

Sanders calls Central Park a treasure trove of glacial clues. He and Merguerian have mapped them in a guidebook (see Research Guide). For one of his favorites, he sends us "across the street from the American Museum of Natural History and over the wall."

On a rock there, he says, you can see "some beautiful scratches and grooves" from the latest glacier, which rode into the park about 10,000 years ago.



"Almost all the other rocks in Central Park" hold clues to earlier glaciers that were here up to 200,000 years ago, he says.

Merguerian's favorite spot in the park is east of Central Park West around 63d St. "There are tremendous, spectacular grooves" scratched into the bedrock by a glacier as it rode past Empire Rock there, he says. One huge boulder, he says, was "pulled up and tipped upside down immediately south of its former home."

Sanders and Merguerian point to many places that may seem mundane to us as having a "resplendent glacial history."

There is, for instance, "a hill of sand and grand boulders bulldozed in front of the snout of the glacier" in Queens, says Merguerian. "It's not called Hillside Ave. for nothing."

Sanders says it was one of the older glaciers that dumped its load near Hillside before it retreated. The glacier's edge and the debris it left form the Harbor Hill moraine and can be traced throughout Long Island, into Brooklyn and Queens, across Staten Island and into New Jersey.

Some of the boulders transported here by the glaciers, Sanders says, landed inside the boundaries of the Brooklyn Botanic Garden and are labeled for the curious.

Through Sanders' and Merguerian's On-The-Rocks series at the 92d St. Y or the Central Park Conservancy's courses on rocks, aspiring geology junkies can get a spectacular view through a window to the deep past all around and beneath us.

But there is a term you'll hear while taking a tour that can send a chill down your spine: "Interglacial." As when Merguerian or Sanders say, "We're in an interglacial period right now."

Another glacier? Here?
"Yep," says Sanders. "We're overdue."

RESEARCH GUIDE

■ **FIELD TRIPS:**
Central Park Conservancy offers variety of field trips and seminars at Dana Discovery Center, 110th St. and Fifth Ave., and Henry Luce Nature Observatory at Belvedere Castle in Central Park. Call (212) 360-2720 or education registrar, 360-2736.
On-the-Rocks Field Trip Series by Sanders and Merguerian, 92d St. Y, (212) 996-1100.
Brooklyn Botanic Garden, (718) 622-4433.

■ **BOOKS:**
Field trip guidebooks for On-The-Rocks, by John Sanders and Charles Merguerian. For 22 available titles, Web: Dukelabs.com
"Geology of New York City and Environs," by Chris Schuberth.
"A Field Manual for the Amateur Geologist," by Alan M. Cvanacara.

■ **INTERNET:**
Hofstra's Geology Department: <http://www.hofstra.edu/> (Click on geology department)
Geology Link: <http://geologylink.com>
New York Geology Resource Page: <http://nethomes.com/newyorker>

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