

## Is Big Apple Rocking at the Core?

The *terra* underneath New Yorkers' feet may not be as *firma* as previously believed, according to a study released yesterday at Hofstra University.

In fact, according to Charles Merguerian, a geology professor at Hofstra, the very bedrock of Manhattan has fault lines previously unknown and may be more susceptible to earthquakes than believed.

"Everyone has thought that we are not in danger in the metropolitan area because we are not near a plate boundary, like California," Merguerian said in an interview after presenting his findings at a conference called "The Geology of Southern New York."

"But there are still stresses in our crust," he said. "Even though they may date to collisions that took place as far back as 450 million years ago, they are still locked in rocks."

Merguerian, whose presentation on the geology of New York City highlighted the conference, studied drill corings, newly excavated water tunnels and outcroppings of rock wherever he could find them. The result is a new geologic mapping

of New York that turned up younger "brittle" faults beneath both Dyckman Avenue and 155th Street in the Bronx, 96th Street in Manhattan and one just to the east of Roosevelt Island. He also confirmed the existence of a fault beneath 125th Street.

While there is a consensus that there is seismic life in the metropolitan area, geologists emphasize that they have yet to decide whether a major earthquake is at all possible, yet alone when it might occur.

"There is enough evidence to say there is something to think about," said Michael Greenman, a geologist who does subsurface investigations of new city construction for the Department of General Services.

Merguerian said the 63rd Street water tunnel, which is currently under construction, provided crucial evidence of movement in the deeper, so-called "ductile" faults, which are reactivated when the brittle faults, which measure no more than two inches in width and extend through Manhattan, move.

"You can see the fresh-looking greenish activ-

ity in the ductile fault here," he said, referring to a photograph of the tunnel's bare rock. "It indicates a recent northwest trend."

The direction of movement, or trend, is especially significant because it reflects the movement of last October's earthquake in Westchester, which measured 4.0 — considered moderate — on the Richter scale.

"The northwest trend of the brittle faults appears to be the same as the quake in Westchester," Merguerian said. "This demonstrates the possibility of activity in an area previously thought to be free of it."

Other geologists see some validity in Merguerian's study.

"There seems to be a correlation between the geometry of his brittle faults and our own earthquake studies," said Leonardo Seeber of Columbia University's Lamont-Doherty Geological Observatory.

Engineers of the city's tall buildings are taking note of the new discussion, but thus far do not consider it necessary to alter their standards.