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Geologic Faults Are Found Under East River

By WALTER SULLIVAN

Recently identified faults under the East River have reawakened concern that, contrary to widespread belief, New York City may be vulnerable to moderately severe earthquakes, according to an authority on the geology of the New York area.

"New York City has always been considered safe from earthquakes, but that is now being reevaluated," said the expert, Dr. Charles Merguerian of Hofstra University in Hempstead, L.I. Geologists, he added, are having to reconsider the "seismic potential" of the area.

Faults Shown on Maps

While the city's high-rise buildings are not considered particularly vulnerable to earthquakes of moderate severity, this may not be true of other structures, such as the water tanks perched atop many older buildings. Dr. Merguerian said the earthquake potential should be taken into account in designing new structures.

He and Dr. Leonardo Seeber of Columbia University's Lamont-Doherty Geological Observatory have been seeking evidence within the city for faults, or cracks produced by past movements in the earth's crust.

Three faults cross the city from northwest to southeast, as shown on maps of New York City's third water tunnel, now under construction.

One, known as the 125th Street Fault, enters Manhattan at about 125th Street, skirts the northeast corner of Central Park and crosses the East River near the center of Roosevelt Island. Dr. Seeber has found a band of crushed rock where the water tunnel cuts across that fault on the East Side of Manhattan.

Another of these faults traverses the Inwood section of Manhattan and continues into the Bronx. A third, parallel to the others, lies farther north in the Bronx.

Additional faults have been identified running under the city from southwest to northeast, parallel to the Hudson Highlands, which cross the Hudson River in the vicinity of Bear Mountain and West Point. These faults also run parallel to Cameron's Line, which extends from Massachusetts to New York City and marks a "suture" where formations once widely separated were pushed together as the two sides of an ocean ancestral to the Atlantic converged some 400 million years ago.

Dr. Merguerian has found where that suture is crossed by the new subway

tunnel from 63d Street in Manhattan to Long Island City, Queens. The line runs north and south under the channel between Roosevelt Island and Queens.

None of the scientists who have examined the faults that are evident in the water tunnel or subway tunnel have reported any sign of recent activity.

Last October, New Yorkers were reminded that earthquakes occur in this city as well as in California when one rated at magnitude 4 on the Richter scale of severity occurred in Westchester County. Damage was slight, but geologists such as Dr. Seeber warned that a more severe one was possible.

Quakes strong enough to topple chimneys have occurred in the city in 1737, 1783 and 1884. While major quakes are rare on the East Coast, one in Charleston, S.C., in 1886, estimated at magnitude 7.5, destroyed much of that city and took at least 60 lives.

None of the East Coast faults has been a source of frequent earthquakes in the manner of the San Andreas Fault in California. The most active one in the New York area is the Ramapo Fault along the southeast margin of the Hudson Highlands.

Dr. Merguerian is to present his findings in more detail during a day of lectures on geology of southern New York at Hofstra on April 14.