

# Tangshan Quake: Portrait of a Catastrophe

Chinese officials have finally ended a year-long moratorium by revealing many of the circumstances related to the devastating Tangshan earthquake of last July 28 (SN: 8/7/76, p. 87). The earthquake was possibly the second worst in recorded world history (the worst occurred in China's Huasien county in 1556). Information about the tragedy was volunteered unexpectedly to two Mexican scientists, Cinna and Larissa Lomnitz, from the National University of Mexico during their seismological visit to China several weeks ago. Then last week, a group of foreign correspondents were escorted through the razed city of Tangshan, 100 miles south-east of Peking. The scene was compared by many to the desolated remains of

Hiroshima following the atomic bomb.

Although the Chinese still refused to comment explicitly on the quake's final death toll, neither did they avail themselves of numerous opportunities to deny popular guesses that it was as great as 750,000 victims. By comparison, the 1556 earthquake claimed 830,000 lives.

According to the Lomnitzs' reports and eyewitness accounts by the foreign correspondents, physical demolition of Tangshan, with its one million inhabitants, was literally complete. The ravaged remains for miles around include piles of bricks and junk heaps of contorted steel parts, all that remain of factories, bridges, railroads and homes. The area most affected was four miles wide by five miles

long, intersected by an extensive lateral fault. In some places the earth was actually rent apart by several feet, and in many others the ground caved in to form thousands of craters.

Although a few factories are now operating on the city's outskirts, Tangshan remains largely unrestored. The human survivors live nearby in makeshift shelters fashioned from the quake's debris, and some of the rail bridges have been replaced. Although some minimal coal mining seems to have resumed, much of the supporting heavy machinery necessary to transport the coal is incapacitated. The enormous shock registered 8.2 on the Richter scale and undulated much of the previously flat agricultural land.

Besides descriptions of the awesome damage, there were some interesting revelations about the phenomenon itself. Just before the earth began to shudder, residents were awakened by a brilliant incandescence that lit up the dark, early morning sky for hundreds of miles around. The glow was predominantly red and white.

When the quake struck, many people were catapulted 6 feet high by what they said felt like a violent, hammerlike subterranean blow. In the quake's aftermath, many bushes were scorched on only one side, much like snow accumulates preferentially on the windward side of a tree trunk during a driving blizzard. Trees and crops were bowled over as if by a colossal steamroller and other plant leaves were burned to a crisp.

Although there was no explicit prediction of the Tangshan earthquake, Chinese scientists were aware of some preliminary warning signs. On the basis of these tentative omens, they announced in early 1976 that an earthquake would occur either in Tangshan or the Peking area. But the subsequent data were so conflicting and confusing, no final, specific prediction was ever made.

Some last minute, unequivocal harbingers were manifest, but there was too little time to process the information and issue a warning. In order to eliminate this bureaucratic delay in the future, the Lomnitzs reported, local Revolutionary Committees have been instructed to forego normal channels of communication during an emergency and directly broadcast a public warning.

Summarizing what he and his wife learned while in China, Lomnitz said: "There's no doubt the Chinese are predicting earthquakes. They missed on [this one], but they realize the rapidly increasing hazards of earthquakes in a modern world with an increasing populace [and number] of power lines, factories, irrigation works and nuclear power plants. The West has a lot to learn." □

## Lava flow causes 70 deaths

According to recent information, an unusual kind of volcanic eruption, in eastern Zaire, killed about 70 persons and left homeless about 800. But the manner, not the toll, of death was peculiar in that victims were incinerated by a flow of unusually fluid lava. The watery lava streamed down the slopes of the Nyiragongo volcano with ease, speeding along at up to 60 kilometers per hour and overtaking people who typically could have outrun or dodged a more normal, sluggish flow.

Lindsay McClelland, staff geologist for the Smithsonian Institution's Scientific Event Alert Network, which has been collecting information on the disaster, said the low viscosity was due to the lava's abnormally low content of silica (SiO<sub>2</sub>). Because of its mudlike consistency, it sped forward in shallow waves, encircling tree trunks that normally would have been toppled over by a gummier lava.

Since 1928, the volcano's central crater steadily filled with hot lava, forming a lake. According to SEAN's records of the strato volcano, it had shown sporadic activity on 10 separate occasions before that time. One of the most recent studies of the volcano was done less than a decade ago, when a National Geographic Society expedition, led by noted French scientist Haroun Tazieff, monitored its behavior and produced a television special about it.

On Jan. 10, 1977, a system of parallel openings fractured the volcano's flanks. In only an hour's time, some 20 million cubic meters of white-hot lava surged forth, speeding down a 2,000-meter drop and incinerating everything in its path for 1,200 hectares. The effect was very much like pulling the plug out of a dike.



Maurice Krafft/Equipe Volcan

*Fluid lava flow swathes Zaire landscape.*

About six days following the initial eruption, interior parts of the main crater collapsed, plugging up the central conduit. Billows of steam smothered the nearby city of Goma, plunging it into partial darkness, but fortunately the city was spared any lava damage.

Although the lava lake that had accumulated for half a century is now completely drained as a result of the eruption, there is concern among volcanologists that future eruptions might be more explosive. One of the advantages of having had the lake during those many years was that gas and heat could dissipate out from beneath slowly, instead of building up to explosive pressures. Now that the main pipeline from the subterranean supply of magma has been plugged up by debris, there is a chance that future eruptions may surface, via alternate routes, closer to populated regions. □