

Sinkhole Reminds Old Cairo of its Historic Tunnels

Kholoud Mahamed Ali

On September 3, 2009, at 5:32 am, yet another catastrophe hit Cairo, Egypt. A 15-meter-wide section of street collapsed in a part of the city known as “Old Cairo.” The sinkhole that resulted from this collapse is estimated to be seven meters in depth and 25 meters in length. The hole immediately filled with water and seven cars sank into it. Six of the seven cars were eventually lifted out of the sinkhole. Can you imagine such a huge collapse in a busy urban area?

The place where the collapse occurred is in the oldest part of Cairo. The ancient Egyptians who lived there established a thriving city of countless houses and roads, but it was a city that contained many tunnels. In the present, Old Cairo is inhabited by the new Egyptians of the 21st century. To accommodate the modern city, a decision was made to develop a new project — an underground metro that would pass through Old



Water-filled sinkhole in Old Cairo destroys a car.

Kholoud Mahamed Ali (kholoudmalii@yahoo.com) teaches at Cairo University in Egypt

Cairo. Yet in implementing this project plan, the project engineers appear to have overlooked or not fully considered the history of this place, and perhaps they did not do the necessary pre-drilling surveys to map out ancient tunnels and determine excessive groundwater levels in the area.

Currently, the cause of the sinkhole is thought to be the drilling associated with the underground metro project. Most likely the drilling intercepted an old tunnel and extreme amounts of groundwater. In addition, this area is composed of marl and limestone intercalated with soft clay. It is very similar to the Tertiary Muqattam Formation which also failed and caused a catastrophic landslide in a part of Cairo last year — at about this same time (see Kholoud Mohammed Ali’s article about the landslide in the November-December 2008 *Gaea*). Thus, the material in this formation requires special treatment in drilling it. It is also very susceptible to mass movement.

So if you can imagine yourself passing by this street in Old Cairo early that fated morning — what would you do if you were standing there as the street collapsed? Or, imagine yourself living in one of the 10 buildings that were soon evacuated after the street collapse and waking up to see your parked car underground and then told that your building might soon fall!

What happened in this area was a huge catastrophe to those people living here. The collapse resulted in shaking of ten buildings containing 500 citizens, and then the evacuation of these people for an unknown length of time. In addition to the terror that occurred among passersby, there was also the temporary loss of several cars and the total loss of one car. Area water, gas, and drainage pipes also required repair after the street collapse. It took workers about three days to drain the sinkhole and to then backfill it with more than 1000 cubic meters of concrete.



Once drained, the sinkhole revealed marl and limestone, and what may be an ancient tunnel. (Photo: Kholoud Mahamed Ali)

Really, I don’t know what to say about this event — did our engineers misinterpret data or did they ignore the history of this area and neglect to consider geological data for their drilling plans?

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