

### New conclusions on the existence of the paleolandslide: Summer of 1960

Upon receiving Edoardo Semenza's communication, Engineer Carlo Semenza decided to perform further investigations to verify the existence of the paleolandslide and its thickness. The additional investigations included geophysical surveys, topographic monitoring of the slope and the drilling of three holes between Pian del Toc and Pian della Pozza. However, the drillers encountered rock so intensely fractured that progress was extremely difficult, and at some depth, the drillholes had to be abandoned before reaching intact bedrock (Vaiont Limestone).

From the drilling data, Edoardo Semenza deduced that the paleolandslide was thicker than that he had estimated in 1959 and furthermore that the ancient failure plane could not outcrop near the Pian della Pozza depression, but rather farther uphill. He therefore concluded that the landslide mass must have been much larger than 50 million cubic meters, his previous estimate.

A geologic survey was conducted farther upslope in the summer of 1960 (see photograph 21, panel 9: Discovery of the upper margin of the paleolandslide) led Edoardo Semenza to the following conclusions (*The Story of Vaiont* p. 97):

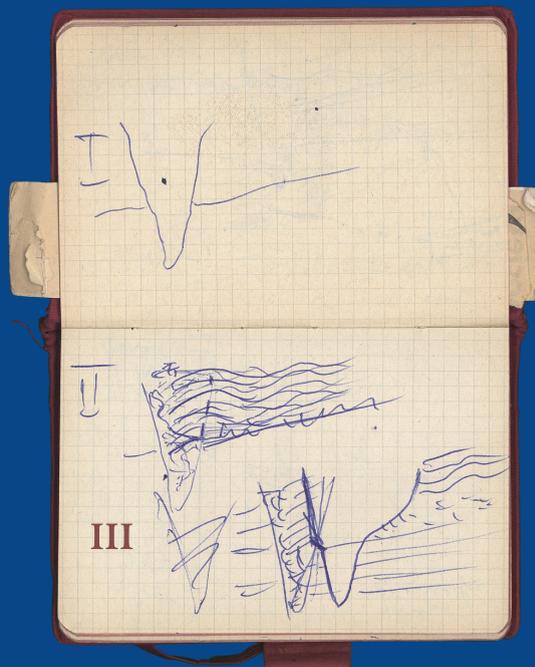
*"The mass in question, limited at the base by a thick level of cataclasites and mylonites (more or less heavily fractured or even ground up rock) was made up, in the remainder, of rock that was somewhat less fractured. In the upper part, the mass rested on solid rocky strata dipping north at 40°.*

*The upper margin of the mass reached approximately the little depression at the elevation of 1110 m to the west of Massalezza Stream, and it must have been very high to the east as well."*

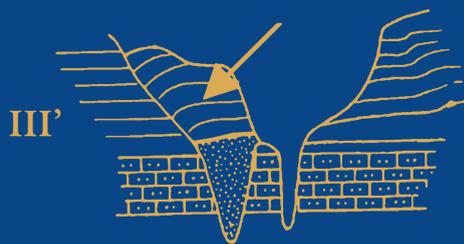
Based on the new geological information, Semenza drew a series of geological sections that showed the probable location and shape of the paleolandslide failure surface. He argued that a mass of approximately 200 million cubic meters might fail along this plane.

#### 15 - A sketch drawn by Edoardo Semenza in his field-notebook

26 August 1959 | from *La Storia del Vaiont* - figure 26



- I Layout of the valley before the ancient landslide.
- II Ancient landslide filling the valley.
- III Incision of the new channel of the Vaiont Stream south of the old stream channel as seen in a north-south section passing through Colle Isolato. In the northernmost part of Colle Isolato, the rock layers were visibly folded; their attitudes changed in a northerly direction from sub-horizontal to sub-vertical or even overturned. This folding gave Semenza the idea that the Colle Isolato rock mass was part of a landslide that impacted the north wall of the valley from the south.
- III' In 1961, during excavation of the bypass gallery, Vaiont Stream deposits were encountered at the base of Colle Isolato. After the ancient landslide, the Vaiont Stream cut a new channel into the landslide mass and the underlying bedrock, isolating a portion of the foot of the landslide from the south side of the valley. The discovery of these alluvial deposits confirmed the Semenza's hypothesis, formulated in 1959, of how Colle Isolato formed. Section III', from Semenza and Ghirotti (2000), illustrates what one could clearly see after the first drawdown of the reservoir in February 1961: Colle Isolato (indicated by the arrow) covers the paleo-streambed filled with alluvial deposits.



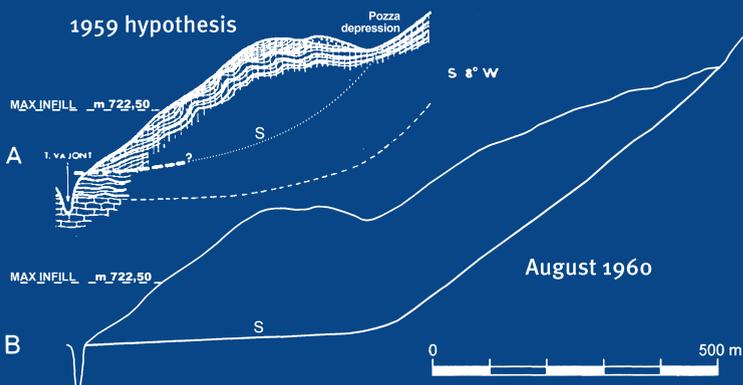
#### 16 - The narrow Vaiont gorge at Colombè Bridge, from the walkway downstream from the dam

Photo Edoardo Semenza, September 1959 | from *Le foto della frana del Vaiont* - GS\_62



#### C - The sliding surface of the paleolandslide

from *La Storia del Vaiont*, figure 31



Two north-south profiles through Pian della Pozza. "S" indicates the sliding surface of the paleolandslide.

The sliding surface (A) proposed by Edoardo Semenza in the summer of 1959 (from Giudici and Semenza, 1960) and (B) formulated after the geological survey carried out in the summer of 1960.

There is no rock outcrop just below the level of the church on the north side of the valley; instead, one can see gravel in a cut that corresponds to the old channel of the Vaiont Stream before the paleolandslide. Similar narrowings of the gorge occurred 100 m upstream, at the hotel on the right side of the photograph and at Colle Isolato (photograph 14).