

Book Review of “The Story of Vaiont Told by the Geologist Who Discovered the Landslide”

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THE STORY OF VAIONT TOLD BY THE GEOLOGIST WHO DISCOVERED THE LANDSLIDE, BY: E. SEMENZA, K-FLASH PUBLISHER, FERRARA, 205 PAGES, PRICE: 28.00 €, ISBN 978-88-89288-02-3

On 9 October 1963, at 10:39 p.m. local time, between 240 and 300 million cubic meters of sedimentary rocks detached from Mount Toc, in Veneto, northern Italy, and slid into the Vajont Lake. The falling rock mass acted like a huge piston, pushing the water of the lake against Casso and Erto, two small villages on the slope in front of the slope that failed, and then over an artificial dam 210 m high. A large wave overtopped the dam and reached the town of Longarone at 10:46 p.m., destroying it. The dam did not fail and was only marginally damaged. However, the landslide and the resulting flash flood killed at least 1921 people: seven at San Martino, at least 151 at Frasnègn, le Spesse, Cristo, Pineda, Ceva, Prada, Marzana, 54 at a construction camp near the dam, 109 in the town of Castellavazzo, and at least 1759 between the town of Longarone and the area downstream along the Piave River valley. News about the disaster went around the world; the Herald Tribune titled: “Vajont Dam: Warning Ignored”. Before the catastrophic event, landslides had been identified in the Vajont valley by prominent investigators, but none had anticipated the size and potential dynamics of this event.

This book is the story of the famous Vajont landslide, from the perspective of the geologist who was first to discover the landslide and who, following the disaster, spent most of his career to investigate one of the most significant landslide disasters ever experienced. The son of Carlo Semenza, the engineer who designed and built the Vajont dam, Edoardo Semenza, was the geologist who discovered the Va-

jont landslide in August 1959, four years before the catastrophic failure. Semenza performed a systematic, large-scale geological and geomorphological investigation of the area, and specifically of the site affected by the landslide before the slope failed catastrophically. During his fieldwork, Semenza was able to identify and document a number of geological and morphological features that he correctly interpreted as evidence of the presence of a very large, ancient landslide deposit. The geomorphological information and geological data collected by Semenza remain a brilliant example of a landslide investigation.

The book begins with a description of the hours preceding the catastrophe. The day before the event, the author was returning home from a day of geological mapping in the Dolomites. In the late afternoon, he stopped in Longarone to leave three rolls of film in the shop of a local photographer. He could not imagine that he would not get his photographs printed, and – most importantly – he would not see the photographer, his wife, and their little son ever again. They all died hours later in the massive inundation that wiped out most of the town of Longarone. The day after, Edoardo Semenza reached Longarone, and was probably the first geologist to reach the landslide site behind the standing dam. He had discovered the landslide and had followed the evolution of the slope movement. However, in his own words, he “*could never have predicted the exact details of the final outcome*”.

The Vajont rockslide, and the terrible consequences that resulted from it, represented a turning point in the history of landslide studies and of natural hazard investigations – in Italy and elsewhere. Analysis of the Vajont case study has become an important part of graduate and post-graduate courses in Engineering Geology and Geomorphology, worldwide. Professor Paul G. Marinos, of the National Technical



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University of Athens, uses the Vajont case study to demonstrate the importance of Engineering Geology to his students. Field trips are organized every year to the site of the Vajont landslide to show to students and practitioners the complex, and to a large extent poorly understood, relationships between geological setting, occurrence of the event, and the effects on the engineering structures. In Italy, the Vajont rockslide has conditioned the societal acceptance of dams and of other large engineering projects for decades. In the book, Semenza recognizes that “*the studies about landslides that were conducted in those days were very superficial and, at least in Italy, an adequate school and a tradition of study regarding the subject did not exist*”. The catastrophic landslide was a very hard way to discover our lack of understanding of a phenomenon – landsliding – which is recurrent and widespread in many areas of the world, and whose frequency, intensity, and impact can be highly conditioned by human actions.

At several places in the text, Semenza acknowledges his lack of understanding of the phenomena he was called to investigate. It is shown how his understanding improved through successive investigations, before and after the failure. As a young scientist (when he discovered the landslide he was 32-years old), he showed his findings coherently and presented his interpretation of the field evidence very clearly. Furthermore, he defended his interpretation courageously against his father (who at the beginning was sceptical, but then became supportive of his son’s interpretation and concerned about the potential consequences) and

against the opinion of some of the leading scientists of the time, including Prof. Giorgio Dal Piaz, a renowned geologist, Prof. Leopold Müller, a pioneer of modern rock mechanics, and Prof. Francesco Penta, a leading geotechnical engineer. In this respect, the scientific conduct of Prof. Edoardo Semenza teaches an important lesson to all of us dealing with natural hazards and their consequences.

The book is the English edition of the Italian volume “*La Storia del Vaiont raccontata dal geologo che ha scoperto la frana*”, published in 2001 by E. Semenza, one year before his death at the age of 76. The volume was translated and published in English with the contribution of the Fondazione Vajont, the Italian Federation of Geological Sciences (FIST), and the Italian National Group of the International Association of Engineering Geology and the Environment (IAEG). The book contains a wealth of valuable information on the Vajont landslide. More importantly, it represents tangible evidence Prof. Edoardo Semenza’s legacy of landslide studies and engineering geology. In their preface to the book, A. J. Hendron Jr. and F. D. Patton, two eminent scientists who published a well-known report on the Vajont landslide in 1985, write that “*this excellent book should be required reading for all geotechnical engineers and engineering geologists*”. We share their opinion, and we recommend the book to all young scientists and practitioners that study natural hazards and their potential societal and economic consequences.