Preface

The Vajont dam disaster stands among the large-scale events that deeply stirred the conscience of the global society. Fifty years have elapsed since that event and, after many vicissitudes (including judicial ones), the Italian research community has decided to hold an International Conference on the theme, together with professional associations and organisations, foremost among them AIGA - Associazione Italiana di Geologia Applicata Ambientale - and CNG - Consiglio Nazionale dei Geologi. The aim of the conference is to prompt a debate among all the scholars of the world on the event of 9 October 1963 and on its repercussions on the evolution of technical-scientific knowledge and of international legislation.

At the time of its construction, the Vajont dam - with a height of 261.6 m and a crest length of 190 m - was one of the tallest and most significant double-curve arch dams in the world. It had a storage capacity of 168×10^6 m^3 and an active capacity of 150×10^6 m^3. Studies for the design of the impoundment and, in particular, geological ones began in 1920. Based on the practice of the time, these studies consisted of a detailed investigation of the dam body area. From 1957 to 1959, Giudici and Semenza conducted more thorough geological studies, detecting a large landslide on the left bank of the impoundment. Further investigations and inspections measured displacement rates and piezometer levels. The monitoring activity went on for three years, revealing intermittent movements of minor extent. The dam designers believed that the recorded slope instabilities involved low volumes of soil and that they had slow displacement rates. During the first filling test (when the lake water level reached about 170 m), the displacement rate was equal to a few centimetres per day and a long fracture developed. This fracture, which can now be interpreted as a tension crack, was regarded at the time as negligible. From October 1961 to February 1962, the lake water depth was raised to 185 m and, in November 1962, to 235 m. Displacement did not increase initially, but hit 1.2 cm/day at the end of the filling period. In the next stage of emptying of the basin, displacement remained high, but then declined in December 1962 until dropping to zero in April 1963. This fact led the dam designers to assume that landslide movements could be controlled by adjusting the basin water level. From April to May 1963, the basin water level was rapidly brought to 231 m and displacement always stood below 3 mm/day. Between June and mid-July, the water level was raised to 240 m and displacement mounted to 5 mm/day. After a period of suspension, during which displacement grew to 8 mm/day, the water level was elevated to 245 m towards the end of September. In some parts of the landslide mass, the measured speed was in the range of 3.5 cm/day. At the end of September, the water level was drawn down to gain control of the displacements, which however continued to rise up to 20 cm/day, observed on 9 October 1963. At 22:39 of the same day, 270 to 300 million cubic metres of rock detached from the northern slope of Mount Toc and plunged in less than 40-45 s into the artificial basin of the Vajont dam, generating a giant wave that propagated upstream and downstream. The about 200 meter-high wave overtopped the dam, flooding the Piave river valley and sweeping away the town of Longarone and the villages of Pirago, Villanova, Rivalta

and Faé. The dam withstood the massive stresses induced by the impact of the wave and recorded only minor damage. The tragic event killed about 2,000 people. Figure 1 is an aerial shot taken the day after the event; the figure shows the enormous mass of material that almost completely filled the storage volume upstream of the dam.

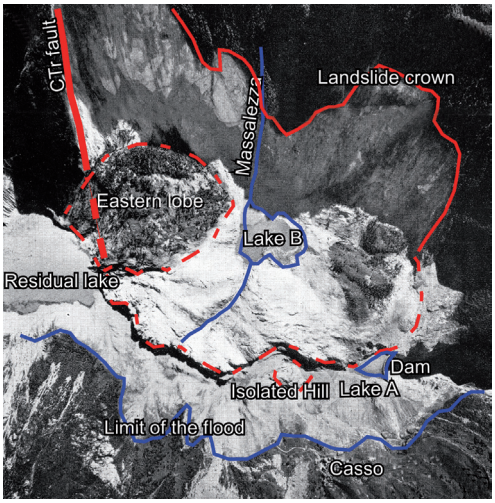

*Fig. 1 - **Aerial photo of the basin taken on the day after the event of 9 October 1963** (after Selli et alii, 1964)*

The scientific sessions of the Conference will be held in Padua on 8 and 9 October 2013. A field trip to the dam area and to the sites of the disaster will take place on 10 October.

Out of the 90 scientific papers submitted by scholars from all parts of the world, the Board of Referees selected 60 papers to be published, together with the keynote addresses, in a special book. Twenty of these papers will be presented during the six sessions of the Conference. Invited keynote addresses will be given upon the opening of each session. Their topics will cover not only the areas of interest of the Conference, but also analyses of natural phenomena which had a major social impact.

We are indebted to the Executive Committee, to the Organising Committee and, in particular, to the International Advisors' Committee for reviewing the scientific papers with dedication and competence.

Heartfelt thanks also go to Prof. Cesare Roda, who passed away all of a sudden on… As President of AIGA, he was not only one of the promoters of this Conference in 2010, but also worked until the end to ensure its success.

THE EDITORS

Rinaldo Genevois — Department of Geosciences, University of Padova, Italy

Alberto Prestininzi — CERI Research Centre on Prediction, Prevention and Mitigation of Geological Risks, Sapienza University of Rome, Italy

[1] Selli R., Trevisan L., Carloni C.G., Mazzanti R. & Ciabatti M. (1964) - *La Frana del Vajont.* Giornale di Geologia, **XXXII** (I): 1-154.