Introduction

In this time of digital communication, the number of those still believing in a personal and direct discussion is rapidly decreasing. The senior editor of this issue, an old Emeritus Professor at the University of Napoli Federico II, probably because of his age, belongs to this number and has organised many symposia, meetings, workshops, and conferences, often even in a very informal way. In particular, he has a vivid remembrance of a series of workshops organized at the University of Napoli Federico II and colloquially known as the "3x2 Workshops" because the first edition, which took place in 1991 and was devoted to the "Experimental characterization and modelling of soils and soft rocks", included 3 institutions (City University, London, University of Roma La Sapienza, University of Napoli Federico II) and 2 speakers from each institution. The workshop was a success, and so three more editions followed: "G7: Pile foundations - experimental investigations, analysis and design" (1994); "3x3: Prediction and performance in geotechnical engineering" (1998); "3x4: Constitutive modelling and analysis of boundary value problems in geotechnical engineering" (2003). The topics and the number of speakers varied from one edition to another; what did not change were the very informal atmosphere and the ample time to discuss. Sometimes, senior speakers were asked to introduce the topics.

As Jean Kerisel told many years ago, age improves the quality of wine but not that of men; accordingly, when trying to continue the series of workshops, the old professor resolved to ask for help. He chose eventually two (relatively) young professors in the realm of Geotechnics, serving in the Universities of Grenoble (France) and Cambridge (UK).

Since the names of the three editors (by mere chance!) start with the same letter V, this time the workshop has been named "3xV". It consisted of three one-day sessions, devoted to: Tunnelling (Convenor Giulia Viggiani), Pile Foundations (Convenor Carlo Viggiani), and Advanced Experimental Geomechanics (Convenor Cino Viggiani).

The original idea was to publish a volume of proceedings, as it had been for the previous workshops. However, prof. Renato Lancellotta, Chief Editor of the Rivista Italiana di Geotecnica (RIG), kindly offered to host the contributions in two devoted issues of the journal and we have been very glad to accept: admittedly also because, in doing so, we managed to avoid a substantial part of the editorial work, but mainly because this solution guarantees a much wider diffusion of the papers.

This is the first of the two issues and includes six papers, covering all the three topics, in the same order in which they were presented orally at the workshop in Napoli.

On tunnelling, Stefan Ritter and his co-authors Matt de Jong, Giorgia Giardina, and Robert Mair, from Cambridge University Engineering Department, investigate the effect of the presence of surface structures on soil deformations due to tunnelling in sand with a series of well controlled centrifuge model tests. Dimitri Litsas and his co-authors Panagiotis (Panos) Sitarenios and Michalis (Mike) Kavvadas, from the National Technical University of Athens, present a numerical procedure to simulate the main physical phenomena that govern the local interaction between the shield, the permanent lining and the soil in mechanised tunnelling and carry out a parametric study of the effect of several operational parameters of the TBM on tunnelling-induced ground movements. Although the approaches are rather different, reduced scale physical modelling in the first case and advanced numerical modelling in the second, it is not by chance that both contributions focus on tunnelling-induced displacements. In fact, the construction of tunnels in urban areas often suffers from high costs and long completion times due to con-

straints imposed by the interaction with existing buildings and services and, therefore, the development of reliable tools for the prediction of tunnelling-induced displacements and potential damage to existing structures and services is essential.

On pile foundations, Rodrigo Salgado, Fei Han, and Monica Prezzi, from Purdue University in USA, adopt advanced finite element analyses and calibration chamber tests with DIC technique to investigate the response of bored piles and pile groups to static axial load. Luca de Sanctis from the University of Napoli Parthenope and Raffaele Di Laora, from the University of Campania, review some aspects of pile-soil kinematic interaction in the light of recent research findings. Terzaghi says that the value of an Engineering science is determined by what it can accomplish as a tool in the hands of the practicing engineer. From this general (and totally shareable) principle, Terzaghi and Peck derive that, because of the wide variability of soil conditions encountered in practice, theoretical refinements in dealing with pile problems are completely out of place and can safely be ignored. This statement has been contradicted by plenty of fruitful research during the last decades, and is again denied by these two papers. The former uses advanced methods of analysis to interpret and explain a number of facts already known on an empirical basis; the latter to explore phenomena and mechanisms that are still rather unknown.

On advanced experimental geomechanics, Erika Tudisco and her co-authors Stephen (Steve) Hall, Stefanos Athanasopoulos, and Jan Hovind, from Lund University in Sweden, illustrate how neutron imaging (quite an "exotic" technique in our field) can be effectively used for characterizing the coupling of fluid flow and deformation of cemented sand subjected to triaxial compression. Although not easily accessible (there are only twenty or so neutron sources around the world), neutron tomography has in fact tremendous potential for full 3D (volume) imaging of fluid distribution in rocks and soils, and even more when coupled with the measurement of strain fields through 3D Digital Image Correlation. The behaviour of granular materials with crushable grains under one-dimensional compression is studied by Francesca Casini and her co-authors Giulia Guida, Manuel Bartoli, and Giulia Viggiani, from two universities in Roma (Tor Vergata and Niccolò Cusano), who focus on the evolution of grain size distribution with grain breakage. Grading evolution of an artificial granular material (Light Expanded Clay Aggregate – LECA) under one-dimensional compression is shown to be well described by a bimodal model obtained from the superposition of two Weibull functions. Understanding the behaviour of granular materials with crushable grains is an important and necessary step to further develop constitutive equations (at the macroscopic level) that incorporate the effects of an evolving grain size distribution.

We hope that the readers enjoy the written contributions at least as much as we enjoyed the workshop!

Carlo, Cino, and Giulia Viggiani