Introduction

In the introduction to the issue 2017/4 of RIG, we noted that in this age of digital communication those still believing in a personal and direct discussion are rapidly vanishing. The senior editor of that issue and of the present one still belongs to them, probably because of his age, and accordingly has organised in the years a number of 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 (1991: Experimental characterization and modelling of soils and soft rocks. 1994: Pile foundations – experimental investigations, analysis and design. 1998: Prediction and performance in geotechnical engineering. 2003: Constitutive modelling and analysis of boundary value problems in geotechnical engineering).

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 man resolved to ask for help, and eventually chose two younger professors 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 was named "3xV". It consisted in three one-day sessions. Two of them were devoted to engineering problems (Tunneling, convenor Giulia Viggiani, and Pile Foundations, convenor Carlo Viggiani). The third one had a convenor who is not a rude engineer, but a scientist as Cino Viggiani, and was devoted to Advanced Experimental Geomechanics.

We accepted the kind offer of Professor Renato Lancellotta, Chief Editor of RIG, to host the contributions in two devoted issues of the journal; this is the second one, and includes four papers.

On pile foundations, Gianpiero Russo presents an overview of analysis and design of pile foundations subjected to vertical load. The paper is actually a valuable integration and update of the State-of-the-Art presented by Gianpiero and others to the XIV ICSMGE held in Osaka, Japan, in 2005.

Since the behaviour of piles depends markedly on the effects of the installation technique, their design, although based on the concepts of soil mechanics, inevitably relies heavily on an intelligent use of simple models and empiricism. This appears a significant shortcoming, since experience is not readily available to everyone. It is to remind, however, that quite a lot of experience has been collected on pile foundations, and made available through papers, reports and books. The Author presents a critical and up-to-date scrutiny of such evidence, allowing him to support and improve a number of design methods. As Terzaghi stated, theory is the language by means of which lessons of experience can be clearly expressed; the Author seems to share this view, producing a balanced mix of experimental results and theory.

On advanced experimental geomechanics there are three stimulating papers. Edward Andò and Gioacchino (alias Cino) Viggiani discuss the techniques by which 3D grain-scale images of a natural granular material as sand can be recorded during a mechanical test. The Authors claim that grain kinematics is relatively easy to measure, but of limited use for the mathematical modelling of granular materials. The measurement of the inter-particles contact properties, on the contrary, is a much more challenging but potentially much more useful operation. Possible future experimental techniques are presented and discussed.

Erminio Salvatore, Roberta Proia, Giuseppe Modoni and again Edward Andò and Cino Viggiani discuss strain localisation in triaxial testing of sand, and its influence on the determination of the critical state. The experiments on two quarzitic

sands and an assembly of steel spheres include conventional triaxial compression and extension tests in a standard triaxial apparatus, and similar tests with x-ray scanning and results processed by digital image correlation. All experiments confirm the concentration of strain in narrow bands, even when the specimen appears to deform uniformly. Caution is therefore required when extracting critical state parameters from macroscopic results of triaxial tests.

Finally, Claudia Vitone, Federica Cotecchia, Antonio Federico and Cino Viggiani present the results of an experimental investigation on two heterogeneous fine-grained soils of Southern Italy: a fissured clay, where the heterogeneity is due to fissures, and a contaminated submarine sediment, where the heterogeneity is of chemical nature. It is found that the fissured clay behaviour can be predicted by traditional models based on Cartesian reductionism, while the submarine sediment behaves as a complex adaptive system at the edge of chaos.

Admittedly, the advanced experimental geomechanics represented by these papers may appear somewhat exoteric to a significant portion of the community of geotechnical engineers; it is aimed to pursue the knowledge, even without an immediate practical aim. But we all know that the history of science and technology is full of examples of the contributions to the progress of the human kind by apparently abstruse theories and discoveries, from Euclidean geometry to Higgs boson!

Again, we hope that the readers enjoy the written contribution at least as much as we enjoyed the workshop!

Carlo, Cino, and Giulia Viggiani