

Exploration for rock engineering, Volume 2. Z. T. Bieniawski (Editor). A. A. Balkema. 1977. D.fl. 125.00.

This volume completes the publication of the Proceedings of the Symposium on Exploration for Rock Engineering held in Johannesburg, South Africa, in November 1976. The first volume was reviewed in *Géotechnique* 27, No. 2, 275–276. The present volume contains an invited lecture 'The application of mechanics to rock engineering' by Professor Charles Fairhurst, a group of four papers on monitoring and instrumentation, three papers on stress measurements, three papers on research investigations, three case histories all dealing with South African hydro-electric schemes, short session reports by ten discussion reporters and a summary of the conference by Professor J. E. Jennings. As might be expected, the contributions follow the pattern set in Volume 1 in that they are of variable quality and value. Some of the contribution are of a quite general nature, and give only the briefest details of theories, techniques and practical examples. Such papers are unlikely to be of lasting value to the engineer or geologist seeking to advance his or her knowledge of rock exploration techniques.

Fairhurst's paper outlines the research philosophy and achievements of his renowned University of Minnesota group which, for 20 years, has had as its overall objective the development of rock engineering approaches based on sound theory. Fairhurst lucidly points out the differences between stress analysis and stability approaches in rock engineering, and demonstrates the applicability of energy-based stability analyses to a wide range of rock mechanics problems. His lecture makes thought-provoking reading for those who share his interest in developing rational methods of rock engineering design.

The group of papers on in situ stress measurement provides a useful addition to the literature on this important but difficult subject. Kirsten reviews the development of stress measurement techniques in South Africa, discusses special methods and problems associated with the use of the various techniques, and gives useful cost estimates for measurements made with the door-stopper and the triaxial cell. Cahnbley discusses the problems of making stress measurements in sedimentary rocks, while de Wet, Grobbelaar and le Roux present a detailed analysis of the errors associated with in situ strain measurement and a method for evaluating the best six from a cluster of nine strain measurements.

Of the case histories included, that by Bowcock, Boyd, Hoek and Sharp is outstanding. They describe the exploratory geological and geotechnical work for the Drakensberg pumped storage scheme being constructed in horizontally bedded sedimentary rocks. Perhaps the most significant features of the work described are the machine hall test enlargement and the penstock test chamber. The analysis and publication of the results of measurements made in such trial openings is one of the most effective methods available for improving the general level of understanding of the behaviour of large underground excavations in rock.

E.T.B.

Corrigendum

Soil compaction by impact. *Géotechnique* 25, No. 1, 19–30.

The expression immediately following eqn (10) on page 25 should read:

$$F = \left[1 + \frac{2k\rho(V-v)}{m} t - \frac{k\rho\sigma_L}{m^2} t^2 \right]^{1/2}$$

The previous corrigendum in *Géotechnique* 27, No. 1, 109 is erroneous and should be disregarded.