The S.P.T. remains the most simple and convenient tool for sub-surface exploration work, especially in cohesionless soils and its universal standardization will greatly add to its value.

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Use of servo mechanisms for volume change measurement and K_0 consolidation

LEWIN, P. I. (1971). *Géotechnique* 21, No. 3, 259-262

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The Author has described a method of measuring volume change in the triaxial test using the linear movement of a piston in a cylinder.

The Writer has developed a similar type of apparatus for the measurement of in situ permeability which enables the results to be logged automatically. The system is shown schematically in Fig. 1. In the apparatus, a gear train is employed to translate the motor drive into linear motion of the piston. A magnet and reed-switch assembly are used in determining the number of revolutions of a selected gear. For the measurement of field permeability an

Fig. 1. Schematic diagram of volume measuring system

increment of 0.025 ml for each revolution of the gear was found to be convenient. However, alternative gear ratios can be employed to provide a wide range of increments of volume change, enabling the apparatus to be used for other applications.

The displaced volume of the piston and cylinder assembly is about 100 ml. However, the system incorporates a facility for automatically re-charging the cylinder during a test, thus enabling the apparatus to be used in circumstances where large volume changes occur.

Automatic logging of the volume change is achieved by means of a battery-operated printer with a facility for accumulating the number of revolutions of the gear. Each revolution generates a pulse through the reed-switch and magnet assembly which actuates a counter incorporated within the printer.

A clock-unit incorporated in the system initiates a print of the total number of revolutions together with the elapsed time at predetermined time intervals. A range of time intervals varying between 15 seconds and 25 minutes can be selected on the clock-unit.

The method of recording by pulse-counting was employed because the system has a very low power consumption when compared with conventional data loggers which use analogue to digital converters. This is an important feature in situations where the apparatus has to be used on sites remote from a mains power supply.

Compatibility of the apparatus with other laboratory equipment which generally employs analogue voltage inputs to the data-loggers can be achieved by incorporating a precision-wound potentiometer in the gear assembly in place of the reed-switch and magnet.

The apparatus has been used successfully on sites for a period of about six months for measuring the in situ permeability of the subsoil.

Corrigenda

Discussion on 'Shear strength of montmorillonite,' by G. Mesri and R. Olsen; contribution by V. Thanikachalam and R. Bhaskaran. *Géotechnique* (1971) **21**, No. 3:

(i) page 267

for 'can attack the alumina in the tetrahedral layer (Brindley, 1952; Grim, 1962; McAtee and Henslee, 1969) and cause other damage (Rosenqvist, 1955; Brown, 1961; Van Olphen, 1963).'

read 'can attack the alumina and cause other damage to the clay structure (Brindley 1952; Rosenqvist, 1955; Brown, 1961; Van Olphen, 1963; McAtee and Henslee, 1969).'

(ii) page 268, line 7

for 'by dialysis through a cellophate tube'

read 'by washing by dialysis through a cellophane tube'.