DISCUSSION

R. E. OLSON[1]—The authors' present convincing data to show that the "standard method" of dismantling a specimen after a triaxial shear test leads to errors in the determination of the final average water content. The "standard method" apparently consists of closing the pore pressure valves, reducing the cell pressure to zero, draining the cell fluid, and removing the specimen.

At the University of Illinois, the standard procedure for dismantling a specimen was somewhat similar, but the specimens were always cut up into about five pieces, the bottom piece being the disk of soil in contact with the lower porous stone. Measurements involving several hundred specimens showed that the water content of this bottom disk of soil was almost always abnormally high. It seemed apparent that this disk of soil was removing water from the base pedestal and lower porous stone during the dismantling procedure. However, when the water content of this disk of soil was adjusted to its probable value before tear down, the average water content of the soil was seldom changed by more than 0.2 per cent, so no particular effort was made to eliminate the problem.

Several years ago, a series of experiments were started using highly pervious kaolinite. Typical distributions of water content within these specimens at failure were as follows:

Consolidation Pressure, psi	Overconsolidation Ratio	Position of Specimen				
		Top	Center			Bottom
60.....	1	38.1	37.5	37.5	39.4	39.3
80.....	1	36.4	35.7	36.1	36.8	38.0
60.....	2	36.1	35.1	35.3	35.9	37.3
80.....	1½	34.6	34.4	34.9	35.6	37.0

The water contents near the bottom of the specimens are consistently too high by one or more per cent. Further, the plots of void ratio versus consolidation pressure were reasonably well defined at low pressures but involved considerable scatter at high pressures.

In order to find out if removal of the axial stress could result in cavitation of the pore fluid in the base, several of the specimens were unloaded slowly, and the pore water pressures were measured. A typical curve is shown in Fig. 10. It was concluded that cavitation of the base probably did not occur when the axial stress was removed. The following procedure was then used in dismantling the tests. When the test was completed, the pore pressure fittings were turned off, and both the pressure saturation and pore pressure lines were completely disconnected (the axial load still being in place). The axial pressure was then removed as rapidly as possible, and the loading piston was locked in place with the cell pressure still maintained. The Klinger valve between the cell and the cell pressure line was then turned off, so

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as to lock the pressure within the cell, and the pressure hose was disconnected leaving the cell free of encumbrances. The cell, with pressure locked in, was then taken to a sink where the cell pressure was quickly released, the top of the cell disconnected and lifted up allowing the cell fluid to splash into the sink, and the specimen was separated from the lower porous stone as quickly as possible.

about 0.2 per cent in average water content for specimens that have been consolidated to pressures of 80 psi and greater. Hence, reasonable adjustments can be made so that the final average water content is known to within about 0.1 per cent (unfortunately, the water content in the failure zone at the time of failure cannot be defined with comparable precision).

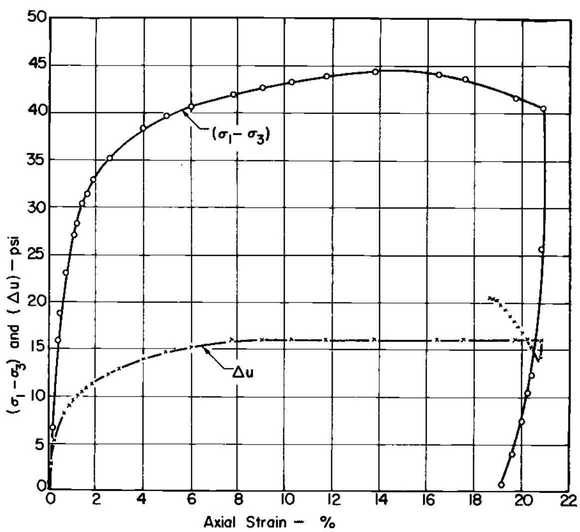

FIG. 10—Typical Stress-Strain Curves for Overconsolidated Specimens of Kaolinite.

Measurements with a stop watch indicate that the total time from the moment the axial load is released to the moment the specimen is separated from the lower porous stone can be reduced to 90 sec, and the total time that the specimen is in contact with the stone under zero cell pressure can be reduced to less than 15 sec. Measurements have shown that the water content of the lower disk of soil is still higher than that of other parts of the specimen, but the error appears generally to be only about 1 per cent in the lowest disk of soil and, therefore, only

The procedure suggested by the authors—of allowing the soil to rebound to a low pressure before dismantling the apparatus—leads to significant delays in laboratories where there is a shortage of triaxial cells, and may lead to new errors if the base fittings contained any air bubbles prior to pressure saturation.

P. W. ROWE[2]—The principal difference between the authors' present results on Weald clay and earlier results appears to lie in the method of consolidation of

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the specimens. In the present work, more time appears to have been given for secondary consolidation to occur during anisotropic consolidation than for isotropic consolidation. For this reason the structure of the clays at failure may have been different for the two clays at identical water contents. In this case the findings would support in principle the importance of structure rather than water content alone, as discussed in the first section on theories.