1 centistoke this effect was negligible. The value of K_1 was also found to be slightly temperature dependent agreeing with the results of Harrison and Lamb,[3] whereas De Bock *et al.*[6] found K_1 to be virtually independent of temperature. Experimental values of K_2 (from frequency change in a standard liquid) varied from 5 to 10 % from values calculated from eqn (6), so that the change in frequency was not used in this work to determine viscosities.

APPARATUS AND TECHNIQUE

CRYSTAL ASSEMBLY

The crystals were mounted by soldering the 4 leads to metal straps, for which both stainless steel and gold-plated brass were used. The metal straps were screwed into a pair of pyrophilite rings to form a protective cage around the crystal. Opposite pairs of metal straps were electrically connected by small stainless steel bars contained in the lower pyrophilite ring. 10 BA tappings were made in 3 adjacent straps for connection to external leads. The crystal assembly was transferred as a unit from a stainless steel calibration vessel to the high-pressure apparatus, being conveniently mounted by screwing the upper pyrophilite ring against stainless steel spacers. Some of these details are shown in fig. 2.

HIGH PRESSURE SYSTEM

Fig. 2 shows the crystal assembly attached to the pressure vessel closure which was threaded to receive a stainless steel sleeve argon arc-welded to a stainless steel bellows. This separates the crystal and test liquid from the hydraulic fluid and allows compression. A schematic layout of the high-pressure system which was designed for pressures up to 10 000 bar is given in fig. 3. Pressures up to 2000 bar were obtained on the charge pump. For higher pressures the high pressure side of the intensifier was primed to 2000 bar and this pressure increased by operation of the drive pump. Pressure measurements were made on Bourdon gauges, a 40 000 psi gauge calibrated against a dead weight piston gauge, and

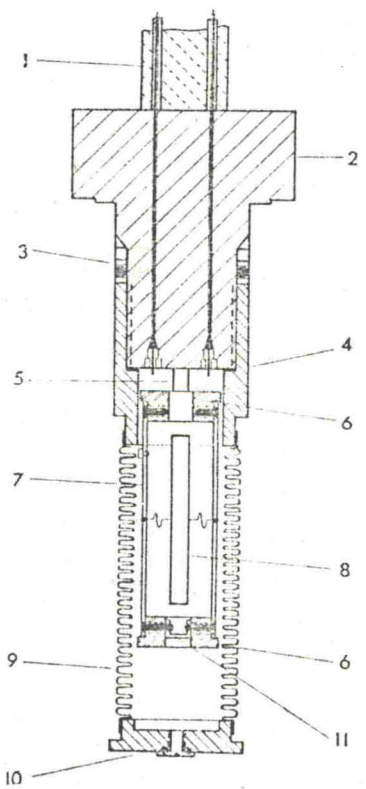

FIG. 2.—Details of mounting of crystal and attachment to pressure vessel closure. 1, Tufnol cylinders; 2, pressure vessel closure; 3, pressure seal; 4, stainless steel sleeve; 5, spacer; 6, pyrophilite ring; 7, metal support strap; 8, quartz crystal; 9, stainless steel bellows; 10, bottom plug; 11, connector.