determine the uncertainty associated with this problem one has to determine the function p(T). In other words the pressure and temperature gradients within the high pressure cell have to be established. Equation 4 reduces to,

$$V = A \int_{T_1}^{T_2} p(T)dT \tag{5}$$

which is a constant times the area under the curve p(T) vs T. The error introduced by assuming no pressure gradients where there are temperature gradients is just the difference in area between the actual p(T) vs T curve and the area calculated if it is assumed that $p = p_{max.}$ from T_1 to T_2 and is zero everywhere else.

We have made a detailed analysis of the pressure and temperature distribution in our piston cylinder cell and have established the p(T) relation so that the area is determined to an accuracy of 2 percent.

EXPERIMENTAL

Single wire measurements were carried out in both a hydrostatic gas apparatus to 8 Kb, and in a piston cylinder solid media apparatus to 40 kilobars. A schematic diagram of the hydrostatic apparatus is given in Figure 2. The materials measured were standard 36-gage teflon-coated thermocouple wire. The wires were threaded through the 0.6-mm-diameter bore of a stainless steel high-pressure tubing. One end was