the first reading; voltage change readings agreed to within 0.1%. In some cases, however, two different oscilloscope records of the same voltage change ΔE disagreed by 3 millivolts or up to 5%.

The reference voltage level E_o should be accurate to within 0.5%. Considering all elements of measurement, ΔE is accurate to about 5% and

$$\frac{E}{E_o} = 1 + \frac{\Delta E}{E_o} = \frac{R}{R_o}$$

is accurate to within 0.8% for the range studied.

Calculation of temperature in the shocked state is subject to systematic uncertainty. The thermodynamic calculation is generally accepted as valid for compressions of less than 20%. However, there has been no accurate experimental confirmation of the temperatures. Systematic uncertainties arise because the equation of state is fit to Hugoniot and hydrostatic compression curves; the fit is insensitive to thermal parameters. One can understand this by realizing that it would require a large temperature change to cause a 1% increase in volume at a given pressure; for silver it would take about 200°K temperature change from ambient conditions. Rice, McQueen, and Walsh (1958) state that calculated temperature increases should be accurate to within 10%. In fact, Rice, McQueen, and Walsh's calculated temperatures agree with those from the Zharkov and Kalinen equation of state to 60 kbar and diverge to a difference of 6% at 120 kbar of pressure (Fig. 8).

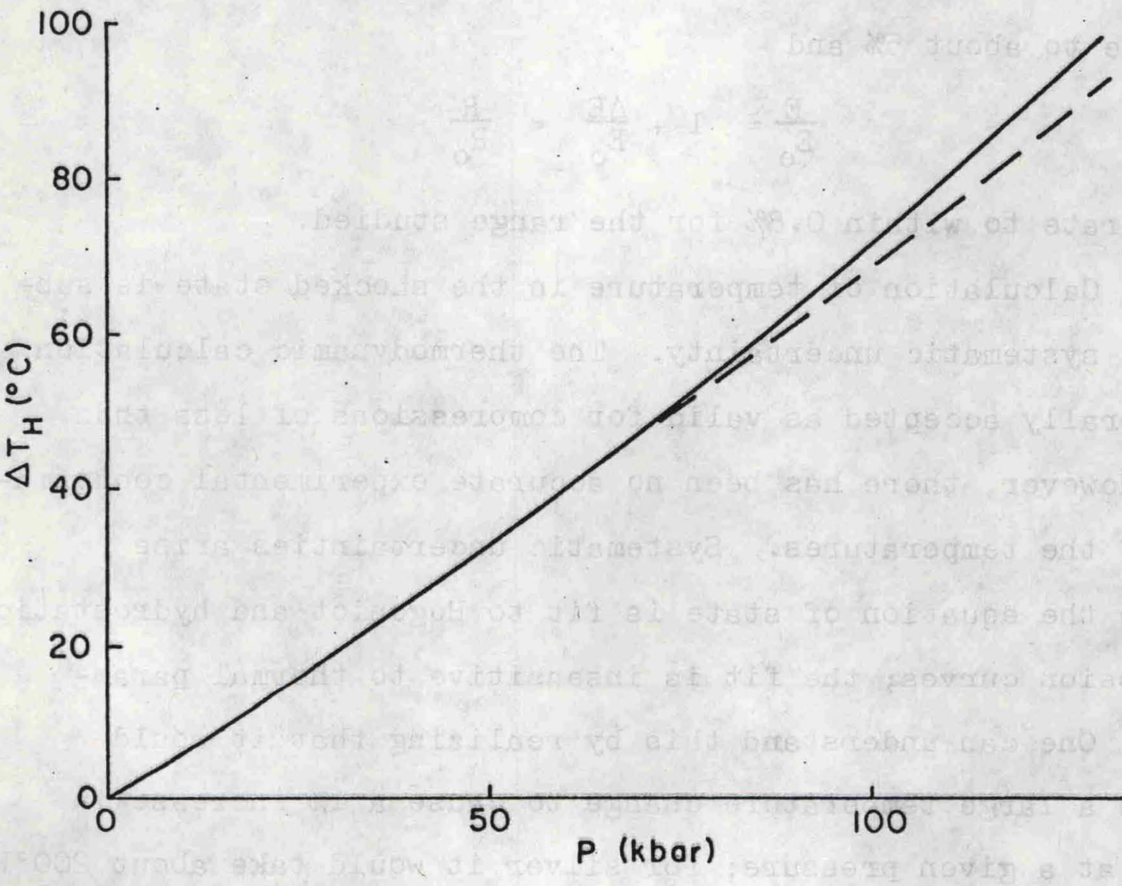

Fig. 8. Hugoniot temperature rise versus pressure. ———, from Zharkov and Kalinen equation of state; — — —, from Rice, McQueen, and Walsh (1958).