smaller by about 4 per cent than expected from the relation

$$C'_{ii} = \frac{4\rho L^2}{T_i^{\,2}} - P_i \qquad (5)$$

where ρ, L, T_i and P_i are, respectively, density, length, mode transit time and mode "perturbation correction" due to misorientation[13]. The cause of this discrepancy is not known.

As shown in Fig. 1 the fractional change in transit time, $\Delta T_n/T_n$, is a linear function of the change in pressure, ΔRg. The quantity dlnT/dP may then be calculated from the slope and pressure gauge constant. Neglecting the small perturbation correction in equation (5) and differentiating with respect to pressure gives

$$\frac{d\ln C'_{ii}}{dP} = \frac{1}{3B_T} - \frac{2d\ln T_i}{dP} \qquad (6)$$

where all quantities are to be evaluated at zero pressure. The error introduced by dropping the perturbation term is much less than 1 per cent. Table 3 shows the computed values of $d\ln C'_{ii}/dP$ and dC'_{ii}/dP where $dC'_{ii}/dP = C'_{ii}\,d\ln C'_{ii}/dP$.

Equation (2), (3) and (4) can be differentiated with respect to pressure (the direction cosines are pressure independent), and the numerical values of dC'_{ii}/dP substituted. The resulting expressions give the pressure derivatives of the fundamental elastic constants, and these values are entered in Table 4 in several forms. The fourth column results from the relation $d\ln C/d\ln r = -\,3\,B_T d\ln C/dP$. The derivative of the isothermal bulk modulus, dB_T/dP, was calculated from the approximate expression[14]