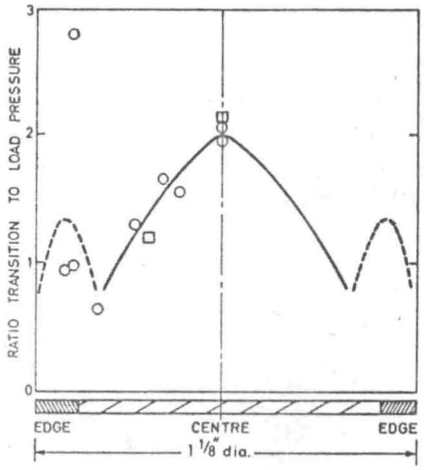

Fig. 11. *Pressure variation in a sample assembly as shown in Fig.* 9a *with the Bi I–II transition of* 25·4 *kb in comparison with the average load pressure for each run*

Circles and squares are for runs at room temperature and 140°, respectively. Diameter/thickness ratio close to 9

recorded by the thermocouple. Studies have shown that this temperature is only two to three degrees higher than the temperature recorded by a thermocouple embedded and electrically insulated by a thin sample wafer under pressures of at least 15 kb. Automatic control of furnace temperature assures uniformity of sample temperature to within $\pm 5°$ for several days if necessary.

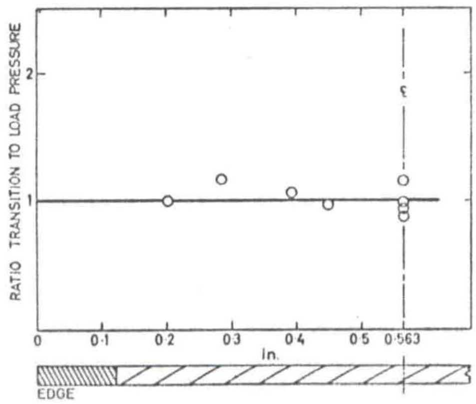

Fig. 12. *Pressure variation study as in Fig.* 11 *but with a diameter/thickness ratio of* 14

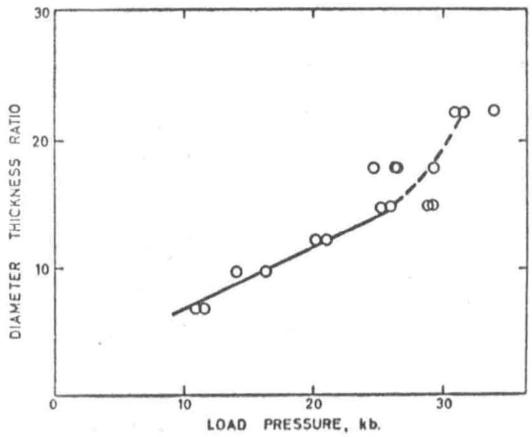

Fig. 13. *Results showing the variation of load pressure with the diameter thickness ratio of an assembly shown in Fig.* 9a *to obtain the Bi I–II transition of a centrally placed sample*

Application

Results of studies made using anvil apparatus have been described elsewhere and will be referred to only briefly here. High-pressure synthesis and equilibrium are represented by studies of silica isotypes,[11] polymorphism of lead oxides,[12] manganous fluoride,[13] boric oxide,[14] titanium dioxide[15] and, more recently, the interesting zinc oxide polymorphism (to the NaCl structure) at pressures over 110 kb.[16] An extensive equilibrium study involving the olivine–spinel transition[17] and its geophysical applications, and a purely crystal chemical study[18] of the pressure-dependence of the ionic size at which a phase transformation occurs in certain rare earth ABO_4 compounds, also attest to the potential of the method in systematic studies involving literally several hundreds of runs each.