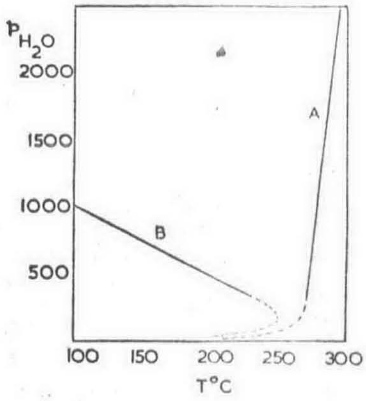

Fig. 7. Equilibrium vapour pressure of the reaction: analcime + quartz = albite + water. Curve A is that suggested by synthesis. Curve B is that estimated for the conditions that $P_{total} = 3\,P_{H_2O}$. The dotted extensions are schematic and illustrate the behaviour expected at low pressures.

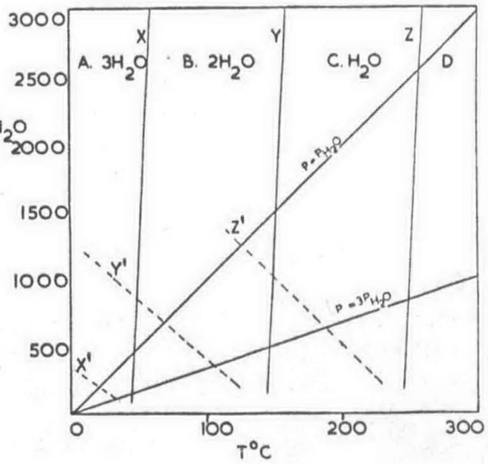

Fig. 8. Diagram illustrating the difference in reaction temperatures in areas where $P_{total} = P_{H_2O}$ and where $P_{total} = 3P_{H_2O}$. X, Y and Z represent the equilibrium vapour pressures for successive dehydration reactions when $P_{total} = P_{H_2O}$, and X', Y', and Z' represent vapour pressures for the same reactions when $P_{total} = 3P_{H_2O}$. A gradient of 30°/km is assumed.

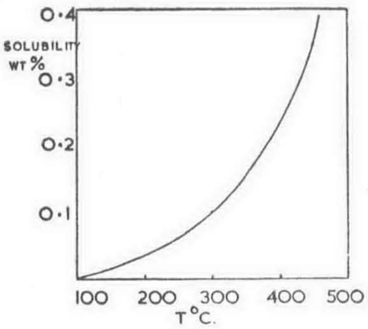

Fig. 9. General form of the 1750 bars solubility curve of quartz in water (after Kennedy, 1950a).

To regain equilibrium, the temperature must be lowered at constant pressure such that a term $\Delta T \Delta S$ equals the above $\Delta P \Delta V$ term. In this region the ΔS of the above reaction will be of the order of 5 cal/mole and $\Delta V_{solids} = 19\ cm^3$ so the new equilibrium temperature will be 150–200°C below the experimental value. The result is that of curve B (Fig. 7). Yoder (1954) has reported failure to produce the expected differential pressure effect with analcime. The subject warrants further investigation (see also Harker, 1958).