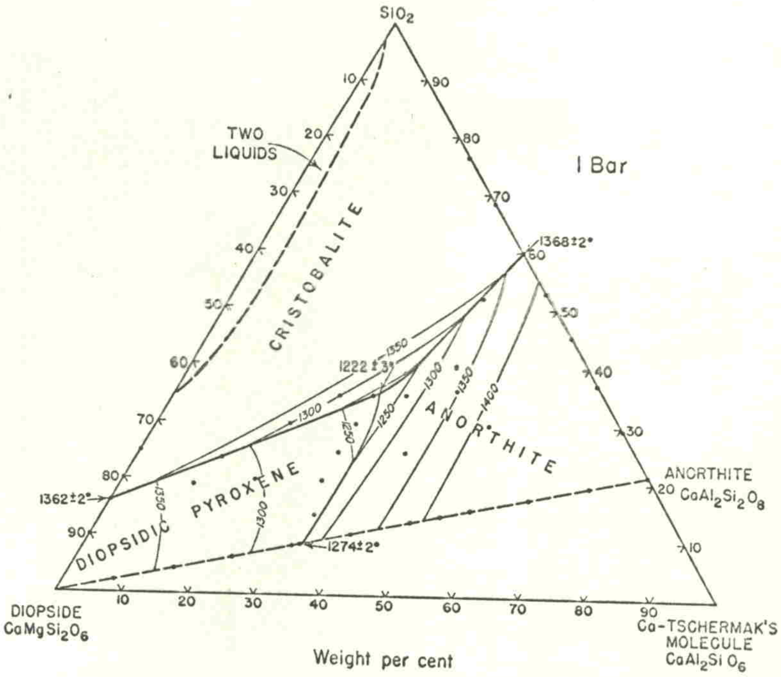

Fig. 6. Equilibrium diagram for the system diopside-lime Tschermak's molecule-silica at 1 atmosphere.

must lie close to the plane of figure 6 at 1222°C. The X-ray evidence implies that it is essentially pure diopside. The piercing point, or ternary eutectic, must be close to or at the thermal maximum on the quaternary univariant line connecting two quaternary eutectics. At one, wollastonite, diopsidic pyroxene, anorthite, and a silica phase coexist with liquid, and at the other enstatitic pyroxene, diopsidic pyroxene, anorthite, and a silica phase coexist with liquid. Determination of the composition of the latter eutectic is of great geologic significance, since it represents the goal of crystallization of a simplified silica-saturated basalt at low pressures.

High-pressure studies of the liquidus in this system have been carried out in a "single-stage" type of apparatus similar to that described by Boyd and England in *Year Book 60*. Results at 20 kb are shown in figure 7; a large number of runs have also been made at 30 kb, but this work is not yet ready for presentation. In all the work described the load pressure has been decreased by 3 per cent to allow for the effect of friction.

The accuracy with which temperature can be measured is much lower at high pressures than at atmospheric pressure. At high pressures the uncertainty in temperature ranges from ±10°C in favorable cases to ±20°C or so. These estimates are based on the internal consistency and the reproducibility of some of our results. There is in addition a correction for the systematic effect of pressure on the emf of a thermocouple; this has been omitted because the elusive problem of quantitative determination of the correction remains to be successfully attacked. In contrast, at atmospheric pressure an accuracy of ±2°C can be achieved with care.

The eutectic temperature in the binary system diopside-silica is raised by slightly more than 200°C by a pressure of 20 kb.