vations on the velocity variation with depth in the upper mantle, useful information on the physical properties and the structure of the *C* region of the mantle are derived. Several recent studies using travel time and apparent velocities of body waves have shown striking similarities that there exist two major velocity discontinuities starting at 320–375 km and 610–680 km in the *C* region of the mantle [*Golenetskii and Medvedeva,* 1965; *Niazi and Anderson,* 1965; *Archambeau et al.,* 1966; *Kanamori,* 1967; *Johnson,* 1967]. When the first step of the sharp velocity discontinuity around 370 km is assumed to be due to the beginning of the olivine-spinel phase change, the temperature at that depth can be determined from Figure 8 to be about 1150°C if the composition of the mantle olivine is assumed to be $(Mg_{0.9}Fe_{0.1})_2SiO_4$. Further, both the spinel and the olivine solvus curves shown in Figure 8 strongly suggest that the two-phase region is likely to range from 18 to 28 kb (corresponding to 50- to 80-km width) in the above composition under the geothermal gradient less than 2°C/km through this region. This narrow width of the two-phase region of the olivine-spinel transition is in good accordance with the latest determinations by *Kanamori* [1967] and *Johnson* [1967] that the width of the first step of the transition zone ranges from 40 to 75 km. A more detailed discussion on the temperature and the structure of the transition zone based on the present experimental results will be given in a separate paper by one of the authors [*Fujisawa,* 1968].

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