down" metamorphism. Brothers ruled out deep tectonic burial on grounds of the passage downward into "lower pressure" rocks. He ruled out tectonic overpressure on grounds of textural evidence for static recrystallization. Brothers proposed a new hypothesis of gas overpressure by vapors trapped below an impermeable ultramafic caprock. But the relationships described by him are also compatible with my model of development of unusual chemical conditions in pore fluids near ultramafic bodies undergoing serpentinization.

In summary, the spatial association of blueschists with serpentinites is firmly established on a worldwide basis. In regard to the possible genetic significance of the association, I urge the interested reader to take neither my word nor Ernst's as the final authority. Rather, he should read the available literature and let the evidence speak for itself.

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REPLY

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Progressive, areally distinct, at least in part contemporaneous metamorphic sequences developed in *in situ* Franciscan rocks have been elucidated by many workers. (For documentation of this and other aspects of the problem, see references cited in Ernst, 1971, and Gresens, 1971.) In quartz and layer silicate-bearing metagraywackes, the most typical paragenesis seems to be: (A) laumontite + albite ± calcite; (B) pumpellyite + albite ± calcite; (C) lawsonite + albite ± calcite or aragonite; and (D) lawsonite + jadeitic pyroxene ± aragonite. Mafic metavolcanics exhibit a corresponding progression from feebly recrystallized greenstones to blueschists. The available thermochemical data and numerous experimental phase equilibrium studies are consistant with the observed mineralogic changes and suggest that relatively high pressures attended metamorphism. Combined with oxygen isotope geothermometry, it would appear that aragonite- and jadeitic pyroxene-bearing metagraywackes and associated metavolcanics must have crystallized at pressures exceeding 8 kb at temperatures on the order of 150 to 300°C. (Some investigators, while accepting these high pressures, have postulated substantial stress increment as the means whereby high pressures could have accompanied such low temperatures of metamorphism. However,