EARLY MESOZOIC BASALTS OF THE POMPERAUG BASIN, SOUTHWESTERN CONNECTICUT: VOLCANIC FEATURES AND MAGMATIC CORRELATIONS

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Basalt ridges dominate the small (c. 3 km x 11 km) Pomperaug Mesozoic basin of southwestern Connecticut. Because it is midway between much larger basins of central Connecticut and northern New Jersey, the Pomperaug basin has been studied for evidence for or against the “broad terrane” and “closed basin” models for Mesozoic rift strata in eastern North America.

In particular, the main 100-m thick “Orenaug basalt” unit of the Pomperaug basin is closely correlated by chemistry and petrography with Holyoke basalt of the Hartford basin and Preakness basalt of the Newark basin. No large dikes are evident in or around the Pomperaug basin, implying that the basin basalts were derived from fissure dike systems already identified for other basin basalts. Unlike the Holyoke basalt, the Orenaug basalt is divided into lower, middle, and upper flow members, with the middle member being very altered and amygdaloidal. Another 8 to 10-m thick flow (the “East Hill basalt” of LeTourneau and Huber, 1997) lies about 30 m beneath the Orenaug. This basalt is highly weathered, but its element ratios place it as a thin distal portion of the Talcott basalt (Hartford basin) and Orange Mountain basalt (Newark basin). No equivalent to the higher Hampden basalt is recognized in the Pomperaug basin, even though the Bridgeport dike fissure source for the Hampden is less than 20 km to the east. Only a thin (30 m or less) sedimentary section remains above the Orenaug basalt, and it is possible that additional Early Jurassic strata, including a third basaltic unit, were removed by erosion.

A model of the same lavas flowing across all three basins requires low topographic relief, allowing the basalts to spread very widely before removal by uplift and erosion. It is therefore possible, even likely, that Early Mesozoic clastic sediments were also present across portions of inter-basin regions beneath the basalts. However, it is also evident that coarse alluvial fans formed directly above some of the lava flows, implying the onset of uplift and erosion that may have isolated the basins and limited stratigraphic connections in the Early Jurassic.

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