

Extensional Tectonics in Compressional Orogens: Late-stage Gravity Sliding of Ophiolite Thrust Sheets in Oman and Western Newfoundland

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Ophiolite complexes in Oman and western Newfoundland are the highest slices in transported stacks of ocean basin and continental margin rocks. The transported rocks overlie contemporary passive margin carbonates and their continental base-

ment. Overall lithologic and structural relations indicate assembly and emplacement of the transported rocks by foreland propagating thrusts. Ophiolite slivers show additional evidence for further transport after initial emplacement. Basal fault surfaces are sub-horizontal and show an overall extensional geometry, cutting down through underlying rock units and imbricate fault surfaces. Locally, the entire underlying imbricate stack has been structurally removed and the ophiolites rest directly on shelf carbonates. The ophiolite sheets are broken into a series of plates or blocks which occupy depressions adjacent to major structural culminations. The culminations were generated by late-stage thrusting along a sole thrust lying in continental basement. Structures generated during basement thrusting are truncated by

the ophiolite sheets. Remobilization of the Oman and west Newfoundland ophiolites coincides, or immediately post-dates, basement thrusting and culmination formation. The ophiolites are interpreted to have moved from the crest of these culminations to the adjacent depressions on gravity-drive slide surfaces. In Oman, culmination formation and gravity sliding took place during the Late Cretaceous Alpine Orogeny and immediately post-date ophiolite obduction (arc/continent collision). In Newfoundland, ophiolite obduction and allochthon emplacement coincide with the Ordovician Taconian Orogeny but culmination formation and gravity sliding did not take place until the Devonian Acadian Orogeny.