

CONVERGENT AND COLLISIONAL TECTONICS IN PARTS OF OREGON,  
MAINE, AND THE VERMONT- QUEBEC BORDER

by

Adam Schoonmaker

A Dissertation

Submitted to the University at Albany, State University of New York

in Partial Fulfillment of

the Requirements for the Degree of

Doctor of Philosophy

College of Arts and Sciences

Department of Earth and Atmospheric Sciences

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## ABSTRACT

Four problems of tectonic significance were addressed. The first is a study of the structural emplacement of the Snowcamp ophiolite over the Rogue-Chetco arc complex during the Nevadan Orogeny in southwestern Oregon. Similarities in age, pressure and temperature conditions during thrusting, metamorphic history, and kinematics indicate that thrusting there was correlative with the nearby Madstone Cabin thrust. This implies that the overlying ophiolitic rocks have undergone a similar history as the Josephine ophiolite and are not exotic to Jurassic North America.

Two projects involve the geochemical and field relationships of rocks in north-central Maine, which are used to constrain the tectonic setting of pre-Taconic and early Acadian magmatic rocks. Early Ordovician basalts and gabbros have MORB characteristics derived from depleted mantle, but intrude mélangé and continental margin rocks. The most likely interpretation is that they intruded an active continental margin as a result of a ridge subduction event. Younger Devonian rocks are enriched with respect to MORB, but are not to the extent of other within-plate, plume-related settings. They are associated with rocks deposited on a continental margin and in the foreland of a lower plate prior to arrival of the Acadian orogen. Geochemical analysis indicates a subduction-modified subcontinental mantle source, and the magmatic rocks are interpreted to have intruded as a result of lower plate lithospheric detachment during the early stages of subduction of the continental margin.

The final project addresses a long-standing conflict in interpretation of the depositional history and structural evolution of the Stanbridge Group in southern Quebec, and the correlative Highgate and Morses Line Formations of northwestern Vermont. Field relationships in Vermont indicate that the Highgate and Morses Line Formations were deposited on the Laurentian shelf and shelf margin, and were later imbricated during the Taconic Orogeny. The correlative Stanbridge Group in Quebec likely followed a similar history and is not allochthonous as previously believed, in the sense that it was not transported from the Laurentian continental rise.

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