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EARLY MESOZOIC, SUBDUCTION-RELATED, HIGH AND LOW K MAGMATISM OF WESTERN QUESNELLIA, BRITISH COLUMBIA.

№ 101261

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In Cordilleran syntheses, the volcanic rocks of the Nicola Group (and correlative Takla Group to the north) are inferred to represent a Carnian to earliest Jurassic island arc assemblage (e.g. Monger and Price, 1979). However, hypotheses involving rifting have also been suggested (e.g. Preto, 1979) because major element chemistry has shown that many of these rocks are distinctly alkaline.

Results of a combined petrographic and major and trace element study of Nicola Group mafic lavas show that three rock series can be recognized. In decreasing order of abundance these are:
1) HIGH K TO SHOSHONITIC SERIES which consists principally of basaltic to andesitic augite (±plag±olivine±opaque±analcite pseudomorphing leucite) porphyries, trachyandesites and rare picrites.
2) LOW K CALCALKALINE SERIES of plag±augite±olivine basalts and andesites. Dacitic and rhyolitic tuffs and flows dominate this series.
3) LOW K THOLEIITIC-TRANSITIONAL SERIES of plag±augite±olivine±opaque basalts and 'big feldspar' basaltic andesites.

Low Ti, Nb, Zr and Y in all but a few of the tholeiitic-transitional series plus variable enrichment in K, Ba and Rb suggest that the Nicola lavas are typical products of subduction-related magmatism. A crude space-time distribution is apparent with the calcalkaline rocks being generally (but not exclusively) west of and older than the shoshonitic rocks, as expected in a simple model of a west-facing and evolving island arc.

Rocks of identical age and similar petrology occur in several belts further south. These include augite porphyries of the Happy Creek igneous complex (NW Nevada) and Rattlesnake Creek terrane (Klamath Mtns) and alkaline plutons in the White/Inyo Mtns and Mojave desert. This petrologic association seems unique to the Early Mesozoic time interval in western North America.

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Speaker's status (check one):
1 ☐ GSA Mem or Fel
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Accepted for GSA Cordilleran Section meeting, Los Angeles, March 1986.

GSA Abstracts with Programs v.18, no.2.