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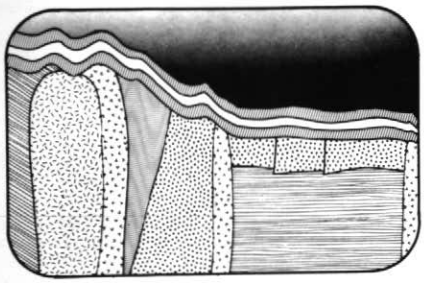

Third Field Conference of Western Structural Geologists

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On May 3rd, 1974, structural geologists from southwest British Columbia and northwest Washington met to examine relationships between the Cascade Thrust Belt and the Coast Crystalline Belt. The conference was organized by G. H. Eisbacher and led by J. W. H. Monger (Geological Survey of Canada), P. B. Read (University of British Columbia), and D. Pearson (British Columbia Department of Mines). Setting out during two sunny days in an otherwise soggy spring, the group traversed the northern end of the Cascade Thrust Belt near Chilliwack, crossed the Fraser River to the southern extremity of the Coast Crystalline Belt, and hence moved eastward over Paleozoic and Mesozoic sedimentary and volcanic successions of the eastern Cascade Belt.

In the Chilliwack area our attention was drawn to the large faults that define the geologic framework of the region. The westerly directed Shuksan and Church Mountain thrust faults carried Paleozoic and Triassic units over Jurassic rocks in mid- to late-Cretaceous time. The Paleozoic and Triassic successions contain the metamorphic mineral lawsonite, indicative of elevated pressures. The lawsonite must have crystallized in post-early Jurassic time, possibly contemporaneously with thrusting. In Washington, however, similar blueschist assemblages are believed to be of Permo-Triassic or mid-Paleozoic. As much is made these days of blueschists and plate margin interactions, it is obviously crucial to determine the time or times of blueschist development in these rocks.

Tracing the thrust faults along Harrison Lake directs the questing eye as far as 250 kilometres to the northwest beyond the lake into largely unmapped areas. Although not easily accessible, large and possibly deeply rooted extensions of the Cascades Thrust Belt may yet be found here, in effect redefining the northeastern border of the Coast Crystalline Belt (Fig. 1).

Younger than the thrust faults are strands of the Fraser River Fault System. Of particular note is the Hope-Straight Creek fault along which Peter Misch (University of Washington) has postulated as much

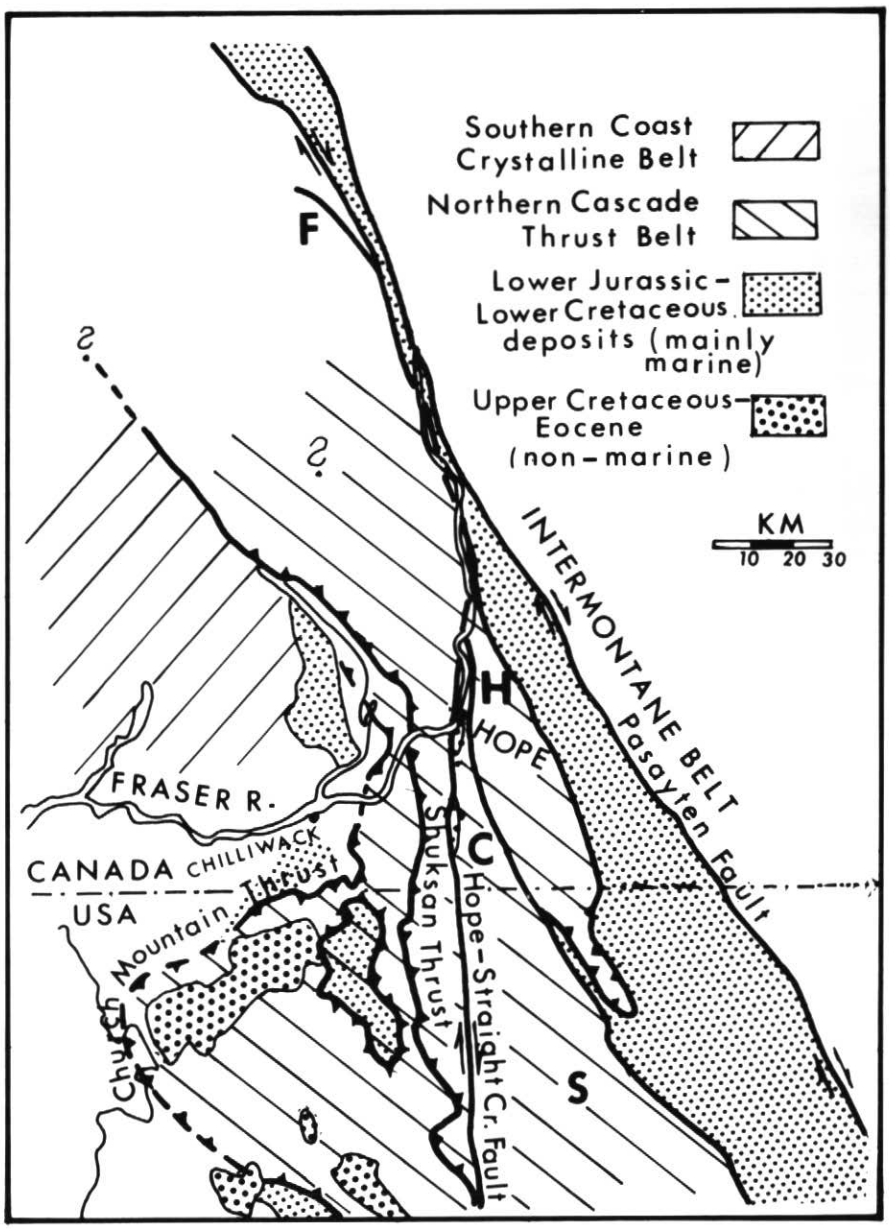

Figure 1
Sketch map of structural elements of southwest British Columbia and northwest Washington.

as 190 kilometres of right lateral displacement based on the offset of clearly defined metamorphic zones on opposite sides of the fault. This hypothesis is certainly plausible when one considers the apparent offset of the seemingly correlative Permo-Triassic Fergusson and Hozameen Groups (F and H in Fig. 1), and that even greater movements of similar sense have been postulated for northwesterly extensions of the Fraser River Fault System (Yalokom Fault). Close constraints can be put on the timing of strike-slip movement. It must have post-dated thrusting (which occurred about 90 m.y. ago), yet has been completed before intrusion and cooling of unfaulted intrusions 74 m.y. old. The inferred rate of displacement (2 cm/yr) is acceptable within modern crustal hypotheses but reconstruction of pre-Cretaceous paleogeography becomes fraught with greater difficulties than heretofore considered.

Returning to comparisons of older crystalline rocks north and south of the border, discussion between Peter Read and Scott Babcock (University of Western Washington) revealed startling differences in lithology between the supposedly correlative Custer and Skagit Gneisses of the Cascade core zone (G and S in Fig. 1). Coordinated research in these crystalline complexes should be most fruitful.

Excellent earlier studies by Coates and Jeletzky (Geological Survey of Canada) guided us at Jurassic and Cretaceous outcrops 50 km southeast of Hope. Discussion centred around apparent paleontological hiatuses between flysch successions and indicated that further work remains to be done to present alternative syntheses of the depositional history.

The study of problems of correlation and paleogeography for Upper Cretaceous to Eocene continental deposits of the Hope and Georgia Strait areas are beginning at the University of Washington, but a cooperative effort will be required to describe models of the complete basin of deposition.

In conclusion, this field conference pointed out the need for many such informal meetings to test new ideas concerning tectonic and stratigraphic correlation across political and geological boundaries.

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The MAC Symposium on Low Grade Metamorphism

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The MAC Symposium on low grade metamorphism was held at Memorial University of Newfoundland (St. John's) on May 20, 1974. The symposium opened with two invited papers, the first by Professor W. S. Fyfe of the University of Western Ontario and the second by Dr. E-an Zen of the U.S. Geological Survey.

Professor Fyfe began with a historical review of the study of low-grade metamorphic rocks. He pointed out the importance of low-grade metamorphism on the ocean floors and emphasized the tremendous quantities of H_2O-rich fluids that can be involved in the process. One possible side effect of these fluids is the generation of 'fluid overpressures' ($P_{fluid} > P_{load}$) with subsequent hydraulic fracturing. Consumption of H_2O in exothermic hydration reactions can be shown to have important thermal effects and could account for oceanic heat flow in the absence of radioactive elements. Professor Fyfe concluded with some speculations on the budget of H_2O on an earth which is undergoing active sea-floor spreading.

Dr. Zen discussed processes involved in burial metamorphism; in particular, the thermal regime of rocks beneath a thrust plate. He also