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EDITORIAL

The papers collected in this special issue are the result of a joint meeting of the "Geologische Vereinigung," the Swiss Geological Society, and the Swiss Mineralogical and Petrological Society held in Bern 25–28 February 1998. This meeting was devoted to one general theme: Geological Dynamics of Alpine-Type Mountain Belts – Ancient and Modern. Although the unifying concept of plate tectonics has prompted much progress in our understanding of orogenic processes at all scales, it has become increasingly clear that mountain belts are not only controlled by forces within the Earth, but by the interaction of tectonic, erosional, and climatic forces. More recently, in the context of "global change", high mountain regions have been identified as particularly fragile environments that are sensitive to environmental change. Concerns derived from this realization and the increasing human pressure on alpine environments have triggered essential research as well.

In view of such a broad topical spectrum, the contributions at the Bern meeting reflected diverse optics. The need to put one's work and results into perspective became apparent. Perhaps the best a conference of this type can hope to achieve is to increase awareness and communication beyond the disciplinary limits that tend to confine topically more narrow meetings. In Bern, the concert of the Earth sciences sounded symphonic. Those playing tectonics, petrology, or whatever in the hinterland, to understand the formation of a mountain belt, would hear complementary tunes from those analyzing the basin in its foreland and those studying the climate record or natural hazards. Most of us discovered unexpected variations on familiar themes.

As (mostly specialized) scientists and as people we retain a central message: We depend on each other. There is as yet no consensus as to whether the emergence of mountain chains reflects primarily internal (tectonic) or external (climatic and erosional) effects, but it is clear that all of these forcings are interrelated. Analyzing the crucial feedback mechanisms may present one of the larger research efforts ahead in Earth science. It awaits many a case study yet and a multitude of models at a variety of spatial and temporal scales. Transdisciplinary work may be needed, and this takes time; however, what need not and cannot wait is cross-communication among fields.

The articles in this issue reflect a spectrum of essential topical studies. The themes progress from mountain building to erosion to climate to natural hazards.

In the first section, Kley and Eisbacher point out structural similarities between the central Andes and the Himalayas and contrast these to the Alps. In the paper by Burg and Podladchikov, the evolution of lithospheric scale antiforms are proposed as an important mountain building process, and to explain the evolution of the (eastern and western) Himalayan syntaxes. Fügenschuh et al. then document the structural evolution of an area situated between the internal Western Alps and the European foreland, whereas Cartwright and Barnicoat analyze and interpret fluid–rock interaction in ophiolites from the Western Alps, using stable isotopes. Finally in this first section, Hecht et al. report on a case study of the Königshain granites, in which they address the problem of granite alteration by hydrothermal fluids.

The next two papers relate the sedimentary record in the Molasse basins of the Alps with their exhumation and orogenic history. Kempf et al. present an integrated study of the Swiss Molasse basin; Schlunegger derives constraints on surface erosion in the Alps from an analysis of their northern and southern foreland basins. His paper forms a topical link to the climate, which is in the center following three contributions.

Stocker analyzes mechanisms he holds responsible for rapid climatic variations documented for the last glacial, i.e., reorganizations of the atmosphere–ocean system. Berger then examines the reasons behind the 100,000-year ice-age cycles and returns to Milankovitch forcing rather than the inclination of the Earth's orbit. Bowen, on the basis of high-resolution facies analysis and correlation, documents only four main glaciations in the Pleistocene of the British Isles.

Finally, Slaymaker reviews and recounts problems associated with natural hazards, such as terrain stability, in British Columbia, bridging the gap from Earth science to society.

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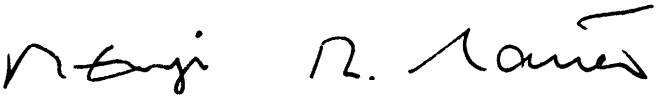

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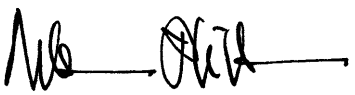

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