Symposium : basement-cover relationships in the Alps : structural, metamorphic, and chronological aspects

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Symposium
Basement-cover relationships in the Alps: structural, metamorphic, and chronological aspects

BAGNES-VERBIER (SWITZERLAND), SEPTEMBER 24, 1993

ORGANIZED BY
THE SWISS SOCIETY OF MINERALOGY AND PETROLOGY
AND THE SWISS GEOLOGICAL SOCIETY

Introduction

by *Arnold Stahel*[1] and *Didier Marquer*[2]

The symposium was organized by the Swiss Society of Mineralogy and Petrology in common with the Swiss Geological Society. Its aim was to present and discuss several aspects of current research in the Alps by bringing together representatives of different branches of geology.

The contributions in this issue of SBMP show that basement and cover can be defined in many different ways. Basement means a mass of crystalline, usually polymetamorphic rocks, underlying a cover mass, formed by sediments or at least less-deformed and less-metamorphosed rocks. Referring to the evolution of orogens, terms such as polycyclic basement and monocyclic cover are used. The interface between basement and cover is also defined as any kind of basement-cover relationship: some unspecified sort of discontinuity is possible as well as a true unconformity; a tectonic contact as well as a more or less continuous lithology; a contact of continental basement with sedimentary lithology as well as of oceanic basement with accretionary prism material.

The following articles and abstracts present case studies which clearly show the very obvious tectonic character of the basement-cover interface in the Alps and elsewhere. Different deformation styles due to competence contrasts; complex imbrications in the basement or in the cover, or in both; mobilization of the basement; transferring of main thrusts towards higher levels allow for any degree of complexity.

Several articles show how the basement-cover interfaces are influenced by crustal extension and collision processes during Alpine tectonics. Decoupling, décollement, crustal thickening and post-collisional thinning are interpreted using structural relationships between basement and cover. There is a particular emphasis on the heterogeneous deformation in the basement (geometry and distribution of faults and shear zones) and their connection to the cover.

Other contributions focus on older orogenies recognizable as relics in the pre-Alpine basement of the Alps which itself has been a subject of much interest in recent years. A paper concerning a portion of the Swedish Caledonides gives a good example of basement-cover relationships in a terrane that was not modified by Alpine events. The article shows – as others in this issue – that isotopic and petrological studies are especially important for elaborating consistent models of the basement evolution. It is shown how isotopic and metamorpic patterns may correspond to results of structural findings.

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The topic is not conclusively treated with the original articles, short communications / extended abstracts, and the abstracts of all the other oral and poster communications presented here. However, it is clearly demonstrated that observation and interpretation of basement-cover relationships are very useful tools enabling the combination of different view points. Results from earlier symposia such as "Metamorphism and Deformation" at Basel, 1992, or "Alpine Metamorphosen" at Bellinzona, 1986 are accordingly expanded. It is encouraging to see how the understanding of orogenic evolution has progressively increased in recent years and how it is certainly going to increase in the future.

The site of the symposium in the heart of the "Bernhard nappe" was especially suited for a field excursion. In spite of dramatic weather conditions, the exemplary outcrops and the scenery of the Penninic Briançonnais and Piémontais units were visited by about 20 weatherproof colleagues under the guidance of M. Sartori and M. Marthaler.

The editor wishes to express his gratitude to all authors who made this special issue possible, in several cases by completing their contribution at very short notice.