OCEANIC METAMORPHISM AND ALPINE OVERPRINT OF FORMER OCEAN FLOOR SEQUENCES: CIMA LUNGA UNIT (CENTRAL ALPS) AND MALENCO-FORNO UNIT (AUSTROALPINE-PENNINIC BORDER REGION)

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The Cima-Lunga unit (Val Verzasca, Ticino, Switzerland) is a middle Penninic nappe of the Central Alps. It consists mainly of pelitic and semipelitic schists interlayered by amphibolites and orthogneisses. These gneisses contain a suite of ultramafic lenses (mainly lherzolitic and harzburgitic peridotites), which are closely associated with mafic rocks (metarodingites and eclogites), calcite marbles and sometimes coarse-grained calcsilicates, the latter representing former ophicarbonates (PFIFFNER, this volume).

The Forno unit (Val Forno, Val Malenco/Switzerland, N-Italy) is formed by metabasaltic rocks and an overlying Mid-Late Jurassic to Cretaceous sedimentary sequence consisting of metaradiolarites, calcsilicates and marbles (interpreted as Calpionella or Aptychus Limestones), metapelites and metaarkoses. The Malenco ultramafic mass represents pre-rift subcontinental mantle of the Adriatic plate (TROMMSDORFF et al., 1993). The Malenco-Forno nappe is part of the Austroalpine-Penninic border region of the Alps.

Field relations indicate an ocean floor sequence in both areas: (1) MOR basalts crosscut partly as dykes and partly as intrusive bodies the layering and pre-Alpine structures of the ultramafic rocks. (2) Ocean floor metamorphism leads to serpentinization of the ultramafic rocks and subsequent rodingitization of the mafic dykes and intrusive bodies. (3) Ophicarbonates have been deposited either as fracture fillings along oceanic fracture zones or as sediments on top of the ultramafic sea floor.

Chemical data from metarodingites from both areas indicate a MORB character. Despite this metasomatic process the MORB character is still preserved in most of the major, trace and rare earth element chemistry (EVANS et al., 1981; PUSCHNIG, this volume).

Macroscopic and microscopic observations indicate the preservation of two metasomatic processes in both areas: (1) Rodingitization (Ca-metasomatism) on the ocean floor with a fine-grained paragenesis of diopside + grossular ± epidote/zoisite ± titanite. (2) An Alpine overprint is represented by an irregular blackwall formation with the growth of chlorite + magnetite (dynamic overprint in the Malenco-Forno unit) and amphibole + chlorite ± epidote (static overprint in the Cima-Lunga unit).

The former ocean floor sequences survived different Alpine metamorphic and deformational overprints. The Cima-Lunga unit was overprinted (1) by an Eocene high-pressure subduction metamorphism (45 to 40 Ma; BECKER, 1993, GEBAUER, 1996)

and associated deformation, (2) by the Lepontine regional amphibolite facies metamorphism and by a polyphase late-Alpine deformation history (GROND et al., 1995). The Forno unit was affected (1) by an Alpine regional metamorphism reaching upper greenschist facies conditions, (2) by a polyphase Alpine deformation history and (3) by the contact metamorphism of the Bergell intrusives.

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