

Compositional layering in the basement of Sri Lanka: crustal thickening by injection of granitic and basic sills

G. VOLL

*Mineralogische - Petrographische Institut, University Köln,
Zùlpicher Str. 49, D-5000 Köln 1, Germany*

Compositional layering in the basement of Sri Lanka consists of the following elements :

- sedimentary bedding of marbles, calc-silicate rocks, itabirites, quartzites, psammopelites and pelites. Over large parts bedding is flat and simple, in other parts folded by folds from cm to km dimensions.
- granite sills, 0.6 - 200 m thick, parallel to bedding. Individual sills differ in content and the kind of feldspar phenocrysts, in dark constituents and in accessory minerals. They can be treated as marker horizons maintaining their positions over large distances.
- basic sill swarms parallel to bedding. These sills, too, are intruded parallel to bedding, even where they intrude granite sills. Some granites contain many, others few, others no such basic sills. Cross-cutting feeder dykes are extremely rare.
- large, basic, layered intrusions, four of which have been found. Parts of these intrusions show pronounced compositional layering, produced by cumulate bedding.

Sediments and sills suffered strong flattening (to about 1/15 - 1/20 of original thicknesses) parallel to bedding and stretching in NNW to NNE directions. The sills were intruded very early, during incipient deformation or before all deformation.

Mechanisms of metamorphic differentiation producing compositional layering are discussed. None of these mechanisms is responsible for compositional layering in Sri Lanka. Partial melting does not produce compositional layering; its products cut the layers and dissect or obliterate layering. One of the basic intrusions, which is partly layered, arrived at the climax of metamorphism and after considerable deformation, but before the end of flattening and stretching. Only 1/7 of the thickness of the Highland Series and even less of the Vijayan and Wannu units are composed of sediments. The rest is taken up by sills.