Journal of the Virtual Explorer, 2000
Volume 02
Paper 19
http://virtualexplorer.com.au/

# Development of axial plane foliations in layersilicate rich rocks

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**Abstract:** Development of an axial plane mica foliation in shale clast sediments from Woody Island in Newfoundland is described and analysed. The foliation is shown to develop largely by crenulation of an earlier surface that is mimetic after a shaly parting within the clasts. Analysis is facilitated by the presence of bedding in some clasts, because by making the reasonable assumption that the clasts were originally elongate parallel to bedding, it is possible to recognise the original long dimension of the clasts, irrespective of their present shape. Where strain magnitude is large the crenulations completely transpose the original foliation into the new orientation. The resulting mica fabric is commonly bimodal and symmetrical about the generalised orientation of the foliation. Some clasts are rotated without being crenulated so that the foliation is defined by the original foliation rotated into the new orientation as well as by the length of the clast. It is generally true that bimodal fabrics are common in rocks with axial plane foliations defined by layersilicates. It is concluded therefore that transposition and mimetic growth are important processes in the development of axial plane foliations, not only on Woody Island but elsewhere.

The crenulation cleavage is generally differentiated and attention is draw to the simple relationship that exists between the compositional domains and strain partitioning. The observations are best explained by shear parallel to the length of the mica-rich domains and extension parallel to the length of the quartz-rich domains.

Conceptual modeling of the foliation development indicates that folding involved a large component of bulk shortening perpendicular to the axial plane of the fold throughout deformation. This may be generally true of folded pelitic sediments.

# Table of Contents

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