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A plea for geometrical order in tectonics

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Ever since publishing his landmark book "Folding and Fracturing of Rocks" 50 years ago John G. Ramsay (Ramsay 1967) has fascinated many of us with his stringent mathematical-geometrical approach towards analyzing finite strain in rocks, in particular what the geometry and kinematics of folding are concerned. The figures in this early book, as well as John's drawings and photographs published in later books and articles, undoubtedly also impressed many of us by their sheer aesthetic value. This book and his later work conveyed the message that rock deformation behaves in an "orderly" way, a message that is shared by many, but not all, of John's colleagues in structural geology and tectonics.

This contribution is a plea for careful structural analysis and extensive fieldwork, providing the indispensable base in any attempt to go further and also understand the physics of rock deformation and geological processes at all scales. Two large-scale examples will be discussed in this respect: (1) The problem of mélanges in an ophiolite-bearing unit of the Swiss Alps (Arosa Zone) showing that careful structural analysis leads to the view that such chaotic mélanges were postulated by some authors in the absence of a carful structural analysis, and that the geometry in fact is a result of polyphase deformation, and (2) the problem of orogen scale transects of across the Alps that reflect an amazing degree of order in the stacking of diverse paleogeographical units enabling geometrical-kinematic attempts of retrodeformation and contrasting with alternative and rather "chaotic" views.

Reference:
Ramsay, J.G. 1967: Folding and Fracturing of Rocks. McGraw-Hill New York, 568pp.