

The Construction of Geological Cross-Sections

The following seven papers are dedicated to the memory of David Elliott. All the papers have obviously been influenced by his work which not only included the construction of balanced geological sections but also the study of the geometry of thrusts and their associated structures, deformation mechanisms in rocks, and limit analysis on the physical conditions under which rocks deform in nature. Five of the papers were originally given at a Tectonic Studies Group-Joint Association of Geophysics meeting held at Burlington House on 5th May 1982. The contribution by Mark Cooper matured at about the same time. Finally I have included a short paper under the name of David Elliott. Sadly, much of his work remains unpublished but in an attempt to pass on some of his ideas I have compiled a note expressing his views on the validity and levels of confidence that can be placed on cross-sections.

I am grateful to D. E. Roberts for his helpful comments on early drafts of the manuscripts.

DAVID ELLIOTT—AN APPRECIATION

David Elliott was a graduate of McGill University and like most Canadian undergraduate geologists he worked in summer field camps in the Canadian Arctic. These trips were the source of many of his amusing stories, usually accompanied by a certain sense of Elliott hyperbole, loved and appreciated by his friends. He then carried out post-graduate studies at Glasgow University where he pioneered the use of isogons in structural analysis. Dave continued his career with post-doctoral studies at Imperial College where he began investigating processes of geological deformation, especially finite strain and strain paths. He then took up the post of Associate Professor, later Professor, of Structural Geology at Johns Hopkins University where he began field work in the Appalachians which led him to investigate the geometry of thrust belts. He widened his investigations into the thrust belts of the Canadian Rockies, the Moine thrust zone, the Alps and, much later, the Scandinavian Caledonides. This work led him to pioneer and popularize many new geometrical techniques which help the study of the nature and development of thrusts. Dave introduced the concept of the balanced section to a wider audience and developed the technique so that it could be applied to cleaved and similarly folded rocks. He unstintingly shared his unpublished manuscripts with colleagues in Europe, and largely as a result of his lectures at the Geological Society of America and the Tectonic Studies Group of the Geological Society of London, and the distribution of notes for courses given in Calgary and Lausanne, he influenced and encouraged a large number of workers to look at thrusts and thrust belts in a new way. Dave also continued, along with his students, investigations into the processes and mechanics of natural deformation and produced an elegant, simple model, analogous to glacier behaviour, which helped to explain the origin of thrust belts. He also ran a series of informal field trips to the Appalachians and the Canadian Rockies for his students and colleagues which were great eye-openers and tremendous fun for those geologists lucky enough to attend. Dave became an advisor to the editors of the *Journal of Structural Geology* because he had very strong views on the way that the geological literature ought to be published.

Dave was *en route* to the August 1982 'Fabrics Conference' in Zürich, before intending to visit the Pyrenees to investigate a thrust belt new to him, when he tragically died. He once described the death of a *U.S.G.S.* geologist in the field as a proper and fitting end for a geologist to 'die with his boots on' and, sad to say, Dave achieved this. He will be remembered by his many friends and colleagues as a tall, boyish figure full of amazing fun and wit who could tolerate unbelievers gladly with a slight knowing smile on his lips. He was incredibly widely read in many branches of the geological, physical and mathematical sciences and seemed to have an infinite capacity for work and research. He obviously influenced very many structural geologists and his written work is likely to rank with the best. Fortunately, the Department of Geology at Johns Hopkins have plans to bring out his unpublished work and that of his research students. His loss will be felt by all the geological profession but mostly by his wife Lois and his daughters Kate and Jenny who have suffered a tragic bereavement.

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