



PERGAMON

Journal of Structural Geology 24 (2002) 997–998

**JOURNAL OF
STRUCTURAL
GEOLOGY**

www.elsevier.com/locate/jstrugeo

Editorial

Microstructural processes: a special issue in honor of the career contributions of R.H. Vernon

This Special Issue is one of three that resulted from the Vernon Symposium, held at the 15th Australian Geological Convention in Sydney, July 2000. The other two issues focus on metamorphic processes and igneous processes, and will be published in the *Journal of Metamorphic Geology* and *Lithos*, respectively. The Vernon Symposium was held to honor the career of Ronald H. Vernon, retired from Macquarie University in Sydney. We are pleased to present here 15 papers relating to microstructural processes, one of several fields of study that Ron helped to shape during his career.

We both met Ron in 1984 at the University of New Mexico in Albuquerque, where he was visiting as the Caswell Silver Distinguished Professor. Mike was working towards his Ph.D. and Scott towards his B.Sc. Ron was not the only visiting Australian. Rod Holcomb and Tim Bell just happened to be there as well, which made for a lively and challenging year! During his visit to UNM, Ron was a live-wire, running seminar courses and writing profusely, as usual. Of the several papers he completed during his visit, perhaps the two most impressive were his review of K-feldspar megacrysts (Vernon, 1986), and his explanation of orbicular granite formation (Vernon, 1985). These two papers also serve as examples of Ron's style: careful observation and rigorous analysis, solidly based on the literature, all followed by logical, balanced conclusions. Like many of his ca. 150 published papers, these two continue to be very popular and influential.

Our memories of Ron, both past and present, are as an energetic, endearing man with a natural talent for observational science. Whether on the microscope, in the field or in the classroom, his enthusiasm and genuine curiosity are contagious. Owing to his love of nature, fine wine, art and music, he is also a pleasure to be around on those occasions when the conversation turns from geology! The breadth of Ron's interest and expertise in geology is apparent in his newly published book *Beneath Our Feet* (Vernon, 2000). His interest in book publishing exemplifies another one of Ron's strong traits — his generosity and willingness to share his view of the world. We note with interest that Ron is currently putting the finishing touches on another book — an introductory text on rock microstructures.

We thought it would be informative and enjoyable to give readers some background information on how Ron became interested in rock microstructures. When we asked him for a synopsis he sent the following. We hope you enjoy this Special Issue, and we extend our thanks to all of the contributors for helping to make it an excellent collection. We feel that the clear bias toward new techniques and multi-disciplinary approaches reflects Ron's example. We sincerely thank Ron for his significant influence on all of us, as a mentor, teacher, and friend.

I think I first became interested in rock microstructures as an undergraduate petrology student. I was really taken with minerals in the microscope, and during my honours work at Urala (University of New England, 1956), I became interested in granite and contact metamorphic microstructures in a very unsophisticated way. For example, I accepted (along with nearly everyone else) the Bowen–Nockolds–Grout interpretation of microgranitoid enclaves, namely that the igneous-looking fabrics are due to reaction between granite magma and solid xenoliths. It took many years to unlearn that!

When I went to the CSIRO Division of Building Research in 1958, I was initially set to work on ceramic microstructures, but soon transferred to the CSIRO Mineragraphic Investigations Section at the University of Melbourne, where I was fortunate to come under the guidance of the great A.B. Edwards, who (along with colleagues like Ken Williams and Ian Threadgold) taught me not only the rudiments of ore mineral identification, but also inspired me to look carefully at ore microstructures. Edwards's 1947 book "Textures of the Ore Minerals" is a classic. F.L. Stillwell was there too. Though retired, he came in on most days, continuing his work on the Broken Hill lode and related rocks. I'm pleased that I was able to receive an introduction to the rocks of this fascinating region from such people. About this time, I read a small book on dental metallurgy, of all things, belonging to my father-in-law, a dentist in Lismore, where I was on holiday. This set me thinking even more about microstructures, as many of the photos in the book resembled microstructures of sulphide and oxide rocks I had seen at the CSIRO.

This was emphasized when I joined Bruce Hobbs at the University of Sydney in 1961, where my horizons really

started to expand at a rapid rate. Bruce was right into physical metallurgy, in an attempt to learn more about basic processes behind the microstructures and deformation of rocks. Every week we devoured the latest metallurgical and ceramic literature at the library of the nearby National Standards Laboratory, and we had many discussions with a keen group of postgraduate students (including Paul Williams, Dick Read, Dave Anderson and Tim Hopwood). We also developed a senior undergraduate course called Structural Petrology. We had the benefit of the red-hot latest paper, a wonderful review called “New Work on Petrofabrics” by Gerhard Voll (Liverpool and Manchester Geological Journal, 1960), which is another microstructural classic. We also had a copy of von Steinemman’s 1958 paper on experimental deformation and recrystallization of ice, and we all had to translate passages from it each week. It was a very stimulating time for me, and I spent many (happy?) hours manipulating a U-stage and twirling sheets of transparent paper on stereonet, as I measured the true dihedral angles of every mineral I could lay my hands on in the high-grade metamorphic rocks of Broken Hill. Ralph Kretz at the University of Queensland, was doing the same sort of thing on silicates, and Dick Stanton was measuring sulphide dihedral angles at the University of New England. Soon after, Alan Spry decided to devote a couple of years at Monash University to his 1969 book “Metamorphic Textures”, which was the most comprehensive work on the subject to that time, and which also became a classic publication.

At Macquarie University (since 1969), I have gone even more into microstructural studies, continuing with metamorphic rocks, of course, but also expanding into granites (e.g. orders of crystallization, K-feldspar megacrysts, orbicular granites and magma mixing/mingling) and, more recently, migmatites. I’ve also been considering problems with using microstructural evidence to infer meta-

morphic reactions and with making tectonic inferences from porphyroblasts. It’s been great fun. I’ve learnt a lot, though I’m still confused by many microstructural relationships. (I’m sure that many of my scientific opponents would agree with that!) I know that some people feel that the subject of rock fabrics is in decline, and in any event should take a back seat to the chemical and isotopic approaches that are so prevalent and so powerful these days. However, microstructural studies constitute the necessary control on such investigations. Moreover, studies of rock fabrics are still being pursued strongly and effectively throughout the world by many wonderful people, whose work I admire very much, and I’m pleased to see that many younger researchers are using new and imaginative techniques and approaches. So I feel that the subject is in good hands, and I’m sure I will enjoy learning from the results of their labours as I grow still older.

References

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