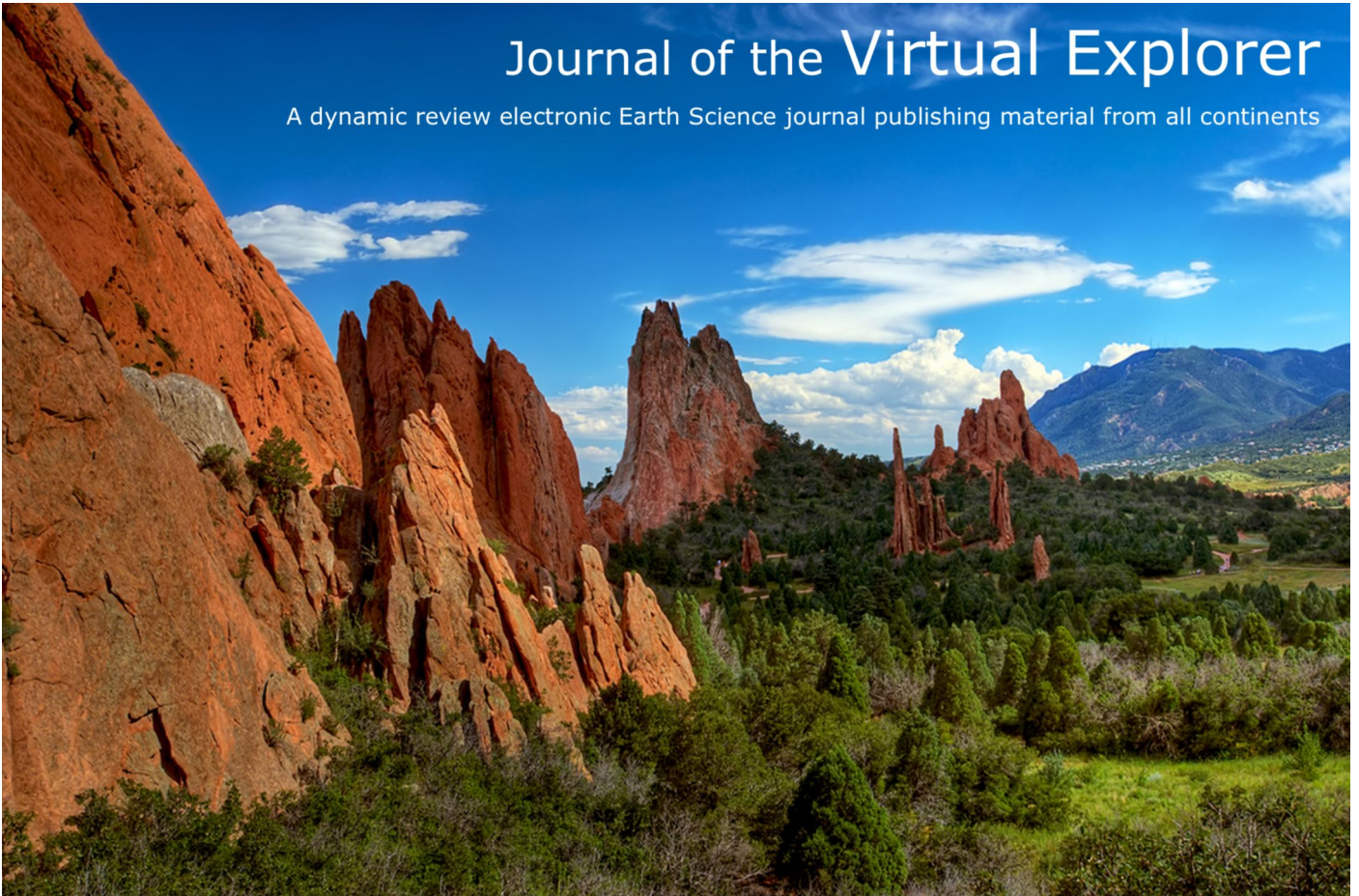


# Journal of the Virtual Explorer

A dynamic review electronic Earth Science journal publishing material from all continents



## The formation of veins and their microstructures

*Paul D. Bons*

Journal of the Virtual Explorer, Electronic Edition, ISSN 1441-8142, volume **02**, paper 4

In: (Eds.) Mark Jessell and Janos Urai,

Stress, Structure and Strain: a volume in honour of Win D. Means, 2000.

Download from: <http://virtualexplorer.com.au/article/2000/7/veins-and-their-microstructures>

Click <http://virtualexplorer.com.au/subscribe/> to subscribe to the Journal of the Virtual Explorer.

Email [team@virtualexplorer.com.au](mailto:team@virtualexplorer.com.au) to contact a member of the Virtual Explorer team.

Copyright is shared by The Virtual Explorer Pty Ltd with authors of individual contributions. Individual authors may use a single figure and/or a table and/or a brief paragraph or two of text in a subsequent work, provided this work is of a scientific nature, and intended for use in a learned journal, book or other peer reviewed publication. Copies of this article may be made in unlimited numbers for use in a classroom, to further education and science. The Virtual Explorer Pty Ltd is a scientific publisher and intends that appropriate professional standards be met in any of its publications.

## The formation of veins and their microstructures

### Paul D. Bons

1. Epsilon Earth Processes Simulation Laboratory, Department of Earth Sciences,
2. Monash University, Clayton (Melbourne), VIC 3168, AUSTRALIA
3. Email: [bons@mail.uni-mainz.de](mailto:bons@mail.uni-mainz.de)

**Abstract:** An overview is presented of the various vein types, their microstructures and the processes that lead to vein formation. Vein types and their structures are divided into three categories:

1. macroscopic morphology (e.g. sigmoidal vein),
2. microscopic morphology (e.g. fibrous, blocky, etc.),
3. growth morphology (e.g. syntaxial, antitaxial, etc.).

The formation of veins involves two steps: (a) transport of vein forming material (nutrients) to a vein and (b) precipitation of the vein forming mineral(s). Main modes of transport are diffusional transport, advective or Darcian fluid flow and mobile hydrofractures. Causes for precipitation range from local supersaturation in, for instance, pressure shadows, which is mostly associated with diffusional transport to, often large, supersaturation in externally derived fluids. Variations in fluid pressure between hydrostatic and lithostatic can also cause precipitation of vein material.

In general, fibrous textures form due to diffusional transport to low pressure sites, such as pressure shadows. Fibrous textures can form without brittle fracturing. Elongate blocky and stretched crystal textures form in case of repeated fracturing and sealing (crack-seal mechanism). Nutrient transport can be by diffusion or by advective fluid flow. Rapid fluid flow, especially in mobile hydrofractures, can bring fluids quickly from their source region to the sites of vein formation, allowing large supersaturation and precipitation of massive amounts of vein material. Resulting veins are often blocky, although elongate blocky / stretched crystal textures can also be found if repeated crack-sealing occurs.

The volume and its media content (including movies, interactive animations and figures) should be viewed in its original format.

## Editor's Note

This paper is available only in its original format.

It is preferable to view the entire volume and its media content (including movies, interactive animations and figures) in this original format.