Forget the hammer, go with the flow

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Published: 07 May 2004

Title: **Geofluids**

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Reviewer: David Alderton

Publisher: Blackwell, quarterly

ISSN: 1468 8115 (print) 1468 8123 (online)

Pages:

Price: Institutions £270.00 Individuals £60.00

As a geology student in the late 1960s and early 1970s, I was immersed in classical geology, the study of rocks and minerals and other allied constituents of the solid earth. Yes, we used the pure sciences, but mostly in support of our field observations, and the age of modelling was still in its infancy. The editors of *Geofluids* describe this traditional approach in their first editorial as: "If you can't hit it with a hammer, it's not geology."

However, the emphasis in geology has steadily changed. There has been a major shift from field studies to those in the laboratory and those with a more theoretical content. And part of this evolution has been an increased realisation that fluids have played a major role in effecting and controlling many important geological processes. One of the reasons for establishing *Geofluids* was not only to provide a publication for the expanding research on geological fluids, but also to bring together those working on fluids in diverse geological environments.

What are those environments? Mineral deposits researchers had long surmised that the majority of metal accumulations were generated by hot, aqueous ("hydrothermal") fluids. Those working on rock metamorphism were quite happy with the concept of invoking large volumes of fluid and adding H2O and CO2 to their mineral transformation equations. But the lack of suitable analytical techniques and the paucity of reliable reference data were major hindrances to our understanding of the exact nature and origin of these fluids.

In most instances, we are attempting to study a fluid that is no longer present; its nature, role and even its very existence have to be deduced indirectly. Luckily some fluids can be seen and studied directly, the most spectacular being those issuing on a grand scale in tectonically active continental areas and those in the deep parts of the oceans at spreading centres. Investigation of these fluids has provided valuable insights into the formation of mineral deposits and helped to solve major problems of heat transfer from the earth and the chemical budget in the oceans.

So hydrothermal fluids are more than just an academic curiosity; their study also has an economic justification - to elucidate the processes governing the accumulation of metals or the generation of geothermal systems. More recently, there has also been a considerable increase in the study of fluids in sedimentary environments, prompted in part by the appreciation of the significant role of fluids in influencing hydrocarbon migration and accumulation. This greater awareness of the importance of geological

fluids has been coupled with major developments in instrumentation, in which many of the early analytical deficiencies have been remedied.

Geological fluids has been a "rendezvous" subject, visited by chemists, physicists and mathematical modellers but lacking a clear forum for publication. It was often difficult for those involved in the field to keep abreast of the published research, and the subject has suffered from a lack of interdisciplinary knowledge dissemination. For instance, petroleum reservoir engineers had long been familiar with fluid movement in rocks, but the application of their understanding to geological scenarios is relatively recent.

Now three years old, *Geofluids* aims to pool research on chemical and physical aspects of fluids from diverse geological settings and disciplines. Authors are encouraged to stress the "transdisciplinary relevance of their research". And to date there has been a varied mix of papers; many different environments have been covered - mineral deposits, hydrocarbons, metamorphism and geothermal systems; and a wide range of techniques has been applied - isotopic (both radiogenic and stable), mineralogical and petrological, thermodynamic. (Silicate melts are specifically excluded from the journal.) *Geofluids* is of modest size; an average issue contains five papers. It is well produced and noteworthy in containing a relatively large number of colour diagrams and images.

In spite of its broad remit, there has been a preponderance of papers on fluid flow and fluid-rock interactions, particularly in marine, sedimentary-basin environments. Although not always specifically directed towards the genesis of hydrocarbon deposits, these studies have no doubt been driven by the large amount of data generated by oil and gas exploration. The underlying influence of the industry is also revealed in the two thematic issues dealing with "Fluid seeps at continental margins" and "Seismic evidence for fluid distribution and migration". The latter is of particular interest as it contains novel demonstrations of how seismic studies (the main exploration tool of petroleum geologists) can be used to image fluids and their pathways directly.

The appearance of *Geofluids* is symbolic of the quiet yet dramatic revolution in geology over the past few decades. It represents the coming of age of the study of geological fluids. For this it deserves to succeed. If researchers can be weaned off their chosen journals to publish in it, *Geofluids* will become a valuable addition to the crowded field of geoscience journals.

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