

icles his scientific achievements, over 200 papers, from his first paper in 1906 at 18 years of age, on the pyroluminescence of quartz to his receipt of the highest accolade from the Geological Society of London—the Wollaston Medal.

One realises what a major language barrier existed in science this century when the works of Goldschmidt, written mainly in German were unavailable to most English-speaking scientists until the 1930s or when his book appeared in 1954 after his death. Up until the year he received his doctorate he had published some 16 papers and made a major contribution to our understanding of contact metamorphism. Interestingly, during his doctoral work the participants on a field excursion to the Oslofjord islands included Einstein. In 1922 VMG (and Bowen) published similar ideas on reaction series in igneous rocks and VMG made a major contribution on Earth differentiation and the distribution of the elements. His search for element 72(Hf) in minerals containing some 16% HfO<sub>2</sub> was beaten into publication by 29 days. His pioneering study of ionic radii published at this time was later confirmed by the wave mechanics work of Pauling. Suggestions that glacial clays may be a good candidate for average crustal composition (81 analyses) closely matched the work of Clarke and Washington on 5159 crustal rock samples. In the 1930s VMG made significant contributions to our understanding of the geochemical cycle and expressed a profound concern at the amount of man-made CO<sub>2</sub>!! The Hugo Müller lecture to the Chemical Society in the 1930s on 'The Principles of distribution of Chemical Elements in Minerals and Rocks' preceeded his book by 17 years and provided an invaluable insight, to the English-speaking community, of the pioneering works of VMG. His concern for the determination and reporting of precise data was apparent when he placed a financial wager with Harwood & Holmes that a published value of 0.0001% Sc for pyroxenites was incorrect and misleading.

This Special Publication provides valuable information on the scientific output of VMG and his influence on generations of geologists. His dedication to the science in the first half of the twentieth century led to a surge of interest and major advances in geochemistry in the second half. Interwoven with details of his career in Oslo and Gottingen are details of the suffering of scientists in Europe during two World Wars. Conveniently a letter signed by Goebbels and Hitler releasing VMG from his post at Gottingen later freed him from a concentration camp. His research on apatites associated with the Fen carbonatite kept him from being deported.

A Goldschmidt story to be remembered by all examiners. VMG asked a student during an oral exam 'Tell me . . . why is amazonstone green?' The student attempting to bluff his way through replied 'Well sir I did know but I have forgotten.' Goldschmidt replied 'That really is too bad . . . nobody else knows and you have forgotten!'

An excellent read and any department that boasts interest in geochemistry must obtain a copy for the interest of academic staff and students alike.

M. A. MENZIES

Pagel, M. and Leroy, J. L., eds. *Source, Transport and Deposition of Metals*. Proceedings of the 25 years SGA Anniversary Meeting, Nancy, 30 August–3 September 1991, Rotterdam (A. A. Balkema), 1991. 841 pp. Price £61.00.

I usually regard conference proceedings with as much interest as a hamburger grabbed from an all-night petrol station. The contents seem often to be an unsorted mixture, with little to stimulate literary or intellectual interest. The scientific content is bland, being written in anticipation of results, rather than actual known data. Choicer scientific works are virtually certain to be dressed and published elsewhere in reputable journals. Other articles are disposable, or of merit solely to the authors' publication record at the risk of being a source of embarrassment later. I suspect I am not alone in these opinions, having seen conference hall, railway station and airport waste bins filled with conference proceedings, baggage limits being assigned to less dense and more enjoyable contents.

These opinions, however, do not apply to the proceedings of the 25th anniversary meeting of the Society for Geology Applied to Mineral Deposits (SGA). The meeting itself was stimulating to an exceptional degree, and well organised. These attributes permeate the volume. Instead of purposely forgetting it in the Hotel de Guise (courtesy of an unknown organiser with a sense of humour), I still have the compact volume, and refer to it frequently. The all-encompassing title (*Source, Transport and Deposition of Metals*) is justified, as the 841 page volume contains 202 extended abstracts, varying from 2–4 pages each. The abstracts have been organised into the following sections: fluid-rock interaction and ore deposition, *P-T-x*-time determination in ore deposits, sources of metals, dating of deposits, structural environment, metals and organic matter, oceanic crust metallogeny, transport and

deposition of gold, and rare metal concentration in granites. From these titles, it can be seen that the emphasis of the meeting was on the fundamental processes behind ore deposition. Not included are descriptions from mines destined to be flooded and inaccessible in 10 years time. Consequently part of the volumes' merit is that it is rich in ideas applicable to a variety of geological locations, rather than being limited geographically and historically.

Although the SGA tends to be a European foil to the North American Society of Economic Geologists, the meeting turned out to be one of those conferences where everyone from all the continents decided to attend. This mixture of backgrounds is evident in the volume, and adds significantly to its' worth. Instead of a series of papers written in the same predictable scientific style, a *mélange* of outlooks is presented. I find this has the merit of making me read thoroughly, rather than glossing over until I find the point I am seeking. Although there are two editors, I suspect abstracts were published as written. My one disappointment is that the three invited lectures are only extended abstracts, as I would have liked their lectures to have been expanded. Excepting

D. Rickard, the contributions of the other invited lecturers are probably the shortest in the volume.

The publishers (A. A. Balkema) have exploited a market for the rapid production of hardbound conference proceedings. Although their final products look polished superficially, the typeface, diagrams, and photographs are reproduced directly from the submitted paper. This lack of quality control has previously produced some poor quality volumes, memorable only by illegible or unlabelled diagrams. The SGA volume is full of sketches, maps, photographs and tables, and I have yet to be puzzled by any of them. Photomicrographs frequently lack contrast, but my main criticism is the the back-scattered electron photomicrograph of gersdorfite–nickeline–coffinite on the front cover is out of focus!

I unhesitatingly recommend any geological library or active researcher to purchase this volume. Although perhaps beyond the pocket of students, I strongly recommend perusal. Instead of being a disposable set of extended abstracts, the volume contains a wealth of fundamental ideas worth digesting at leisure.

A. P. GIZE