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Book review

W. K. Fletcher: Exploration Geochemistry: Design and Interpretation of Soil Surveys. Reviews in Economic Geology, Vol. 3. El Paso/USA: Soc. Econ. Geol. 1986. 180 p., US \$ 22.00.

As with the two previous volumes of *Reviews in Economic Geology*, the present volume under review was initially prepared as a handbook of the SEG Short Course programme: this one was jointly sponsored by the Society of Economic Geologists and the Association of Exploration Geochemists and was given in February, 1987, in Denver, Colorado. This published version was finally prepared after the course (Foreword of April, 1987) and is more updated than the year of copyright may suggest.

It was not the intention of the authors to challenge any of the existing textbooks on exploration geochemistry as clearly indicated in W. K. Fletcher's preface, but to point to "selection and linkage of appropriate methods of sample collection, analysis, and interpretation" based on their experiences "that the effectiveness of soil surveys is often compromised when the conceptual simplicity of the method leads to its unthinking application." Consequently, the book offers, in a positive sense, a huge accumulation of case histories drawn from the personal experience and active involvement of the authors. The style of presentation follows the original objective as a course handbook and is purposely retained in the bookform: "we have attempted to challenge the reader, by asking questions as each case history unfolds, to become a participant in the exploration process."

There are 11 chapters: the first 6 being devoted to aspects on how to carry out soil surveys, the last 5 presenting individual case histories on important genetic types of mineral deposits. I. Thomson starts with "Getting It Right", treating the major problems normally encountered in applying geochemical soil surveys (optimum target identification, maximum geochemical contrast, cost effectiveness and orientation studies among others). S. J. Hoffman, in the second chapter "Geochemical Exploration – The Soil Survey", follows the working sequence: office – field orientation – regional exploration – routine soil survey – the ultimate test – the diamond drill program. He continues the third chapter with "Soil

Sampling", pointing to the importance of this step in the exploration sequence and which is often based on technical aspects with only little consideration of the "Geochemical factors affecting trace element distribution" which are treated quite extensively (27 pages). Chapter 4 on "Analysis of Soil Samples" is presented by W. K. Fletcher, author of the well-established textbook *Analytical Methods in Geochemical Prospecting* (Handbook of Exploration Geochemistry, Vol. 1), with special emphasis on mineral-specific decomposition methods and the very essential aspects of quality control and reliability. The following chapter "Statistical Interpretation of Soil Geochemical Data" is by A. J. Sinclair, well known for his introduction of probability graphs in geochemical data interpretation in the early 1970s (cf. The Association of Exploration Geochemists Spec. Vol. 4, 1976), here again advocating rather simple techniques to link geological situation and geochemical data ("In many practical cases sophisticated statistical methods are not essential and add little to the understanding of a geochemical data set." p. 114). Assembling all the previous steps into the final interpretation is summarized by S. J. Hoffman and I. Thomson in Chapter 6 "Models, Interpretation, and Followup".

On the remaining 50 pages, 5 case histories are displayed: "The Tonkin Springs Gold Mining District, Nevada, U.S.A." and "Coed-Y-Brenin Porphyry Copper, North Wales, Great Britain" by M. B. Mehrtens; "The Volcanogenic Massive-sulfide Target", "The Volcanogenic Massive Sulfide, A Second Example" and "A Copper Property" by S. J. Hoffman. Each of these case histories presents a lot of graphical and tabular data combined with specific questions to get the course participants/reader actively involved in deciding the next steps in the exploration sequence.

This volume as a whole provides an excellent source for practically oriented training in exploration geochemistry. It is, furthermore, a valuable guide for the exploration geologist as well as the management, to improve exploration results by applying the recommendations put forward in this volume prior to the technical execution of geochemical soil surveys.

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