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Uranium Mineralogy and the Geochemistry of Radioelements in Crystalline Rocks: Preface

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EXPLORATION for uranium over the past few decades has led to the discovery of many economically important deposits but evaluation of the genetic aspects of ore formation requires further study before reliable exploration criteria can be established. If we take a long-term view uranium is likely to become one of the vital strategic elements of the twenty-first century for which there is no natural substitute. It is essential therefore that the processes which control its occurrence and distribution be studied in detail and from all aspects.

To meet these demands a better knowledge of existing uranium provinces will be required, and new uranium provinces will also need to be discovered. Mineralogy and geochemistry are very important in the recognition of uranium provinces and in unravelling the physical and chemical mechanisms that permitted uranium deposits to be formed and preserved. They are especially useful when broad-based regional studies are integrated with detailed investigations carried out on individual uranium deposits.

Another important aspect of the subject is the disposal of high, intermediate, and low-level radioactive wastes. Modes of disposal require a thorough knowledge of the chemistry of the nuclides involved and of their likely behaviour in the particular geological environment. This will neces-

sitate collaborative mineralogical and geochemical investigations and although the papers in this volume are concerned with natural occurrences of uranium, many of the methods employed will prove equally valuable in studies related to the geological disposal of radioactive and other toxic wastes.

This meeting of which this volume provides a record emphasized uranium mineralogy and geochemistry in crystalline rocks which, with the exception of certain types of granite, have been relatively neglected over the past decade. The topic proved so popular that the one-day meeting grew into a two-day international discussion involving speakers from at least a dozen countries, working in national atomic energy laboratories, geological surveys, universities, industry, and intergovernmental agencies. The meeting was held at the Linnean Society, Burlington House, London, on 16 and 17 January 1981. It followed an earlier discussion meeting of the Royal Society on Theoretical and Practical Aspects of Uranium Geology (*Phil. Trans. Roy. Soc. Lond.* 1979). We hope that the success of these two occasions will encourage others to arrange further meetings at which ideas can be exchanged and new perspectives obtained, and thank P. R. Simpson of the Applied Mineralogy Group and G. C. Brown and J. A. Plant of the Geochemistry Group for organizing this meeting.

The following papers were also read at the Uranium 81 Meeting. Space prevents their inclusion in this number, but they will appear in the Mineralogical Magazine for June 1982.

- M. PAGEL: The mineralogy and geochemistry of uranium, thorium, and rare-earth elements in two radioactive granites of the Vosges, France.
- G. R. PARSLOW and D. J. THOMAS: Uranium occurrences in the Cree Lake Zone, Saskatchewan, Canada.
- E. VON PECHMANN and F. BIANCONI: Synmetamorphic uranium mineralization from Tiraun, Graubünden, Switzerland.
- A. H. RANKIN, D. H. M. ALDERTON, M. THOMPSON, and J. E. GOULTER: Determination of uranium:carbon ratios in fluid inclusion decrepitates by inductively-coupled plasma emission spectroscopy.
- J. A. T. SMELLIE: The mineralogy and genesis of uranium in rhyolitic ignimbrites of Precambrian age from Duobblon, Sweden.
- A. STEENFELT: Uranium and selected trace elements in granites from the Caledonides of East Greenland.
- P. K. SWART and F. MOORE: The occurrence of uranium in association with cassiterite, wolframite, and sulphide mineralisation in S.W. England.
- B. TROËNG: Uranium-rich granites in the Olden Window, Sweden.
- D. B. WENNER and J. D. SPAULDING: Uranium and thorium geochemistry in the Elberton Batholith of the Southern Appalachians, USA.
- M. R. WILSON and G. V. ÅKERBLOM: Geological setting and geochemistry of uranium-rich granites in the Proterozoic of Sweden.