
Introductory Remarks

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Introductory remarks

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Geologists concerned with the discovery and assessment of mineral deposits rarely have sufficient time to become involved in theoretical studies of ore-forming processes. Neither can they be expected to be fully conversant with more than a few of the methods of approach that can now be applied to the understanding of how elements became concentrated to economic proportions. Thus it is rare to find a field geologist with knowledge of structure who can fully appreciate the applications of isotope geology, crystal chemistry or solution chemistry in helping to decide where new ore bodies are likely to be found. It is clear, however, that if we are to ensure that adequate mineral raw materials are available for future generations the broadest possible spectrum of approach must be applied to this problem.

Uranium is a unique element to study since it occurs in many types of deposit formed from Precambrian times to the present day. It is radioactive and is thus relatively easy to locate both on the macro and micro scale. The time of formation of uranium minerals can be dated by isotopic methods with great precision and related to other events. The chemical and physical properties of uranium are probably better known than for most other elements and its solution chemistry, though very complex, is also fairly well understood.

The distribution of what may be termed normal amounts of uranium in various rock types is well documented as is evidence for its distribution in depth below the Earth's surface. What must be developed further is our ability to recognize uranium provinces; to understand the physical and chemical mechanisms that acted in the formation and preservation of ore bodies; and to appreciate the order in which the various processes occurred.

I believe that important new evidence on ore genesis will only become available by greater interaction between practical geologists concerned with uranium, and geologists, geophysicists and geochemists following a more theoretical approach to the problem. To the best of my knowledge this is the first international discussion group aimed at encouraging such an exchange. Many questions will no doubt be posed in the papers which follow that have no immediate answer nor are they likely to be unravelled by a single method of attack. It is by a multi-disciplinary approach that useful new information is likely to be made available.

I consider that the pattern of uranium deposit distribution was set in the Precambrian so it is appropriate that the first paper, by Professor J. Sutton, is entitled 'The evolution of the continental crust'.