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## Introductory Remarks

J. Sutton

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### Introductory remarks

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The realization that the behaviour of the Earth has changed radically during geological time has come about largely in the last decade. This development, which constitutes one of the major advances in geological thinking, results from the study of Precambrian phenomena in many parts of the world and in particular from the work of a small number of geochronologists. In the last ten years as large numbers of unfossiliferous Precambrian rocks have been dated, it has become clear that the nature of geological processes has varied throughout geological time and that one of the cardinal doctrines of geology – the concept that the present is the key to the past – could not be applied to the study of the early history of the Earth.

Geologists have learnt how to interpret very subtle features of the geological record, so that the history of erosion and of the deposition of sediments can be confidently translated into a record of the advance and retreat of seas and of the elevation and destruction of mountain chains. Although the extent and distribution of past seas and mountains was soon recognized as having changed throughout the Phanerozoic it was the constant repetition of familiar geological phenomena throughout the known geological record which produced such confidence in the doctrine of uniformitarianism – the notion that the past history of the Earth can be interpreted in the light of its present behaviour. The doctrine can be applied quite satisfactorily to the interpretation of the latter part of the history of the Earth, but it is now clear that over the first half of its 4600 Ma the Earth passed through a succession of stages during which geological behaviour differed in quite distinct ways from what had gone before and what was later to follow.

The aims of this discussion meeting were threefold: first, to provide first-hand accounts of the geology of some of the key regions where steps in this changing record have been established, written by those who have played a large part in elucidating these classic areas; secondly, to encourage debate on the interpretation of what has been discovered; and thirdly, to provide in a compact form some of the critical evidence which indicates that while Lyell's doctrine of uniformitarianism accounts satisfactorily for the latter part of the geological record, the early development of the Earth was in many respects wholly different.