

## Volcanoes in the Quaternary

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# Volcanoes in the Quaternary

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## Preface

It has long been suggested that there is a causal link between volcanic activity and Quaternary environmental changes. The impact of individual eruptions on regional and global weather conditions was first identified by Franklin (1789) and has been assessed in detail by Lamb (1972). A more contentious issue is the relationship between volcanic activity and Quaternary glaciations. Indeed, some workers (e.g. Humphreys 1940; Wexler 1952) suggested that volcanic activity may have driven the larger scale Quaternary glacial fluctuations. More recently, however, there has been a growing body of evidence which suggests that the converse view is true, namely that Quaternary environmental changes resulted in increased volcanic activity (Zielinski *et al.* 1996; McGuire *et al.* 1997). In addition, Quaternary scientists have used tephra layers as chronological horizons and have recently started to suggest that volcanic events may produce not only short-term changes in climate but also variation in regional vegetation patterns and in the distribution of society. It thus appears that a full understanding of the eruptive histories of volcanoes and Quaternary environmental change requires co-operation and collaboration between these two fields of science. It is hoped that this volume provides the first step in this process.

The seed of this volume was planted during a European Communities funded research project looking at the link between volcanic activity and Quaternary sea-level change. The project illustrated that much was to be gained from the interaction of Quaternary scientists and volcanologists. As a consequence a conference was jointly convened by the Volcanic Studies group of the Geological Society and the Quaternary Research Association, the principal aim being to ensure that scientists from the two disciplines could see how their research interacted. The following collection of papers reflects the diversity of research being conducted in this field, ranging from methodological papers which illustrate how eruptive chronologies can be determined, through studies which look at the regional impacts of eruptions, to assessments of modern volcanic hazards.

This volume contains a collection of 13 papers which, together, form a representative cross-section of research into Quaternary volcanic activity and associated environmental impact. The papers have been grouped on a geographical basis and attempt to illustrate the diverse focus of research in each area. The first three papers are associated with the volcanic province of New Zealand's North Island. These provide an assessment of its eruptive history, the impact of eruptive events on local vegetation and an evaluation of the volcanic hazard based on tephrostratigraphic records. The next 3 papers relate to the East African Rift Valley and the Mediterranean, outlining the importance of tephrostratigraphic records in the determination of eruptive chronologies and the link between eruptive and seismic activity on one major volcanic edifice. The following 5 papers deal with Late Quaternary eruptions in Iceland, in particular how such events can be identified at local and distal sites via analysis of tephtras and what impacts such events can have on regional weather conditions and society. The final 2 papers are based around research conducted on Atlantic volcanic islands and provide detailed study of hazard assessment in such areas.

I would like to thank the referees who provided valuable comments on the papers accepted for publication and the support provided by my co-author Bill McGuire. I would also like to thank the staff of the Geological Society Publishing House and Burlington House for their patience and determination which ensured that this volume was published.

Callum Firth  
West London

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