

Preface

Although William Robert Grove, later Sir William, first expounded the fuel cell principle in a postscript to a letter in *Philosophical Magazine* one hundred and fifty years ago, fuel cells as electricity generators still, unfortunately, remain full of promise for the future.

Notwithstanding, the pace of development for most of these attractive devices has steadily accelerated during the last two decades, as evidenced by the intense interest, fervent activity and large attendances at recent meetings. Thus it was that an *ad hoc* committee of British industrialists, researchers and others were prompted to convene this Symposium to pay tribute to the vision of Grove; it was held at The Royal Institution, London, 18 - 21 September 1989, where he had collaborated with Faraday and many other distinguished scientists of the day. The main purpose was to provide a forum for appraising contemporary developments in fuel cells, their potential role in an increasingly environmentally-aware community and how they might influence future energy strategies, particularly in the United Kingdom.

Well over two hundred delegates from many disciplines and from all around the world, met on this occasion to hear twenty papers, three panel discussions and six short contributions given by international authorities in the field. Apart from two of the latter, all are collected within the present volume and will serve as a reference to events, opinions and views on fuel cells at this time.

The meeting was opened by HRH The Duke of Kent as President of The Royal Institution. Professor J. M. Thomas, its Director, presented the Grove Anniversary Fuel Cell Lecture, amply illustrated by archival material written by Grove; this was followed by spectacular demonstrations of the explosive oxidation of hydrogen in air and concluded with the cool, controlled combination of hydrogen and oxygen in a Ballard solid polymer fuel cell.

The technical sessions of the programme focussed on the many aspects of fuel cells, including their promise to reduce the topical 'greenhouse effect' due to their efficiency, present national development programmes, progress in the several fuel cell types, market assessments, opportunities and prospects through to applications as static generators and mobile power sources.

Speakers identified the present problem areas in the technology, with cost reduction the most prominent. This editor's contention is that fuel cell introductions face the same paradox which surrounds all new technologies in that the benefit of mass production with its implicit cost reduction depends on market size! Other major considerations for fuel cells are lifetimes/reliability and materials development. Appleby highlighted the latter aspect in his closing remarks, having opened proceedings two days earlier with a

comprehensive historical account of the field. We are privileged to include both of his papers here. All authors are to be thanked for their prompt provision of high-quality manuscripts which have ensured rapid publication. A complete record of the proceedings was tape recorded, including panel discussions, and is presently held by this editor.

Overall, the Symposium proceeded smoothly if somewhat hectically. But like all such meetings, it provided that essential opportunity to renew old and begin new acquaintanceships between the *cognoscenti*. International collaboration across the scientific, technical and engineering disciplines will prove to be the *sine qua non* for successful fuel cell implementation in the cleaner, quieter and more efficient world we are all seeking.

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