

## Preface

I am delighted to write this preface to this collection of Royal Institution Christmas Lectures, edited by Professor James. As Director of The Royal Institution (Ri), I am very proud that our annual flagship event is being commemorated in this way. The Christmas Lectures represent the core of what The Ri stands for: the engagement of young people through experiment-driven exploration. The lectures are unique in engaging the audience in both the design and interpretation of experiments — an approach all too sadly neglected these days in the dash to meet the targets of a dense scientific curriculum.

For the last 50 years, the Christmas Lectures have reached out to an ever-wider audience comprising a large majority of adults through the now well-known broadcast over the Christmas period. These broadcasts have been, for some time, a familiar part of the traditional landscape of the British Christmas holidays. As such, they empower the general public to appreciate not just cutting-edge scientific discoveries, but also the joy and excitement of asking a question that can be tested empirically. Anyone who has watched these broadcasts will know how different they are from the standard scientific programmes: far from relying on extensive emphasis on outside broadcasting, the Christmas Lectures instead adopt a much more modest yet realistic approach, often using

everyday objects and situations familiar to young people. As the youngest ever Nobel Prize winner and Director of The Ri, Lawrence Bragg, remarked, “Never talk about science, *show* it to them”. If anything, this is the mission statement of The Royal Institution in general and the Christmas Lectures in particular.

As Professor James shows in the forthcoming pages, this tradition has been seamless since Faraday’s time until the present day. I myself was privileged to give the 1994 series; I therefore feel particularly familiar with the thrills and spills that inevitably occur. I can quite honestly claim that just before the beginning of the first lecture was one of the most frightening times of my life. Imagine standing in front of closed doors behind which waited some 400 children, several live animals, and five television cameras. As the monitor screen counted down the last minute, I finally understood the term “legs turning to jelly”. Anyone who has watched the Christmas Lectures will know that invariably so many things can go wrong — after all, this is real science. In my own experience, a cockerel did not crow when it was supposed to, but did give full voice offstage 20 minutes later during a completely different demonstration. However, it is the ability of the lecturer to improvise with appropriate explanations when the results are unexpected that gives adults and children alike a true insight into scientific methods.

The Christmas Lectures then are unique and represent the very special agenda of The Royal Institution: to diffuse science for the common purposes of life. In the spirit of Faraday, the blacksmith’s son who went on to discover electromagnetic induction, the Christmas Lectures are truly democratising and have never been needed as much as they are today. This anthology stands testament not just to the narrative of the science of the past, but also to the importance of this approach for the science of the future.

Susan Greenfield

Director of the Royal Institution

Fullerian Professor of Physiology and Comparative Anatomy