

THE NORTON HISTORY OF

THE ENVIRONMENTAL SCIENCES

Peter J. Bowler



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NORTON HISTORY OF SCIENCE
(Editor: Roy Porter)

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THE ENVIRONMENTAL SCIENCES

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PREFACE TO THE NORTON HISTORY OF SCIENCE

Academic study of the history of science has advanced dramatically, in depth and sophistication, during the last generation. More people than ever are taking courses in the history of science at all levels, from the specialized degree to the introductory survey; and, with science playing an ever more crucial part in our lives, its history commands an influential place in the media and in the public eye.

Over the past two decades particularly, scholars have developed major new interpretations of science's history. The great bulk of such work, however, has been published in detailed research monographs and learned periodicals, and has remained hard of access, hard to interpret. Pressures of specialization have meant that few survey works have been written that have synthesized detailed research and brought out its wider significance.

It is to rectify this situation that the Norton History of Science series has been set up. Each of these wide-ranging volumes examines the history, from its roots to the present, of a particular field of science. Targeted at students and the general educated reader, their aim is to communicate, in simple and direct language intelligible to non-specialists, well-digested and vivid accounts of scientific theory and practice as viewed by the best modern scholarship. The most eminent scholars in the discipline, academics well-known for their skills as communicators, have been commissioned.

The volumes in this series survey the field and offer powerful overviews. They are intended to be interpretative, though not primarily polemical. They do not pretend to a timeless, definitive quality or suppress differences of

viewpoint, but are meant to be books of and for their time; their authors offer their own interpretations of contested issues as part of a wider, unified story and a coherent outlook.

Carefully avoiding a dreary recitation of facts, each volume develops a sufficient framework of basic information to ensure that the beginner finds his or her feet and to enable student readers to use such books as their prime course-book. They rely upon chronology as an organizing framework, while stressing the importance of themes, and avoiding the narrowness of anachronistic 'tunnel history'. They incorporate the best up-to-the-minute research, but within a larger framework of analysis and without the need for a clutter of footnotes – though an attractive feature of the volumes is their substantial bibliographical essays. Authors have been given space to amplify their arguments and to make the personalities and problems come alive. Each volume is self-contained, though authors have collaborated with each other and a certain degree of cross-referencing is indicated. Each volume covers the whole chronological span of the science in question. The prime focus is upon western science, but other scientific traditions are discussed where relevant.

This series, it is hoped, will become the key synthesis of the history of science for the next generation, interpreting the history of science for scientists, historians and the general public living in a uniquely science-oriented epoch.

ROY PORTER
Series Editor

PREFACE

This book is a history of the environmental sciences in the broadest sense of that term. It includes all the sciences that deal with our physical and organic environments, ranging from geography and geology to ecology and evolution theory. It is not meant, however, as a collected history of all the special disciplines involved. An account that included details of every branch of natural history would have little interest to the general reader, and would also be impossibly long. Instead, I have concentrated on major areas of science and on important theoretical innovations. Even so, to survey such a broad range of topics is a daunting task, and it has been necessary to select those issues which I thought would most interest the non-specialist reader. If that choice betrays my origins as a historian of evolution theory, I offer my apologies. I have tried to build on my own strengths and add material as widely as possible. This has meant that the choice of topics outside my own areas of expertise has been influenced by the availability of good secondary literature.

The main purpose of the book is to show how modern historians try to understand the development of sciences that influence the way we think and behave. The history of science no longer provides a dry catalogue of factual discoveries. It is a discipline that attempts to put science into its social context, to understand the cultural and professional factors that influence the way scientists explain their observations. The results are controversial because many scientists think of their work as the simple accumulation of factual knowledge. They may actually prefer a catalogue of discoveries to a sociological analysis that implies that sometimes their choice of research topic or

theoretical model is influenced by external factors ranging from economic pressures to religious beliefs.

It must also be conceded that historians of science have allowed the direction of their own research to be influenced by a preconceived sense of which issues are the 'big' ones. The result is that some topics – the Darwinian revolution, for instance – have been written about almost endlessly, while others have been left on one side. This situation is changing, partly as a result of new attitudes in society as a whole. The history of ecology is at last becoming fashionable, although in other areas (meteorology and oceanography, for example) one can count the number of sophisticated studies on the fingers of one hand.

As far as I know this is the first comprehensive history of the 'environmental sciences', and the fact that it has been commissioned in this format reflects a sense that the general public has now begun to think of 'the environment' as an important problem in which science is deeply involved. One facet of the history of these sciences is the changing attitude of western civilization to the environment, and I have tried to include this in my account. At one level the 'environmental sciences' represent an artificial category – a collection of distinct specializations that have no unity beyond that thrust upon them by the public concern over the environment. Many environmentalists argue that, unless we think of our planet as a system of interlocking natural processes, we may destroy it altogether through our interference. Science often seems part of the problem: its professional fragmentation symbolizes the materialistic trend in modern thought, the desire to divide Nature up into separate units, each of which can be studied in isolation and exploited for short-term profit. Efforts to reintroduce a sense of the unity of Nature for environmentalist purposes have been rejected as the expression of an unworkable idealism.

This trend towards materialism and professional fragmentation is part of the story told below, but we shall also see that science has passed through phases when the study of broad

natural interactions has been actively encouraged owing to the influence of rival philosophies such as romanticism. We now have more practical reasons for reintroducing a sense of the unity of Nature, but this may prove equally powerful as a means of persuading scientists to rethink their tendency to compartmentalize everything. I hope that a survey illustrating the wide range of motivations that have influenced scientists in the course of time will encourage the hope that a new, more responsible science of the environment is not ruled out by the very nature of science itself.

February 1992

PETER J. BOWLER

The Queen's University of Belfast

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