

PREFACE

It is a pity if science has come to constitute almost a secret world, guarded from the general public by the use of an esoteric language. A historical approach provides an interesting and instructive introduction to understanding the situation. It is not the aim of this book to provide the reader with a key to such challenging subjects as relativity. The science of previous centuries was much simpler and easier to understand. Indeed, if one goes back far enough, much was based on little more than a common sense interpretation of the natural world, which came to be modified in the light of later experience. So the starting point of the language of science was everyday language – the vernacular. But with greater sophistication and better understanding of the natural world there was finally need for a special vocabulary – hence the sub-title of this book.

Academics regularly write learned articles and books, replete with many foot notes, perhaps to be

read mainly by their professional colleagues. But the history of science is far too interesting to be confined to the university world and specialist meetings. A wider public deserves access to a variety of introductions to science. These may reveal many of the problems confronting the human spirit over the last few hundred years as well as some of the triumphs. Recently there have been hopeful signs that there is indeed a public eager to know more about the foundations of the modern world in its many aspects.

I have received several useful hints on the contents of the book from Simon Flynn and Jon Agar and I should also like to thank Daniel Pearce, the copy editor.

INTRODUCTION

In modern times one of the major obstacles, separating the general public from science is its specialised vocabulary. Indeed the different sciences all have their own specialist technical language, very useful for the professional scientist but often baffling for the lay person. Yet this has not always been the case. In the early stages of science familiar words from the common vocabulary of ordinary people were used. Only gradually was this found to be unsatisfactory. Some system had to be introduced and many new words invented to describe the growing knowledge of the natural world.

Most spoken languages have developed slowly over the centuries. Some are never written down and these often show great variations. In Shakespeare's time many words used in one part of England were not understood in other parts. Even in one place words were often spelled in different ways. Standardisation came only slowly,

a feature which helps daily life but is really essential in modern science.

In the study of the natural world there were major differences at first because science as a separate activity developed only slowly. (Everything happens much more quickly today.) The word 'scientist' did not exist before the 1830s and even then took some time to be accepted. In early societies, when there were few towns, most people lived on the land and used ordinary words for the things around them, such as plants or the weather. As trade developed, some measurement of quantity was necessary and the measures introduced were often derived from the human body, such as the width of the thumb, the length of the arm or the stride of a man. This could only provide a rough measurement and might not even be recognised in a neighbouring region.

In early economies the basic problem for most of the population was sheer survival and regular hard manual work in the fields might not even guarantee this. Yet a small leisured class had time for entertainment or contemplation, and there were even a few who tried to make sense of the material world in which they lived. From the speculations of the philosophers of ancient Greece some early science emerged.

By the sixteenth century ideas had developed in the western world to the stage that not everyone accepted the common sense view that the Earth was the centre of the universe. Various plants were cultivated and a few people began to consider how

they were related to each other – the basic problem of classification. Plants were often given fanciful names. Some basic chemistry had developed in various trades, such as the smelting of metals, the dyeing of cloth, yet most processes depended on trial and error rather than any theory. Chemical changes were not understood and there were still alchemists who believed that base metals like lead could, by some tortuous process, be converted into gold.

The seventeenth century is traditionally described as the period of the ‘scientific revolution’, when there were significant advances in physical science associated with such names as Galileo and Newton. The invention of the telescope opened up a greater knowledge of the heavens while the microscope revealed another previously unknown world. There was much work to be done in exploring these new realms, yet the workers were few, even after the foundation of the Royal Society in 1660. The following century was in some ways a period of consolidation but it was much more than this. There emerged so much new information and so many new ideas about the natural world that there needed to be some organisation of knowledge. In three particular areas, where chaos threatened, this was especially true: botany, chemistry and measurement, which are the subjects of successive chapters of this book.

Previous scholars have done research on all of these subjects but it seems that no-one has appreciated an important connection between them.

In making this claim, the author argues that the late eighteenth century has not previously been understood as such a crucial period in the history of science, a period which laid the foundations for later science in many different areas.

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