The Cambridge History of Science: Vol. 4. Eighteenth-Century Science edited by Roy Porter

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This volume edited by the late Roy Porter, a renowned historian of medicine, offers to general and specialist readers alike a complete survey of the development of science in the 18th century. This volume explores the implications of the 'scientific revolution' of the 17th century and the major new growth-points of the 18th century, particularly in the experimental sciences. This is the first comprehensive history of 18th-century science in more than 30 years. It is, bar none, the fullest and most complete work of its kind.

The volume is broken into five distinct parts:

I. Science in Society
II. Disciplines
III. Special Themes
IV. Non-Western Traditions
V. Ramifications and Impacts

Primary attention is paid to western science, though space is also given to science in traditional cultures and colonial science. The coverage within the volume strikes a balance between analysis of the cognitive dimension of science itself and interpretation of its wider social, economic, and cultural orientation. The contributors, all world leaders in their respective specialties, engage with current historiographical and methodological controversies and strike out on directions of their own.

In the remainder of this review, I shall highlight some of what I think are the more notable contributions. (My selection of chapters for comment is not intended to imply that the other chapters will not reward the reader's attention.) In the introduction, Porter notes that

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whereas Enlightenment thinkers of the 18th century have received much (inordinate?) attention from the academy, 18th-century science, in contrast, has typically been portrayed in a subdued manner, and that the period has generally been perceived to lack the 'heroic quality' of the century preceding it [1]. He remarks, however, that even in well-plowed fields of inquiry such as natural history, remarkable changes in thinking can be seen. Indeed, scientific inquiry in the 18th century did not stall here. Linnaeus, for example, developed his the enduring taxonomic system of plants and the first evolutionary theories were advanced at this time. As a matter of fact, the forerunners of Darwin found the static and hierarchical chain of being no longer to possess the greatest explanatory power, and felt the need to re-conceptualize living biota in a more dynamic framework and an extended timescale. Porter consistently reminds readers that in order to understand 18th-century science properly, one must place it in its proper context. He asserts that the central problem of attempting to comprehend 18th-century science is the question as to the species of knowledge that it was supposed to constitute [14].

In chapter 2, 'The Legacy of the "Scientific Revolution": Science and the Enlightenment', by Peter Hans Reill, one finds a characterization of the Enlightenment as a movement that 'adopted, extended, and completed the intellectual and social project usually characterized' as the 'Scientific Revolution' [23]. Reill notes that mechanical natural philosophy was dominant in the period of roughly the late 1680s to the early 1740s. In this period, matter's essence was extremely simplified and defined as merely a homogeneous 'heap of things' that are extended, hard, impenetrable, and inert [25]. However, in the late 18th century, there was a revolution by Enlightenment vitalists who viewed living matter as containing an immanent principle of self-movement whose source lies within an active power inherent within it. Teleology was, thereby, effectively reborn.

In the fourth chapter, 'Scientific Institutions and the Organization of Science', by James McClellan III, it is argued that out of the intellectual revolution of the 16th and 17th centuries grew an organizational revolution in the scientific enterprise during the 18th century. McClellan notes that science was drastically reorganized in the 18th century after the government moved to support science in part by developing new academies, various new observatories, botanical gardens, and new forms of publications. In chapter 10, 'Classifying the

Sciences', by Richard Yeo, it is asserted that in the 18th century there were significant changes in the social and cultural conditions related to the classifications of knowledge. Yeo concludes that with the collapse of the categories of natural philosophy and natural theology, classification schemes no longer sought to show how the various scientific subjects related to one another.

In one of the most important chapters within the volume in my view, 'Ideas of Nature: Natural Philosophy', John Gascoigne shows that the 18th century inherited a long tradition derived from Greek antiquity which maintained that nature could be understood by the employment of reason. He contends, moreover, that, although natural philosophy remained at the beginning of the 18th century a branch of philosophy (along with metaphysics, logic, and moral philosophy), by the end of the 18th century it saw increasing independence from its philosophical origins. He further contends that by the end of the 18th century, natural philosophy grew in scale and complexity to the extent that it began to give birth to separate disciplines.

Shirley A. Roe, in a chapter entitled 'The Life Sciences', notes that for much of the 18th century (what today is known as) the biological world was seen as a highly ordered and somewhat static place. This notion, however, was forcefully challenged by the middle of the century. Roe highlights the relationship between matter and activity as one of the burning issues of the 18th-century advancement of the life sciences. She focuses upon two principal areas in which questions of mechanism, vitalism, and materialism arose: physiology and the theory of generation.

All in all, this volume is designed to be read as both a narrative and an interpretation, and also used as a work of reference. It will be an excellent reference for historians and professionals in the history of science. According to Porter, his aim in producing this volume was to provide critical syntheses of the best modern thinking regarding scientific developments in the 18th century. He more than exceeded his expressed intentions.