

# Philosophical transactions

Jacqueline Reynolds

**A Skeptical Biochemist.** By Joseph S. Fruton. *Harvard University Press: 1992.* Pp. 330. \$29.95, £23.95.

THERE was a time when science and philosophy were essentially the same discipline. The world produced natural philosophers — not chemists, zoologists or botanists. As knowledge and understanding of nature expanded, scientists and philosophers drifted apart and the former fragmented into different disciplines and subdisciplines. Also in that not too distant past — before the advent of the professional historian of science — it was not uncommon for the ‘man at the bench’ to write his own account of the history of his field. Today, however, most working scientists display little interest in philosophical discussions about the scientific method or the role of hypotheses in discovery, nor do they appear particularly knowledgeable about past events (‘past’ referring to anything before their PhD theses). We now have a bevy of historians of science chronicling and interpreting the various facts of discovery, investigating sociological attitudes or looking at the role of religious belief in the formulation of hypotheses. There appears to be little dialogue and perhaps even a marked antipathy between those historians and philosophers who write about science and those who actually do the work of discovery.

Joseph Fruton, a “skeptical biochemist” and a working scientist, deliberates on the separation of these disciplines. His discourse ranges from a consideration of the scientific method to historical accounts of the development of biology through the past two centuries to advice on how the history of science should be studied. Thrown in for good measure are musings on scientific language and communication. Given the breadth of topics and the candour of the author, this book is guaranteed to raise a few hackles.

Fruton’s encapsulated survey of the ideas and influence of philosophers of science comes from the perspective of an experimentalist, questioning whether present-day philosophers value “thinkers above workers, intellect above craft” — suggesting that much could be learned about the development of the scientific method from a study of the practical manuals used by generations of scientists. A lengthy account of Sanger’s work on the primary structure of insulin is presented as a case history supporting

the triumph of experiment over philosophical theorizing — a reminder to those who write about ‘scientific method’ that “the place of organic chemical practice in the rise and fall of competing theories” should not be neglected.

When he turns to the history of biology since 1800 (“The interplay of biology and chemistry”), Fruton is the trained

IMAGE  
UNAVAILABLE  
FOR COPYRIGHT  
REASONS

## Joseph Fruton: apologist for the working scientist.

organic chemist, presenting an admirable discussion replete with quotations, references and personal views. There is a little of everything here, from embryology to immunology, from cytology to energy-rich phosphate bonds, not to mention extensive philosophical musings on such subjects as the search for unity in nature and its component parts. Not all scientists will agree with Fruton’s view of contemporary scientific achievements. Physical chemists, for example, may be chagrined to find a discussion of forces governing protein structure that relegates hydrophobicity to a relatively minor (and inaccurate) position, with no references to twentieth-century scientists who were prominent in developing this concept. Indeed, we are given a strong impression that physical chemistry (with the exception of X-ray crystallography) has not played a particularly constructive role in the recent history of biological sciences. Perhaps this is because physical chemists tend to look for simplicity and regularity, two vices that we are

told “afflicted some protein chemists before 1940”.

Fruton’s approach to the study of the history of science will strike a responsive chord in many working scientists. “I also believe that a major purpose of professional historians of the various modern sciences ought to be, through meticulous scholarship, the enlightenment of the practitioners in these sciences. If members of the present generation of historians continues [*sic*] to reject this aim ... they will do a disservice both to the advancement of their profession and to the education of future scientists who perhaps may later be inclined to become patrons of their enterprise.” (Amen!) Fruton also takes issue with the tendency of many historians to discount “internal history” (autobiographies, laboratory notebooks, a scientist’s personal account of research developments and so on). Surely there can be little argument that what scientists say about themselves and their disciplines and what they put into the research papers are prime historical data, often giving considerable insight into the character and methods of the individual. An example of the informative nature of internal history can be found here in Fruton’s discourse on “Origins of molecular biology”, which tells the reader as much about the author, his concerns and his biases, as it does about the emergence of this now highly active field.

Fruton concludes with a fascinating discussion of the evolution of scientific language and its effect on communication, both among scientists themselves and more importantly between scientists and those writing about the enterprise. He reminds us of the reasons for adopting what is often described as technical jargon (for example, the need for a single word or symbol that precisely describes an object or an action) and also warns us about the changing meanings of this language as a particular research area develops. Scientists, historians and journal editors could all profit from reading this section.

Fruton has produced a book that demonstrates the sources of tension between scientists on the one hand and historians and philosophers of science on the other, and, as such, it can be commended to anyone engaged in these disciplines. Many of his opinions will be disputed, and so much the better. More dialogue and less tribal exclusivity might profit both the working scientist and those who write about the scientific endeavour. □

Jacqueline Reynolds is at *Tarlswood, Back Lane, Easingwold, North Yorkshire YO6 3BG, UK.*