NFS did not lobby on behalf of the CWA. On the other hand, both social work organizations objected to the demobilization of the CWA. Furthermore, not all social workers opposed Hopkins' administration of this governmental agency. Unfortunately, Schwartz devotes very little attention to particular professional altruists' anti-CWA activities, and quickly plunges into a discussion of public relief projects, such as the Comprehensive Employment and Training Act, in the 1970s.

In the final analysis, the role of social workers in bringing about the termination of the CWA was relatively minor compared to the efforts of the Southern Democratic-Northern Republican congressional coalition. Southern Democrats opposed the CWA's color-blind wage scales which encouraged blacks to take well-paid (by Dixie's standards) federal jobs rather than continue as impoverished agricultural workers. And northern rural Republicans complained that the CWA benefited chiefly urban-industrial centers and increased the patronage power of state Democratic machines. It was the Southern Democrat-Northern Republican coalition, rather than the social workers, whose political constituencies were insignificant by comparison, that engineered the demobilization of the CWA in 1934 and ultimately the immobilization of the New Deal itself in 1938. ■

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Science and Technology in the Eighteenth Century: Essays of the Lawrence Henry Gipson Institute for Eighteenth-Century Studies.
Edited by Stephen H. Cutcliffe.

(Bethlehem, Pennsylvania: Lawrence Henry Gipson Institute for Eighteenth-Century Studies, Lehigh University, 1984. Pp. xi, 69. Introduction. $4.95.)

The Gipson Institute at Lehigh University was established to honor Lawrence Henry Gipson, a distinguished scholar of the eighteenth century. The institute is dedicated to promoting studies of a broad interdisciplinary nature focused on the eighteenth century. It was during this century that the Industrial Revolution began in England and reached such an intense period of development and change by the

end of the century that Toynbee, looking at these events from a late Victorian perspective, identified this movement as a revolution. The term has been debated and evaluated in countless lectures, books, and articles since Toynbee coined the term in his *Lectures on the Industrial Revolution,* but it has never been replaced, although our ideas of revolution are remarkably different than Toynbee's and his contemporaries. In addition, there were associated political and social revolutions which provide the context for viewing the Industrial Revolution, which are quite familiar. Equally important, but less well known, were the earlier scientific and agricultural revolutions which were an essential part of the development of science and technology.

As part of its continuing scholarly activities, the Gipson Institute has published a set of three essays dealing with science and technology in the eighteenth century. They have been published as a booklet complete with notes on the contributors, a very brief history of the Gipson Institute, and most important, an introduction by Stephen H. Cutcliffe of Lehigh University, which puts the three seemingly disparate essays in context.

Arthur Donovan, a distinguished historian of science, is a scholar of the Scottish Enlightenment and of the history of chemistry in the eighteenth century. His essay is not a recapitulation of the history of chemistry, but rather an excursion into the idea of the term revolution used not only by historians of science and technology, but by historians in general to describe the nature of certain historical events. The concept of revolution in terms of the history of science or engineering, as conventionally stated, involves the discovery of new knowledge or a new technological creation which overturns a previously held understanding of nature or traditional technology. Using the chemical revolution of the late eighteenth century as a case study, Donovan explores the idea of revolution as applied to the development of science. In this case the revolutionary theme is espoused by Lavoisier, while the conventional phlogiston theory was defended by Joseph Priestley. Although not considered by Donovan, it is interesting to note that Carnot in his seminal work on thermodynamics based his understanding of heat engines on the phlogiston theory, which was no longer accepted by leading natural philosophers. The establishment of a new orthodoxy in science and the relegation of old theories to the status of heresy is the essence of Donovan's message which is told in a convincing manner and with the style and grace we have come to expect from him.

At the same time as scientists (or as they were called then, natural

philosophers) were involved in the new chemistry, engineers in America were concerned with transportation systems as the key to what would later be called the Internal Improvement movement in America. Darwin Stapleton, who is director of the Program for the History of Science and Technology at Case Western Reserve University, has published a study of the engineering contributions of Benjamin Henry Latrobe, together with other published accounts on the history of science and technology in America. In his essay for this series, Stapleton turns his attention to Philadelphia in the late eighteenth century for the earliest example of the Internal Improvement movement. It was perceived by politicians, businessmen, and others that the transportation links with the interior of the state were essential if Philadelphia was to maintain its role as the foremost city and port in the United States. One usually thinks of internal improvements as a national activity to have begun with the construction of the Erie Canal and the intense competition that resulted from Boston to Norfolk to build canals, roads, and later railways to connect the heartland of America with east coast ports. Stapleton, however, convincingly argues that the cradle of the transportation revolution was Philadelphia in the second half of the eighteenth century and not New York's Erie Canal in the early nineteenth century, nor the publishing of Gallatin's report in 1808, which provided a blueprint for development involving the public as well as private sectors of the economy in their enterprise. In order to insure that Philadelphia would be the center of transportation, plans were developed to link the Schuylkill, Susquehanna, and the Delaware rivers to the Chesapeake Bay by canals, and build a turnpike from Philadelphia to the Susquehanna. To develop these plans and begin their implementation, it was necessary to "import" engineers from Britain. Thus, William Weston and Benjamin Latrobe, British-trained engineers, *embody* the transfer of technology across the Atlantic. They both made significant and early contributions to the development of engineering in America. Stapleton's essay is a solid piece of scholarship, while having the merit of a well crafted narrative.

A well-trained, disciplined, and literate work force was an essential ingredient of the Industrial Revolution, but as Patricia Cline Cohen points out in her essay, numeracy—the ability to use numbers, is also an important skill for anyone living in a technological society. She states her theories in the following lines:

> But in the end, the quest for a definitive definition of innumeracy is really not very fruitful, for what is truly interesting about numeracy in the past was not so much *what people knew* as *what they used numbers for.*

It was not just numerical data on death and taxes that concerned Cohen, but how quantitative information was used in the new society which was unfolding. In its original eighteenth-century connotation, statistics meant quantitative information on the state, hence the establishment of regular census taking. Statistics, in conjunction with the new "science" of political economy, provide important new perspectives on how individuals and society *saw* themselves. The early statistical societies in Manchester, England, were formed by those interested in social and political reform and needed "certain" data to prove their point that there were widespread abuses in the new urban industrial society which had developed. Cohen points out that despite religious objections in some quarters, statistical information on contagious diseases which swept over cities such as Philadelphia and London, laid the ground work for the provision of safe water supplies and waste water treatment. The roots of our modern concern for numbers lie in the late eighteenth century and *have seen* a continuous growth even in the face of cries that this kind of quantification is de-humanizing. Thus, Cohen has presented a thoughtful essay on a neglected, but important, aspect of eighteenth-century life.

Although the three essays are widely different in context, they all have in common an original historical perspective on the history of science and technology in the early years of the Republic. In addition, they are particularly relevant to the history of Pennsylvania which really was the "keystone" state in terms of the history of American science and technology. ■

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The Early Career of Malcolm Cowley: A Humanist Among the Moderns. By James Michael Kempf.

(Baton Rouge and London: Louisiana State University Press, 1985. Pp. xii, 145. Preface, selected bibliography, index. $17.50.)

Both James Michael Kempf and LSU Press are to be commended for producing what is not only a good but a necessary book, for the name of Malcolm Cowley is not nearly so well known as it should be.