before, the war exposed the deep divisions within the ranks of strategists and demonstrated their fallibilities. In Herken's words, "the illusion of objectivity had finally been shattered" (p. 222). An "encouraging sign" in the current debate is the continuing and expanding involvement of this "very different group of nuclear gnostics" (p. 343).

Despite its readability and richness in detail and ideas, there are a few disconcerting things about Herken's book. The numerous chapter and section headings are more dramatic than informative, and too much valuable information is hidden away in lengthy footnotes (which the reader should take the time to pursue). More seriously, Herken makes a number of factual errors in his presentation that others—primarily participants themselves in the events—have chosen to stress. Though these errors (most of them minor in nature) should make the reader wary, they should not overshadow the basic contribution Herken makes in unraveling without polemics the evolution of conflicting ideas about American nuclear strategy.

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A Division in Chemistry

Science versus Practice. Chemistry in Victorian Britain. ROBERT BUD and GERRYLYNN K. ROBERTS. Manchester University Press, Dover, NH, 1984. 236 pp. $35.

This book deals, as the authors note, with what might appear to be one of the most practical of sciences in one of the most pragmatic of nations, chemistry in mid-19th-century Britain; and it deals with much more than this. For chemistry was the most popular and the most publicly visible science at the beginning of the century, and it became the major academic science and the most powerful industrial enterprise later on. Debates over the relationship between theoretical or scientific knowledge and practical or industrial performance moreover reached a critical stage during the 19th century, when both academic chemistry and the chemical industry were growing in importance and self-awareness and their sometimes conflicting views became a matter of national interest. Hence the authors quite justly assume that a study of these debates should reveal a great deal about 19th-century science in general and about the origins of many institutional and educational patterns that still continue.

In the beginning gentlemanly London, the industrial north of England, and the Scottish university cities offered rather different social and institutional conditions for chemistry. Eventually Thomas Thomson's research school, which adopted Berzelius's chemical system, established itself as the leading group in the country, took a firm stand in the "Decline Debates" of the 1830's, and exerted its power through the Chemistry Section of the British Association for the Advancement of Science. Thomson's catholic view of chemistry, embracing both theoretical and practical goals, dominated the first stage of institution-building in Britain. In 1845 the Royal College of Chemistry was founded with support from academics, manufacturing and consulting chemists, landowners, and medical men, and a professor from Germany, August Wilhelm Hofmann, a student of Liebig's, was hired to teach. Similarly the Chemical Society, founded in 1841, was meant to serve as a link between the London professional chemists and chemical manufacturers and the new generation of young academics. Since research abilities and publications soon became the decisive criterion when new teaching positions had to be filled, the research-oriented academics gradually acquired hegemony over the discipline. Institutional development and educational aims of the Royal College of Chemistry, University College London, and Owens College Manchester clearly indicate an increasing separation between the leading group of academics, devoted to increasing theoretical knowledge, and the more humble but more numerous practical men. Under these circumstances attempts, such as Lyon Playfair's, to create a first-rank Continental-style educational system for engineers and manufacturers were bound for failure. In fact, the authors argue, there was a sharp social division between academics and practical men, as an analysis of the membership of the Chemical Society and the publication patterns of chemical patents reveal. The scientific professoriate, who portrayed themselves as disinterested spokesmen for the entirety of chemistry, bridged this gap by creating a new rhetoric of pure science, according to which the principal responsibility of academia would be to create and pursue pure science, the results of which could in turn be applied to industry. The authors question the validity of this rhetorical compromise and point to the fact that in chemistry the relationship between theory and practice is far more complex. They quote a few supporting statements by 19th-century chemical manufacturers, but their far-reaching claim that "on the whole, the academic discipline of chemistry did not prove to be in itself a basis for industrial innovation, even in the chemical industries" (p. 108) should have been based upon more factual evidence. The division of labor between pure and applied chemistry, as developed by the academic elite, became a powerful argument in the late 1860's and early 1870's, when chemistry was given high priority in the reform of higher education, and this not primarily because of chemistry's potential utility but because of its contribution toward the ideal of a liberal education. Thus again the leading role of pure chemistry was reinforced. "Ironically chemistry, which had always been championed as the most universally applicable of the sciences, thrived especially as a pure science taught separately from its applications" (p. 147).

For those who are willing to struggle through the peculiarities of British and especially London institutional history, the book offers a stimulating introduction to the debates over the relationships between academic science, higher education, society, and industry, based upon sound historical scholarship. Similarities with present-day issues are obvious. Being historians of science, however, the authors have wisely avoided drawing anachronistic parallels between entirely different historical contexts.

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Blacks in Science

Black Scientists, White Society, and Colorless Science. A Study of Universalism in American Science. WILLIE PEARSON, JR. Associated Faculty Press, Millwood, NY, 1985. xii, 201 pp. $24.

The corpus of research on careers in science gives little attention to the experiences of black scientists. To correct this state of affairs, Willie Pearson conducted a study in 1978 on the background and status of blacks in the social, life, and physical sciences. The present volume summarizes the results of that study. Pearson subtitles the book "A Study of Universalism in American Science" to capture his theme that from the vantage point of black scientists universalistic principles in science have not always prevailed. The ethos of science, Pearson asserts, holds that "a given contribution should not be accepted or rejected merely on the basis of some particular trait of its contributor such as race, ethnicity, sex, religion, nationality, or social origin." But large numbers of