

Book Reviews

American Chemistry in Context

Chemistry and Modern Society. Historical Essays in Honor of Aaron J. Ihde. JOHN PARASCANDOLA and JAMES C. WHORTON, Eds. American Chemical Society, Washington, D.C., 1983. xvi, 203 pp., \$24.95. ACS Symposium Series, 228.

The history of modern American chemistry and chemical engineering is today a subject of lively research, for a number of reasons. First is the current interest among historians of science in the cultural context of science. In this regard chemistry, with its large size and rich ties to modern life, logically commands attention. Second, the relevance of the history of chemistry to university-industry relations and environmental pollution, matters of current concern with respect to public policy, has not gone unnoticed. Third, spurred to action during its centennial in 1976, the American Chemical Society has vigorously promoted the subject of late.

This festschrift, an example of the Society's sponsorship, honors a fourth cause, Aaron J. Ihde. In a long career in chemistry at the University of Wisconsin Ihde has pursued admirably diverse interests, with the history of chemistry prominent among them. His *Development of Modern Chemistry* has impressed upon a generation of chemists and historians the multifarious influence of chemical science on recent times. In the present volume, seven of his students in the history of chemistry join with two other contributors to expand upon this theme in light of recent historiography. Their work concentrates almost solely upon the United States since the Civil War, with one chapter each devoted to geochemistry, chemical engineering, synthetic fuels, and chemical warfare and five to food, drugs, and nutrition. The contributors, including some of the most promising and the most accomplished practitioners of the art, pursue several key themes, all related to the ways in which chemical knowledge and society are intertwined.

As John W. Servos points out in his study of geochemistry, Americans at the turn of the century tended to make their

major contributions in interdisciplinary specialties, rather than in crowded mainstream research areas from Europe. Current scholarship emphasizes how such hybrids emerged in response to institutional pressures on American campuses and to demands for specialized research talent. In contrast, geochemistry uncharacteristically emerged outside the university and derived more from intellectual innovations than from what Servos calls institutional arrangements or market forces. His thesis unnecessarily reduces "market forces" to enslavement to profit, but he demonstrates authoritatively the significant role that champions of new theories in physical chemistry played in carving out a niche for this subdiscipline. Like Servos, Jean-Claude Guédon discusses characteristic New World innovations, but he stresses the academic milieu. He traces how the transition from unit operations to unit processes in some American chemical engineering departments reflected an adaptation of pedagogy and disciplinary taxonomy to interwar industrial needs. In a brilliant twist, Guédon shows that the demise of the unit processes terminology proves that unit operations, long touted as the organizing principle for chemical engineering, proved but a pragmatic expedient, eventually giving way to the more quantifiable concepts of "chemical conversion" and "transport processes." Sheldon Hochheiser argues that urbanization and industrialization in late-19th-century America were primary forces behind the government certification of food colors and the industrial research that this regulatory activity spawned; defending the efficacy of regulation, his lively account indicates precisely how this facet of current dye certification emerged between 1906 and 1912. Taken together, such studies show that the causal arrow goes both ways in the relations between scientific ideas and the social milieu that nurtures them.

Nearly every chapter stresses the crucial role of World War I. Daniel P. Jones argues that wholesale mobilization of chemists for the Chemical Warfare Service led to American dependence upon

project-oriented research; herein lie the roots of big science and of today's Procrustean grant system. John Parascandola shows that wartime crises prompted Charles Holmes Herty to recognize the need for a national drug research facility, and his long agitation for such an entity led to the creation in 1930 of the National Institute of Health; Herty's gradual endorsement of public financing reflected larger trends in the American promotion of social services. Anthony N. Stranges chronicles the production of synthetic fuels in Germany and America, from its first vigorous endorsement during World War I to its lukewarm revival today. Stanley L. Becker argues both that the war slowed vitamin research in Britain while accelerating it here and that wartime dietary concerns legitimated ongoing research into the nutritional value of milk, the unresolved quantitative issues regarding which underlay F. G. Hopkins's Nobel Prize of 1929.

Such close connections between chemistry and health provide the focus for the two remaining chapters. James Harvey Young's tight, chilling account of the Elixir Sulfanilamide tragedy of 1937 demonstrates how that episode focused attention upon drug safety, led to new concepts of and tests for toxicity, precipitated the passage of new drug legislation, and added competent research scientists to pharmaceutical firms. James C. Whorton's hilarious study of the uric acid "fetish" among turn-of-the-century vegetarians shows how the concepts of chemistry can promote dietary fads, but also how the subsequent popular notions of nutrition can stimulate new chemical ideas in their turn.

More focused than the average festschrift, this compilation constitutes ample testimony to the complexity of the links between chemistry and society, illuminating some of the more salient causal relationships between them during the 20th century. The volume has only a cursory introduction to the unifying themes and the differences of interpretation in the case studies, however, and it lacks a concluding chapter that attempts a synthesis of the findings; given the nascent state of the social history of modern chemistry, this is perhaps excusable. For those wishing to contribute to this new enterprise, the book includes a useful bibliography of Ihde's historical publications.

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