influence, and he was a devoted teacher. Eminent biochemists grew up in his department. In addition to those already mentioned, the most notable were J. B. Sumner, who later was the first to crystallize an enzyme, urease, and Cyrus Fiske, who, with his gifted collaborator Yellapragada Subbarow, discovered phosphocreatine and adenosine triphosphate; the latter was discovered independently by Karl Lohmann in Germany, who has generally, but unfairly, received most of the credit.

In addition to the main text Meites has provided, in 60 pages of small print, a detailed study of the chemistry of Folin's analytical methods and procedures. Most readers will skip this, but it is there for those who have occasion to use it. The most serious deficiency in the book is the lack of an index, which is badly needed to trace the various characters who appear and reappear.

This book provides a helpful complement to the recent biography of Walter B. Cannon (to 1917) by Saul Benison, Clifford Barger, and Ellin Wolfe (Harvard University Press, 1987). Cannon and Folin worked closely together for a quarter century, in the teaching of first-year medical students, in matters of educational policy, and occasionally in research. It is good that we now have studies of both of them.

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The Technological Past

Nuts and Bolts of the Past. A History of American Technology, 1776–1860. DAVID FREEMAN HAWKE. Harper and Row, New York, 1988. xii, 308 pp., illus. $18.95.

Historians of technology have reason to rejoice that there is an apparently broad and deep popular interest in their subject. The subject is intrinsically interesting, and there is a growing realization that it may even have important potential public benefits: that technology assessment should include a historical dimension and that "technological literacy" might be better served by a course in the history of technology than yet another in mathematics or "how things work."

There is as yet, however, only a corporal's guard of professionally trained historians of technology, and most of them have not ventured into the problematic waters of addressing the public on their subject. The public's interest in the field therefore is met, if at all, by popularizers who, at their worst, treat the hardware as a black box and perpetuate and elaborate myths about the personalities and institutions that are the other parts of the technological enterprise.

David Hawke's *Nuts and Bolts of the Past* is the latest in this sorry genre. The 262 pages of text are divided into 42 subsections, one treating "the founding fathers," another the sewing machine, yet another the Franklin Institute. Each chapter is typically based on one or two scholarly articles (perhaps a book in some cases) salted with some popular works of a previous generation and a smattering of published contemporary sources. The book represents no attempt at original research.

Nor does it offer new insights. Despite his clear dependence upon a few excellent recent studies, Hawke takes from them details rather than interpretations. The analytical contribution of the book is that some leading American technologists were "dirty fingernail people" and others were "song-and-dance men," that is, some inventors were

skilled mechanics (Oliver Evans, for example) and others were more skilled at promotion (Samuel F. B. Morse). The resulting story is the hoariest tale of Progress, a steady march from one improvement to another with only winners, no losers: American technology is one great free lunch. An entire generation of scholarship providing rich contextual complexity and a cautionary balancing of costs and benefits is missing.

Written in a folksy style, decorated with citations and issued by a trade publisher, *Nuts and Bolts of the Past* will find an undeserved audience and contribute to our continuing misunderstanding of the source, cost, and meaning of our technology. We deserve better.

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Evaporite Geology

Evaporite Sedimentology. Importance in Hydrocarbon Accumulation. JOHN K. WARREN. Prentice Hall, Englewood Cliffs, NJ, 1989. xvi, 285 pp., illus. $50. Prentice Hall Advanced Reference Series.

Evaporites and Hydrocarbons. B. CHARLOTTE SCHREIBER, Ed. Columbia University Press, New York, 1988. viii, 475 pp., illus. $57.

Gypsum, rock salt, and potash deposits have recently become targets of greater attention at geological conferences both in Europe and in North America. These two books on the subject, a textbook and a collection of papers, are thus timely. Both books are products of a growing realization that there may be a close relationship between evaporite occurrence and many pools of hydrocarbon accumulation.

Warren's textbook is a sorely needed addition to evaporite literature, a concise introduction to all aspects of evaporite geology, including shoreline and offshore textures in both marine and lacustrine settings, dolomites and dolomitization, and post-depositional salt movements. Warren deals with general concepts, such as mineralogy, diagenesis, environmental factors, or models of shoreline and lagunal deposits, and also with specific examples from various parts of the world. He interprets each topic in terms of significance for oil accumulation. The book is suitable for the petroleum geologist as well as the graduate student and provides a lengthy list of references.

Schreiber's book contains eight contributions of varying styles and impact. One chapter that deserves wide circulation is R. Evans and D. W. Kirkland's review of evaporitic environments as habitats of algae, bacteria, and other productive organisms. This chapter is most welcome because it is generally not appreciated that in rate of organic matter generation evaporitic environments vie with even the most productive terrestrial environments. In several examples, the authors demonstrate that this organic matter can be a source of petroleum generation. C. Pierre complements this review by discussing the application of stable isotope studies to evaporitic brine concentration and carbon and sulfur fractionation in the evaporitic brine pool. She gives a stimulating insight into what interpretations can be attempted with a judicious use of stable isotope chemistry.

In another chapter, A. C. Kendall suggests a model of evaporite genesis by seepage through a barrier, an idea proposed by K. R. Cercone, who is not cited. Also, Kendall does not document his claim that Ochsenius's silled basin model has been discredited. C. G. St. C. Kendall and J. K. Warren review peritidal evaporites, giving an excellent concise overview of settings along the Persian Gulf, in South Australia, and corresponding ancient examples. Regrettably the authors omit the substantial amount of French and Spanish literature of the last decade on very different North African and Mediterranean settings. C. R. Handford expands on the topic with a review of coastal sand flats in an evaporitic setting, where gypsum may accumulate but halite is only of ephemeral significance, as it blows away or redissolves.

In purporting to deal with subaqueous evaporite deposition, Schreiber discusses primarily gypsum and halite. She touches only very briefly upon potassic salts as expressions of desiccation and omits the hygroscopic K-Mg-, K-Fe-, Mg-, and Ca-Mg-chlorides, which are apt to decompose in their crystal water when exposed to the atmosphere. She also ignores the many other sulfatic K-Mg minerals abundant in Neogene, Permian, and other marine evaporite sequences and does not mention coarse siliciclastics in halite sequences such as the Vaca Triste intercalation in the Permian Basin of Texas.

R. O. Kehle writes about the origin of salt structures. Unfortunately Lerche and O'Brien's *Dynamic Geology of Salt and Related Structures*, Baar's *Applied Salt Rock Mechanics*, and the voluminous German literature on halokinetic movements and their causes do not seem to have been consulted.

In the final paper, R. D. Nurmi discusses seismic and well log signatures of reefs, grainstones, eolian sandstones, and salts under the North Sea, and potential pitfalls in data acquisition and processing. This chapter and the one by Evans and Kirkland should be compulsory reading for any petroleum geologist.

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Outpourings of Lava

Continental Flood Basalts. J. D. MACDOUGALL, Ed. Kluwer, Norwell, MA, 1988. viii, 341 pp., illus. $96. Petrology and Structural Geology.

Flood basalts represent great outpourings of lava on dry land. They are surprising, because it is easier for magma to come out through thin ocean crust than through tens of kilometers of continental crust. Some magmas that emerge through continental crust show the expected mineralogical, chemical, and isotopic effects of crustal contamination. More surprising to some people are many flows that do not show contamination, evidently rising from the mantle through self-armored pathways that exclude contaminating crustal materials. The flood basalts are therefore of interest for what they teach us of processes in the earth, not to mention the structure and composition of the heterogeneous mantle beneath the crust.

Flood basalts range in age from Precambrian to a few million years, but examples older than 1200 million years are rarely preserved except in their dike roots. Some younger examples are in the news as possible causes for the catastrophic extinctions at the Cretaceous-Tertiary (K-T) boundary, in opposition to the asteroid impact hypothesis. The Deccan eruptions straddled this boundary in age and could perhaps have contributed to a darkening of the skies at that time.

Basalt floods produce spectacular landscapes over huge areas. People familiar with the U.S. Pacific Northwest may be surprised to learn that the vast basalts of the Columbia Plateau rank only tenth on the list of great flood basalts. The list, ranked by volume, is: Karoo, Siberia, Parana, Coppermine, Deccan, North Atlantic, Keweenawan, North Australia, Ethiopia, and Columbia. Many of the lava piles are associated with continental rifting, so they represent spillovers from small, early oceans. Others, like Columbia, are not far from subducting slabs at active continental margins.

Because of size and chemistry alone, these rocks are worth reporting. This book does it well, and about time. The 25 authors provide regional physical descriptions, ages, and petrographic and chemical data, and they discuss niceties and problems of origin