

enterprise provided a model of academic science that was to spread throughout the world.

There is much in this rise of German science that needs to be explained, and the study of the subject has undergone an efflorescence during the last two decades. The writings of such scholars as Joseph Ben-David, R. Steven Turner, Fritz Ringer, and Charles McClelland have shifted the focus of many observers from the cognitive development of the sciences to the institutional, social, and political contexts within which the enterprise was carried out. In the process, new and powerful analytical approaches have been framed and utilized, focusing on competition between the states, between university administrators, and between the professorial ranks; on the influence of state interests in promoting science for the purposes of modernization and industrialization; on the origins, rise, and effects of the "research ethic" both within and without the Germanic lands; and on the social organization of the universities, institutes, foundations, and research schools. But cognitive history of science has not been neglected. *Science in Germany*, focusing especially on teaching and research in the 19th- and early 20th-century universities, is an outstanding example of a genre that seeks to integrate the two historiographic traditions by depicting the symbiotic dynamism of cognitive and social factors.

Kathryn Olesko has assembled a fine cast of ten historians addressing as many topics under four rubrics: *Wissenschaft* and Reform, focusing on the early part of the 19th century; Science and Education, centered on Prussia and Hesse-Darmstadt, chiefly before 1866; Institutions and Scientific Creativity, concerned with the Imperial and Weimar periods; and Science and Political Institutions, dealing with electrification at the turn of the century and eugenics through the Third Reich. Olesko has written a useful historiographic introduction, and James Albisetti, Charles McClelland, and Steven Turner provide thoughtful commentaries at the conclusion of the volume. There is a good index (a rarity in a collection of this kind), the typography and production are excellent, and footnotes are found where they belong.

The character of the volume can be indicated by brief accounts of three papers that span its chronological and subject coverage. In "Kant, Schelling, and the administration of science in the romantic era" Frederick Gregory depicts the faculty recruitment choices made by state ministries in Baden (for the University of Heidelberg) and Prussia (for the University of Berlin) and how those choices were affected by both philo-

sophical and political developments. Gregory's clear delineation of the Kantians' predilection for experimental science, as opposed to the commitment to intellectual intuition of the *Naturphilosophen* and their partisans, makes sense both of the political maneuvering by advocates of the two schools in the ministries and of the science pursued during this critical period.

Frederic L. Holmes provides a masterly treatment of the relation between teaching and research in Justus Liebig's laboratory at the University of Giessen up to around 1840, demonstrating that Liebig's teaching underwent remarkable shifts in response to the evolution in his research. Inter alia, Holmes argues that Liebig's laboratory institute and pedagogy developed only gradually, starting from a mere professional school for training pharmacy students and only in the late 1830s attaining the mature form for educating academic chemists that is so well attested. He also believes the impact of Liebig's potash-bulb apparatus for elemental organic analysis has been exaggerated—first and foremost by Liebig himself.

David Rowe discusses Felix Klein, David Hilbert, and the Göttingen mathematical tradition. Despite their different agendas and emphases, Klein and Hilbert transformed "the remote little town of Göttingen" into the future center of Weimar mathematics, while at the same time directing the field into a renewed focus on its general foundations and its applicability to modern physical science.

Gregory, Holmes, and Rowe all break important new scholarly ground; in fact, almost any of the ten papers in this collection might have been singled out for mention, for all are outstanding contributions. The volume is a model of its type.

Both Olesko and Turner draw attention to the explosion of scholarly interest in 19th-century German science. Research on the subject not only is more extensive and diverse, it has become more thoroughly founded on materials from hitherto little-used archival collections in both Germanies. Although Olesko rightly emphasizes the new historiographic directions, Turner—one of the protagonists in the changes—goes on to argue that there is nonetheless considerable continuity between the new and the old scholarship. *Science in Germany* may be taken as emblematic both of the continuities and the novelties. It is a collection that no historian of 19th-century science will be able to (or want to) ignore, and one that will interest many browsers as well.

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Our Continent

The Geology of North America. An Overview. ALBERT W. BALLY and ALLISON R. PALMER, Eds. Geological Society of America, Boulder, CO, 1989. x, 619 pp., illus., + boxed maps and microfiches. \$60. The Geology of North America, vol. 4.

As a part of its vast Decade of North American Geology Project (DNAG), the Geological Society of America is publishing a 28-volume synthesis series on the geology of North America and flanking oceans. Almost half of the volumes have now been published, and, except for some of the volumes that are being published jointly with the Geological Survey of Canada and will be delayed by the need for simultaneous publication in English and French, the rest are expected to be published by 1992. The general level of the papers is excellent, and they contain a vast amount of new synthesis.

Most of the 20 papers in the present overview volume for the series summarize subjects to which other entire volumes are devoted. A few of these reviews are by editors or major authors of the primary volumes and are valuable summaries of those volumes: Vogt and Tucholke on the evolution of the North Atlantic Ocean basin; Sheridan on the Atlantic passive margin; Winterer *et al.* on the northeast Pacific Ocean; Trettin on the Canadian Arctic Islands.

Most of the papers, however, have no direct counterparts in the other volumes. Some cover ground similar to that covered by other volumes but incorporate different perspectives; other topics treated here are not treated at all in the primary volumes or are treated more broadly here. Bally *et al.* present Phanerozoic global-reconstruction maps. Hanna *et al.* describe the gravity map of North America and comment on some of its anomalies, and Hinze and Hood do the same for the magnetic map. Mooney and Braile discuss the seismic structure of the continent. Worrall and Snelson give a major new synthesis of sedimentation and synsedimentary deformation, particularly growth faulting and salt tectonics, in the Gulf of Mexico. In the longest paper in the volume, Oldow *et al.* give a coherent overview of and important new perspectives on the vast U.S. and Canadian Cordillera. They view the Cordillera as "an orogenic float" produced by "the mechanical separation of sediments and crustal units from the underlying continental and oceanic lithosphere," major decoupling systems separating complex structures of the "float" from simpler lithospheric roots. The geology of Mexico is described by de Cserna. Donnelly summarizes the

geology and petrology of Caribbean islands and discusses tectonic evolution. Rast discusses the evolution of the entire Appalachian chain and Arbenz that of the Marathon-Ouachita chain. Bally describes the diverse types of North American Phanerozoic basins and passive margins. Hoffman presents a superb description and plate-tectonic synthesis of the Precambrian geology of the continent. Wright discusses Quaternary climatic variations. Meyer summarizes the hydrology of the continent, Bird its fossils fuels, and Skinner its mineral resources.

Most of the text figures and the many folded plates are well drawn and reproduced, with red added to many of them for clarity. The multicolor plates are mostly disappointing 1:20,000,000 maps of North America on the transverse-Mercator DNAG projection—extremely generalized surficial and bedrock-lithology maps to accompany the hydrology paper, and low-resolution maps of magnetic and gravity anomalies that are no match for the previously published 1:5,000,000 DNAG maps.

The other DNAG volumes have been published promptly as completed, but because of the sluggishness of some authors all but the early volumes contain papers written years apart. All papers in this volume were written within little more than a year and hence are current. A number of them provide the best compact summaries anywhere on their large topics.

This book is a bargain, and it is recommended highly.

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Some Other Books of Interest

Archaeological Thought in America. C. C. LAMBERG-KARLOVSKY, Ed. Cambridge University Press, New York, 1989. viii, 357 pp., illus. \$39.50.

This volume is intended as a companion to a similar collection on method and theory in Soviet archeology emanating from an archeological exchange program in which the editor was involved. Quoting a statement by one of the contributors that "there is . . . no unity to archaeology as a discipline in the United States," Lamberg-Karlovsky notes that the present collection does not provide a "holistic" overview of the field, "nor does it pretend to offer geographical or chronological comprehensiveness" or a representation of humanistic (as distinct from anthropological) approaches.

In addition to an introduction in which Lamberg-Karlovsky considers various issues

and trends in the field (the legacy of the "new archeology" and the validity of the "deductive nomological" model associated with it, the revival of idealist and relativist perspectives, the "cultural critique" provided by historical archeology), the volume contains 17 papers. The first group, History, Method, and Theory, begins with an essay by Bruce Trigger concerned with the exclusion of the discipline of history and its methods from archeology and a discussion by Robin Dunnell of the use of evolutionary theory in archeology. In the ensuing papers such topics as the "new archeology," Marxist perspectives, the use of statistics, hunter-gatherer studies, the interpretation of religion, and the reconstruction of prehistoric economics are discussed by Lewis Binford, Antonio Gilman, George Cowgill, Arthur Demarest, John Yellen, and Mark Cohen.

The remaining papers in the book are devoted to interpretation and evaluation of archeology as applied to particular geographic regions. After a discussion of the use of structuralism in the interpretation of the art of Paleolithic Europe by Margaret Conkey and an anthropological view of ancient China by Kwang-Chih Chang, two papers deal with New World studies—Gordon Willey on evidence of intensive agriculture in the Maya Lowlands and Timothy Earle and Terence D'Altroy on the political economy of the Inka empire. The remaining papers, by W. A. Fairservis, Philip Kohl, Lamberg-Karlovsky, Rita Wright, and Allen Zagarell, are focused largely on the Middle East, considering in that context such topics as cultural epigenesis, the use of world systems theory, the production and exchange of ceramics, and pastoralism and state formation. The volume includes a 45-page combined bibliography and an index.—K.L.

Prehistory at Cambridge and Beyond. GRAHAME CLARK. Cambridge University Press, New York, 1989. x, 176 pp., illus. \$39.50.

Having himself been a Cambridge prehistorian for some 60 years, the author of this brief chronicle of the discipline of prehistoric archeology as based there has been able to draw on the memories of many of its practitioners as well as a variety of published sources. In an introductory chapter he traces the development of prehistoric archeology in Britain, "almost entirely a private pursuit" until the First World War and thereafter for a time dependent on importation of expertise from abroad. In keeping with the observation that, as in North America, Cambridge archeology has always been closely associated with anthropology, a chapter is then devoted to the latter discipline at Cambridge up to the 1920s. The author then

turns to archeology itself, beginning with the period 1920–1939, which saw the first appointment of a salaried staff and other institutional arrangements and rearrangements. Key figures in this era included E. H. Minns, H. M. Chadwick, Louis Leakey, and Dorothy Garrod, among their students being Desmond Clark, Glyn Daniel, Charles McBurney, and the author himself. With World War II Cambridge prehistory was "put in abeyance."

The story resumes with an account of an era of expansion marked by the establishment of archeology and anthropology as a full Tripos in 1948 and including training in field excavation. This expansion included the establishment of a subdepartment of Quaternary research, and such research (enhanced by new dating techniques) and the development of a concern with economic prehistory are the subject of the next chapter. Also following on World War II was an expansion of opportunities and incentives for working overseas, and the "beyond" of the title is represented in two final chapters devoted to the work of Cambridge-trained prehistorians in Africa, Australasia, America, and Asia and in continental Europe and Britain generally. In these chapters the further careers of many figures who appeared earlier in the book are traced.

The book ends with 1974 (the year of the author's retirement), but some observations on more recent matters are offered in a brief epilogue. The volume includes 59 photographs of Cambridge prehistorians and their work in progress, as well as two maps, 16 pages of notes, and an index.—K.L.

Books Received

Archaeological Research in the El Cajon Region. Vol. 1, Prehistoric Cultural Ecology. Kenneth Hirth, Gloria Lara Pinto, and George Hasemann, Eds. University of Pittsburgh Department of Anthropology, Pittsburgh, and Instituto Hondureño de Antropología e Historia, Tegucigalpa, 1989. xxii, 281 pp., illus. Paper, \$15. University of Pittsburgh Memoirs in Latin American Archaeology, no. 1.

Archaeological Wood. Properties, Chemistry, and Preservation. Roger M. Rowell and R. James Barbour, Eds. American Chemical Society, Washington, DC, 1990. xii, 472 pp., illus. \$79.95. *Advances in Chemistry*, vol. 225. From a symposium, Los Angeles, CA, Sept. 1988.

Aspects of Climate Variability in the Pacific and the Western Americas. David H. Peterson, Ed. American Geophysical Union, 1989. xviii, 445 pp., illus. \$50. *Geophysical Monographs*, vol. 55.

The Atomic Bomb. Voices from Hiroshima and Nagasaki. Kyoko Selden and Mark Selden, Eds. Sharpe, Armonk, NY, 1990. xxviii, 257 pp. + plates. \$24.95. An East Gate Book.

Bacterial Capsules. K. Jann and B. Jann, Eds. Springer-Verlag, New York, x, 162 pp., illus. \$69.50. *Current Topics in Microbiology and Immunology*, vol. 150.

By Design. Planning Research on Higher Education. Richard J. Light, Judith D. Singer, and John B. Willett. Harvard University Press, Cambridge, MA, 1990. x, 272 pp. \$25; paper, \$10.95.

Camping with the Prince and Other Tales of Science in Africa. Thomas A. Bass. Houghton Mifflin, Boston, 1990. xvi, 304 pp. \$19.95.