French physiology during this period. Lesch's handling of the surgical theme is skillful, and his arguments are for the most part well documented. It is only to be regretted that he did not make some reference to the pioneering work of Owsei Temkin in this connection.

In his chapter on Bichat, Lesch argues for a radical distinction between the two different styles of physiological work in which Bichat engaged: a descriptive systematization of bodily processes based upon the philosophical medicine of the 18th century, and an experimental investigation of specific animal functions based upon the outlook and techniques of contemporary surgery. Lesch's insistence on the importance of surgery for Bichat's experimental work in physiology represents an advance on our previous understanding of Bichat and his career; but his conclusion that Bichat's work is therefore bifurcated into "two physiologies" having little or no connection with one another seems somewhat forced.

The lengthy treatment of Magendie in this book gives Lesch the opportunity to cover, in some detail, the main features of Magendie's career, from his doctoral thesis of 1808 to his retirement in 1852. In the chapters devoted to this material Lesch presents a fine synthesis of the interrelated elements in Magendie's development of experimental physiology, including not only the central theme of surgery but also the associated aspects of Magendie's researches on the actions of drugs and the beginnings of experimental pharmacology. In the course of his analysis, Lesch challenges the self-image of Magendie, perpetuated by Claude Bernard, as a "scavenger of facts" unconstrained by theoretical conceptions. Although it is doubtful that Magendie's scavenger image was ever wholly accepted by scholars at face value, it is nevertheless useful to have Lesch's documented rebuttal of this characterization on the record.

Having shown that Magendie was not unconcerned with the systematic relationships between experimental findings in physiology, and highlighting also the occasions when Magendie expressed his experimental goal in terms of the control of phenomena, Lesch is able to demonstrate a number of continuities between Magendie and Bernard. Some of these continuities were suggested in the 1940's by J. M. D. Olmsted, but Lesch's case is more extensive and better argued. It also helps us to understand, in the context of Lesch's argument as a whole, the ways in which Bernard moved beyond the medically oriented physiology of Magendie to become a specialist in physiological research.

As a whole, *Science and Medicine in France* is a sound and informative book that presents a coherent thesis about the early development of physiology as an experimental science. In defending this thesis, Lesch takes full account of recent research in the relevant areas, although often he seems to characterize the findings of his immediate predecessors in straw-man terms so as to maximize the novelty or distinctiveness of his own contribution. This kind of exercise, usually associated with weaker scholarship than Lesch's, is quite out of place here, since the genuine strengths of *Science and Medicine in France*, both analytic and synthetic, are a sufficient recommendation of the book.

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A Figure of Modern Science

A Time to Remember. The Autobiography of a Chemist. ALEXANDER TODD. Cambridge University Press, New York, 1984. viii, 257 pp. $29.95.

This is an account of the life of a remarkable man. Alexander Todd won the Nobel Prize in Chemistry in 1957 in recognition of scientific work that dominated, and indeed created, the synthetic chemistry of nucleotides and coenzymes. This work was central to our understanding of the structure and chemistry of nucleic acids and vitamins. Throughout his career Todd also has participated actively in public affairs, playing a key role in the formulation of science policy as an adviser to government and acting as a spokesman for British science in international organizations. This remarkable dual career led to other honors: a knighthood in 1954, a Life Peerage (Baron Todd of Trumpington) in 1962, and election to the presidency of the International Union of Pure and Applied Chemistry, of the British Association for the Advancement of Science, and of the Royal Society. His autobiography chronicles this career and includes insights into his ideas about science, universities, and public policy. These ideas are amplified in six appendixes, containing extracts from his presidential addresses to the British Association for the Advancement of Science and to the Royal Society.

Todd was born in Glasgow, Scotland, in 1907, in average circumstances. When he was eight or nine he received a Home Chemistry Set and augmented it with equipment and chemicals bought from a local laboratory supply house. An outstanding chemistry teacher helped inspire his interest, which led him to enter the University of Glasgow as an honors candidate in chemistry. He went off to the University of Frankfurt for graduate work, receiving a D.Phil. in 1931, and then went to Oxford to do research with Robert Robinson (Nobel Prize in Chemistry, 1947) and received a second D.Phil. in 1933. His independent career started at the medical chemistry department in Edinburgh, where he developed a good practical synthesis of vitamin B-1. In 1936 he moved to the Lister Institute in London.

Todd's work on vitamins attracted wide attention and stimulated several offers of university positions. He accepted an offer to join the University of Toronto as professor of chemistry, but shortly after his acceptance the offer was reduced to an associate professorship. After some hesitation he accepted this, whereupon the offer was reduced to an assistant professorship. Thus Canada lost an opportunity. The United States also came close. After a visit to Caltech in 1938 he received an offer of a faculty position and was about to accept it. At the last moment he was also offered the professorship of organic chemistry at Manchester; at the age of 30 Todd took up this position, one of the traditionally major posts in British chemistry. In 1944 he moved to the University of Cambridge, where he has been ever since.

It is difficult to convey the importance of the role that Todd has played at Cambridge. He inherited a dispirited department and developed it into one of the leading scientific centers. He designed and constructed the first modern university chemical laboratories in Britain, which have served as a model for others throughout the world. Todd initiated the creation of Churchill College, devoted to science and technology, and served as master of Christ's College for 15 years. He brought in strong successors and retired from the professorship at the early age of 63, determined to see his department continue to flourish under fresh leadership. I first went to Cambridge in 1955, as a postdoctoral fellow with Todd. Cambridge has established the Todd Professorship, an annual visiting post that I had the honor to hold in 1982. The new

laboratories to which I returned and the new Churchill College in which I stayed are lasting monuments to the efforts that Todd has made on behalf of Cambridge.

Todd is a man of great charm, with a strong interest in other people. Much of this comes through in his book, which is populated with the leading figures of modern chemistry and many friends and associates. This is largely an account of Todd's professional life, however, and in only a few cases is there much personal characterization of the people involved.

In addition to insights into a fascinating career, the author leaves us with some advice of general value to all scientists. On choosing a research field, he suggests that young scientists look for one that is important, that has scope, and in which they will be the principal contributors to the literature. With respect to government support of science, he writes, "In science, the best is infinitely more important than the second best;—a country which ignores or forgets it does so at its peril." The career of Alexander Todd indicates that these principles have indeed guided his life.

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Paleoindian Assemblages

The Agate Basin Site. A Record of the Paleoindian Occupation of the Northwestern High Plains. GEORGE C. FRISON and DENNIS J. STANFORD. Academic Press, New York, 1982. xx, 404 pp., illus. $74.50. Studies in Archaeology.

Frison and Stanford have done us the great service of bringing the scattered archeological data from a classic Paleoindian locality together with a series of environmental and specialist studies and making the collection available in publication. The Agate Basin "site" is actually a series of Paleoindian activity loci that have been investigated over the years by numerous individuals, beginning with F. H. H. Roberts in 1941. The most recent work by the University of Wyoming and the Smithsonian Institution led up to the present compilation.

The Agate Basin site taken together comprises a classic stratified sequence of Paleoindian occupations, including Clovis, Folsom, Agate Basin, and Hell Gap components. The monograph is primarily a descriptive and analytic presentation of the archeology of these components and the paleo-environmental–contextual studies associated with them. In addition to the straightforward description of the components and their artifactual content, there are very useful chapters on flaked stone technology and typology by Bruce Bradley, on the production of the famous Folsom point by Bradley and Frison, and on the bone tool assemblage by Frison and Carolyn Craig. Of considerable interest is the detailed technologic-typologic similarity between the Folsom and Agate Basin components. The study of Paleoindian core preparation and lithic reduction techniques is particularly useful. One could have wished for a more detailed, more sensitive, or more relevant analysis of the unifacial flake tools than that based on the adoption of Bordes's 1961 *Typologie de Paléolithique Ancien et Moyen*. The experimental reconstruction of the Folsom fluting technique is ingenious and, since it reproduces the evidence exactly, seems highly probable. Of interest is the inference that, since fluting seems to serve no obvious function and is difficult and wasteful of material, it may have had a socio-ceremonial function.

The "anthropologically" oriented portions of the volume focus on the reconstruction of specific Paleoindian activity sets. Of particular value are Frison's analyses and inferences on bison-procurement strategies. From the character of the bison dentition and other evidence, he believes that the Clovis hunts may have taken place in the spring, whereas those of the Folsom, Agate Basin, and Hell Gap components represent large-scale communal activities occurring in the winter. In a comparison of the topographic situation at Agate Basin with that at other well-known early kill sites, he concludes that entrapment of bison herds involved a skillful use of a combination of natural and human obstacles. The disposition of the bison remains suggests regularized meat-processing activities and the piling of meat into frozen storage caches. The specific character of the activities represented seems to reflect primarily meat processing rather than actual "kill sites." Bradley's lithic studies document weapon and other tool production and repair. Together the evidence suggests short-term specialized occupation.

The ancillary studies in paleontology (Zeimens, Frison, and Walker), geology (Albanese), soil development (Reider), vegetation (Marlow), pollen (Beiswanger), phytoliths (Lewis), and gastropods (Evanoff) are all competent and add considerably to the general utility of the volume. The series of soil studies for inferring paleoenvironmental conditions are particularly useful and tend to confirm other reconstructions of late-Pleistocene–early-Holocene climatic conditions for the High Plains.

Frison and Stanford conclude with a summary section and a culture-historical perspective on the relations between the assemblages. As a whole the volume constitutes a very valuable and welcome addition to the literature on the Paleoindian occupation of western North America.

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