rightly recognized that a detailed treatment of these aspects would not be possible in a book of this kind, and therefore they give instead a well-chosen collection of references to the most important review articles. The work is completed by a subject index consisting of 18 two-column pages.

This book provides a comprehensive overview of a very important class of chemical compounds, and it has appeared at the right time. *Alkoxo and Aryloxo Derivatives of Metals* will gain a place as a valuable work of reference, and indeed as the standard work on alkoxide chemistry. It is to be hoped that it remains available on the market longer than its predecessor.

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The Transuranium People: The Inside Story. By *Darleane C. Hoffman, Albert Ghiorso* and *Glenn T. Seaborg*. Imperial College Press, London 2000. xciii + 467 pp., hardcover $ 112.00.—ISBN 1-86094-087-0

The Lawrence Berkeley Laboratory (formerly the Lawrence Radiation Laboratory), the organization with which the authors of this fascinating book have long been affiliated, is the site of the discovery of more transuranium elements than any other laboratory in the world. The book's title is well chosen, and the authors are the ideal persons to have written it. The volume is a felicitous and balanced blend of personal reminiscences, history of science and technology, and nuclear science. The authors are true nuclear pioneers, who from an early stage were conscious of their place in history and consequently recorded events in incredible detail. It should appeal not only to persons interested in these matters but also to anyone concerned with the development of science policy and the role of governmental support for research during both wartime and peacetime.

The volume is carefully organized with its 15 chapters divided into numbered sections, subsections, and subsubsections, all meticulously cross-referenced. Although scrupulously documented, with altogether 245 references that appear at the ends of the chapters, it is eminently readable and frequently laced with humor. A sense of the authors' excitement evoked by the historical events in which they participated is conveyed by their frequent use of exclamation marks. The book reads like a veritable "Who's Who" of nuclear science; hundreds of pioneers come to life on its pages.

The text proper is preceded by 93 pages which include a three-page tribute to 1951 Nobel chemistry laureate Glenn T. Seaborg (1912–1999), who died after suffering a stroke at the August 1998 American Chemical Society national meeting in Boston, followed by first-person "Intimate Glimpses of the Authors' Early Lives" (72 pp.), and a three-page glossary of the numerous acronyms, decay modes, units, and prefixes referred to in the book.

In the "Intimate Glimpses" the authors present interesting, fascinating, and often little known details about their lives, both personal and professional. For example, we learn that Darleane Hoffman (née Christian, born in 1926) decided at Iowa State University, Ames, to switch her major from applied art to chemistry, after taking a required course in home economics chemistry, at a time when chemistry was an unusual profession for a woman and usually limited to "spinsters". She recollects that in 1951, when she married physics graduate student Marvin Hoffman (who then remained at Ames to pursue his doctoral studies, while she, who had just received her PhD, left to work at the Oak Ridge Nuclear Propulsion Project), Marvin's doctoral supervisor told him the marriage was a "horrible mistake… [that] would never last under such unconventional circumstances". Their daughter, Maureane, is now a professor at the Duke University Medical School, and their son, Daryl, is a plastic surgeon.

When Darleane Hoffman went to the Radiochemistry Group of the Test Division of Los Alamos Scientific Laboratory (LASL) in 1952, she was told, "We don't hire women in that Division". Despite these and other examples of sexism, she went on to become a "genuine transuranium person", becoming the first woman Division Leader of the LASL Chemistry/Nuclear Chemistry Division, and eventually Professor of Nuclear Chemistry at the University of California, Berkeley (since 1984). She received numerous honors; her American Chemical Society national awards include the Award for Nuclear Chemistry (first woman, 1983), the Garvan Medal (1990), and the Priestley Medal (the society's highest award, 2000).

Albert Ghiorso, the fifth of seven children of a poor family, whose father sold "bootleg" liquor during Prohibition, was born in 1915 and received his bachelor's degree as an electrical engineer from the University of California, Berkeley in 1937 during the Great Depression. Because no jobs were available, he earned money by constructing and selling amateur radio equipment. By 1941 he was producing Geiger–Müller counters for the Manhattan District Atomic Energy Project and often visited the UC Berkeley Radiation Laboratory, where he met Wilma Belt, the secretary of Donald Cooksey, Ernest Lawrence's deputy. In 1942 he married Wilma and joined the Chicago Metallurgical Laboratory, where he took care of the instrumentation needs of Glenn T. Seaborg's group, whose task was "to determine the complete chemistry of an element that no one had yet seen" (plutonium). He developed new and improved methods for determining different types of nuclear radiation and was involved in the discovery of several transuranium elements. In 1946 he returned with Seaborg to the Berkeley Radiation Laboratory, where he continues to work. In 1973 he received the ACS Award for Nuclear Chemistry. His son, William Belt Ghiorso, who joined the laboratory in 1978, collaborated with him in an experiment to produce element 110.

Because Seaborg kept a daily journal for more than six decades since 1 January, 1927, when he was fourteen, we were not surprised by the depth of detail in his reminiscences. Although we have written several articles about him, we encountered biographical facts of which we were unaware and photographs that we had not seen (the picture of his third class shows that as early as the age of nine, because of his height, he was already relegated to the back row of group pictures). Fortunately, he was able

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to proofread the final text before his stroke.

Chapter 1, "Introduction" (27 pp.), orients the reader with a pithy summary of the main events in the discovery of the transuranium elements, beginning with Fermi, Amaldi, D'Agostino, Rasetti, and Segrès 1934 bombardment of uranium with neutrons (1934), through Hahn and Strassmann's now classic paper in *Nature* (1939), to the superheavy elements (SHEs). Along with quotations from pertinent articles in both the original languages and English translation, a lengthy (10 pp.) excerpt from an address by Seaborg in 1970 gives an account of early days at the Berkeley Radiation Laboratory.

Chapter 2, "Neptunium and Plutonium" (15 pp.), discusses the discovery of the first two transuranium elements by use of the 60-inch cyclotron, while Chapter 3, "The Plutonium People" (57 pp., the longest chapter), describes the wartime characterization of the properties of plutonium and the development of the process for its production, resulting in the first sample of the element to be seen without a microscope. More than 200 of the persons involved are mentioned or profiled. Chapter 4, "Americium and Curium" (30 pp.), details the use of energy-absorbing foils over the targets to fractionate the isotopes of the first two transplutonium elements—a new tool that became a routine procedure for future research as the half-lives of the elements to be discovered became shorter.

Chapter 5, "Berkelium and Californium" (25 pp.), discusses the first elements to be discovered after the transfer of Seaborg's group from the Chicago Metallurgical Laboratory to Berkeley, with emphasis on the use of cation exchange techniques for their isolation. Chapter 6, "The 'Big Bang': Discovery of Einsteinium and Fermium" (46 pp.), recounts the dramatic, unplanned, and unexpected synthesis of two elements as by-products of the debris of the hydrogen bomb dubbed "Mike," the first U.S. thermonuclear device, detonated at Elugelab Island in the Eniwetok Atoll of the Marshall Islands (November 1, 1952). The elements heavier than fermium ($Z = 100$) could not be produced at reactors by neutron capture but required light or heavy-ion bombardments by suitable accelerators. Chapter 7, "Mendelevium" (29 pp.), describes the tour de force of all research on the transuranium elements—the discovery of new elements "one atom at a time" for a grand total of 17 atoms by a new technique. The success of the recoil experiment led to its use for all the following discoveries. Mendelevium was the last transuranium element to be discovered and identified by direct radiochemical separation of the element itself.

The elements beyond mendelevium were first identified by detection of their nuclear decay, and they required new techniques for their positive identification. This is one of the reasons for the controversies and friendly competition between workers at Berkeley and Dubna and elsewhere concerning the discoveries of elements 102 and heavier. These decades of controversies over priority in discovery and naming are detailed in the chapters on these elements: Chapter 8, "Nobelium and Lawrencium" (28 pp.), Chapter 9, "Rutherfordium and Hahnium" (42 pp.), Chapter 10, "Seaborgium" (28 pp.), Chapter 11, "Bohrium (107), Hassium (108), and Meitnerium (109)" (13 pp.), and Chapter 12, "Elements 110, 111, and 112" (28 pp.), as well as in Chapter 13, "Naming Controversies and the Transfermium Working Group" (31 pp.). Chapter 10 includes Ghiorso's account of the more than 20-year-long "untold story" of seaborgium, the naming of which Seaborg regarded as an even greater honor than his Nobel Prize. Chapter 14, "Searches for the Superheavy Elements" (34 pp.), reviews reported discoveries of SHEs—"hits" and "near misses," how scientists were sometimes led astray, and current plans to produce them. Chapter 15, "Reflections and Predictions" (7 pp., the shortest chapter), contemplates the past and forecasts the future with an imaginative, futuristic Periodic Table projected out to element 168.

The book is copiously illustrated with 125 numbered figures including photographs of individual persons (both familiar and previously unpublished, and formal and informal), group photographs with almost all persons identified, equipment and apparatus, buildings, diagrams, graphs, schematics, elution data, documents, letters, organizational charts, decay sequences, discovery time-lines, aerial views of nuclear explosions, and Periodic Tables before and after Seaborg's actinide concept. A detailed (27 pp.) name index is provided; the lack of a subject index is not serious in view of the nature of the material. This unique volume is a rich treasury of information that will interest general readers while providing scholars with valuable primary sources for future research.

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