defer civilian nuclear fuel reprocessing. The participants in this seminar, from 17 countries and 3 international bodies, met to exchange past experiences and to consider future methods for the short-, intermediate-, and long-term storage of spent fuel elements.

Twenty-one papers were presented in four technical sessions. Most of the papers were followed by brief but valuable discussion periods in which the authors answered questions from the audience. A fifth session consisted of summaries of the four technical sessions followed by informative and sometimes lively panel discussions.

The papers and the country or international organization of origin are as follows: "Spent Fuel Storage–Philosophies and Experience," Germany; "Spent Fuel Storage–The Magnitude of the Problem," OECD: "U.S. Spent Fuel Policy–A Status Report," U.S.; "Prospects of Spent Fuel Management in Spain," Spain; "NRC Analysis of the Environmental Impacts and Licensing Policies for Expanded Spent Fuel Storage in the United States," U.S.; "The U.S. Department of Energy Program to Support the Design and Licensing of a Spent Fuel Storage Basin," U.S.; "An International View of Spent Fuel Storage as One Aspect of Fuel Cycle Safety," OECD; "La Surete des Installations Francaises de Stockage des Elements Combustibles Irradies de la Filiere à Eau Legere," France; "Study on Separate Spent Fuel Storage Facility," Finland and Sweden; "A Central Spent Fuel Storage in Sweden," Sweden; "Safety Aspects on the Design of a Swedish Spent Fuel Storage Facility," Sweden; "Evaluation of the Problems Associated with ENEL's Irradiated Fuel Management," Italy; "Cost and Implications of a Middle-Term Program for Storage of Spent Fuel in a Nuclear Power Station (BWR)," Spain; "Comparison of Concepts for Independent Spent Fuel Storage Facilities," Austria; "Expansion of Capacity of Spent Fuel Pools and Associated Problems," Spain; "Design Bases for U.S. Department of Energy Storage Basin," U.S.; "Behaviour of Spent LWR Fuel Assemblies," Germany; "Impacts of Reactor-Induced Defects on Spent Fuel Storage," U.S.; "Normal and Compact Spent Fuel Storage in Light Water Reactor Power Plants," Germany; "The Encapsulation of Magnox Type Fuel Elements for Extended Storage in Cooling Ponds," United Kingdom; and "Neutron Analysis of Spent Fuel Pools," Spain.

The papers, 20 in English, 1 in French, are almost uniformly clear and concise, well written and well illustrated. Together they constitute an excellent introduction to almost all aspects of spent fuel storage: experience with stored fuel for two decades, magnitudes of future storage requirements in the U.S. and in Europe, philosophies of various governments, safety and environmental aspects, licensing of facilities, designs of at-reactor pools and away-from-reactor pools and dry-storage facilities, specific technical problems such as criticality, temperature, and radioisotope-release limitations, and estimated costs of at-reactor storage and away-from-reactor wet and dry storage.

Anthony Foderaro (PhD, physics, University of Pittsburgh) is professor of nuclear engineering at the Pennsylvania State University. He has just completed his twenty-fifth year in the nuclear power field with experience in industrial research and design followed by teaching, academic research, and consulting. He is the author of two books and co-author of three more.

Energy Dictionary

Author Daniel Hunt

Publisher Van Nostrand Reinhold Ltd. (1979).

Pages 518

Price $22.50

Reviewer James G. McCray

The *Energy Dictionary* was compiled and written with the concept of collecting all of the important terms associated with the educational disciplines involving all aspects of energy and energy systems. In addition to the more than 4000 definitions and 320 charts and figures, there is a short preface entitled "Energy Overview," which strongly reflects the current administration's concepts of a comprehensive and effective national energy plan.

In that many of the definitions are specific to a particular discipline or may have different definitions in different disciplines, I believe the dictionary would be more effective if it had been organized into separate sections by energy categories, as was done in the bibliography.

The major value of this book is that of a quick reference for non-technical people working in the general energy area or technical people not working in their area of expertise.

James G. McCray, acting director of the Nuclear Fuel Cycle Research Program at the University of Arizona, is a retired U.S. Army officer who has had a great variety of engineering experience including civil, electrical, mechanical, and nuclear. He has spent the last seven years working with nuclear engineering problems and currently is involved in both high- and low-level nuclear waste management research.

Advances in Nuclear Physics

Editors J. W. Negele and Erich Vogt

Publisher Plenum Press (1979)

Pages 420

Price $37.50

Reviewer D. A. Bromley

This volume is the eleventh in a now classic series on advances in nuclear physics; the series was originally edited by Michel Baranger and Erich Vogt; in recent years John Negele has replaced Baranger.

The volumes typically contain five or six definitive review articles on some topic in modern nuclear physics prepared by internationally recognized experts in the field. As such, the series represents one of the most useful reference sources for the kind of review that is essential not only for those working in the specific fields covered, but

also those who, for whatever reason, require a comprehensive and up-to-date status report on that field.

The present volume begins with a chapter on clustering phenomena and high-energy reactions prepared by V. G. Neudatchin, Yu. F. Smirnov, and N. F. Golovanova, of the Institute of Nuclear Physics at Moscow State University. This is a highly formal treatment of the theoretical approach to understanding of clustering phenomenon; while invaluable to those working in the field, to those outside it will be more than a little opaque because of the detail involved. The second major review is on pion production in proton nucleus collisions by B. Höistad of the Gustaf Werner Institute in Uppsala, Sweden, where some of the pioneering work in this field was carried out, using the 185-MeV protons from the Uppsala cyclotron. This review is much more experimental and phenomenological in character and provides an up-to-date review of the information available in this relatively new, but rapidly growing, area of nuclear science.

One of the most widely used techniques in nuclear theory is the self-consistent or so-called Hartree-Fock-Bogaliubov (H-F-B) theory. The present volume has two excellent reviews relating to it, the first by J. P. Svenne of the Department of Physics of the University of Manitoba, Canada, titled "Fourteen Years of Self-Consistent Field Calculations: What Has Been Learned," the second by A. L. Goodman of the Department of Physics, Tulane University, entitled "Hartree-Fock-Bogaliubov Theory with Applications to Nuclei." The first is a general review of the H-F-B approach to nuclear problems, the second a more formal and detailed discussion with application to the calculations of properties of specific nuclei. The volume ends with the review entitled "Hamiltonian Field Theory for Systems of Nucleons and Mesons," by M. Bolsterli of Los Alamos Scientific Laboratory. Reflecting the continuing march of nuclear science toward ever higher energies, this paper formulates the relativistic, many-body problem in a mean field approximation, including an interacting system of nucleons and mesons.

As is clear from the above, this is a volume and a series designed for experts in nuclear physics, and not one that is readily accessible to those outside the field. In particular, it has only the most indirect connections with nuclear engineering.

Vogt and his co-editors have established a firm reputation for this series in terms of their selection of very highly qualified authors, and their insistence on clear writing and presentation. The present volume is no exception. While it will clearly be required reading for professionals in nuclear physics, I doubt that it will find any significant readership within the nuclear engineering community.

D. A. Bromley is Henry Ford II Professor of Physics and director of the Wright Nuclear Structure Laboratory at Yale University. He is a director of United Nuclear Resources, Inc., of the United Illuminating Co., and of several other organizations. He is currently vice president of the International Union of Pure and Applied Physics and president-elect of the American Association for the Advancement of Science.