



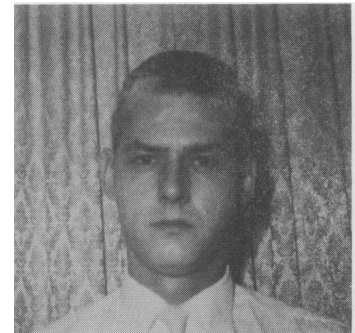
## AUTHORS — FEBRUARY 1972

### REACTORS

#### THE BREEDING RATIO WITH CORRELATION TO DOUBLING TIME AND FUEL CYCLE REACTIVITY VARIATION

*C. R. Adkins*

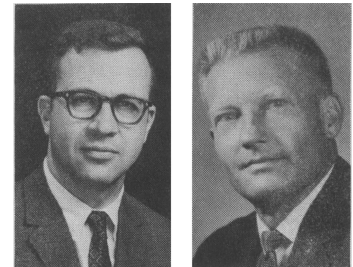
Charles Richard Adkins (PhD, nuclear engineering, Carnegie Institute of Technology, 1966) is associate professor of nuclear science and engineering, Carnegie-Mellon University, Pittsburgh, Pennsylvania. His interests are in reactor design (principally LMFBR design and optimization), reactor physics, kinetics and safety, and public acceptance of nuclear power for peaceful applications.



#### MODELS FOR THE SAFE STORAGE OF FISSILE METAL

*S. J. Altschuler  
C. L. Schuske*

Sidney J. Altschuler (left) (BChE, The Cooper Union for the Advancement of Science and Art, 1957) is a research physicist at Dow Chemical USA's Rocky Flats Plant working on computer calculations for nuclear criticality safety purposes. C. L. Schuske (BA, Whittier College, 1943; MS, University of Southern California, 1945) is director of nuclear safety and an ANS and APS member. He is active in ANS standards committees.

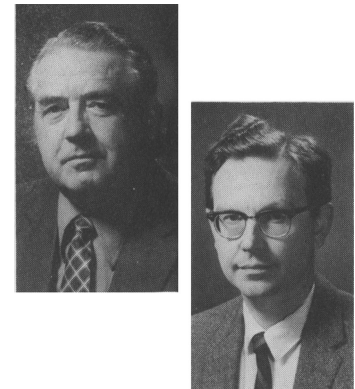


### CHEMICAL PROCESSING

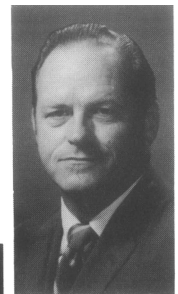
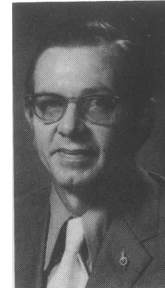
#### THE CUSP PROCESS FOR PREPARING CONCENTRATED, CRYSTALLINE URANIA SOLS BY SOLVENT EXTRACTION

*J. P. McBride,  
K. H. McCorkle, Jr.  
W. L. Pattison  
B. C. Finney*

John Patrick McBride (left) (MS, physical chemistry, University of Notre Dame, 1941) joined the Metallurgical Laboratory (later, the Manhattan Project) at the University of Chicago in 1942 and became associated with Oak Ridge National Laboratory in 1944. He was a group leader in the thorium oxide slurry development program for the homogeneous reactor and was recently a group leader for sol-gel process development studies in the Chemical Technology Division. Kenneth Hall McCorkle, Jr. (PhD, chemical engineering, University of Tennessee) is engaged in nuclear fuels fabrication development for the General Atomic Division of Gulf Energy and Environmental



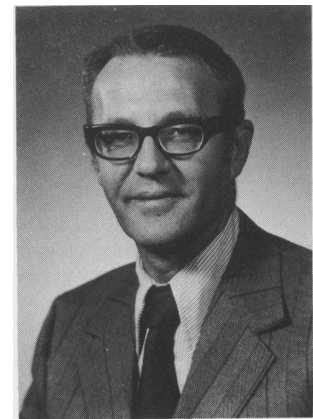
Systems. He was associated with the Chemical Technology Division of Oak Ridge National Laboratory from 1952 to 1971. For the past 12 years he has been engaged in research and development for oxide nuclear fuel properties and fabrication processes. William Lawrence Pattison (left) has been associated with the Chemical Development Section of the Chemical Technology Division at Oak Ridge National Laboratory since September of 1952. He has spent the past 19 years in various efforts involving the development of chemical processes for manufacture of nuclear fuel materials. He worked with the fluid fuel systems of the homogeneous reactor program at ORNL, and has been associated with the colloidal chemical systems research efforts of the laboratory in the sol-gel fuel technology program for the past 9 years. Bruce Carter Finney (BChE, University of Detroit, 1951) joined Battelle Memorial Institute, Columbus, Ohio in 1951. He became associated with Oak Ridge National Laboratory in 1957 and is presently a senior development engineer in the Chemical Technology Division.



**RADIOLYSIS OF HANFORD B PLANT HDEHP EXTRACTANT**

*Wallace W. Schulz*

Wallace W. Schulz (BS, chemistry, University of Nevada) has over 20 years experience at Hanford in all phases of fuels reprocessing and waste management research and development activities. Now with Atlantic Richfield Hanford Company, he is currently exploring applications of macroreticular ion exchange resins to cleanup of Purex process solvent.



**FUELS**

**STUDIES OF FUEL-CLAD MECHANICAL INTERACTION AND THE RESULTING INTERACTION FAILURE MECHANISM**

*E. Rolstad  
K. D. Knudsen*

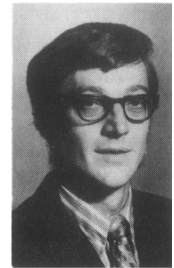
Erik Rolstad (left) (BSc, mechanical engineering, London, 1958) is in charge of the Test Fuel Data Evaluation at the OECD Halden Reactor Project. He joined the project in 1962 and was initially concerned with the thermohydraulic behavior and heat transfer limitations of the fuel assemblies in the reactor. His more recent interest is the thermal and dimensional behavior of fuel rods. In support of his work he has developed a number of computer codes which are being used in the fuel technical and thermohydraulic prediction and evaluation of the test fuel experiments at Halden. Kjell D. Knudsen (BSc, mechanical engineering, University of Manchester, United Kingdom, 1956) is head of Fuel Research Division at the OECD Halden Reactor Project, Halden, Norway. He has been with the Halden Project since 1959, serving initially as a member of the reactor operation staff in installation, maintenance, and operation. Since 1964 he has been working in the Fuel Research Division on fuel design, testing, and experiments.



## INSTRUMENTED CAPSULE FOR MEASURING FISSION-INDUCED CREEP OF OXIDE FUELS

A. A. Solomon (left) (PhD, materials science, Stanford University, 1968) is employed at Argonne National Laboratory. His post-doctoral research was at Centre d'Etudes Nucléaires de Saclay, Saclay, France, 1969. Current interests include flow and fracture studies of reactor fuel and structural materials. R. H. Gebner has been associated with Argonne National Laboratory since 1964. Currently he is a member of the staff of the Reactor Analysis and Safety Division where he is involved in fuel coolant interaction studies.

*A. A. Solomon*  
*R. H. Gebner*



## MATERIALS

## ELEVATED-TEMPERATURE DAMAGE FUNCTIONS FOR NEUTRON EMBRITTLEMENT IN PRESSURE VESSEL STEELS

C. Z. Serpan, Jr. (left) (BS, Ohio University, 1956) is engaged in neutron dosimetry and spectrum aspects of irradiation effects studies of reactor structural materials at the Naval Research Laboratory. W. N. McElroy (PhD, Illinois Institute of Technology, 1965), at Hanford since 1967, is engaged in neutron dosimetry and fuels and materials irradiation effects studies for the LMFBR program.

*C. Z. Serpan, Jr.*  
*W. N. McElroy*



## RADIOISOTOPES

## A RADIOISOTOPE-FUELED STIRLING ENGINE ARTIFICIAL HEART SYSTEM

L. T. Harmison (top) (PhD, nuclear engineering, University of Maryland) is the acting chief of the Medical Devices Applications Program of the National Heart and Lung Institute. He is responsible for design, development, and testing of medical devices for the diagnosis, monitoring, and treatment of cardiac and pulmonary diseases. William R. Martini (center) (PhD, chemical engineering, University of Michigan) is branch chief for Dynamic Conversion at the Donald W. Douglas Laboratories, Richland, Washington, a part of McDonnell Douglas Corporation. He has been involved in development of various energy conversion devices for 15 years and has led the development of the heart engine for 4 years. Peter Riggle (bottom) (BS, mechanical engineering, University of Washington) is project engineer in charge of analysis and testing in the Dynamic Conversion Branch. He has been involved in dynamic and thermodynamic design analysis and testing of Stirling engine artificial heart energy systems for the past 3 years. He was previously engaged in nuclear reactor heat transfer and fluid flow analysis and testing.

*W. R. Martini*  
*P. Riggle*  
*L. T. Harmison*

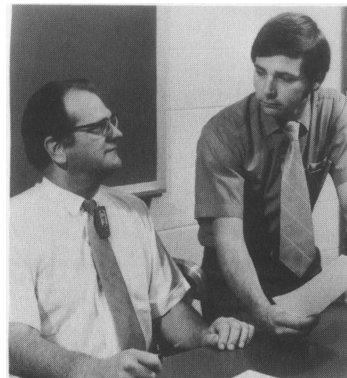


## SHIELDING

### BRACKETING THE PEAK PRIMARY GAMMA-RAY DOSE RATE FROM NUCLEAR DEVICES BY STEADY-STATE TRANSPORT CALCULATIONS

*H. C. Claiborne  
W. W. Engle, Jr.*

H. C. Claiborne (left) (MS, University of Tennessee) has been involved in various phases of reactor design and analysis at the Oak Ridge National Laboratory since 1953 with the past five years primarily devoted to shield design against radiation from reactors and nuclear weapons. Currently, his primary interest is in the area of radioactive waste management. W. W. Engle, Jr. (BS, University of Tennessee) is a staff member of the Neutron Physics Division of Oak Ridge National Laboratory. His present interests include the application of the discrete ordinates method to problems in the reactor and weapons radiation shielding program.

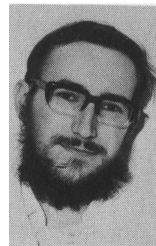


## ANALYSIS

### HEAVY ELEMENT ANALYSIS BY ISOTOPE-EXCITED X-RAY FLUORESCENCE

*J. Kuusi  
M. Virtanen  
P. Jauho*

P. Jauho (top) (PhD, nuclear physics, Helsinki University, 1951) has been Director General of The State Institute of Technical Research in Finland since 1970. His main interests are in statistical and nuclear physics. J. Kuusi (center) (Doctor of Technology, radioisotope applications, Helsinki University of Technology, 1970) has been head of the Applied Radiation and Isotopes Division of The Reactor Laboratory of The State Institute of Technical Research since 1970. His main interests are in application of radiation and radioisotopes in industry, and environmental studies. M. Virtanen (bottom) (MS, analytical applications of radioisotopes, Helsinki University of Technology, 1971) is a research worker in The Reactor Laboratory of The State Institute for Technical Research. His present main interest is in tracer studies of waste water currents in lakes and sea.



## MATERIALS

### IMPURITY EFFECTS ON THE SWELLING OF IRRADIATED ALUMINUM OXIDE

*R. A. Skarupa  
C. E. Backus*

R. A. Skarupa (left) (BS, U.S. Military Academy, 1962; graduate studies in nuclear engineering at Arizona State University) is a major in the U.S. Army. He received his MS in 1971 and is presently serving in Vietnam. C. E. Backus (PhD, nuclear engineering, University of Arizona, 1965) is an associate professor of engineering at Arizona State University. During the last three years he has been a visiting staff member at the Los Alamos Scientific Laboratory working in the area of thermionic reactor development with particular emphasis on insulators in high flux fields. His interests include all direct energy converters and associated technology.

