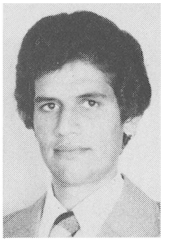
nuclear technology®

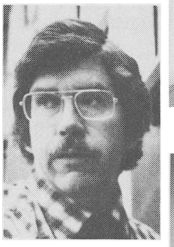
AUTHORS — APRIL 1980

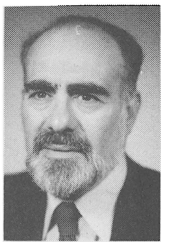
REACTORS

AN EXPERIMENTAL TECHNIQUE FOR DETERMINATION OF STEAM FRACTION IN FLOWING STEAM/AIR MIXTURES

N. Saba
R. T. Lahey, Jr.
J. C. Corelli





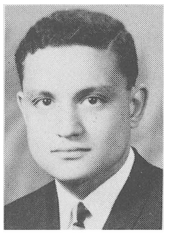


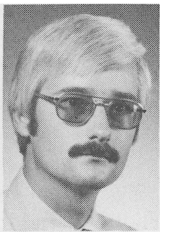
N. Saba (top) [BS, electrical engineering, University of Washington, 1975; MS, nuclear engineering, Rensselaer Polytechnic Institute (RPI), 1977] is currently pursuing a PhD in nuclear engineering at RPI. His current interests include reactor thermal-hydraulics, two-phase flow, and reactor safety. **R. T. Lahey, Jr.** (center) (PhD, Stanford University, 1970) is professor and chairman of the Department of Nuclear Engineering at RPI. He has extensive experience in reactor thermal-hydraulics and safety. He is currently chairman of the American Nuclear Society (ANS) Technical Group on Thermal-Hydraulics and is a member of the ANS Board of Directors. **J. C. Corelli** (bottom) (PhD, Purdue University, 1958) is a professor of nuclear engineering at RPI. His main research interests involve the study of radiation effects in ceramics for nuclear fusion applications, semiconductors for device applications, and polymer materials.

FUEL CYCLES

PELLET AND PELLET-BLANKET NEUTRONICS AND PHOTONICS FOR ELECTRON BEAM FUSION

Magdi M. H. Ragheb
Gregory A. Moses
Charles W. Maynard





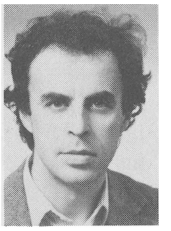
Magdi M. H. Ragheb (top) (BS, MS, nuclear engineering, University of Alexandria; MS, PhD, nuclear engineering, University of Wisconsin, Madison, 1978) is an assistant professor of nuclear engineering at the University of Illinois at Urbana-Champaign. He had a year of post-doctoral work with the Fusion Engineering Program at the University of Wisconsin. He worked as a faculty member of the Department of Nuclear Engineering at the University of Alexandria, Egypt, and collaborated with the Department of Applied Science at Brookhaven National Laboratory and the Division of Engineering Physics at Oak Ridge National Laboratory. His theoretical interests are in the areas of reactor theory, statistical simulation, variational and weighted residual methods. His current technical interests are in the neutronics and photonics of fusion and fusion-fission energy systems. **Gregory A. Moses** (bottom) (PhD, nuclear engineering, University of Michigan, 1976) has been an assistant professor of nuclear engineering at the University of Wisconsin since 1976. His work has been in the area of inertial confinement fusion technology, particularly on the interface between the fusion pellet and the reactor cavity and first wall. He has previously worked for two summers at the Lawrence Livermore Laboratory and is currently a visiting staff member with the Laser

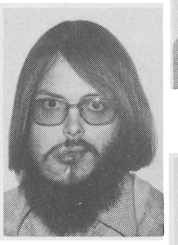
Fusion Applications Group at the Los Alamos Scientific Laboratory. **Charles W. Maynard** (right) (BS, electrical engineering, University of Maryland; PhD, applied physics, Harvard University, 1961) worked at Bettis Atomic Power Laboratory operated by Westinghouse Electric Company in the Reactors Theory and Methods Section. He was appointed associate professor of nuclear engineering at the University of Wisconsin, Madison, in 1961 and became a professor in 1965. His research interests are centered on design and neutronics analysis of reactors.

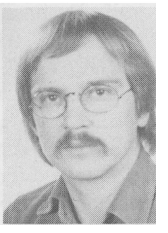
MULTIGOAL FUEL CYCLE OPTIMIZATION INCLUDING NONPROLIFERATION OBJECTIVES

P. Silvennoinen
T. Vieno
J. Vira

Pekka Silvennoinen (top) (PhD, nuclear science and engineering, Virginia Polytechnic Institute and State University) is the head of the Nuclear Engineering Laboratory at the Technical Research Centre of Finland. His research interests cover fuel management and fuel cycle analysis. **Timo Vieno** (center) (MS, nuclear engineering, Helsinki University of Technology, 1978) is currently involved in waste management studies at the Nuclear Engineering Laboratory at the Technical Research Centre of Finland. **Juhani Vira** (bottom) (MS, mathematics, Helsinki University of Technology, 1975) is working on nuclear fuel cycle calculations, including optimization. He is also on the staff of the Nuclear Engineering Laboratory at the Technical Research Centre of Finland.





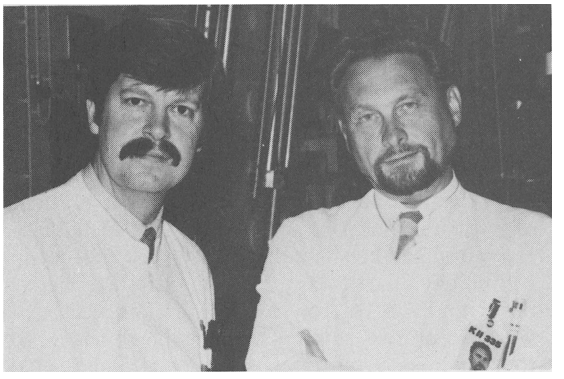


FUELS

FISSION GAS RELEASE AND MICROSCOPIC SWELLING IN HIGHLY RATED ADVANCED FUELS

M. Coquerelle
C. T. Walker

Michel Coquerelle (right) (PhD, solid state chemistry, University of Brussels, 1960) is in charge of postirradiation examinations at the European Institute for Transuranium Elements at Karlsruhe. He gained his initial experience in this field while working for the French Nuclear Research Centre at Saclay (1960-1964). His current interests include both conventional fast breeder oxide and advanced fuels. **Clive T. Walker** (PhD, materials science, University of Surrey, England, 1974) is responsible for electron microprobe analysis of irradiated fuel at the European Institute for Transuranium Elements. His technical interests focus on the physical chemistry of conventional and advanced fuels. He also contributes to investigations of the compatibility of nuclear wastes with glasses and ceramics, to work on actinide crystal chemistry, and to studies of cladding corrosion in liquid-metal fast breeder reactor fuel pins.



REPROCESSING NUCLEAR FUELS OF THE FUTURE: A RADIOLOGICAL ASSESSMENT OF ADVANCED (Th,U) CARBIDE FUEL

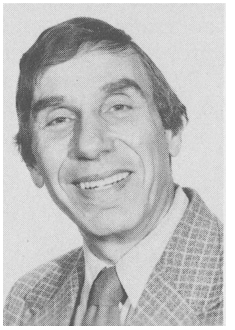
J. E. Till
H. R. Meyer
L. E. Morse
W. D. Bond
E. S. Bomar
V. J. Tennery

John E. Till (bottom left) (graduate, U.S. Naval Academy, 1967; MS, health physics, Colorado State University; PhD, nuclear engineering, Georgia Institute of Technology) is a consultant to the Health and Safety Research Division of Oak Ridge National Laboratory (ORNL). He served in the Naval Nuclear Submarine Force from 1967 to 1971, and was employed at ORNL from 1974 to 1977, when he left to manage a family-owner dairy farm near Orangeburg, South Carolina. He remains actively involved in research with ORNL. His main area of interest is the analysis of critical radionuclides released to the environment by nuclear facilities. **H. R. Meyer** (bottom center) (BA, St. Olaf College; MS, health physics, and PhD, radiation biology, Colorado State University) joined the Health and Safety Research Division at ORNL in 1976 and has been involved in radiological assessment of advanced nuclear fuels since that time. He was previously a line officer in the U.S. Navy, leaving the service to pursue graduate education. **Leon E. Morse** (top left) (BS, chemistry, Brooklyn College) is a member of the Chemical Technology Division at ORNL. His principal field of interest has involved aspects of aqueous chemical processing related to nuclear fuels. **W. D. Bond** (bottom right) (PhD, physical chemistry, Vanderbilt University) is a member of the Chemical Technology Division at ORNL, where he has been employed since 1957. His work has been concerned with chemical research and development studies in nuclear fuel reprocessing, refabrication, and waste management. **E. S. Bomar** (top center) (BS, metallurgical engineering, University of Cincinnati) is a member of the Ceramic Technology Group of the Metals and Ceramics Division of ORNL and has been involved in various aspects of nuclear fuel synthesis and fabrication since joining ORNL in 1950. In recent years, he has participated in several studies assessing the environmental impact of reprocessing and refabricating fast breeder reactor (FBR) fuels. **Victor J. Tennery** (top right) (BS, MS, and PhD, ceramic engineering, University of Illinois) is group leader of the Ceramic Technology Group in the Metals and Ceramics Division at ORNL. Since 1974, he has organized and directed several FBR advanced fuel and neutron absorber programs at ORNL, including radiological assessments for various FBR fuel systems. Before 1974, he studied oxidation properties of mixed-oxide FBR fuels and the synthesis, fabrication, and irradiation behavior of mixed-nitride FBR fuels.

RADIOACTIVE WASTE

ANALYSIS, CRITIQUE, AND REEVALUATION OF HIGH-LEVEL WASTE REPOSITORY WATER INTRUSION SCENARIO STUDIES

Bernard L. Cohen

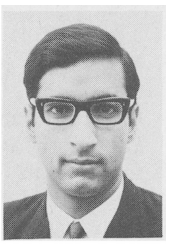


Bernard L. Cohen (BS, physics, Case Institute of Technology, 1944; MS, physics, University of Pittsburgh, 1948; DSc, physics, Carnegie-Mellon University, 1950) has been a professor of physics at the University of Pittsburgh since 1958. He has worked on environmental assessments of nuclear waste problems for the past five years. He is also currently involved in research on radon problems, health effects of radiation, and risk-benefit considerations.

MATERIALS

EFFECTS OF SIMULATED FISSION PRODUCTS ON THE MECHANICAL PROPERTIES OF ZIRCALOY-2

R. Kohli
F. Holub

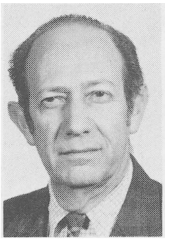


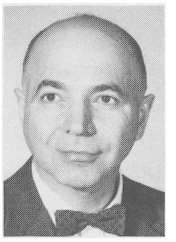
Rajiv Kohli (top) (MS, metallurgy, Indian Institute of Science, Bangalore, 1976) is a research fellow in the Institute of Metallurgy at the Österreichische Studiengesellschaft für Atomenergie (ÖSGAE), Austria. His main interests are in fuel-cladding interactions and oxidation of zirconium alloys. **Friedrich Holub** (Dr. phil., chemistry, University of Vienna, Austria, 1961) is group leader for materials testing in the Institute of Metallurgy at ÖSGAE. He is currently interested in fuel-cladding interactions and the behavior of coated fuel particles for high temperature reactors.

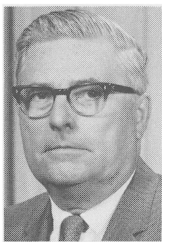
RADIOISOTOPES

DESORPTION KINETICS OF METHYL IODIDE FROM IMPREGNATED CHARCOAL

Leonard A. Jonas
Victor R. Deitz
J. B. Romans







Leonard A. Jonas (top) (PhD, physical chemistry, University of Maryland, 1970) has been associated for many years with research on methods and materials for the removal of trace contaminants from the air. His research interests encompass aerosol filtration theory as well as equilibrium and kinetic studies on gas adsorption. Since 1974 he has been chief of the Pollution Abatement (now Air Purification) Section of research at the Army's Chemical Systems Laboratory in Maryland. **Victor R. Deitz** (center) (PhD, chemistry, Johns Hopkins University, 1932) was a Gugenheim Fellow at the Imperial College of Science and Technology in London from 1957 to 1958. His current interests are in the fundamental structure and micromechanics of carbon fibers and in new catalysts using charcoal as the support. **James B. Romans** (bottom) (BA, chemistry, Central College of Iowa, 1935) is a research chemist with the Naval Research Laboratory (NRL). After a relatively brief career as a high school science teacher, he joined the National Bureau of Standards in 1938, where he worked principally on the physical properties of liquid fuels and lubricants and on oil filtration. Since coming to the NRL in 1946, he has been engaged in research on the properties and application of synthetic lubricants, the dielectric properties of synthetic liquids, the fatigue characteristics of glass fiber-reinforced plastics when flexed while immersed in water, the surface chemical aspects of the shock sensitivity of high explosives, the adhesional characteristics and water sensitivity of solid rocket propellants, and the frictional electrification of Teflon. Since 1975, he has been engaged in several aspects of iodine trapping by charcoals used in the nuclear industry.