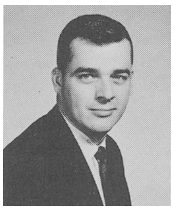
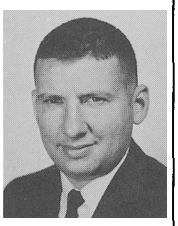
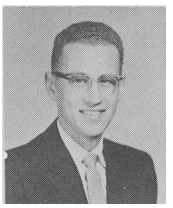
# AUTHORS AND PAPERS

The highly condensed summaries of papers and technical notes (below) are intended to assist the busy reader in determining the order in which to read the technical material. Biographical comments are for human interest.



## LOSS OF COOLANT

Tests at the Bettis Atomic Power Laboratory on the loss of coolant from a circulating water test loop were run to identify the significant transient heat transfer and hydrodynamic phenomena and to support the model development for digital computer programs.

*J. A. Redfield (PhD, University of Pittsburgh, 1963), a Fellow Engineer at Bettis, has worked on many phases of reactor and reactor plant dynamics. S. G. Margolis (PhD, University of Pittsburgh, 1962) worked on various reactor kinetics problems during his ten years at Bettis and is currently Associate Professor at the State University of New York at Buffalo. J. H. Murphy received his PhD from Carnegie Institute of Technology (1965) prior to coming to Bettis as a Senior Engineer. G. A. Snyder, cognizant engineer during the experimental phases of the test, is now Development Engineer for the Dravo Corporation, Pittsburgh, Pennsylvania.*


## EFFECT OF Pu ON DOPPLER COEFFICIENT

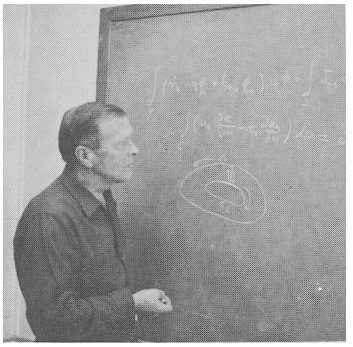
Plutonium fuel for fast breeder reactors will have different isotopic composition depending on its source. The effect of various compositions on safety parameters such as the Doppler coefficient is examined in this work.

*S. Yiftah is Director of the Soreq Nuclear Research Center, member of the Israel AEC, and Professor of Nuclear Science and Engineering at the Technion (Israel Institute of Technology). He has been doing research on fast reactor physics since 1959, after a stay of about two years at ANL. G. Shaviv, now at California Institute of Technology, has worked on fast reactors since 1960. His DSc thesis subject (Technion) was the Doppler effect on fast reactors.*

## DOSE FROM RADIOACTIVE GASES

This paper develops formulas for the calculation of the whole-body gamma dose from a cloud of radioactive gases. The formulas are greatly simplified by the assumption that the cloud does not change in size and shape during the exposure time. For most cases of interest, the numerical solutions based on this assumption are nearly identical with more detailed solutions. The formulas have been programmed for computer solution so that large parametric studies are possible in an hour or two of machine time.

*L. M. Arnett received his MS from West Virginia University and his PhD from the University of Illinois in Physical Chemistry in 1941. He has been with DuPont since 1941, and at the present is a Research Supervisor in the Applied Mathematics Division at the Savannah River Laboratory.*



## DIFFUSION PHENOMENA IN SLABS

This paper develops a mathematical model for diffusion of contamination into and out of coatings of finite thickness. Curves are presented to make the model useful for the experimental determination of the diffusion coefficient.

*William Bradley Lewis served as coordinator for early irradiation programs in the MTR, and later as head of the Theoretical Physics and Applied Mathematics branch. He is currently working on special assignments in applied physical theory for Phillips AED.*

## RADIOISOTOPE ENERGY SOURCES

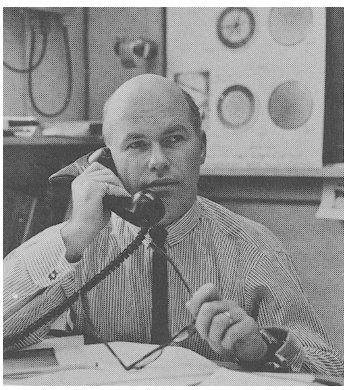
Interest in the possible use of radioisotopes to fuel kilowatt-level energy sources is gaining momentum, and several conceptual designs for such devices have been presented. This paper explores some of the technical and economic aspects of providing radioisotope energy sources for small manned Antarctic stations.

*Robert M. Rodden has been an operations analyst in the Management and Social Systems division of Stanford Research Institute since July 1964. His work has been concerned largely with nuclear-effects studies and cost-effectiveness analyses. He received his MS in bioradiology from the University of California (Berkeley) in 1954.*

## EFFECT OF CORE CHANGES

The fast flux intensity and spectra in several irradiation positions of the GETR are changed by varying the material composition in various reactor positions. Once a detailed spectral calculation has been made a new one is not required for each change in core loading.

*J. W. Helm (left) and J. A. Ulseth have been engaged in irradiation testing programs for the past several years at Battelle-Northwest. Helm has been conducting irradiation experiments on graphite in high-flux test reactors. Ulseth is involved in neutron spectral calculations in conjunction with material damage studies.*



## $UO_2$/SHEATH HEAT TRANSFER

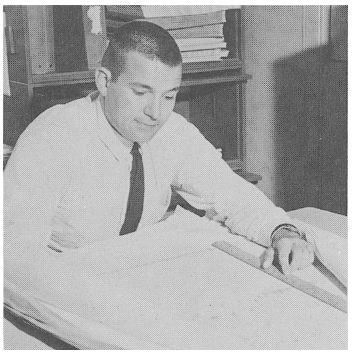
UO fuel elements sheathed in Zircaloy or stainless steel were irradiated under controlled conditions to study the transfer of heat across the fuel-sheath interface. Variables studied were diametral clearance, heat transfer medium, duration of irradiation, and power rating.

*A. S. Bain, a Research Officer at Chalk River since 1951, is presently Leader of the Fuel Irradiation and Examination Group of the Reactor Materials Branch. He is a metallurgical engineering graduate of the University of British Columbia.*

## FUEL PROCESSING IN TUNGSTEN CRUCIBLES

Two-phase systems of zinc or zinc-rich alloys and molten chloride salts are being employed at temperatures up to 800° C in developing pyrochemical processes for the recovery of uranium and plutonium from partially spent fuels. Several methods of fabrication were employed to produce the tungsten crucibles that were tested under process conditions in the work reported here.

*Leslie Burris, Dean Pierce, Irvin Winsch, and Martin Kyle (l to r) are staff members of the Chemical Engineering Division of ANL. Burris is Head of the Fuel Recycle Section of the Liquid Metal Fast Breeder Reactor Program Office and former Head of the Pyrochemistry Section. Pierce, Leader of the Pyrochemical Engineering Group, has been actively engaged in pyrochemical process engineering development for 13 years. Winsch has been associated with pyrochemical, aqueous, and volatility process development at ANL for 19 years. Kyle, whose primary interest is in the field of material development, has been involved with pyrochemical processing for the past six years.*



## VAN ALLEN BELT PROTON MEASUREMENT

Short range particles such as low-energy protons are not easily measured in the electron environment of the Van Allen belts. This paper concludes that the high flux of trapped electrons places limitations on the use of pulse-height analysis techniques to measure low-energy protons.

*Lt. George A. Kuck is assigned to the Cosmic Radiation Branch of Air Force Cambridge Research Laboratories, Bedford, Massachusetts. He has an MS in Engineering Space Physics from the Air Force Institute of Technology and a BS in Physics from Allegheny College.*