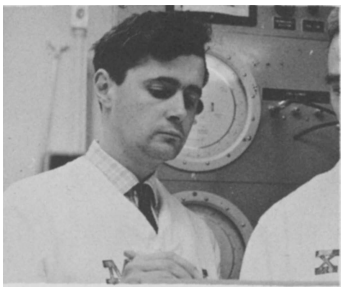
AUTHORS AND PAPERS

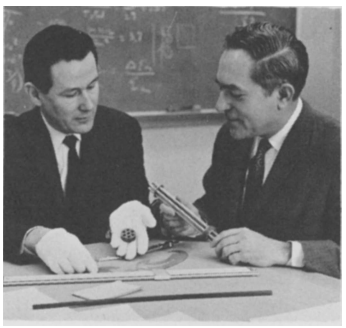
The highly condensed summaries of papers and technical notes (below) are intended to assist the busy reader in determining the order in which to read the technical material. Biographical comments are for human interest.



FISSION-PRODUCT GAS PRESSURES

A method for calculating fission-product gas pressure inside operating UO_2 fuel elements uses a model in which the hot center of the UO_2 pellet is assumed to flow plastically under stress and the outer annulus is cracked.

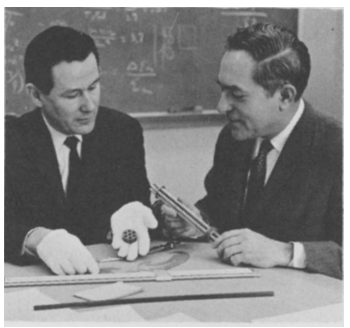
M. J. F. Notley, author of two previous papers in Nuclear Applications, *is a member of the Reactor Materials Branch of Atomic Energy of Canada, Ltd., where he has been concerned with the design and analysis of in-reactor experiments on fuel-element performance.*



SUPERHEAT FUEL ELEMENTS

A combination boiler-superheater element utilizing the oxide fuel itself as insulation between the superheated steam and the surrounding water appears uniquely qualified for thermal spectrum, integral superheat reactors. Design studies, fabrication development, and out-of-pile experiments attest to the desirability of this type of fuel element.

Since 1960, John F. Gibbons (BSME, Carnegie Institute of Technology, 1948) (shown on left) has worked at the General Nuclear Engineering Corporation (now merged with Combustion Engineering, Inc.) on the BONUS Reactor and as Project Manager of the Advanced BONUS Core. Joseph R. Dietrich (PhD, Physics, University of Virginia, 1939) has been in power reactor development since 1946, when he joined the Daniels Pile group at Oak Ridge. He is currently Chief Scientist of the Nuclear Division at Combustion Engineering, Inc.



CONTROLLED REFLUX

Controlled reflux improved the efficiency of removing strontium from solution by foam separation, by increasing the volume reduction factor to 3700 (from about 30 for nonrefluxing systems) and giving a decontamination factor of $>10^3$.

Ernest Schonfeld, a chemist in ORNL's Chemical Technology Division, obtained his BS (1954) and his MS (1955) from the University of Buenos Aires. Since 1958 he has studied foam separation and its application to radioactive waste decontamination. Arlene Kibbey, with the Chemical Technology Division of ORNL since 1948, has worked on nuclear fuel reprocessing, radioactive waste disposal, and inorganic separation processes using ion exchange and foam separation techniques. She attended The University of Michigan College of Engineering at Ann Arbor from 1942 to 1945.

XENON-133 IN CANCER THERAPY

The qualification of xenon-133 as an implantation source in cancer therapy are examined. Methods for source fabrication and attenuation measurements are presented.

L. Leonard Packer (MS, Nuclear Engineering, 1957, North Carolina State College) is Chief of the Radioisotope Laboratory at United Aircraft Research Laboratories. Over the past five years he has been involved with the application of radioactivity. Previous experience is in nuclear and non-nuclear power plant design and operation.

$^{238}PuO_2$ FROM DEPLETED OXYGEN

Preparation of $^{238}PuO_2$ from oxygen depleted in ^{18}O can minimize neutron emission and thus enhance the utility of this material as a source of energy for biological purposes, e.g. the cardiac pacemaker.

William M. Rutherford, Gary N. Huffman, and Dale L. Coffey (l. to r.) are members of the staff of Mound Laboratory. Rutherford (PhD, Chemical Engineering, University of Illinois, 1954) is a Senior Research Specialist in the Isotope Separation Section of the Research Department. Huffman (BS, Chemistry, Michigan Technological University, 1963) is currently involved in studies on the corrosive effects of sea water on PuO_2 and other plutonium fuel forms. Coffey (BS, Physics, 1957 Southwest Missouri State College) is Group Leader in charge of the Source Development Group.

SOLID STATE NUCLEAR TRACK DETECTORS

Solid-state nuclear track detectors read with a microdensitometer can be used conveniently to measure distributions of fission density and of fast and thermal-neutron flux.

J. W. N. Tuyn, a Research Engineer at Institutt for Atomenergi at Kjeller, Norway, on leave from Reactor Centrum Nederland, the Netherlands, is interested in neutron dosimetry and spectrometry. His MS in physical engineering is from the Technical University of Delft, the Netherlands (1965).

ACTIVATION ANALYSIS OF LUBRICANTS

Neutron activation analysis techniques have been developed to measure quantitatively trace impurities in mineral oils and organic esters. The effects of processing on the concentrations of certain trace constituents, and the effect of these constituents on the response of the fluid to inhibitors and additives are indicated.

William A. Jester (PhD, Chemical Engineering, Penn State, 1965) (shown on right) is an Assistant Professor of Nuclear Engineering at The Pennsylvania State University and a staff member of the Penn State TRIGA Reactor Facility where he is establishing a Radionuclear Applications Laboratory for the University. E. Erwin Klaus (PhD, Chemistry, Penn State) is a Professor of Chemical Engineering at Penn State. Since 1947 he has led a team of chemists and engineers in research on and development of hydraulic fluids, lubricants, and instrument oils.

RADIOCHELATOMETRIC TITRATIONS

Ion-exchange membranes, used to separate reaction products from the initial components in radiochelatometric titration, speed up and simplify the titration. Traces of cobalt and zinc were determined by this method.

Juraj Tölgyessy (upper left) is Associate Professor of Radiochemistry at the Slovak Technical University in Bratislava, Czechoslovakia, and author of various books on radiochemical analysis. Jiři Konečný does research on the measurement of low-level radioactivity, radiochemical separation methods, and radiometric titrations at the Nuclear Power Station in Jaslovské Bohunice, Czechoslovakia. Tibor Braun (right) is Assistant Professor at the Institute of Inorganic and Analytical Chemistry of the L. Eötvös University, Budapest, Hungary. Tölgyessy and Braun are Co-ordinating Editors of the new Journal of Radioanalytical Chemistry.

FUSIBLE METAL THERMOMETRY

Gamma scanning to detect melting in pure metals and alloys is particularly applicable to non-destructive determination of maximum temperature attained in an irradiation capsule that contains no external instrumentation.

A graduate of the University of Alaska and Stanford University, Thor Lauritzen (shown on left) has been associated with the Nuclear Energy Division of the General Electric Company since 1962. Frank Comprelli received his formal education at Stevens Institute of Technology and Stanford University and has been with GE since 1960. Both are engaged in the development and evaluation of materials for fast breeder reactors.