

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.



SPR II REACTIVITY CONTRIBUTIONS

Materials with low absorption cross sections have negative reactivity effects in the 1.5-in. diam glory hole of the Sandia Pulsed Reactor II, in contrast to positive values for the same materials in the core center of LASL's Godiva reactor.

Robert L. Long (PhD, Purdue University, 1962) an associate professor of Nuclear Engineering at the University of New Mexico, is involved in fast burst reactor design, analysis and safety, reactor measurements, and the techniques of engineering education. He has been associated with the development of fast burst reactors at White Sands Missile Range, Sandia Laboratories, and the Atomic Weapons Research Establishment in England.



ISOTOPE PRODUCTION COST MINIMIZATION

Pontryagin's Maximum Principle has been used to minimize isotope production costs when the sum of the integrated time and effort is used as the cost function.

N. Dean Eckhoff (left) (PhD, Kansas State University), an assistant professor of Nuclear Engineering at Kansas State, has research interests in optimization techniques, systems analysis, and radioisotopes applications. L. T. Fan (PhD, University of West Virginia) is head of Chemical Engineering and Director of the Institute for Systems Design and Optimization at Kansas State. W. R. Kimel, (inset) (PhD, University of Wisconsin) is Dean of Engineering, University of Missouri, Columbia.

PuO₂-POLYSTYRENE CRITICALITY AT 5H/Pu

The latest determinations of critical parameters of plutonium mixtures indicate that for highly concentrated systems published values of critical sizes and masses should be increased.



S. R. Bierman, L. E. Hansen, and R. C. Lloyd (seated left to right) are staff members at the Plutonium Critical Mass Laboratory of Battelle's Pacific Northwest Laboratory. Their primary area of endeavor is the acquisition and analysis of critical mass physics data for plutonium systems. E. Duane Clayton is the manager of the Physics Research Department at the Pacific Northwest Laboratory, an associate professor in the University of Washington's Department of Nuclear Engineering, and Vice-Chairman and Program Chairman for the American Nuclear Society's technical group for Nuclear Criticality Safety.



RESIDUAL ELEMENT EMBRITTLEMENT EFFECT

Extensive work on plates and welding wire for pressure-vessel steels has shown that small amounts of copper and phosphorus increase the sensitivity to irradiation embrittlement.

Uldis Potapovs (left) is a metallurgist in the Naval Research Laboratory's Reactor Materials Branch and J. R. Hawthorne is head of the Mechanical Metallurgy Section of the Branch. Both have master's degrees in metallurgical engineering, Potapovs from the University of Cincinnati (1958) and Hawthorne from Rensselaer Polytechnic (1955), and both are involved in studies of irradiation effects, particularly on pressure-vessel steels.



IRRADIATION OF UO_2 CONTAINING B_4C

UO_2 fuel elements, containing 0.05 wt% B_4C , showed no significant dimensional change or axial redistribution of boron after irradiation to burnups of 1000 and 5000 MWd per metric ton of uranium at peak heat rates of 17.2 and 19.8 kW/ft, respectively.

S. S. Christopher (upper right) (BS, Metallurgy, Michigan Technological University) is manager of the Materials Engineering and Development Group at Combustion Engineering. J. J. Koziol (left) (MS, Metallurgy, RPI), supervisor of the Radiation Effects Group, is concerned with radiation effects on reactor structural materials. D. E. Mahagin (MS, University of Idaho), formerly with his co-authors at C.E., is currently engaged on the FFTF Project at Battelle-Northwest.



IN-LINE ALPHA COUNTERS

A small, remotely-operated in-line alpha counter has given reliable service in determining the plutonium concentration of aqueous and organic process liquids at the Marcoule fuel reprocessing plant.

J. Chabert (BS, Master of Physics) is an engineering assistant to the leader of the Regulation and Control Group of the Plutonium Department of the Marcoule Plant of the French CEA. He is interested in all aspects of various types of instrumentation, including data processing.



LEAD REMOVAL CROSS SECTION

A simplified method of deriving an effective removal cross section for neutron attenuation by metal shields, applied to a shipping cask geometry consisting of a lead sphere surrounded by a polyethylene shell, prevents costly overdesign or detailed neutron transport calculations.

Donald J. Dudziak (PhD, mathematics, University of Pittsburgh), a staff member at LASL, is presently on sabbatical leave for teaching and research at the University of Virginia. His interests include shield design, neutron source analysis, cross section data systems, and several areas of reactor physics.

BACTERIAL LEACHING OF URANIUM

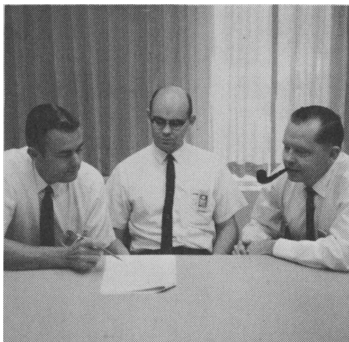
Bacterial leaching of uranium ores, a production method since 1962, uses water or an acid solution to dissolve uranium oxidized by bacteria. The water is pumped to the surface where recovery of ammonium diuranate is carried out by conventional ion exchange methods.

R. A. MacGregor, surveyor, geologist, and presently underground superintendent, has been with Stanrock Uranium Mines (Ontario) since 1960. He developed bacterial leaching of uranium at Stanrock, the first mine in the area to use this process on a commercial scale.

MICROWAVE PHYSICAL PROPERTIES SENSORS

A technique using a waveguide for transmitting a microwave signal to instruments outside the reactor can measure both temperature and gas coolant impurities inside high-temperature high-flux reactors.

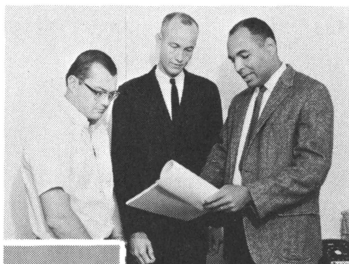
T. Roger Billeter (left) (MSEE, University of Washington, 1961), a senior research engineer at Battelle-Northwest's Instrument Research and Development Section, has primary responsibility for development of temperature and impurity measuring sensors. Donald P. Brown (center) (MSEE, University of Washington, 1965) is a senior research engineer specializing in thermal- and fast-neutron detectors for in-core application. Ward G. Spear (MSEE, University of Idaho, 1960) manages the IRD Section.



GAMMA AND NEUTRON DOSE IN A W-H₂O CORE

The absolute gamma dose in a tungsten water-moderated reactor critical assembly, measured with CO₂-filled ionization chambers with graphite walls, agreed with Monte Carlo calculations within 10%. Calibrated polyethylene-walled chambers, filled with ethylene, measured mixed fluxes which could be partitioned into separate gamma and neutron doses.

George Houghton, Gerald Trimble, and Clyde Jupiter (upper left to right) are on the Accelerator Physics Department Staff at Gulf General Atomic where their research includes subcritical assembly studies, neutron transport, reactor kinetics, and detector instrumentation. David Spielberg (inset), an advisory scientist at the United Nuclear Corporation, has worked on problems of shielding and air scattering. Paul Klann (lower left) and Walter Paulson are nuclear engineers at the NASA Lewis Research Center where they are involved with fast reactor design for space power applications.



Corrigendum

On page 293 of the November 1968 issue of *Nuclear Applications* (Authors and Papers section), the photograph at the bottom of D. A. Costanzo and L. T. Corbin should be at the top of the page; each of the top three photographs should then be moved down one position to appear opposite the proper text.