

BOOK REVIEW

Selection of books for review is based on the editors' opinions regarding possible reader interest and on the availability of the book to the editors. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.



Peaceful Nuclear Explosions III
(Proceedings of a Panel Organized by the International Atomic Energy Agency and Held in Vienna, November 27-December 1, 1972)

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This volume presents the Proceedings of the Third Panel on the Peaceful Uses of Nuclear Explosions (PNE) organized by the International Atomic Energy Agency (IAEA) and held in 1972. Another meeting is scheduled for 1975. The IAEA is certainly facilitating the exchange of information on all aspects of this technology, but at this time, this reviewer is not sure where this technology is going. No single author asked whether the Plowshare concept is, or ever will be, socially acceptable. Without question, the Gasbuggy and Rulison experiments successfully increased gas production, but the stimulation of an entire low permeability basin would require several hundred explosions. Would nearby residents and the general public accept such a program? Fur-

ther, the use of this quantity of highly enriched uranium and plutonium might represent a serious loss to the emerging nuclear power industry. The U.S. Atomic Energy Commission has never released material efficiencies of nuclear explosives; consequently, a person wonders whether or not there is an energy gain in gas release. These rather personal thoughts, however, really do not tell the reader anything about the book. Let us get to the main business.

Papers are grouped under the general headings of "Statements of National Programs," "Specific Applications," "Phenomenology," "Radioactivity Considerations," and "Seismic Considerations." "Specific Applications" was of greatest interest to this reviewer. The paper, "The Use of Large Explosions in Dam Construction," by Rodionov and Romashov appeared to be interesting, and an English translation will be forthcoming. The program of the United States Army Corps of Engineers on the use of chemical explosive excavation for civil engineering applications was well described by LaFrenz. His comparison of cost trends of explosive and conventional excavation shows that chemical explosion excavation definitely offers cheaper costs. This is particularly true in underwater excavation—a high cost construction activity. Probably the most practical paper was concerned with *in situ* chemical leaching of primary copper sulfides and was written by Lewis, Braun, and Higgins. Their use of a large pressure vessel to simulate an underground chimney and the pilot plant leaching of real

copper ore should put a sparkle in the eyes of all good experimentalists. This is really a fine piece of work; the process is astonishingly simple, and it is on firm engineering ground. Taylor's article, "Gas Quality and Geochemical Studies in Gas Simulation Experiments," is a clear and lucid summary of the Lawrence Livermore Laboratory work on understanding the chemical changes and the radioactivity involved in gas stimulation experiments. More work should be done in this area.

In the section, "Radioactivity Considerations," Kelly et al. present an excellent study on relative risks associated with nuclear stimulated natural gas. They show that morbidity rates from this source of radiation and from power reactors is minuscule when compared with other causes of death. In my opinion, this paper makes a real effort to answer some sociological questions about these new sources of power.

The book is clearly printed, the editor has done an excellent job in putting papers from different authors into a reasonably similar format, and the drawings are clear. The book is definitely useful to specialists in the field, and I hope that future volumes will be as pleasing as this one.

John A. Wethington, Jr. is a professor of nuclear engineering at the University of Florida, and except for an occasional leave of absence, he has been there for twenty years. He is known for his slogan, "Good people leave; we incompetents remain." Besides science, his other interests are jogging and flying.