The Constructive Uses of Nuclear Explosives. By Edward Teller, Wilson K. Talley, Gary Higgins, and Gerald W. Johnson. McGraw-Hill Book Co., New York (1968). 313 pp. $12.75.

It is said that the Plowshare "reports" generated by the several national laboratories and USAEC contractors would fill more than 100 feet of bookshelves. The published literature is scattered among many journals. It is, therefore, a great relief to the student and the uninitiated engineer wishing to explore the constructive uses of nuclear explosives that the first professional book on this subject has appeared. The book has many potential readers: applied physicists, nuclear engineers, and earth scientists concerned with the explosive energy underground; nuclear chemists, health physicists, hydro- and geohydrologists, meteorologists, seismologists, structural engineers, and others concerned with the safety of using such "instant-energy" sources; and applied scientists, petroleum, gas, and mining engineers, hydrologists, and hydraulic, construction, and sanitary engineers, and others concerned with the variety of potential applications.

The Constructive Uses of Nuclear Explosives, by Teller and colleagues, goes a long way in providing this condensed package of Plowshare literature to these many potential readers. The 300+ pages in seven chapters span the entire Plowshare program; Chapter 1 serving as an elementary, but broad coverage of the field. It is, in essence, a preview of the rest of the book. Chapter 2 reviews the several aspects of explosive energy transfer from the microscopic point of view of the applied physicist. Earth scientists, and civil, mining, and other engineers, who have not been introduced to advanced physics and quantum mechanics will find the chapter difficult. Chapter 3, entitled "Nuclear Radiation," reviews one of the hazards of nuclear explosives engineering. The other hazards of air blast and seismic disturbances are included as engineering parameters in another chapter. It is not clear why the radiation hazard is deserving of a separate chapter, especially since the seismic energy response may turn out to be the yield-limiting parameter in many applications.

The final four chapters review the state of the technology in underground nuclear explosions and the many potential civil, industrial, and scientific applications. The calculations for the geometric effects of underground nuclear explosions are given by both the empirical scaling laws and the numerical codes developed from two-dimensional stress wave propagation theory and the behavior of brittle materials. Many of the currently-proposed applications are examined, including the 1964 study of a sea-level canal across the American isthmus and the now-executed Gasbuggy experiment to explore the stimulation of natural gas production. The final chapter reviews some scientific applications in neutron physics, geophysics, and space physics.

The book is a must for any scientist or engineer wishing to be informed on nuclear explosives engineering. The student in the many schools now offering, or about to offer, this subject as an academic course will also find the book suitable as a text. The authors have performed a great service in preparing this timely, professional book.

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About the Reviewer: Paul Kruger is Professor of Nuclear Chemistry at Stanford, where he has been a member of the faculty since 1962. Prior to this academic position, he was associated with Nuclear Science and Engineering Corp. and Hazelton-Nuclear. Dr. Kruger's research interests are in radioisotope engineering and in environmental radioactivity; he did his graduate studies at the University of Chicago after earning a BS degree from Massachusetts Institute of Technology.

Corrigendum

WAYNE K. LEHTO and JOHN M. CARPENTER, "Determination of Reactor Kinetic Parameters by Photon Observation," *Nucl. Sci. Eng.*, **33**, 225 (1968).

Two typographical errors appear in Eq. (4), page 228:

In the denominator immediately preceding the bracket α should be squared; in the denominator within the bracket cos ϕ should be squared. The corrected equation should, accordingly, read:

$$\frac{d\sigma(T', E_\gamma)}{dT} = \frac{d\sigma}{d\Omega}\,\frac{2\pi}{\alpha^2 m_0 c^2}\left[\frac{(1+\alpha)^2 - \alpha^2\cos^2\phi}{(1+\alpha)^2 - \alpha(\alpha+2)\cos^2\phi}\right]^2 .$$