

exists that the intense neutron flux from a nuclear explosion could be used to produce very heavy elements in sufficient quantities to study their chemical characteristics. At the same time, the isotopes could be studied with very high beta-decay energies. The difficulty, of course, is in recovering the neutron-irradiated material quickly enough from the underground explosion site to study the material before the rapidly decaying isotopes disappear.

Other physics experiments that appear attractive as subjects for research with nuclear explosions include neutron capture reactions; neutron—neutron scattering; small angle scattering, such as the possible interaction between neutrons and electrons; and neutrino—electron interactions.

In another field of scientific inquiry, the seismic signal from an underground nuclear explosion can aid man's understanding of the composition of the earth. A nuclear explosion providing a source of known seismic-wave strength can be precisely located in the area of interest and can be detonated at a precise and previously agreed upon time. By using nuclear explosions seismologists have already increased their precision in the knowledge of seismic-wave propagation through the earth.

Much is yet to be learned about nuclear explosions, and, conversely, much is yet to be learned about far-ranging fields and disciplines by using nuclear explosions. The technology and understanding of peaceful nuclear explosions has, however, advanced to the state where they can be safely, efficiently, and beneficially used for earth moving, for recovering natural resources, and as research tools for man's understanding of his environment.

The nonproliferation treaty

As of Apr. 10, 1970, the Treaty on the Nonproliferation of Nuclear Weapons had been signed by 97 governments, including the United States, the United Kingdom, and the USSR.

The negotiations showed the world's interest in nuclear explosions for peaceful purposes. The participating countries recognized early in their negotiations the inescapable technological fact that a nuclear explosive device intended for peaceful purposes could also be used as a weapon. Any nation able to make nuclear explosive devices for peaceful purposes would also be able to make nuclear weapons. Therefore, in the