

plausibility to the assumption that Russian nuclear power is indeed being used in this important field.

Unfortunately a discussion of Plowshare must remain incomplete in one respect. We cannot enter into a detailed discussion of the nuclear explosive itself. This is almost as bad as giving a performance of Hamlet in which the Prince does not appear. One important general statement, however, can be made: The best tool for Plowshare is the thermonuclear explosion.

The idea of the hydrogen bomb has been identified with an exceedingly large explosion. Indeed thermonuclear explosives lend themselves particularly well to big explosions and it was in this field that the hydrogen bomb became recognized as a tool of great military importance. However, with advancing knowledge we have learned to make less powerful thermonuclear explosives, and these are of great importance because they furnish relief from the two difficulties facing the acceptance and practicability of the Plowshare proposals. By using thermonuclear explosives we can avoid producing the large quantities of radioactive materials characteristic of fission explosions. Having produced a crater we might enter it at once after the explosion without exposing ourselves to more radioactivity than the personnel of our Laboratory are permitted to take as a routine matter. Explosives of such cleanliness have not yet been produced, but there is no doubt that they are feasible and require only a few more years for development.

A second and no less important advantage of thermonuclear explosions is their lower cost in comparison with fission explosions, for a given energy yield. With further development of the art, it is possible that nuclear explosives will become competitive with conventional explosives in sizes down to a thousand tons or in some cases even a hundred tons TNT equivalent. Thus