

the thermonuclear explosives which were once considered as an instrument of ultimate terror might become the means by which the first large-scale peaceful use of atomic energy will become practically feasible.

### Earth-Moving Devices

The discussion of the peaceful applications of nuclear explosives has produced some concrete ideas that surely can be realized and it has also produced some promising possibilities which for the time being we must consider as dreams. First, we shall mention those applications about which we can feel quite sure. They boil down to a single fact: We can make a hole in the earth - if anybody wants to do that. As a matter of fact, there are some important reasons why one should want to move big quantities of earth.

A kiloton explosion placed 100 to 200 feet underground will produce a crater approximately 300 feet in diameter, which is the length of a football field. Bigger explosions will move (in first approximation) proportionally bigger amounts of dirt. Thus a megaton explosion will move a thousand times as much earth as a kiloton explosion, which means that each dimension of the hole that is produced will be greater by a factor of 10. Thus the crater from a megaton explosion placed 1000 to 2000 feet underground will be about 3000 feet in diameter.\* Such a single hole scooped out from an appropriate shoreline can form a crude harbor.

A better harbor or even a canal can be obtained by setting off a number of simultaneous explosions. If the craters of these explosions over-

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\*According to a more accurate law which takes into account the effects of gravitation, the linear dimension of the crater will increase with the 0.3 power of the yield rather than with the  $1/3$  power.