

PUBLIC HEALTH

"Dirt" from "Clean" Bombs

The "clean" atomic bomb is being offered as a solution to the problem posed by continued nuclear testing and the effects of radioactive fallout on the world now and tomorrow.

► THE IDEA of a "clean" atomic bomb is now being presented to the world as a foil to the public's fear of radiation from radioactive fall-out.

The hope of a "clean" bomb has become an argument for continued bomb testing.

The cleanest bomb is, of course, one that is not exploded.

To stop putting radioactive material into the atmosphere, it is only necessary to stop exploding bombs for testing purposes or otherwise.

The basis of the so-called "clean" bomb is that when the light chemical elements have their mass converted into energy by the process called fusion, the by-products are relatively non-radioactive and harmless. These light elements are double-weight hydrogen, deuterium, triple-weight hydrogen, tritium, and perhaps lithium.

Catch to the "Clean" Bomb

The catch is that in order to fuse these elements or start their mass converting it is necessary to create temperatures of millions of degrees. This can be done, so far as is known, only by using the heavy-element, more conventional atomic bomb made of uranium 235 or plutonium. This is the material that is said to fission. This starter bomb is "dirty," that is, it creates heavy radioactive debris of long life, such as the strontium-90 isotope which persists for many years and works its way into the bones by replacing calcium.

One possibility is that there has been discovered a way of igniting the fusion or hydrogen bomb without the need of a fission bomb. The peaceful equivalent is being sought in the AEC Sherwood project now underway to obtain power from the light elements non-explosively. But success in this research has not been announced, although any progress would probably be kept top secret.

There seems to be another source of "dirt" in the biggest hydrogen bombs.

Mixed in with the light elements, whether they are deuterium, tritium or lithium, is some good old-fashioned uranium. It may be that natural uranium, largely the isotope 238 variety which is non-fissionable in the ordinary A-bomb, is set off or fissioned in the intense heat of the hydrogen bomb. It can be used to beef up the hydrogen bomb, with consequent added "dirt" or radioactive debris.

Uranium 233, another isotope, which is made from thorium and fissionable, could be similarly used, and thorium might be used for H-bomb reinforcing purposes with the idea that it would be converted and then fission. This would still produce "dirt."

When a minimum fallout weapon was first announced last year (this has evolved

into the so-called "clean" bomb), there was speculation that a baby hydrogen bomb, triggered by a minimum fission or plutonium bomb had been developed. But it does not seem likely that a localized H-bomb is being considered. For use in little wars the conventional A-bomb has been made relatively small.

Lithium, known to be used in large quantities in the H-bomb program, is another possible "clean" bomb ingredient. Lithium is used to manufacture tritium, producing it when bombarded with neutrons, obtained by a relatively prodigious expenditure of uranium in large reactors as erected at Savannah River, in Georgia. Under the great heat of the H-bomb, tritium might be manufactured from added lithium and fused in a minute fraction of a second, enhancing H-bomb power. There would not be "dirty" debris.

The catch in the "clean" bomb idea is that it may still be an untried idea. In

other words, it is an argument for continuing bomb testing, in the face of a considerable body of scientific opinion that the tests should be stopped.

If there were world-wide atomic war, the "clean" bomb in its present state would not be greatly involved. The stocks of A- and H-bombs are so large, presumably, in both the U.S.A. and the U.S.S.R., that they would be used.

"Clean" Bombs for Russia

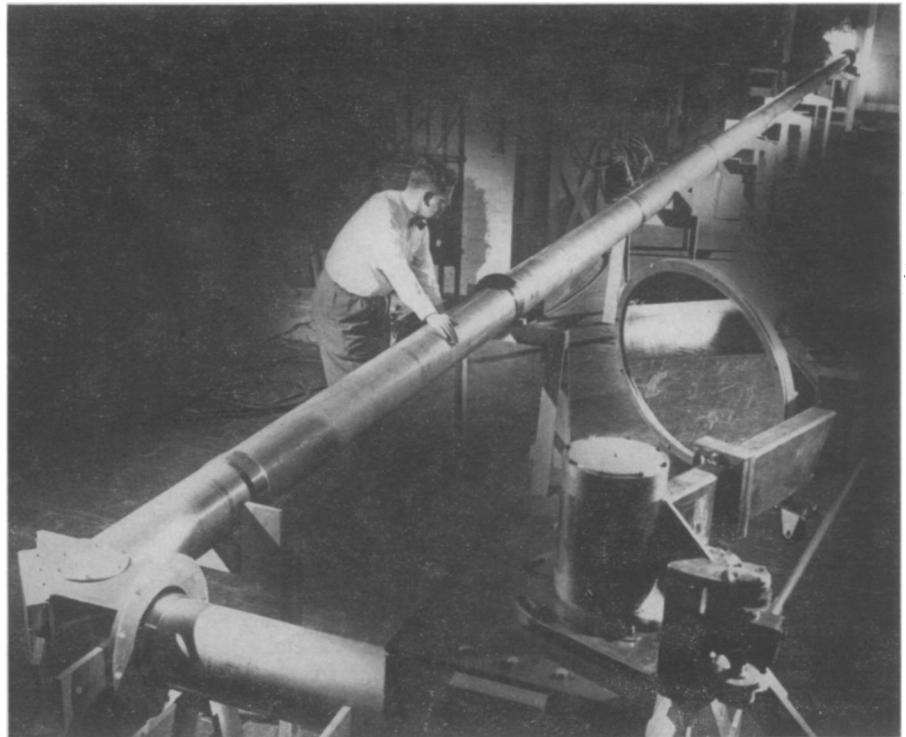
To protect ourselves, if and when we get a "clean" bomb, we should, logically, immediately tell the Russians how to make them, for then bombs used against us might be safer for us and not dirty up our landscape. But since most of what is written about H-bombs, clean or dirty, is of necessity surmise, this will be considered impractical, unless policy so changes that what is happening in the atomic laboratories can be told.

War was never "clean."

War in atomic phases is "dirtier" than ever, with bigger and worse explosions, including the radioactive explosions that extend through damaged germ plasm to many generations in the future and warp human heredity.

The arguments for peace are more compelling than ever.

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WORLD'S LONGEST LOOK—The 90-foot periscope developed by General Electric Company permits engineers to observe a "hot" nuclear reactor while they remain in a shielded cubicle. To protect observers from radiation, the "eye" of the periscope, while it is located only a few feet from the reactor, it pointed away from the reactor at a remotely controlled scanning mirror which can be seen in the right foreground. Images are reflected by the mirror which can be rotated in any direction. The periscope will be installed at the Atomic Energy Commission's National Reactor Testing Station near Idaho Falls, Idaho.