

foolish not to have developed all defensive and offensive angles of this potential weapon. Our enemies were or could have been at work in their medical laboratories.

On the eve of the United Nations Organization's first general assembly, even the facts about biological warfare so far developed may seem to add to the diffi-

culties of building the peaceful world. Like the atomic bomb, however, biological warfare makes a united peaceful world all the more urgent.

The only hope is to bring germs and atoms alike into the open so that they may be controlled in the interest of all peoples.

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BIOLOGY-MEDICINE

## Harmful Effects Persist

Biological warfare doesn't stop with surrender or armistice; once it is let loose it cannot be brought under control again like other forms of war's destructiveness.

By FRANK THONE

► BIOLOGICAL warfare, loosing the germs of pestilence against whole peoples, will undoubtedly strike humaneminded persons as the ultimate in atrocities. It isn't, necessarily: people suffer just as agonizingly from flame-hurt and bomb-blast as they would from plague or cholera—or whatever diseases might be sown among them by an enemy.

No, the worst horror about biological warfare is that once loosed it cannot be brought under control again. Other forms of war's destructiveness are more or less self-limiting: they run their course and stop. The most awesome of them all, the atomic bomb, strikes with the suddenness of a thunderbolt. Most of the thousands who died in Hiroshima and Nagasaki did not even have a hundredth of a second in which to realize that they were dying. Other explosives, though more limited in scope, can be almost as instantaneous in effect.

Incendiary fires, though self-propagating, are also self-limiting. A town or a factory may burn for days, but when everything combustible has been consumed the fire goes out. When the victor moves in, he finds the ruins charred, but cold.

Even the worst of the poison gases, like lewisite and the nitrogen mustards, are limited in their effects. They may contaminate an area so severely as to interfere with the advance of the user's own troops, but after a couple of good rains their curse is washed from the countryside.

Not so, however, with the germs of disease that man may launch against his fellow man, or his ox and his ass, or his wheatfield and vineyard. These are self-propagating but not self-limiting, except

in the mysterious fashion that some epidemics have, of "running their course". But even then, there always remain some reservoirs of the disease, in which it remains latent for a time and then breaks forth again.

The same would be true of artificially propagated diseases of crop plants or of forest or orchard trees. Once an infestation is let loose among them it is almost never eradicated. One or two such plagues have been stopped, but only by most drastic methods and in limited areas, like the outbreaks of citrus canker and the Mediterranean fruit fly in Florida some years ago. For the most part, however, the story is one of heroic effort and final failure: black stem rust of grains, late blight of potatoes, codling moth in fruits, are only three out of a thousand possible examples. And their mischief was wrought blindly and spontaneously; they had no aid from a malicious enemy in getting started.

We must face the fact that if one nation launches such uncontrollable agencies of harm against its neighbor, the war will never stop. Plagues and pests recognize no surrender, know no armistice. A germ-conquered people will make occupation unsafe for the conqueror's troops unless they are thoroughly immunized; and although the weakened survivors may offer no resistance to the victor's will they will be too inert to give obedience to his decrees. Their wasted fields, with blights still sweeping on unchecked, will have little capacity to pay reparations.

Such pestilence-ridden lands could easily forbid entry to victorious armies, even though the exhausted losers could not fire a shot against them, simply through fear of the black tributes of defeat that homegoing troops might carry



**PROTECTION NEEDED—Resembling a "Man from Mars," a man wearing a rubberized protective suit prepares to go about his duties at the Naval Medical Research Unit.**

back with them. If intercontinental war is ever waged with biological weapons, it may become necessary to maintain intercontinental quarantines for years afterwards, with communications (if any) maintained only by cable and radio, and even the magnanimous victor's charity gifts of food and medicine dropped hastily from speeding planes or impersonally hurled across the oceans in rocketcraft.

Biological warfare can be terribly devastating. But it is a two-edged weapon, not to be lightly unsheathed.

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SEISMOLOGY

## Last Earthquake Of 1945 "Got Lost"

► THE LAST big earthquake of 1945 "got lost" and has only now been turned up by seismologists of the U. S. Coast and Geodetic Survey, after a study of data transmitted by wire and radio through Science Service. It was a very heavy shock, but probably produced no harm, for it shook the ocean bottom off the northern coast of New Guinea.

Epicenter location was in approximately 5 degrees south latitude, 147 de-