

PUBLIC HEALTH

# Fighting War Plague

Medical and health authorities are determined that tuberculosis shall not take its toll in this country. Army is X-rayed. Civilians should be, too.

By JANE STAFFORD

► TUBERCULOSIS is on the march again. In Europe, war has already broken the barriers man painfully built through the years against this disease. Reports show an upward swing of cases as the White Plague claims more and more victims. By the time the war is over 10,000,000 persons in Europe will be affected, it is predicted.

Here in America, medical and health authorities are determined to hold this war plague at bay. First and foremost weapon they are using in the fight is the X-ray which shows, before any other sign, when the tuberculosis germ has taken up residence in the lungs and started to brew trouble.

Since the spring of 1942, every man going into service in the armed forces has had his chest X-rayed before induction. Tuberculosis authorities want this example followed by the civilian population, the millions of men too old or too young for service in the armed forces and needed in essential work at home and the 40,000,000 women who are serving their country as workers or homemakers, or both.

The reason for urging X-ray examinations of the chests of every person in the nation is that such examination shows tuberculosis in its earliest stage, when it is most easily cured and before it has had a chance to spread to another person.

## Small, Slow Germ

Tuberculosis is caused by a very small, rod-shaped germ. These germs are very fussy about the places in which they live. Their favorite residence site, apparently, is the lungs, though in about five out of 100 times they may take up residence in some other organ of the body. They are also slow-action germs, taking a full day to complete a full cycle of reproduction, for example, whereas pneumonia germs require only 20 minutes for this process. Similarly, the sickness caused by the tuberculosis germs may take years to develop, in contrast with only a few days for the pneumonia germs.

Whether it is the tuberculosis or the pneumonia germ that invades, the body fights back with all its force and may in time be able to kill all the invading germs. Scars of healed tuberculosis, marking the body's victory over the invading germs, can be seen on millions of chest X-ray pictures.

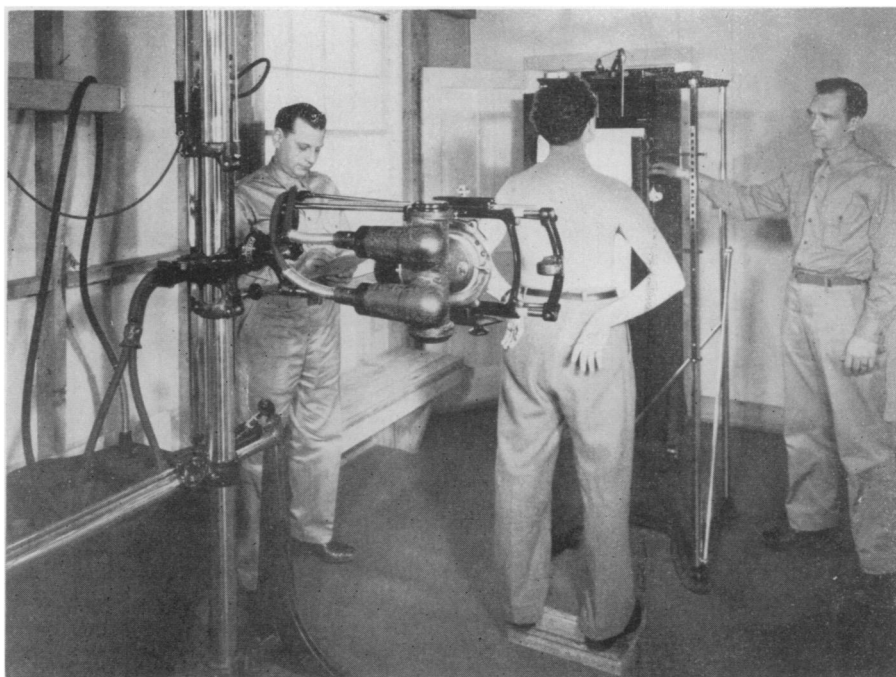
More often, however, instead of victory for the body's germ-resisting forces, there is an armed truce. Both sides fight to standstill, with the body unable to kill all the germs and the germs unable to make headway. This state of balance exists in a person who has what doctors call healed primary tuberculosis. The person is perfectly well but he has tuberculosis germs in his body. Many such people never become sick with tuberculosis.

The state of balance between body resistance and germs, however, can be upset in many ways. One of these is in-

vasion of additional forces of tuberculosis germs. This can happen by coming in contact with a person who is sick with tuberculosis, whether he is in bed or not, and who is scattering germs like parachute troops in droplets of moisture when he coughs.

The balance between tuberculosis germs and the body's resisting forces can also be upset if anything happens to weaken the latter. Serious illness with some other disease often lowers the body's resistance. Lack of proper food, of sufficient rest and sleep, overwork, harmful recreation, worry, excessive stress and strain may lower the body's resistance. Constitutional factors also apparently play a part in maintaining the balance between resistance and the tuberculosis germs. This last factor is being investigated in a research program recently initiated with financial assistance from the National Tuberculosis Association.

You can easily see how war, which overcrowds living quarters, street cars and buses and even work places, increases the chances for tuberculosis germs to get from one person to another. Equally



**CHECKING CHESTS**—All men going into the armed services are X-rayed for signs of tuberculosis. This is a first step of preparedness against the plague of war.



**REDUCED SIZE** — Small X-ray films, only four by five inches, are being used in the wholesale job of X-raying the Army. Examples of the small film technique are shown here compared with the usual size at the nurse's right.

obvious are all the war-caused strains, the worry and the difficulty of getting an adequate diet which singly or together may weaken resistance and upset the balance between the tuberculosis germs and the body's fighting forces in favor of the germs.

Even after that balance has been upset, it may be weeks or months before the person is aware that anything is wrong, before he notices that he gets tired easily, especially in the late afternoon, and that he is losing weight, having night sweats and coughing quite a lot. It may be still later before pain in the chest develops or he starts spitting up blood. All that time, however, the germs are making headway, increasing their numbers and destroying lung tissue. The longer the condition goes unnoticed and untreated, the harder and longer and costlier will be the fight to stop the germs and regain the state of balance between them and the body's resistance, and the greater will be the number of other persons exposed to tuberculosis germs that may break the armed truce in their bodies.

The cost of tuberculosis in man-hours lost alone is given in figures from the

National Tuberculosis Association:

"Tuberculosis sanatoria are giving more than 22,000,000 patient days of treatment yearly; tuberculosis divisions of hospitals give about 6,000,000. These figures, added to the man-days required to take care of patients by doctors, nurses, cooks and janitors, make a grand total of over 40,000,000 man-days yearly."

This is enough time to build 160 destroyers, or 940 flying fortresses, or 8,000 combat planes, or 16,000 light tanks, or 20,000 howitzers, or 34,000 jeeps, or 550,000 30-caliber machine guns. On the financial side, the cost is equally staggering. The cost of tuberculosis among veterans of the last war alone, before X-rays were used to detect tuberculosis in apparently healthy men and to prevent their being inducted into the Army, has passed the billion dollar mark.

One reason why tuberculosis treatment is so long and costly is that it depends

so much on rest. The body must be relieved of all strain and effort so it can concentrate all its strength for fighting the germs back to a standstill. Doctors in recent years have found ways of hastening this process, or helping it along, by putting the affected lung that bears the brunt of the battle at rest. This is usually done by injecting air into the space between the lung and the chest wall, so that the lung, or part of it, collapses. The injected air then acts like a splint, preventing movement of the lung, just as a splint keeps a broken bone from moving while it heals.

Some day there may be a chemical remedy for tuberculosis as effective as sulfa drugs now are in treating pneumonia. Experiments along this line are in progress. The results are promising but the work has not gone far enough for doctors to be ready to use the treatment generally.

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#### RESOURCES

## Search For Crystals

**Radio quality quartz needed in large quantities for war purposes. North America believed possible source in addition to South America.**

➤ NUMBER ONE strategical mineral problem at present is a domestic source of supply of quartz crystals suitable for radio equipment and other electrical uses in the war effort. Radio is the life line of the armed forces. Battle movements of soldiers, sailors and airforces depend upon it. Dependable instruments in which crystals are used must have crystals of the finest quality.

Brazil and other South American countries are the sources of the present supply. In the United States there are plenty of quartz crystal deposits, but satisfactory crystals for electrical uses had not been developed from them in pre-war days. An intensive search is now being made by the U. S. Geological Survey, the Bureau of Mines and other agencies, to locate quartz crystals with the necessary properties.

Results of the search are promising, although specific information will not be released until after the war. The best prospects appear to be in the crystals found in North Carolina, Virginia, Arkansas and California. The western mountain states are being searched as well.

Not all quartz crystals, regardless of

their general resemblance, are usable in electrical work. They must be first cut, and then carefully tested in well-equipped laboratories for their electrical properties. Size and appearance are, however, important factors. To be usable they should be at least an inch in diameter and over two inches long. They should be clear, and free from fractures and discolorations.

Quartz crystals are used in microphones, and as electric filters and oscillators. The so-called piezo-electric quartz crystal vibrates as an electric charge on its surface oscillates. The constancy of the rate of vibration is remarkable. It is more constant than the pendulum on a high-grade astronomical clock. A crystal of good quality kept at a constant temperature will not vary two seconds in ten days. It is this reliability that makes it essential as an electric oscillator.

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A well-mixed *nicotine dust*, 3% nicotine, may be used to control cabbage worms, corn borers and cucumber beetles, replacing war-scarce rotenone and pyrethrum.