

**CIVIL DEFENCE**  
**AND**  
**THE NATION**



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# THE FOURTH ARM

Civil defence, the fourth arm of national security against aggression, proved its worth in the last war and cannot without peril be neglected in the present state of the world. There is a natural reluctance among ordinary citizens to consider it as more than a remote and grim necessity about which the individual must be excused from thinking so long as the danger is round the corner and may never come into sight. This repugnance is based on two understandable impulses. The first is to say that service in the last war was for most people long and onerous and an excuse in itself for relaxing now, and further that, with so many kinds of regimentation and frustration vexing the average man, he has his hands too full to volunteer for an extra commitment. There is, secondly, but even stronger as a motive, the widespread feeling that attack in another war would overwhelm the defences of the civil population. Atom bombs and blister agents, nerve gas and biological warfare make so formidable and, to laymen, so incalculable a striking force that he is inclined to suspect that there is nothing practical that he or anyone else can do about them.

These two articles on civil defence have sought to analyse the effectiveness of each weapon that might be used to destroy life and to disrupt industry. The greatly increased power which science has placed at the disposal of a ruthless belligerent is examined in these articles and recognized to be, indeed, menacing. Fear that it would prove catastrophic, however determined and well organized the defence measures taken against it, is shown to be unjustified. The new warfare, seen in cool and realistic perspective, takes its place in the grimly lengthening list of scientific developments which, since the invention of gunpowder, have, one by one, been greeted on their first appearance as putting an end to all reasonable possibility of defence. The task of resistance to atomic and other forms of attack would be hard, but it need not be impossible. If the plans are well laid in advance and the will of the ordinary man and woman is resolute in helping to carry them out, then civil defence could preserve the nation. This conclusion makes it important to

consider what has already been done and what has still to be attempted.

Progress in recruitment since the campaign was launched last October is evidence that a minority of citizens was promptly prepared to offer itself for this service. The strength of the Civil Defence Corps has risen from 61,000 last autumn to 150,000, that of the Auxiliary Fire Service from 5,000 to 10,000, and of the National Hospital Service Reserve from 4,000 to 16,000. There has also been a rise in the numbers of special constables, which have now reached 21,000. Most of the heavy burden of this duty falls on the local authorities who are in charge of recruitment and on the county councils and county boroughs who are responsible for organizing divisions of the corps. Local effort must be the basis of civil defence, but in an emergency it would have to be reinforced by mobile columns and the position would be improved if some of these were to be raised. A regional unit on a small scale, however efficient it was, could not, by itself, handle a determined large-scale attack.

Industry has a special part to play, and it was given a lead earlier this summer by the Home Office in a preliminary memorandum on the organization of civil defence in industrial and commercial establishments. The object is to enable industry to assist by forming defence units of its own. Expenditure incurred in making such arrangements is classed as "revenue" and is admissible as a deduction in computing trading profits for income-tax. A nucleus of full-time workers must be available to make these various schemes effective, but their ultimate success depends on part-time service. Men and women of thirty or over, who have no commitments with the fighting forces or other branches of the national effort, are eligible for—and wanted by—the Civil Defence Corps and its allies in the police, fire and hospital services call for volunteers. The obligation of those who join up can be as little as attendance at a local centre for four or five hours a month. It is the duty of every one who is free to do so to ask himself or herself whether there is any compelling reason against coming forward as a volunteer. As the PRIME MINISTER said in a broadcast, it is not enough to put off the shouldering of a national responsibility with the reflection "I will be there on the day."

# THE ROLE OF CIVIL DEFENCE

## I

### ACTIVE MEASURES TO COMBAT NEW WEAPONS

The number of people killed in Hamburg during 10 days of Allied bombing in 1943 was about the same as the number killed in the whole of the United Kingdom throughout the war. To-day results comparable with the saturation of Hamburg can be achieved instantly with two atom bombs. Never has civilian life and industry been so exposed to so powerful a cataclysm of possible destruction, and if a future war is to be sustained on the battlefield there must be prodigious effort to maintain the war machine at home.

The Germans at first treated civil defence as an irritating aside to the prosecution of a virile war, an error which ultimately they were hard pressed to repair. The coming of the atomic bomb, and perhaps other potent weapons, leaves no choice but to prepare thoroughly the framework of an efficient home defence system and to build upon it as well as time and circumstance will allow. It is a concern not only of the nation but of the individual, for man's ingenuity has brought death and destruction nearer than ever before to his own doorstep.

The label "defence" is now psychologically unsound, for a strong defence force, if not an active power in the sense of combat, is more than passive, and is better described as active neutralization, rendering abortive enemy attempts to undermine the power or will to fight and win. It would be a mistake to under-rate the importance of this role, for without the tail of supply, based on industry and the people, military operations would quickly be stifled and lost.

Similarly, it is a mistake to decry the civil defence effort on the ground that there is no effective defence against the atom bomb. Much can be done to prevent terrible chaos and loss of life if the problems are properly appreciated.

#### ATOMIC BOMB EFFECTS

The atomic weapon is perhaps the most feared because it is the most spectacular, and, although it is a means of colossal destruction accompanied by certain short-lived but unusually lethal activity, one of its greatest evils is still the age-old-enemy of fire. Great areas of devastation, débris, and fire are caused within a radius of one to two miles from the burst of an atomic bomb. Within a radius of one mile from ground zero (the point on the ground immediately below the bomb burst), collapsing buildings will fill the streets with débris, making it difficult if not impossible for road transport to move through the area, although this collapse will generally smother out the risk of fire.

In the secondary ring, of radius greater than one mile and stretching perhaps to two miles, there will be débris and collapse to varying extent, with many fires and a considerable risk of larger conflagrations. In some heavily built-up areas there may be a risk of firestorms. Because of fires in the outer ring, and much débris but little fire in the inner ring, it may be necessary to begin operations against the damage from the perimeter, working inwards towards the centre of greatest damage—an area, therefore, which cannot expect immediate aid from outside. In a

city with a concentrated working population the number killed and the number injured may each reach 40,000, while in a residential area of average density up to 100,000 may be homeless in addition.

This assumes only one atom bomb. All who are in the streets or parks and not shielded by intervening buildings from the initial gamma flash may be killed instantly within a mile of ground zero, and injuries may be caused to others at distances up to three miles. The fall-out of fission products may cause lingering radioactivity over the area of damage if the bomb burst is relatively low, but may be dispersed over a wide area to negligible effect if the burst is high. If radioactivity persists in strength it may be necessary to forbid entry into the affected area, but this condition is likely to be particularly local.

Next in seriousness to the atomic bomb comes the highly lethal and more insidious weapon of nerve gas, a German invention stockpiled by the enemy during the last war but never used. This gas is both odourless and colourless and is difficult to detect, so that it is possible to absorb a lethal dose before the symptoms begin to appear. A small dose affects the eyesight and causes a violent headache, while a larger dose leads to convulsion and death, sometimes in a matter of minutes.

Nerve gas is a liquid at normal temperatures, but since it is volatile the amount of liquid contamination likely to be encountered will depend on how it is dispersed from the weapon and on the distance of the individual from the point of burst. In most circumstances only people very near to a bursting bomb are likely to be contaminated with liquid, but since the liquid has a penetrative power many times greater than mustard gas extremely rapid action must be taken if it falls on clothing or skin. Any clothing contaminated with liquid nerve gas must be removed at once; there can be no question of seeking a shelter for modesty.

### BIOLOGICAL WARFARE

Of the blister agents, mustard gas is the most likely, and the effects of this are already well known. Although gas was not used in the second world war, the discovery of the nerve group of gases is

believed to have increased the risk of gas in a future war. It is thought in some quarters that both nerve gas and biological warfare could be as lethal as an atomic bomb, but without the equivalent loss of property and industrial plant.

While there are enormous possibilities in biological warfare, which is the spreading of disease and infection through water, food, animals, or in the air, there are at present many practical difficulties in the way of using most germs as a weapon. For one thing, germs are not easily kept in a state of virulence over long periods, thus creating a timing problem, for the value of a weapon depends much upon its facility for storage or ready use. Biological agents are unsatisfactory in both respects, but if used can lead to widespread illness, while ground can be contaminated for a few hours or days if the agent is non-persistent and for a very long time if it is persistent. As with nerve gases, very efficient covering of exposed parts of the body is required for immunity, together with a well-fitting respirator. Since there is no quick way of detecting either nerve gas or biological agents, it may be imperative to put on respirators as soon as an attack begins.

### HIGH EXPLOSIVE

To these possibilities must be added the more familiar high-explosive attacks, which may be to saturation level as in the allied attack on Hamburg, incendiary bombs, rocket and pilotless missiles, and sensitive delayed action bombs such as the butterfly. That several of these weapons may be used in combination, not simultaneously perhaps but in succession, shows clearly the gargantuan problems of the defence.

The destruction of the economic and industrial systems of both Germany and Japan ultimately caused the collapse of their campaigns, taken with overwhelming defeat in the field. It may be concluded that the successful prosecution of modern war depends much on securing mastery of the air and then pulverizing production, transport, and supply lines by methodical bombing. This policy was attempted by Germany but failed because she lost control of the sky, whereas the allies were able to expand the same strategy with impressive results once mastery of the air had been achieved. It may be expected that the same broad principle will underlie any future attack on this country.

## II

### FUTURE NEEDS AND PRESENT PLANS

It is not possible to generalize about defence against atomic, biological, and chemical warfare since much will depend upon the scale of attack and whether raiding will be continuous or sporadic. Steps that would be appropriate in one place would be totally inadequate in another, according to the vulnerability and importance of the target.

It is assumed, because of the present high speeds of aircraft, that not more than five minutes' warning may be given of a piloted attack—rocket and uncontrolled missiles may arrive without warning. It is also assumed that the evacuation of priority classes, such as children and mothers of children under five, will already have been carried out, together with the removal from key targets of all persons not necessary to the safeguarding and production of the area.

On the warning, as many as can reach shelter within five minutes will be expected to do so, although, if raiding is continuous, it may not be possible or desirable for a complete withdrawal to shelters in industry. Those not at work should take to shelter at once. Assuming the tactics of the enemy to be unknown, it will be necessary to wear respirators if anything is being dropped in the area, and, if not in a shelter, to seek any available shielding from exposure to the gamma and heat flash of the atom bomb.

The effects of thermal radiation are much reduced by comparatively slight protection. Light-coloured clothing will reflect

heat rays, and in the same way the painting in white of windows in factories and offices will also afford useful protection. In a future war black-out curtains will have to be fireproof, for heat flash will set fire to a piece of wood at a distance of one mile.

#### USE OF SHELTERS

The only satisfactory protection against flash gamma radiation is in shelter behind such a shield as several feet of brick, concrete, or earth. The domestic shelter can be strengthened to afford reasonable protection against flash radiation, and those of the Anderson type will be of considerable use in a residential area. It is said to be three times safer to be in a house than in the open during an atomic explosion, and five times safer to be in a top-grade shelter than in a house. The question of shelters is at present being carefully studied.

The prime need of the control organization after an atomic explosion is information, and a thorough system of communication, with alternative channels, must be readily available. If there is an efficient system of reporting from control centres, sub-control, and wardens' posts or report centres, the controller is able to direct aid to the affected areas quickly and may also be able to judge at once what assistance is required from outside. Quick information will prevent the aggravation of initial damage. On this, he will send a reconnaissance team to the stricken area to report back on radiation, damage, fire,

and other factors which will decide the measure of aid and the ordering of fire, hospital, police, mobile column, and military services. He must also be able to summon rescue and engineer services, and direct evacuation and billeting operations.

If there are as many as 100,000 homeless, as there might be, they must be assembled, possibly at predetermined points, and transported to camps outside the target area, where the provision of food and stores for the emergency feeding and sheltering of so great a number will itself be a major organizational task. This work will fall largely to the welfare section, which also will have to maintain a record of persons moved and their addresses so that they may be traced. This also will be a huge administrative task.

An atom bomb dropped without warning on an area from which there had been no evacuation might cause casualties, including all grades of injury, to a total of about 80,000, and these would require attention, ranging perhaps from treatment for minor injuries at first-aid posts and mobile units to full evacuation to hospital. Many ambulances would be required to carry out this work speedily, although the number can be scaled down by careful siting of hospitals, to which a short run would give a quick turn-round. The movement of these services in the area must be controlled to avoid confusion and delays, and often an inward and an outward route—chosen before hand—will be followed after any necessary clearing by the pioneer services. These may also be required to deal with damaged mains, bridges, or any other engineering works.

### GAS AND GERMS

It is not likely that an atom bomb would be accompanied by either gas or germ warfare, although this might be used in the same area some time later to interfere with restoration. Neither gas nor biological agents would add much to the losses of an area already attacked by an atom bomb and in which all the services of negation are fully at work. Insidious agents could be more successfully used against an area

not attacked in other ways. If biological warfare is used at all, it is more likely to be used against the civilian population than against troops; the spreading of disease is a slow process not well suited to tactical ends and could lead to inconvenient contamination of ground in a battle area. At home, there may be some risk of germ warfare from saboteurs. For example, the intake ducts of factory ventilating systems, and even paper money, offer possibilities of disseminating infection. The most likely method of dissemination is by aircraft.

The first defence against biological warfare is scrupulous hygiene and sanitation in conjunction with individual aids such as a close-fitting respirator, protective clothing, and vaccines. Removal of contaminated clothing and personal cleansing must be carried out in the same way as for gas cleansing. In the case of liquid gas contamination, particularly liquid nerve gas, this must be done at once, and under the self-help scheme facilities for this will be available in houses which will be appropriately marked.

### A VAST ORGANIZATION

This brief outline of the range of civil defence work shows that a vast organization is required to meet the numerous possibilities of attack, and it is plain that an army of men and women will be needed to defend the home front. At present, as it is not possible to prepare for the severest attack everywhere in the country, plans are proceeding on the basis of medium scale attacks. The possible scale of attack on an important city might be two atom bombs. One atom bomb, it is said, is the equivalent of 20,000 tons of high-explosive detonated at one point. Provision must also be made outside key target areas for wide misses due to navigational errors.

Civil defence has been termed the fourth arm of defence, but if intense blows are rained on Britain's industry, railways, ports, and warehouses, with not enough "defenders" to wrest order out of havoc it could become the front line of a siege.

# THE CIVIL DEFENCE CORPS

## HEADQUARTERS' SECTION:

Signals and communications; technical reconnaissance

## WARDENS' SECTION:

Non-technical reconnaissance;  
reporting of incidents; organization of domestic self-help parties

## RESCUE SECTION:

Release of trapped persons from burning or collapsed buildings

## AMBULANCE SECTION:

Specialists in first-aid; skilled drivers

## PIONEER SECTION:

The engineers of the Corps; débris clearance, demolitions, and emergency repairs

## WELFARE SECTION:

Evacuation and reception services; rest centres; emergency feeding units; mobile canteens and public information

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THE AUXILIARY FIRE SERVICE

THE SPECIAL CONSTABULARY

THE NATIONAL HOSPITAL SERVICE RESERVE

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*All inquiries about Civil Defence can be answered by your local authority*