

from the Air Ministry were largely nullified because of the R.A.F.'s own shortage of planes. Practice by night was handicapped by the fact that all planes were ordered to fly with navigation lights, thus making exercises unrealistic. It is my opinion, an opinion not necessarily endorsed by the other military or air authorities, that it is essential that the Army should be independent of other services in the matter of providing for air co-operation in the training of Anti-Aircraft units.

18. The state of training of the Militia when they arrived was considerably lower than that of the Territorial Army.

19. The only training establishment at the outbreak of war was the School of Anti-Aircraft Defence, which proved totally inadequate for training more than a limited number of officers and N.C.Os. as instructors. To supplement this, Divisional Schools were formed in each of the seven areas into which the country was then divided. Many Brigades and even Regiments founded unofficial schools of their own, where equipment and methods had to be improvised. Owing to the wide dispersal of Anti-Aircraft detachments throughout the country these schools were able to fulfil a need which could not otherwise have been met.

20. The flow of Militia into the Command continued after the battle had been joined and in the first three months of the battle no less than 70,000 recruits received their first training in an anti-aircraft rôle on gunsites which were for the most part in constant action against the enemy.

21. While it was clear that our training was woefully deficient it was also obvious that the successful engagement of enemy planes required the highest technical excellence in equipment.

I was most fortunate in having the help of Professor A. V. Hill who obtained for the Command some of the finest scientists in the land. These scientists were indefatigable in their efforts to improve our equipment and training. They were recruited from all over the British Empire; and even before America came into the war many of her scientists had volunteered to work on our gun sites. No tribute could be too high to pay to all these distinguished men. Although we had many hundreds eventually serving in the Command we never had enough; but I believe it is true to say that thanks to their efforts Anti-Aircraft Command became the most technical and scientific Command in our own or any other army.

22. The problem of scientific training became acute with the introduction of radio-location—or radar as it was later called. A radio school was formed at Petersham at which selected specialist officers and civilian scientists were trained on the equipment. It was arranged that they would subsequently live and work on gunsites and give the Artillery officers the assistance and advice of which they must otherwise inevitably have been deprived. The work of these young men, many straight from the universities, was invaluable.

23. Mention must also be made of the formation of the Operational Research Group of Anti-Aircraft Command; an invaluable organization consisting of scientists and military liaison officers, whose study of operational problems was of such value that their activities were

later extended to embrace all forms of military warfare. This body was then re-named Army Operational Research Group.

24. For the greater part of the period under review the administration of many of the ancillary services rested with Home Commands, who were responsible for the Anti-Aircraft services within their respective areas. On many occasions I had to protest most strongly against this division of control, since I was hampered in my attempts to obtain full efficiency as long as I had no control over many aspects of the life of the troops under my command. In addition, difficulties arose because Home Command boundaries differed from those of Anti-Aircraft Corps and Divisions. In the early part of 1941 full control of most services was vested in me. This decision greatly eased our difficulties.

25. Before I proceed to the details of the battle against the Luftwaffe it is necessary to outline briefly the plans for the disposition of the various forms of defence.

26. It was envisaged that the enemy's main objectives would include aircraft factories, cities, and particularly London and the main purpose of the defences was to prevent their reaching these objectives. The area around the cities and between them and the coast was, therefore, made an Air Fighting Zone in which out fighter aircraft would operate, assisted at night by searchlights. To this end there was a continuous searchlight belt 30 miles deep which stretched from the Solent, east of London, north to the Humber and then north-west to the Tyne-Tees area. A further belt ran between the Forth and the Clyde.

To deal with aircraft which nevertheless penetrated this defence, the important cities were made Gun Defended Areas, with searchlights to enable the Heavy guns to fire by night.

For the protection of isolated points of importance, such as factories and airfields, Light guns were deployed against low level precision bombing.

As more equipment became available more cities were defended and the defences of others increased. Searchlight cover was extended to the greater part of the country.

Each Gun Defended Area had its Gun Operations Room, which was a nerve-centre of the defences and could be used either to pass information to the guns or actually to control the fire.

In each R.A.F. Sector in the Air Fighting Zone the Sector Operations Room was fitted for transmission of information or orders to the searchlights.

27. I felt it necessary to express alarm at the comparative immobility of our defences and particularly of Heavy guns, but since static guns were much more rapidly produced than mobile guns, I was forced to accept them. Consequently I was handicapped whenever it became necessary to move guns from one area to another.

It was not possible to have sufficient equipment or manpower to defend every town which might be attacked nor could even the most mobile defences be moved sufficiently fast to be at any given point as quickly as the enemy aircraft. The value of mobile defences lies in the fact that the air battle, like any other battle, has a pattern which the enemy tries to carry out.