

When such a pattern is evident (e.g. the attacks on our ports; "Baedeker" raids etc.) defences can be organised rapidly to meet it.

## SECTION II.—THE DAY RAIDER.

28. All the equipment available during the first year of war had been designed for shooting at seen targets. Except in cloudy weather it was, therefore, generally suitable for dealing with attacks by day and it was by day that the first attacks were made.

The principle used was the following: a predictor fitted with telescopes was laid on and followed the target, a height calculated by a heightfinder was set into it and the predictor mechanism automatically calculated where the target would be at the time the shell burst in the sky and by means of electric pointers enabled the gun to be aimed at that point.

There were, however, limitations to this equipment. Predictors were not designed to accept heights over 25,000 feet and as the enemy developed his tactics he flew more frequently at greater heights; further, there was a limit to the speed at which the predictor could traverse so that close targets often moved across the sky too fast to be followed. Except in very clear weather the "pick up" was too late to ensure adequate time to bring effective fire to bear.

29. Reference has already been made to the shortage of equipment in the early part of the war. The responsibility for allocating what equipment there was rested primarily with the A.O.C.-in-C. Fighter Command, who invariably consulted me in the matter. The demands for defence were, however, so various and the interests involved so powerful that we were continually faced with fresh agitations for defences. In order to deal with these requests a sub-committee of the Chiefs of Staff Committee known as the C.O.S. AA Committee was formed. The three services were represented on this committee and the Minister of Home Security was also on it.

30. Another effect of the shortage was that none of the units was fully equipped with the weapons it was intended they should have and though other types of weapons were brought in to fill the gap, complications arose because units frequently had to operate two, three or more types of equipment simultaneously.

31. The Heavy guns included the 4.5-inch of which I had 355 by June, 1940, when day raiders began to be serious. Secondly, there was the 3.7-inch on either a mobile or a static mounting, and this gun became the mainstay of heavy anti-aircraft armament throughout the war and in my opinion was the finest all purposes gun produced by any country during the war. Unfortunately it was never mounted in a tank. In June, 1940, I had 306 mobile and 313 static 3.7-inch guns and finally I had 226 obsolescent 3-inch guns.

Light anti-aircraft guns at the same date comprised the following:—273 40-mm Bofors, which was the chief Light weapon; 136 obsolescent 3-inch guns adapted for low level shooting; 140 miscellaneous types of 2-pounder guns on loan from the Royal Navy; and 38 20-mm Hispano cannons.

32. The first raids were made in October, 1939, upon the Forth and upon Scapa Flow.

Though the guns were successful in destroying some of the raiders, it was at once apparent that peacetime training and the existing equipment was insufficient to deal entirely successfully with wartime targets, which continually dived and turned and flew at comparatively high speeds. Steps were taken to have alterations designed and made to meet the needs of the situation, but nearly two years elapsed before these were actually produced.

Until June, 1940, enemy activity consisted mainly of sporadic minelaying or reconnaissance flights, often by single planes, and of small scale attacks upon convoys and the northern bases of the Home Fleet.

33. I do not propose to discuss on what exact date the Battle of Britain began, but what is certain is that in the second half of June, 1940, there was a marked increase in activity by the German air forces over and around the United Kingdom.

34. With the limited resources at my disposal it was impossible to give the country the degree of protection required at this time and the main weight of the attacks during the daylight Battle of Britain was borne by Fighter Command. Nevertheless it is only right to draw attention to the important part played by the guns during this battle, a part which the R.A.F. have never minimised; and indeed of the large daily totals of enemy aircraft destroyed in the battle, at times twenty, and on one occasion thirty, fell to the guns.

When the enemy began to come over in large formations the Heavy guns frequently laid the foundation of the Fighter successes by breaking up the formations with their fire, thereby rendering them vulnerable, while the presence of small groups of enemy aircraft or individual planes, which might otherwise have escaped the attention of fighter pilots, was indicated to them by bursts of anti-aircraft fire in the sky.

Light guns filled a rôle for which there could be no alternative weapon, particularly in the defence of airfields. Experience abroad had already demonstrated, and future experience was to confirm, that airfields lacking anti-aircraft defence were unable to continue in action against a sustained attack. Only guns, and lots of them, can defend an aircraft during the vulnerable moments when it is taking-off or landing.

35. The Battle of Britain may conveniently be divided into four phases although these sometimes overlapped. During the second half of the battle there were attacks by night as well as by day, but I propose to defer discussion of the night raids until later in this despatch.

The first phase of the battle consisted largely of attacks on convoys in the Channel and on south coast ports. The heaviest engagements occurred between Harwich and Lyme Bay, although places as far on either flank as the Orkneys and Cardiff received some attention. So long as the enemy confined his attacks to shipping, the guns of A.A. Command could take no part in the battle and it fell to Fighter Command, who were able by their radar to observe concentrations of aircraft in the Calais region, to endeavour to deal with them. When ports were attacked the guns were in action: and at Portsmouth, Portland and in particular