74. Another change which General Pile found necessary at an early stage was the removal to higher ground of the radar sets belonging to the heavy guns. At the start these were placed in hollows because the "Overlord/Diver" Plan had been made in anticipation of attempts at "jamming" by the enemy. Successful bombing attacks during the "Overlord" preparations had, however, virtually deprived the Germans of this resource, and so it was possible to move the sets to more exposed positions in which the contours of the ground caused less interference.

75. Another variation from the plan concerned the light guns. Originally these were to have been deployed on searchlight sites, but after the attacks had begun, General Pile came to the conclusion that better results would be achieved by concentrating them in front of the heavy gun belt. He also found that by linking troops of four guns each to a heavy-gun predictor and G.L. radar set he could use the light A.A. guns against "unseen" as well as "visual" targets.

76. Towards the end of June we began to receive the S.C.R. 584 radar sets and improved predictors which we had been eagerly expecting since February. These two items of equipment were destined to contribute very largely to the ultimate success of the guns. An intensive training programme which had to be organised with such resources as could be spared from operations was, however, indispensable before they could be used on any considerable scale.

77. With the balloon barrage the problem was largely the arithmetical one of achieving a sufficient density to give a reasonable chance of success. We found, however, that in practice the theoretically computed rate of success was not always attained: somehow more bombs slipped through the barrage than should have done so according to the laws of probability, if our assumptions were correct. One difficulty was that the "double parachute links"* used to arm the balloon cables in normal barrages had not been designed to cope with aircraft travelling much faster than 300 m.p.h. For this reason we did not arm the cables of the balloons deployed during the first few days of the attack. But we soon came to the conclusion that an imperfect arming device was better than none; and by the 21st June all cables were armed. I received a large number of suggestions for increasing the effectiveness of the barrage in other ways, such as by adding "whiskers", nets, kites, and other forms of drapery. Many devices of this kind were tried, and some were of value, but as most of them increased the physical difficulty of handling the balloons in one way or another, I had to adopt a somewhat cautious attitude lest the best should prove the enemy of the good.

78. A slight re-disposition of the barrage proved necessary in order to prevent bombs which penetrated to its northern edge from being brought down in built-up areas. The notion of keeping the balloons up in all weathers—which was contained in the original "Overlord/Diver" Plan but afterwards abandoned—was considered a second time after the attack had begun, but once more found impracticable. We therefore used a system of control which was less flexible than that used for normal barrages, but served its purpose adequately. In order that our pilots should not lose their lives by colliding with the barrage we perpetrated a pious fraud on them by allowing them to believe that the balloons would fly continuously.

79. So much for the problems that confronted the individual arms of the defence and the chief measures taken to solve them. There were, of course, many smaller problems with which I have not space to deal. But the biggest problem of all was not confined to one arm: it was of wider consequence and consisted in securing the right kind and degree of co-operation between guns and fighters. Since in a sense these were rival weapons, the task had always been a troublesome one from the early days of the war; nevertheless, so far as operations against orthodox aircraft were concerned, with experience a satisfactory working solution had been found. During the "Baby Blitz," for example, the co-operation between guns and fighters had been most satisfactory. I found, on the other hand, that as the Germans must have intended, the novel problem presented by the flying bomb created a host of new difficulties. For example, it was sometimes hard for a pilot to realise that he was approaching the gun belt in time to avoid infringing the rule against entering it. Conversely, gunners in the belt who were engaging a flying bomb did not always realise in time that a pilot was legitimately entering the belt in pursuit of this or another missile, and would go on firing to the peril of the pilot's life. The crews of the guns on the coast and elsewhere outside the gun-belt were in a still more difficult position, for except in bad weather they always bore the onus of ensuring that no fighters were about before they could open fire. In the excitement of the moment, when the attention of the gunners was concentrated on their targets, it was only too easy for a fighter travelling at six miles a minute to slip unnoticed into the field of fire. Consequently numerous infringements of the gun-belt by fighters, and many unintentional engagements of our fighters by the guns, were reported, especially in middling weather when guns and fighters were simultaneously in operation. Charges and counter-charges mounted; and with deep misgiving I began to sense a rising feeling of mutual distrust between pilots and gunners.

80. I felt very strongly that this state of affairs could not be allowed to continue. If the causes of friction were not removed, the situation would inevitably grow worse. As the first four weeks of the attack went by, the overall achievement of the defences improved. To all appearances, the machine was growing more efficient. But this improvement brought me scanty satisfaction. I knew that the point would soon be reached at which this friction would become the limiting factor, and no further improvement would be possible. Looking further ahead, I realised that, whatever temporary advantages our existing practice might bring, we could not afford to sacrifice the spirit

* The "double parachute link" was a device whereby, as soon as a balloon cable was struck, it was automatically severed near the top and bottom, so that the aircraft which struck it carried away the central portion. Parachutes then opened at each end of this portion and exercised a drag intended to make the aircraft stall.