Group, many more Bombers would have reached their objectives without opposition.

204. Air Vice-Marshal Park also quotes the results of the ten large formations ordered from Duxford into No. 11 Group in the last half of October, when the Germans were employing Fighter-types only. Nine of these sorties made no interception, and the tenth destroyed one Me. 109.

205. The most critical stage of the Battle occurred in the third phase. On the 15th September the Germans delivered their maximum effort, when our Guns and Fighters together accounted for 185 aircraft. Heavy pressure was kept up till the 27th September, but, by the end of the month, it became apparent that the Germans could no longer face the Bomber wastage which they had sustained, and the operations entered upon their fourth phase, in which a proportion of enemy Fighters themselves acted as Bombers.

206. This plan, although the actual damage caused by bombs was comparatively trivial, was aimed primarily at a further whittling down of our Fighter strength, and, of all the methods adopted by the Germans, it was the most difficult to counter. Apart from the previous difficulty of determining which formations meant business, and which were feints, we had to discover which formations carried bombs and which did not.

207. To meet this difficulty, Air Vice-Marshal Park devised the plan of using single Spitfires, flying at maximum height, to act as Reconnaissance aircraft and to report their observations immediately by R/T.

208. A special Flight was organised for this purpose, and it was later recommended that the Spitfires should be employed in pairs, for reasons of security, and that the Flight should become a Squadron. A special R/T receiving set was erected at Group Headquarters so that reports might be obtained without any delay in transmission from the Sector receiving station. There is reason to believe that the Germans also adopted a system of using high-flying H.E. 113s as Scouts. Their information concerning our movements was transmitted to the ground and relayed to their Bombers in the air.

209. In the fourth phase, the apparent ratio of losses in our favour dropped appreciably. I say "apparent" because, in fighting at extreme altitudes, fighters often could not see their victims crash, and the percentage reported as Certainly Destroyed was unfairly depressed. Our own casualties, nevertheless, were such that the C. Category squadrons, which I was hoping to build up to operational strength again, remained in their condition of semi-effectiveness.

210. Serious as were our difficulties, however, those of the enemy were worse, and by the end of October the Germans abandoned their attempts to wear down the Fighter Command, and the country was delivered from the threat of immediate invasion.

211. The Order of Battle at the beginning of November is shown at Appendix E. Categories of Squadrons (A, B. or C, *vide* paragraph 177) are indicated.

212. Increasingly throughout the Battle had the importance of a high "ceiling" been manifested. It is by no means necessary that every Fighter shall have its best performance at stratospheric heights; any such policy would result in a loss of performance at lower altitude, and we must never lose sight of the basic principle that the Fighter exists for the purpose of shooting down Bombers, and that its encounters with other Fighters are incidental to this process.

213. There are, nevertheless, arguments for giving to a percentage of Fighters a ceiling (determinable by specific physiological tests) above which no enemy can climb without the use of Pressure Cabins. Just as the "Weather Gauge" was often the determining factor in the tactics of sailing ships, so the "Height Gauge" was often crucial in air combat. Exhaust-driver turbo-superchargers have certain advantages over gear-driven blowers at great height, and should be considered for adoption in spite of their disadvantages.

214. It must be remembered also that the initiative always rests with the Bomber, who can select at will the height at which he will make his attack. We must be prepared, therefore, for the appearance of the pressure-cabin Bomber, flying at a height unattainable by any non-pressurised Fighter. (I should perhaps explain that there is a height, about 43,000 feet, above which the administration of any quantity of oxygen at atmospheric pressure becomes ineffective because it cannot be inhaled and a pressure cabin or a pressure suit becomes essential.) Of course, a pressure-cabin Bomber is inefficient and vulnerable, because it is difficult to operate free guns from a pressure cabin, and pressure leakage from holes made in the walls of the cabin will prostrate the crew. The threat from pressurised Bombers is therefore serious only if we have no Fighters to meet them, and for this reason we should always possess a limited number of pressurised Fighters.

215. Various other lessons were learned from the experience of fighting at extreme altitudes. One very tiresome feature was that a considerable proportion of ultra-high-flying raids was missed by the Intelligence systems, or reported so late that time was not available to climb and intercept. This made it necessary to employ standing patrols just below oxygen height (about 16,000 feet). These patrols climbed to intercept at extreme height when ordered to do so. This cut at the roots of the Fighter Command system, which was designed to ensure economy of effort by keeping aircraft on the ground except when required to make an interception.

216. Another lesson was that the system of using an "Above Guard" should be retained even when an attack was initiated from extreme altitude.

217. Flying and fighting-fatigue increases with altitude, and the comfort of the pilot requires unremitting attention. Cockpit heating and the meticulous pursuit and elimination of air leaks are of great importance. Attention should also be paid to the elimination of icing on cockpit hoods (which are apt to freeze immovably) and on the inside and outside of windscreens.

218. A serious handicap, which I have not hitherto mentioned, was the fact that the change over from "High Frequency" to "Very High