

and to assist him in selection or rejection. General Henderson sometimes also consults some officers of the Royal Flying Corps of special experience. The procedure is that general arrangement drawings are sent to the War Office and are examined in General Henderson's office by technical officers who take note of engineering points. An experienced pilot, who deals with the supply of aeroplanes, also examines the drawings. The Inspection Department is consulted, and General McInnes himself inspects and examines the drawings. The drawings, with the criticisms of these various officers, are then submitted to General Henderson, who accepts or rejects.

57. When an aeroplane is submitted for trial it is sent to the Central Flying School, and is there tried before the Commandant, two or three officers, and the Chief Inspector of Aircraft. R.A.F. designed aeroplanes are tried in the same way.

Engines of private design are tested at the R.A.F. under the direction of the Superintendent.

58. In substance the position is that, although great pains are taken to prevent the R.A.F. from having any direct voice in the selection of types of either aeroplanes or engines, engines are tested by the R.A.F. and most of the persons who advise General Henderson and who try the aeroplanes belong to the department which has the control of the R.A.F., while General McInnes is the head of that department, subject, of course, to General Henderson. We do not see how the feeling of the trade, which we are informed exists, that their designs may not receive fair treatment or their finished products fair tests in competition with those of the R.A.F., can be removed under existing conditions.

Charge 3 (c).—The R.A.F. has been a Dis-service and not a Service to the Royal Flying Corps.

59. The first branch of this criticism in effect amounts to the charge that the designs of the R.A.F., whether of aeroplanes or engines, have not been efficient. That the R.A.F. has produced unsatisfactory designs of aeroplanes cannot be doubted, but the R.A.F. exists to make experiments, and it is inevitable that some experiments must fail.

60. The R.A.F. has produced many designs which have done admittedly good service. The B.E. 2 type marked a great advance in aeronautics. The F.E. type is good. The R.E. 7, too, has answered its purpose, but upon the question whether in this war the R.A.F. has well served the Royal Flying Corps, the R.A.F. must be judged by its principal achievement, the B.E. 2c aeroplane combined with the 90 h.p. R.A.F. engine. This is the combination which has been used in far larger numbers than any other, and by it the R.A.F. must, in our judgment, stand or fall. Which is it to do? In answering this question, we bear in mind that at the time the R.A.F. engine was produced, the only possible alternative engine of English design was the Green engine, for which no one has so far produced a satisfactory aeroplane. There was no inherently stable machine of private design. The B.E. 2c was strong, the design was aeronautically sound, the drawings were complete. This last circumstance enabled many manufacturers, entirely new to the trade, to build an aeroplane who could not otherwise have done so. Looking at things as they were at the beginning of the war, we adopt the language of one of the witnesses who appeared before us, Mr. A. E. Berriman, the Chief Engineer of the Daimler Company:—

"The R.A.F. engine and the B.E. 2c aeroplane have their defects, but they form a combination that has been instrumental in enabling the Flying Corps to perform invaluable service to the Army in France,"—service, we may add, which would, in our view, have been impossible without this combination, at any rate, for many critical months.

61. Much of the criticism of the B.E. 2c machine fitted with the R.A.F. 90 h.p. engine has been ill-founded. As an illustration of this, we may refer to the evidence of one of the witnesses who stated that he was absolutely convinced that a tractor machine is worse than useless for night-flying, and that it was either negligence or ignorance of the authorities to allow night-fliers to use tractors such as the B.E. 2c.

62. It is a striking commentary on this evidence that all the three airships which were brought down in flames on the nights of September 2nd, September 23rd and October 1st last were brought down by pilots flying B.E. 2c machines fitted with R.A.F. engines.

63. It is proper to add that stable machines are admitted to be essential for night flying, and the only machines that are now used for that purpose are the B.E. 2c, a tractor, and the F.E. 2B, a pusher, both of which are essentially stable.

64. The later productions of the R.A.F. are not, on the whole, as good as some of the machines now produced by private manufacturers, but are more readily obtainable.

65. In arriving at our conclusion on the B.E. 2c aeroplane fitted with the 90 h.p. R.A.F. engine, we have not forgotten the complaints that, after the drawings of the B.E. 2c and the 90 h.p. R.A.F. engine were sent to the manufacturers, they were constantly being altered in detail, thus creating delay and confusion. There were, in fact, more alterations than one would expect. These, however, were, to some extent, due to the desire to meet manufacturers' own views and objections, and to the fact that it was felt to be necessary to supply aeroplane makers, many of whom had no previous experience, with the most exact drawings, even of the smallest altered parts. In the case of the engine, we think this was overdone, and it would have been well to have given a freer hand and more initiative to the drawing and designing staffs of the engine builders, many of whom, though new to aero engine work, had long experience in motor engine building.

66. The second branch of Charge 3 (c) is that the R.A.F. has discouraged private manufacturers. The evidence of three of the four manufacturers who appeared before us is all the other way, the fourth did not refer to the point.

67. In several cases, makers of aeroplanes and engine builders new to the work have sent their foremen to the R.A.F., who have obtained there much useful information and instruction. The testimony of one of these trade witnesses, a large contractor, is worth quoting:—

"It would be impossible for me to go away from this committee without expressing the gratitude which I feel towards General McInnes and every officer of every department, from the head of the War Office to the bottom of the War Office, for the assistance which is given to me. There is every possible ambition to help me to succeed in the very difficult work which I am doing, very often under very difficult circumstances, and I for one would dissociate myself from any adverse proposition in respect to General Henderson and his staff. People say that they do not seem to help manufacturers and contractors, but I have had nothing but the utmost possible assistance that a human being could have."

68. On the other hand, General Henderson complained that the tact and judgment of some of the subordinate officials of the R.A.F. had been deplorable, and we can well believe that some private manufacturers who came into contact with these subordinate officers have genuine cause of complaint. Indeed, we are inclined to think that this lack of tact may be answerable for much of the dissatisfaction which the trade is alleged to feel.

Charge 3 (d).—Manufacturers' Designs have been copied by the R.A.F. for their own use.

69. There was one regrettable instance of an attempt to do this. We have investigated the matter thoroughly, and are satisfied that, as soon as it was known to the highest authority, it was immediately stopped and measurements which had been taken of the section of the wing of an aeroplane were destroyed.

CHARGE 4. THE INSUFFICIENT TRAINING OF PILOTS AND OBSERVERS.

70. Much was said about the insufficiency of the training of our pilots in flying, bomb-dropping and in fighting in the air. Instances were given of pilots being sent to the front after only five hours' flying. There is no doubt that in the early days of the war, when the demand for pilots suddenly and enormously increased, some were sent out with insufficient experience in flying. This was inevitable in the situation in which the Royal Flying Corps found itself, and no blame can be attached to it in this respect. It follows that pilots were also inexperienced in bomb-dropping and in fighting in the air. Observers were, for the same reason, insufficiently trained.

71. The most strenuous efforts have been made to remedy this state of affairs, and the present system of training pilots, except in regard to fighting in the air, meets with our unqualified approval. Training is still, however, hampered to some extent by shortage of instructors as well as by shortage of school aeroplanes, which explains the fact that there is still a long waiting list of would-be pilots. Such steps as are possible, having regard to the demand for pilots and aeroplanes for more imperative needs, are being taken.

72. There was no school for air fighting until September, 1915, when a small one was established at Hythe. There was no doubt a shortage of machine guns, but that shortage does not account, in our opinion, for the fact that the war had been proceeding for over a year before an aerodrome was fitted up for aerial musketry, and then a by no means sufficient one. Why this aerodrome was not opened for aerial musketry sooner is not apparent, but it is evident that the provision of others has, up to now, proved an almost