be interpreted by subordinating weight saving.

Taking a specific illustration from the above example, if the 1 per cent. reduction in engine fuel consumption can be attained only at the expense of $1\frac{1}{2}$ per cent. increase in the engine weight, *no* saving will result. Conversely a $1\frac{1}{2}$ per cent. reduction in engine weight is very worth while, but not if it results in an increase in fuel consumption of more than 1 per cent. (so long as it still uses the same fuel). I agree with Major Green that the largest bonuses from pure weight reduction is mostly obtainable from the equipment which is partly out of the control of the aircraft or power plant manufacturer.

All these factors do add up to show one extremely important conclusion. The simultaneous improvements in structure, power, plant, equipment, aerodynamic and other aspects of efficiency (compromised where necessary) have a bearing on the future economy, safety and usefulness of air transport which is out of all proportion to the cost of the aircraft employed.

Yours faithfully,

R. F. CREASEY.

APPENDIX

For simplicity, this analysis will neglect any minor factors.

Let W = aircraft weight in lb.

Considering the effect of a 1 per cent. change in each case, 1 per cent. less fuel is carried and burnt in maintaining the same speed.

∴Fuel weight saved per hour

$$= \frac{1}{100} \times \frac{2}{5} \times \frac{W}{20} = .0002W \text{ lb.}$$

Fuel cost saved per hour

$$= .0006W \text{ pence}$$

Weight saved on an average trip

$$= .0002 \times \frac{1000}{200} \times 1.5 = .0015W \text{ lb.}$$

(i) Saving over the life of the engines

$$= £\left\{\frac{.0006 \times 6000}{240} + .0015 \times 25 \times \frac{6000}{15000}\right\} W$$

$= £.03$ W, which is 15 per cent. of the price of the engines.

(ii) Saving over the life of an airframe

$$= £.03 \text{ W} \times \frac{15000}{6000}$$

$= £.075$ W, which is 30 per cent. of the price of the airframe. In addition to this, there is the smaller wear and tear on the engines due to the smaller cruising output.

(iii) Saving over the life of the propeller $= £.03$ W (plus saving in engine wear and tear) which compares with £.03 W for the price of the propeller.

If the size of the engines is fixed by cruising output, the weight of engine can be reduced by .002 W lb. in the latter two cases.

This increases the saving in these two cases by $66\frac{2}{3}$ per cent., in addition to the saving in depreciation, ground service and overhaul with the smaller engines.

To the Editor.

Sir,—I have read with interest the discussion* on the training required for those engaged in civil flying, and was extremely disappointed to find that not only was the ability of our Royal Air Force aircrew grossly under-estimated, but also that those who protested against such under-estimation did so in such mild statements that their protests may have been overlooked. I would, therefore, like to add a few comments on the discussion, even though I am somewhat belated.

I am in the fortunate position, in viewing this subject, of having spent many years of active participation in civil aviation as a member of the greatest British air line; and to have coupled this experience with an active part in operations and in the control of operations throughout the Bomber offensive with its developments of midern equipment. I therefore know intimately and am a close personal friend of many air line pilots and at the same time I am in day to day touch with the flying crews of Bomber Command. I hope, therefore, that I can claim to view the problem with the knowledge of

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all its aspects and without bias. In the previous discussion the statement was made that pilots of the Royal Air Force would take one year to be adequately converted to fly civil aircraft, whilst I would point out that there are many, particularly in Bomber Command, who already possess experience and ability of the standard required for civil flying. They would, of course, require some conversion training, but to talk in terms of a year is quite fantastic. If that is the scale of training required—well, then, it is certain that existing experienced pilots would take at least a year to bring themselves up to date with the modern equipment to which they have not had access due to security regulations during the war. I hope, however, that my civil friends will not take this wild statement seriously. I do not really think they would require more than a short course to modernise their outlook on the new devices. My point is simply that heavy bomber crews of considerable experience do not, in fact, require such an extremely long period of training as has been suggested. Quite apart from anything else, a year's training for a heavy pilot would cost at a rough estimate about £5,000 per head.

Whilst I do not suggest that pilots who have been flying single-engined and twin-engined aircraft are likely to find posts in civil aviation, I do wish to stress, particularly to those in civil flying, that we have a reserve of talent in the Royal Air Force which is of tremendous value to civil aviation. We must not allow any " dog in the manger ", attitude to deprive us of the services of these excellent men. This is not merely a matter of gratitude for the work which they have done, but is just simple practical business sense. In particular, the crews in Bomber Command have had to tackle a job far more difficult than anything ever demanded in civil flying. They have experience of heavy four-engined aircraft, flying to wing loads far exceeding any civil practice, at night, often in adverse weather conditions with black-out restrictions on the ground and in the aircraft, coupled with the ever present danger of enemy fighters and other enemy defences and subject at all times to enemy radio and radar countermeasures. Such experience cannot and must not be wasted. Moreover, it must not artificially be held down or belittled. The civil pilots will, I know, welcome the young serving types; I hope that all others in civil aviation will do likewise.

Air Vice-Marshal D. C. T. BENNETT,
Royal Air Force, Huntingdon.
27th March, 1945.

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