

CORRESPONDENCE

c/o The Shell Co. of N.Z. Ltd.,
 P.O. Box 1663, Wellington, N.Z.
 6th July, 1945.
 Received October, 1945.

To the Editor.

Dear Sir,

I have just received the April Journal and read with very great interest the outstanding paper of Air Commodore Banks on the Importance of Power Unit Development and the valuable discussion included in this issue. Being at this distance virtually completely ignorant of the most recent developments it would be presumptuous to hope to contribute new material to this discussion, but my very ignorance prompts me to raise one or two small questions in your pages.

On page 173 of the paper mention is made of the necessity to avoid in the gas turbine the ingress of sand and foreign bodies. From my understanding of the gas turbine problem it would seem that aerodynamic losses in the turbine and blower unit have a vital influence on the overall efficiency and output. In view of this is the air filtration problem, with its presumably inevitable attendant aerodynamic losses, likely to be a serious obstacle to operation of these units in very dusty areas such as deserts.

The maximum temperature allowable in the gas turbine is limited by the blade materials and Dr. Ricardo mentions that the limit to be expected is around 1,000°C. absolute, i.e., 1,800°F. absolute. I believe that exhaust turbines driving supercharges are already operating at this temperature, whereas, as far as I am aware, the highest temperatures used in steam turbines is about 1,000°F., i.e., 1,464°F. absolute.

These figures may not now be correct in relation to each other, but as the steam turbine is normally expected to run tens of thousands of hours without attention instead

of periods of the order of 1,000 hours for the gas turbine it would be of interest to know if the problems of high temperature scaling, corrosion, embrittlement and creep are overcome in the gas turbine at the expense of a very much shorter life. At first sight the corrosion and scaling would seem to be much less in the steam turbine than in the gas unit where oxygen is present.

On page 174 of the paper it is stated that high combustion efficiency is necessary and that therefore there are limits to the suitability of the fuel, and Mr. Bass on page 194 of his contribution mentions that the advantage of range of fuel suitability is with the gas turbine. In this connection some recent experience with some Velox boilers is of interest. These units incorporate gas turbines to drive the blowers supplying all the air at approx. 35 lbs./in.² to the main combustion chamber and the outlet gases enter the gas turbine at a maximum temperature of 1,000°F., i.e., 1,464°F. absolute. In these units an indication that efficient combustion was affected by certain types of fuels was given by difficulty sometimes experienced in keeping the turbine gas inlet temperature below the specified figure without reducing the boiler output unduly. The range of fuel which gave satisfactory running extended from the heaviest type of boiler fuel down to light Diesel oils and is therefore at least as wide as could be accommodated without difficulty in the ordinary type of oil fired boiler. Some limits of fuel therefore undoubtedly exist, quite apart from the question of low freezing point and high calorific value required for aircraft fuels. In the case of the boilers mentioned above it must be remembered that no mechanical adjustments such as nozzle shapes and sizes, etc., were made and it would be expected that such adjustments (as with the high speed compression ignition

REVIEWS

engine) would allow the use of a very much wider range of fuels. Once the necessary mechanical settings have been obtained for one particular unit, of course, the range of suitable fuels would naturally be more restricted.

The practical side of the actual operation of these turbine and jet propulsion units is, of course, quite unknown to me, but presumably in the initial start up some provision for starting the turbine and blower must be made. Possibly this is done by compressed air, but it would be of great interest to have some information on the actual operating technique. This point reminds me that the propaganda aspect of England's achievements in this field appears to be very much neglected. Apart from the initial announcement of Air Commodore Whittle's work, now well over twelve months

ago, and one or two very bare references to jet propelled fighters being used against the V1 flying bomb, the only references that I have seen out here, either in the daily press or in the semi-technical papers, has been to American machines or else the German V1 and V2 units. Possibly now that hostilities have ended in Europe some more details will be given, but bearing in mind the competitive times that British aviation is now facing I cannot but feel that the necessity for some propaganda depicting the British technical achievements in this field is very much overdue. Both in the daily papers and in the semi-technical press pictures have been shown of the American jet propelled aircraft and surely by now something comparable produced in Britain can be published.

T. T. N. COLERIDGE (Associate Fellow).

REVIEWS

A Bibliograph of Visual Literature, 1939-1944.

J. F. Fulton, P. M. Noff and H. T. Perkins. Committee on Medical Research, Office of Scientific Research and Development, Washington, D.C. 1945. Price not stated.

This is Publication No. 11 of the Historical Library of the Yale Medical Library and was initially put in hand at the request of the British Air Ministry. Its general compilation follows that of the excellent Bibliography of Aviation Medicine which was also prepared by Yale University.

The ultimate importance of vision in flying will not be greatly lessened by any aids to blind flying. Such aids are for use in very special circumstances for the expert. The normal pilot will, at all times, have to rely upon his eyes.

The Literature of Vision has grown as rapidly during the war period as has the

realisation of the importance of its study from a military point of view. It was early realised, for example, that night flying, night operations by troops, had the effect of the black-out on whole nations, presented special problems of sight.

There are some ninety entries in the Bibliography alone which deal with the effect of vitamins, or their lack, on vision, and eighty entries on the effect on Vitamin A on night blindness.

A section of the Bibliography deals with the testing of vision; a section which is not only of great interest to the specialist, but to all those who wish to become pilots as indicating the high standard of not only good eyesight in the general meaning of the term, but of the adaptability of the eye in widely varying conditions of light and visibility.

These Bibliographies prepared under the aegis of the Committee on Medical Research