# CORRESPONDENCE

*To the Editor of the* JOURNAL OF THE ROYAL AERONAUTICAL SOCIETY.

Dear Sir,—With reference to the paper, " The Origin and Development of Heavy Oil Aero Engines," by Mr. D. R. Pye, M.A., F.R.Ae.S., I was unfortunately unable to be present at the reading of this paper, neither was I able to contribute anything to the discussion in writing owing to a somewhat prolonged absence abroad.

Since my return, however, I have taken the opportunity of studying this extremely valuable resumé of the work done on the high speed heavy oil engine for aircraft purposes. It is because I consider that this paper is likely to become of historical value that I feel it necessary to draw attention to a statement that appears on page 275 of the ROYAL AERONAUTICAL SOCIETY JOURNAL, April, 1931, which, from my own personal knowledge, is not quite correct. This statement reads as follows:—

> " The results of this research work found their application in the Beardmore engines fitted in the airship R.101."

It may be of interest to outline briefly how it was that the compression ignition experiments came to be put in hand by the British Air Ministry. The advantages of the use of the heavy oil compression ignition engine—so ably set forth by Mr. Pye in his paper—began to be appreciated shortly after the Armistice. The Aero Engine Design and Research Department, of which I had control between 1919 and 1927, therefore wrote letters to various constructors of heavy oil engines for marine and other purposes, and in some cases chief engineers were visited personally. In each case the reply was similar, namely, that, owing to the time required for the combustion processes, there was no hope of ever producing a heavy oil engine to work at anything like the speeds which would be necessary to obtain a light enough engine for aircraft work. This view was supported by the Aeronautical Research Committee of the day.

As we were aware of the work done by Professor Hawkes at the Admiralty Laboratory during the War on relatively high speed engines, the question was referred to him and, while he considered that the matter was one of extreme difficulty, he thought it just possible that sufficiently good results might be obtainable. Professor Hawkes was therefore appointed as Consultant to the Air Ministry, and it was he who laid down the lines of experiment upon which the R.A.E. worked with such successful results as are now well known.

It was shortly after the appointment of Professor Hawkes, and before any results had been obtained at the R.A.E., that Mr. Chorlton, who had heard of the Air Ministry's interest in the high speed compression ignition engine, requested that he might be allowed to co-operate with the Air Ministry in this work. At the time Messrs. Beardmore were producing a large straight-line petrol aircraft engine, the original of which was actually put in hand towards the end of the War. Mr. Chorlton requested that the Air Ministry would permit him to attempt to convert this engine to compression ignition, working along lines based on Mr. Chorlton's previous experience, as referred to by Professor Robinson on page 295.

The work on the R.A.E. unit and the Beardmore unit proceeded concurrently, and as the two establishments were experimenting on different lines—the R.A.E. pinning their faith to the mechanically-operated injection valve, whereas Mr. Chorlton was using a jerk pump of his own design—we thought it advisable to keep the two experiments *entirely separate*. Actually, in 1924 the Beardmore unit results were slightly better than those obtained on the R.A.E. 20T. as, owing to the use of the jerk pump (accepted by Mr. Pye in his paper as

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the best method), the speed at which successful operation was possible on the former was as high as 1,350 to 1,400 r.p.m., as against 1,200 r.p.m., which was the maximum at which good results could be obtained with the latter.

Nothing in the foregoing is intended to detract in the least from the credit which is justly due to the R.A.E. for their excellent original research work which, having been published in full, has formed the foundation from which a large number of investigators have since worked in this country and abroad. The Beardmore success had, however, no connection with the R.A.E. experiments, the results on the two units being reached by quite different routes.

I feel sure that Mr. Pye will be glad to note this correction, relating as it does to a period before he joined the Air Ministry.

Yours faithfully,

L. F. R. FELL (Lieutenant-Colonel).

*To the Editor of the* JOURNAL OF THE ROYAL AERONAUTICAL SOCIETY.

Dear Sir,—It will be a satisfaction to the Society, not less than it is to myself, to have Lieut.-Colonel Fell's authoritative statement as to the early steps taken by the Air Ministry in the development of the aircraft compression ignition engine. I am glad to think that the rest of the sentence referred to, not quoted above, must have made it clear that it was to Mr. Chorlton and his early work at Messrs. Beardmore's that we owed the existence of the engines which drove the R.101.

Of recent years it has been the policy, when work with a common aim is being pursued on behalf of the Air Ministry at two different places, to maintain the fullest possible interchange of results between the two. In spite of their earlier separation I think it is yet fair to conclude that through the more recent liaison between Glasgow and Farnborough, experience gained during the Farnborough researches has found its application in contributing to the success of the engines as finally fitted, in 1929, to the R.101.

Yours faithfully,

D. R. PYE.

## REVIEWS

### *The Airship—its Design, History, Operation and Future*

Christopher Sprigg. Sampson Low, Marston and Co., Ltd. 248 pp. 4to. 55 illustrations.

The title of this book implies a very comprehensive work on lighter-than-air craft. Not unnaturally the moderate size of the book makes the prospective reader wonder if the author could do justice to the subject.

The author has undoubtedly succeeded in writing a book for the non-technical reader which will enable him to appreciate in broad outline the various problems which are presented to those who are endeavouring to develop the airship into a practical and commercial means of transport.

The sections devoted to Design, History, Operation and Future are each dealt with in an ordered and logical sequence, and may be reviewed in the same order.

*Design.*—A general outline of elementary physics enables the reader to recall to mind the elementary science of his school days and presents to him the difficulties peculiar to the airship—a gas-borne body floating in a gas of variable density and temperature. The aerodynamics of airship flight is touched on, but

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