

The Journal

OF THE

Royal Aeronautical Society

WITH WHICH IS INCORPORATED THE INSTITUTION OF AERONAUTICAL ENGINEERS

*A Monthly Illustrated Magazine
devoted to all subjects connected
with the Navigation of the Air*

EDITED FOR THE
COUNCIL OF THE ROYAL AERONAUTICAL SOCIETY

BY

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THE ROYAL AERONAUTICAL SOCIETY

ACTIVITIES of the GRADUATES' AND STUDENTS' SECTION

December 1947

It is proposed to give, as far as possible, a monthly account of the activities of the Graduates' and Students' Section.

For various reasons many Graduates and Students are unable to play an active part in the Section's activities. Many live too far afield while others are occupied in studying. The Section exists, however, to promote the interests of all Graduates and Students, and the Section Committee considers and makes recommendations upon matters affecting Graduate and Student members of the Society.

Requests have been received from members, who have been unable to attend lectures, for the publication of lectures read before the Section. Unfortunately, the paper shortage prevents the publication in full, either in the Journal or in pamphlet form, of all lectures delivered to the Section. It is intended to issue a short report in these notices of papers delivered to the Section in an endeavour to meet these requests.

WORK OF COMMITTEE

The Section Committee has met three times since its election in March 1947. In addition to arranging visit and lecture programmes covering the period up to May 1948, the Committee has submitted recommendations on matters concerning the new Associate Fellowship examination syllabus and the proposed new membership fees. The Committee has also suggested that the Society's all-day discussions be held on a Saturday.

DANCE

The second annual dance was held at the Royal Hotel, Woburn Place, on Friday 17th October. It was attended by the President, Dr. Roxbee Cox, and Mrs. Roxbee Cox, who were the guests of the Section. It is regretted that the dance was not as well attended as last year, and it is hoped that there will be greater support for events of this kind in future.

LECTURES

A lecture on "Maintenance Difficulties in the Field" was delivered by Mr. M. J. Kemper on Tuesday 4th November, and it is published in full in the December Journal.

On 21st October a lecture on "Rocket Propulsion and Interplanetary Flight" was given at which some 90 people were present. A brief account of the lecture is given below.

"Rocket Propulsion and Interplanetary Flight"
by Mr. A. V. Cleaver, A.R.Ae.S.

A lecture on "Rocket Propulsion and Interplanetary Flight" was read before the Section on 21st October by Mr. A. V. Cleaver, A.R.Ae.S., Special Projects Engineer of the de Havilland Engine Co. Ltd. Mr. J. W. F. Housego was in the chair.

P.T.O.

Mr. Cleaver began by defining a rocket and outlined its main characteristics. It has a jet of small mass and high velocity; it gives a thrust which is almost independent of altitude; it has a high thrust-weight ratio and is simple; it has a high thermal efficiency but a low propulsive efficiency unless the flight velocity approaches the jet velocity. Combustion temperatures are high, presenting difficult cooling problems.

A number of lantern slides were shown, illustrating the development of the rocket from the early Chinese fire-arrows, through the small experimental rockets developed in the 1930's in Germany and America, to the German rocket-propelled fighters, anti-aircraft missiles and V.2's and the British rocket projectiles. At the end of the second world war, one third of all German scientists and technicians were engaged upon development. Led by that able, ambitious pioneer of the rocket, Von Braun, they had designed a two-stage trans-Atlantic rocket with a take-off weight of 100 tons.

The applications of the rocket were mentioned. Some of these, the use of rockets for assisted take-off, for boosted thrust in flight, for guided and unguided missiles, were already familiar. In addition, the Americans were using rockets for research into conditions in the upper atmosphere, the troposphere and the sub-stratosphere, up to heights of about 240 miles. The most intriguing use of rockets, however, was in the field of interplanetary flight, which would, in the lecturer's opinion, be a practicable possibility, in 50 years, at the present rate of technical progress.

It is the rocket that will make interplanetary flight theoretically possible. To obtain the necessary range it can be shown that the jet velocity and the mass ratio (ratio of take-off mass to final mass) must be high. The use of the step rocket would be one way of increasing the mass ratio. To escape from the gravitational field of the earth (or any other body), a certain velocity, known as the escape velocity, must be attained. The escape for the earth was about seven miles per second (25,000 m.p.h.), and once this was attained, the rocket could become either a spaceship or an artificial satellite; the latter could be used as an observation station or a radio relay station.

Chemical fuels could only give a maximum velocity of about three miles per second, and to attain higher velocities, atomic means of propulsion would have to be used. Two methods were suggested: the first was to heat a stream of inert gas by means of an atomic pile and to eject this stream of hot radio-active gas as a jet; the second method was to inject streams of fissile material into a mixing chamber together with the inert gas and again to eject the hot mixture. The dangers of radio-activity were obvious and chemical rockets would have to be used within the atmosphere, the atomic rocket being used when the short distance to the troposphere had been covered.

There were many problems to be overcome in the field of comfort—air supply, cooling, food, Zero gravitational force, etc.—but the more difficult one of propulsion must be overcome first.

Mr. Cleaver then replied to a number of questions, and the Chairman ended the meeting by calling for a vote of thanks to the speaker for his most interesting lecture.

AN APPRECIATION

The Council of the Royal Aeronautical Society wish to thank those Companies who, by their generous co-operation, have done so much to help in the production of the Journal

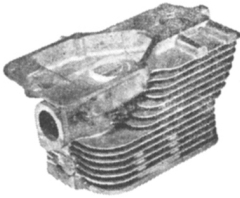
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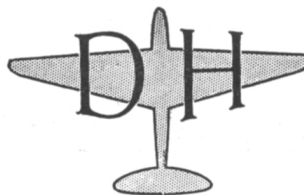


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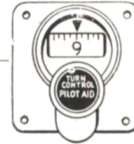
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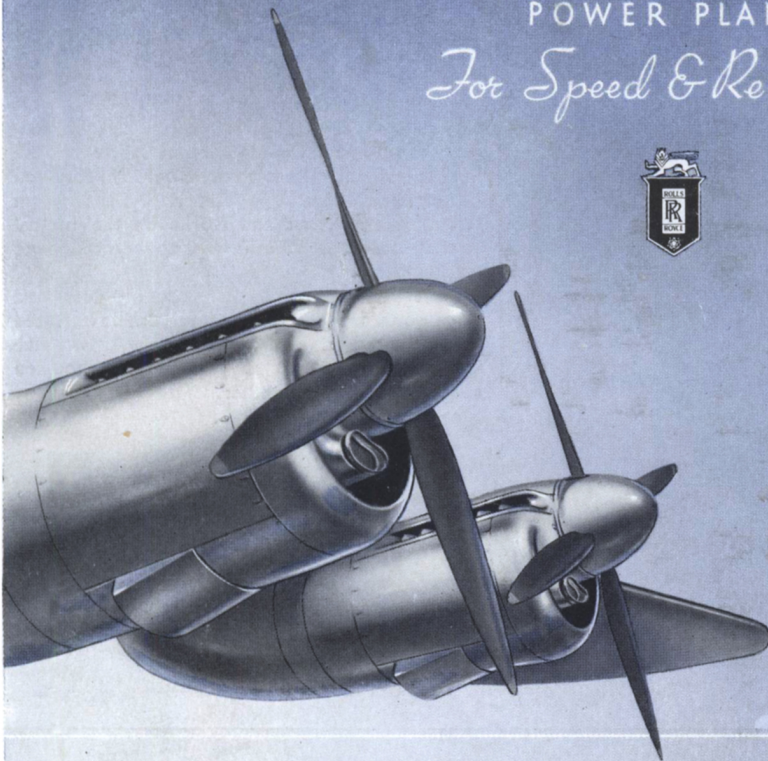


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