COLLEGE OF AERONAUTICS

CRANFIELD BEDFORDSHIRE

College of
AERONAUTICS

CRANFIELD • BEDFORDSHIRE

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COLONIAL OFFICE
W. E. F. WARD, ESQ.

THE UNIVERSITIES
Nomination awaited

GOVERNMENT OF AUSTRALIA
Nomination awaited

PRINCIPAL: **ERNEST F. RELF, ESQ.,** *C.B.E., A.R.C.S., F.R.Ae.S., F.R.S.*
Professor of Aerodynamics: **PROFESSOR W. J. DUNCAN,** *D.Sc., A.M.I.Mech.E., F.R.Ae.S.*
Professor of Aircraft Design: **PROFESSOR ROBERT L. LICKLEY,** *B.Sc., D.I.C., F.R.Ae.S.*
Registrar: **V. F. KNIGHT, ESQ.**

A BRIEF HISTORY OF THE FORMATION OF THE COLLEGE

THE formation of a College of Aeronautics was first officially suggested by the then Minister of Aircraft Production, Sir Stafford Cripps, who asked the Aeronautical Research Committee to prepare for him a Report on the subject giving views on the project and on the form it should take.

On receipt of this Report, the Minister set up an Interdepartmental Committee under the Chairmanship of Sir Roy Fedden "to prepare and submit to the Minister of Aircraft Production detailed proposals for the establishment of a School of Aeronautical Science within the general framework of the recommendations made by the Aeronautical Research Committee." The result of the deliberations of Sir Roy Fedden's Committee is contained in a booklet entitled "A College of Aeronautics," published by H.M. Stationery Office. A very comprehensive College is there proposed, built for the purpose near an airfield, and generously provided with equipment. While it was realised that such a scheme would be justified and would add to the prestige of Great Britain in the aeronautical field, it was not deemed possible to carry out this extensive project in the desired time under the present conditions. The temporary and less comprehensive scheme whose scope is indicated by the present Prospectus was the outcome. It is to be hoped that when more favourable conditions return, the fuller project will ultimately be carried forward, with the experience of the present scheme as a further guide.

THE COLLEGE OF AERONAUTICS has been set up by His Majesty's Government in the United Kingdom to provide a high-grade engineering, technical, and scientific training in aeronautics to fit students for leadership in the aircraft industry, civil aviation, the Services, education and research. For this purpose a two-year course will be given to selected students of graduate standard though the possession of a degree is not an essential condition of entry. Further details of the nature of this course are given later.

It is also the intention, subject to sufficient demand, to provide shorter courses for specialists in particular subjects, refresher courses, and a course giving a broad general knowledge of aeronautics.

In the two-year course the first year will be devoted to general study of aeronautical subjects while in the second year students will specialise in the particular subject which they wish to make the basis of their future careers. Emphasis will be laid on the practical side, but theoretical treatment will be adequate. Flight experiments will be an important feature of the curriculum.

The College is situated at Cranfield, Bedfordshire, about ten miles south-west of Bedford, where it will make use of existing buildings of the Royal Air Force Station for the present.

Administrative Offices

Academic Policy

OF THE TWO YEARS COURSE

ENTRANCE OF STUDENTS

Students will be admitted to the College by the Board of Entrance who will base their decision on an examination of the candidate's record, supplemented by an interview if deemed necessary, and on the vacancies available.

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The Board may require the student to submit to a written examination, but this will normally be dispensed with.

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Students admitted to the two-years course must be of university graduate standard, but the possession of a university degree is not obligatory.

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Candidates for admission will normally have been trained in engineering, physics or mathematics.

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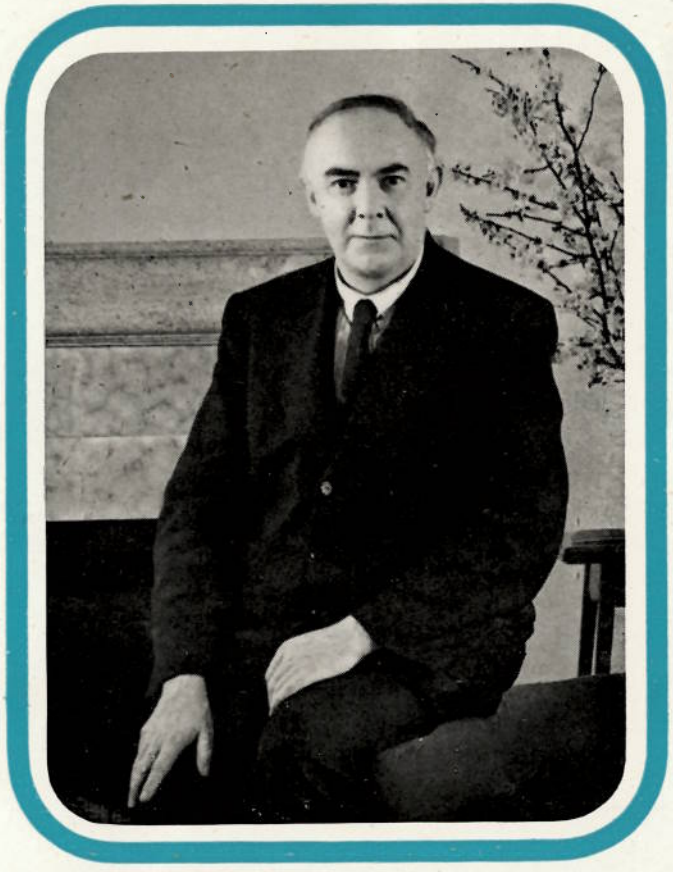
While practical engineering experience is a desirable qualification for entry, it will not be obligatory. The Board of Entrance will base their decisions entirely on their estimate of the candidate's ability to profit from the course.



The Principal, **ERNEST F. RELF, ESQ.,** *C.B.E., A.R.C.S., F.R.Ae.S., F.R.S.*

Born at Beckenham, Kent, 2nd October, 1888.
Apprenticeship in Royal Naval Dockyard, 1904-1909.
"Royal" Scholarship to the Royal College of Science, London, 1909-1912
Joined Scientific Staff of the National Physical Laboratory in 1912.
Superintendent of the Aerodynamics Division of the Laboratory from 1925 *to* 1945.
Fellow of the Royal Aeronautical Society, 1926.
Fellow of the Institute of Aeronautical Sciences (New York).
Fellow of the Royal Society, 1936.
James Forrest Lecture of the Institute of Civil Engineers, 1936.
Wilbur Wright Lecture of the Royal Aeronautical Society, 1946.

INSTRUCTION

STUDENTS' TIME will not be filled by organised instruction; they will be encouraged to think and read independently and to make full use of the cultural facilities offered by the library.

Practical work in laboratories and wind tunnels will have a conspicuous place in the course.

Students in both years of the course will take part in flight experiments and those who are fit will be encouraged to learn to fly.

In the general course excessive pre-occupation with mathematical detail will be avoided, but due encouragement will be given to students with mathematical interests and ability. Special training will be provided for those who are weak in mathematics.

In view of the essential part which physical techniques, such as those of electronics, play in modern engineering, due attention will be given to instruction in such techniques.

Importance will be attached to the student's ability to write a good report and to express himself well.

The FIRST Year

NORMALLY, ALL STUDENTS will take the same first year course, but those with unusual qualifications may receive special treatment.

The first year will be devoted to providing the broad common basis for future specialisation.

Since some students may have little or no knowledge of specifically aeronautical subjects, courses dealing *ab initio* with aerodynamics and the aeronautical aspects of structures, engines and design will be provided.

Hall of Residence

The SECOND Year

THE STUDENTS will specialise in their second year in accordance with their individual needs. Students who have already covered the first year course elsewhere may be accepted for the second year course at the College.

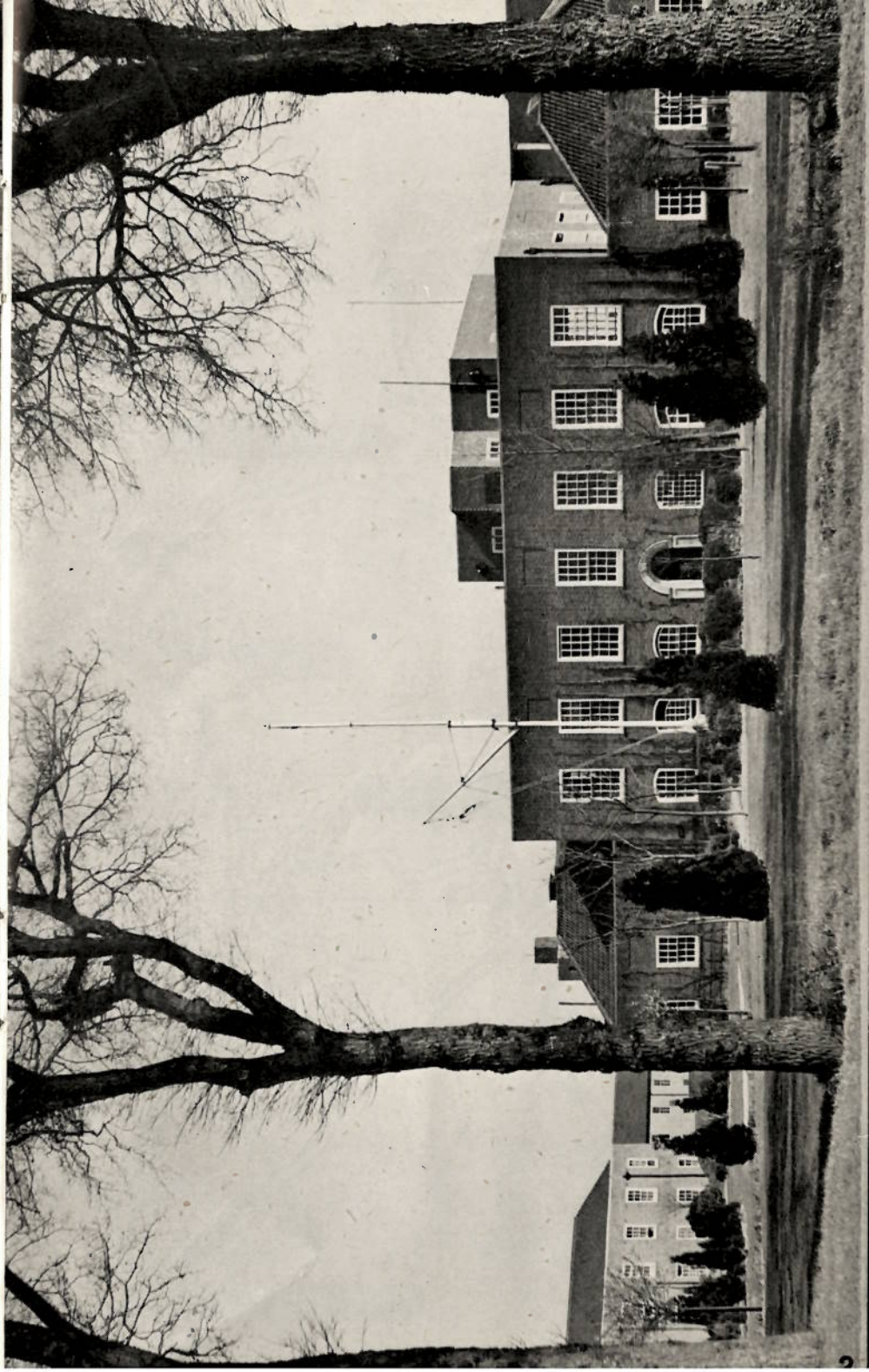
In order to avoid the multiplication of courses, instruction will, as far as possible, be canalised in the directions of aerodynamics, structures, or power plants.

Students will be introduced to research methods. Research will be conducted by the staff of the College and suitable students may be given opportunity to participate.

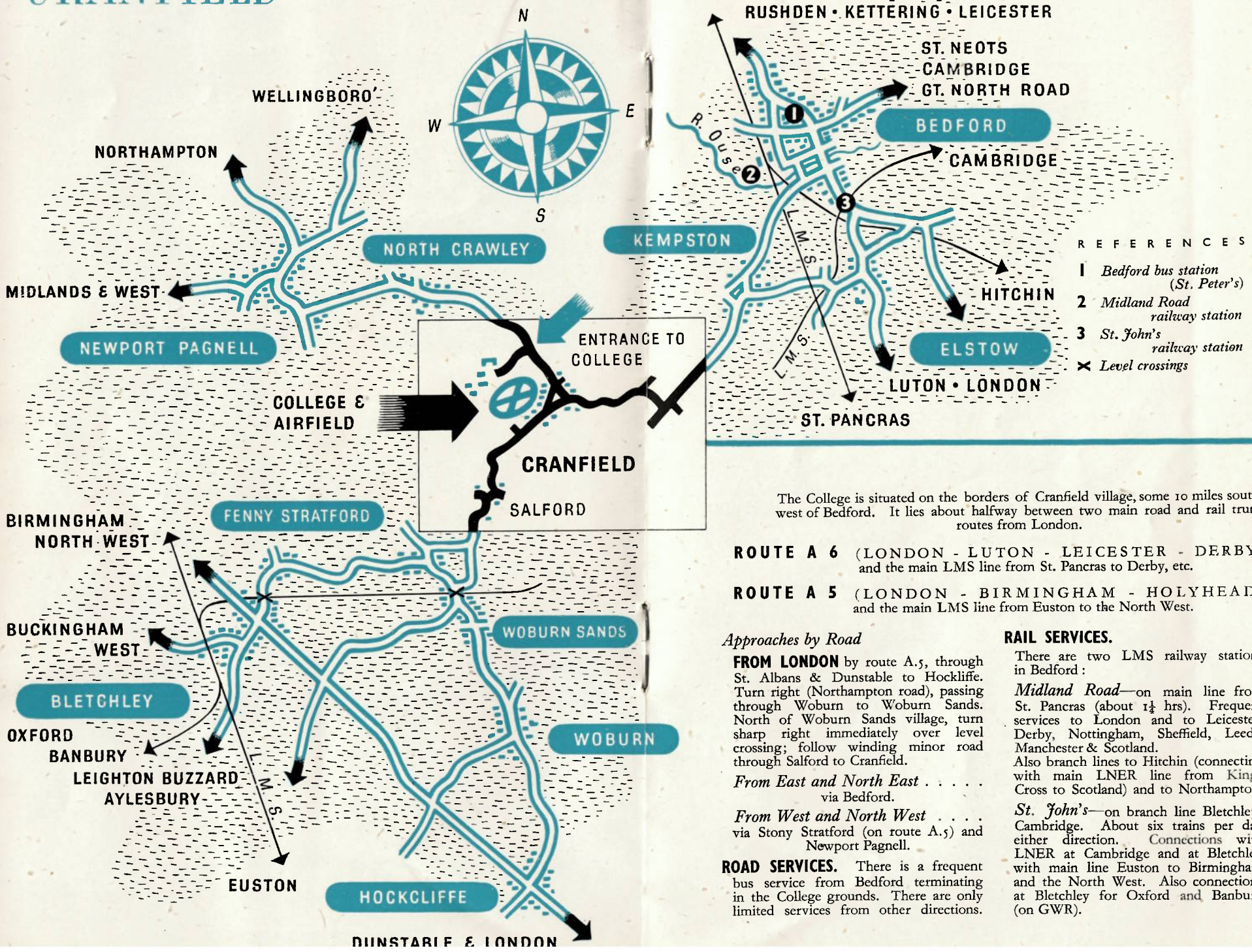
A Diploma will be granted to students who have satisfactorily completed the course.

View from Administrative Building

1 *Entrance to Hall of Residence* **2** *The Playing Fields* **3** *Entrance to College*



CRANFIELD - *its location and approaches*



REFERENCES

1 *Bedford bus station (St. Peter's)*

2 *Midland Road railway station*

3 *St. John's railway station*

✕ *Level crossings*

The College is situated on the borders of Cranfield village, some 10 miles south-west of Bedford. It lies about halfway between two main road and rail trunk routes from London.

ROUTE A 6 (LONDON - LUTON - LEICESTER - DERBY) and the main LMS line from St. Pancras to Derby, etc.

ROUTE A 5 (LONDON - BIRMINGHAM - HOLYHEAD) and the main LMS line from Euston to the North West.

Approaches by Road

FROM LONDON by route A.5, through St. Albans & Dunstable to Hockliffe. Turn right (Northampton road), passing through Woburn to Woburn Sands. North of Woburn Sands village, turn sharp right immediately over level crossing; follow winding minor road through Salford to Cranfield.

From East and North East . . . . . via Bedford.

From West and North West . . . . via Stony Stratford (on route A.5) and Newport Pagnell.

ROAD SERVICES. There is a frequent bus service from Bedford terminating in the College grounds. There are only limited services from other directions.

RAIL SERVICES.

There are two LMS railway stations in Bedford:

Midland Road—on main line from St. Pancras (about 1¼ hrs). Frequent services to London and to Leicester, Derby, Nottingham, Sheffield, Leeds, Manchester & Scotland.
Also branch lines to Hitchin (connecting with main LNER line from Kings Cross to Scotland) and to Northampton.

St. John's—on branch line Bletchley-Cambridge. About six trains per day either direction. Connections with LNER at Cambridge and at Bletchley with main line Euston to Birmingham and the North West. Also connections at Bletchley for Oxford and Banbury (on GWR).

The DEPARTMENTS

AT ITS INCEPTION the College will contain three main Departments, dealing respectively with Aerodynamics, Aircraft Design and Aircraft Propulsion. Instruction in Aircraft Equipment, Production and Maintenance will be given under the aegis of the three main Departments. Ancillary subjects, such as applied mathematics, physics, electronics and metallurgy will be covered as far as is necessary to make the teaching in the primary subjects fully effective.

The equipment in the various laboratories will be as comprehensive as possible, in order that the practical work may illustrate effectively the teaching in the class rooms. In view of the present difficulties of obtaining all that is requisite and providing the necessary labour for its installation, it may not be possible to realise this aim fully in the first year of the life of the College. It is, however, considered desirable in the interest of the development of Aeronautics in this country to open the College at an early date, even at the expense of some lack of facilities, rather than to wait until the equipment could be fully completed. It is hoped that all necessary facilities will become available in time for the second year, or specialist course, when they will be of more vital importance.

General view of College Buildings

The Department of AERODYNAMICS

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The teaching in this Department will aim first and foremost, at the provision of basic knowledge of fluid flow, which lies at the root of all aerodynamic phenomena. Except perhaps in the case of special students no attempt will be made to delve deeply into the very complex theory and mathematics of the subject, but an endeavour will rather be made to explain the phenomena in the simplest possible physical way so that all students may feel that they have acquired the power to think logically and correctly about any problems of applied aerodynamics which they subsequently meet. On these foundations will be built the superstructure of more detailed knowledge of the aerodynamic behaviour of aircraft and their component parts. The more fundamental subjects, such as the aerodynamic design of wings and streamline bodies, will be treated at length, and will lead up to the most recent advances in these fields and to an indication of what future advances are likely to come from research now in hand. The general principles underlying equilibrium and stability in flight will be elaborated, and the vital questions of control and manœuvrability will be covered. Special attention will be given to the effects of compressibility of the air upon the aforesaid matters, since flight is now advancing rapidly into the region of speed in which compressibility effects are dominant.

Aerodynamic effects in non-steady motion will be described and will lead to a general exposition of the problem of aero-elastic distortion and flutter. The design and use of the wind-tunnel as a means of investigating most of the above phenomena in the laboratory will be treated at some length, and the methods used to corroborate and extend wind-tunnel data by means of measurements made in flight will be explained. Students will be given opportunities to carry out both wind-tunnel and flight tests themselves, so that they may have direct and intimate contact with the practical significance of what they have learnt in the lecture room.

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The Department of AIRCRAFT DESIGN

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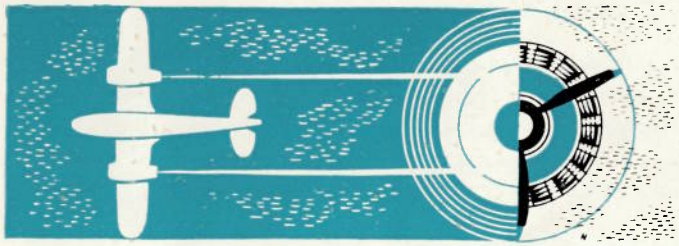
In this Department it is intended to give a thorough and complete knowledge of the design and strength of aircraft structures. Students with some previous contact with industry will obviously have great advantages in this section of the College. The basic ideas underlying the strength and rigidity of structures will be elaborated, and will lead to a study of the way in which these principles are applied to the wide range of structural problems that are met in aircraft design. The use of aerodynamic data in determining the loads experienced by aircraft in steady flight and in manœuvres will be explained, and the bearing of such data on the detail design of the aircraft structure considered. In the laboratories students will be able to study the properties of materials and to experiment with actual structures such as wings and fuselages so as to see for themselves how the strength calculations made in the design office are borne out in practice. They will also be introduced to the modern techniques of stress measurement in flight as a further check on the effectiveness of the design process. To sum up, it is intended to provide in this Department a training not obtainable elsewhere in the United Kingdom; a training which lays emphasis on the application of results of theory, experiment and calculation to the actual practical design of aircraft.

The Flight Hangar



The Department of

AIRCRAFT PROPULSION

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The aim of this Department is to provide a wide knowledge of the principles of aircraft propulsion and of the different mechanical devices by which propulsion is achieved. As, up to the present, these are all heat engines, the general principles of thermodynamics will be an essential basis for further study. The reciprocating engine, in its various forms, will be studied in some detail, and the principles of its design and operation fully explained. Still greater weight will be given to the gas turbine and jet propulsion, since it is now evident that they will play an ever-increasing part in the development of future aircraft. The design of the gas turbine, with its associated problems of air-flow and combustion, will be fully treated together with its use in aircraft, either in association with a jet or a propeller. The use of jet-propulsion devices without rotating parts and of various forms of rocket for propulsion at very high speeds of flight will be treated. Students will be able to experiment in the laboratories with actual engines of different types so as to learn their characteristics by experience.

RESIDENCE
in the College

STUDENTS IN THE TWO-YEAR COURSE will normally be resident in the College, and will be allotted, as far as possible, a study-bedroom each. There will be ample refectory accommodation in the Hall of residence and also Common Rooms in which students can associate.

Sports facilities will be available. A good sports field, tennis courts and squash courts are available. Every effort will be made to encourage cultural, social and athletic activities in the College.

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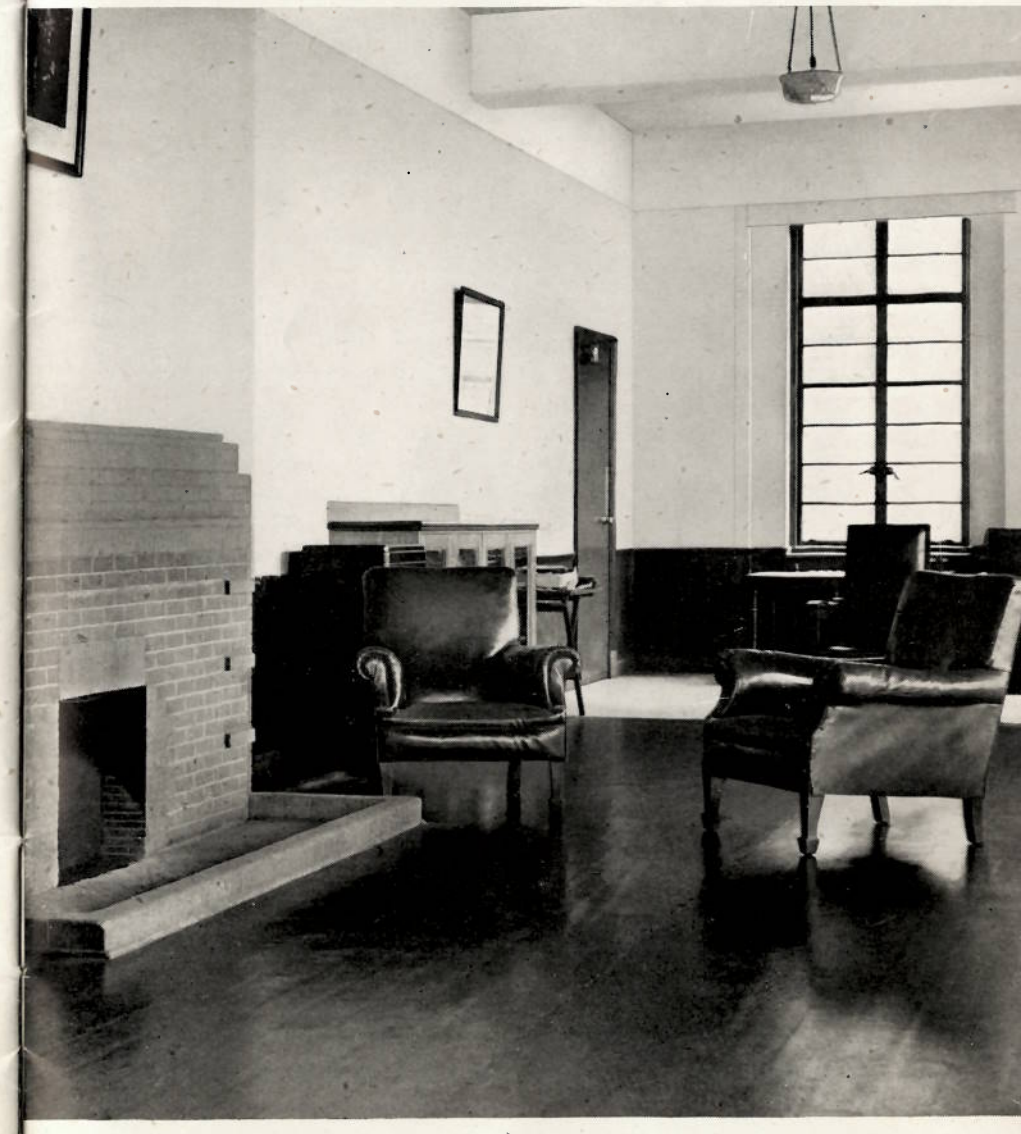
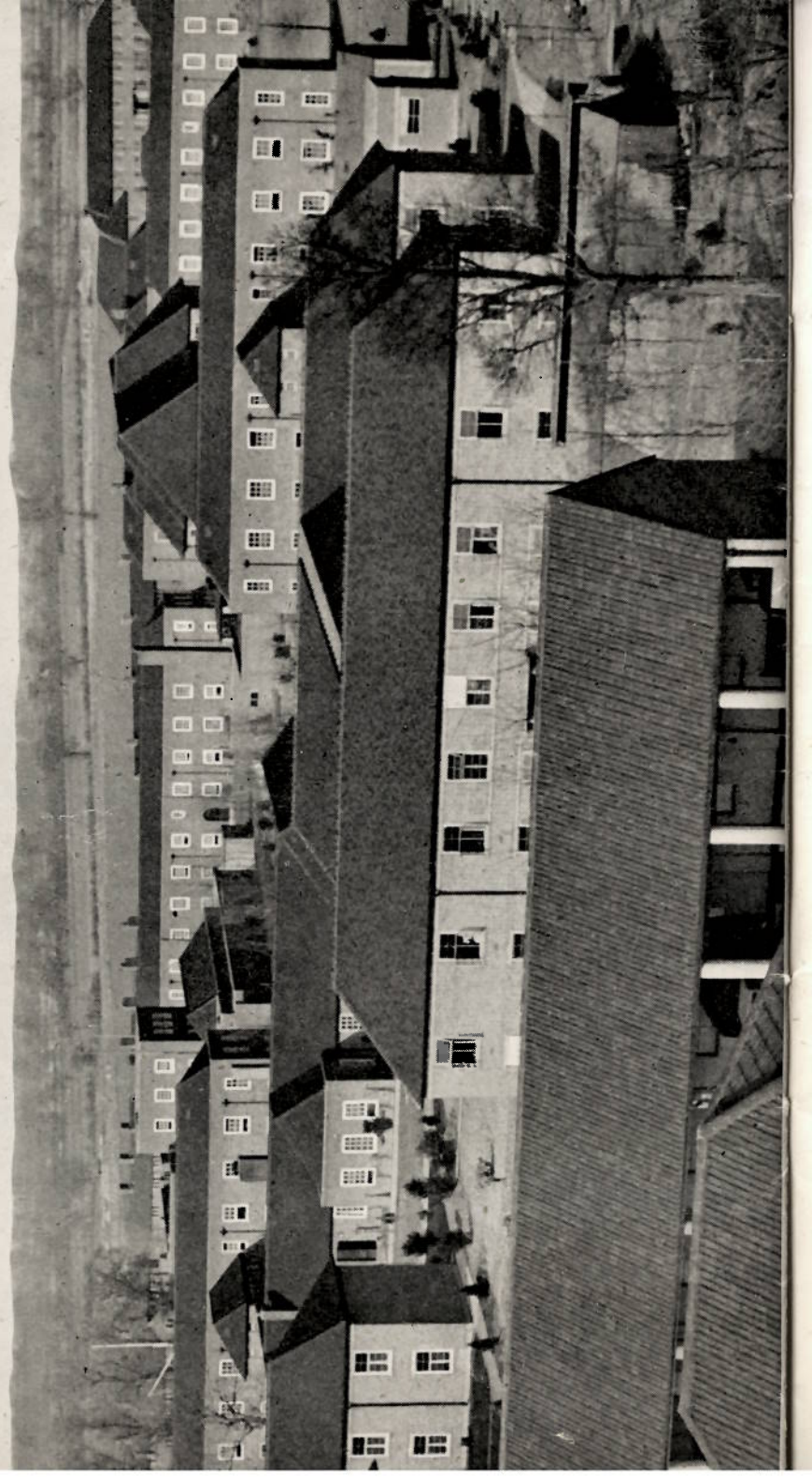
FEES

The normal tuition fee for the two-year course will be £75 per year of four terms. It is hoped that Scholarships may become available from various sources, and that some arrangements may be possible for the remission of fees in the case of deserving applicants. The cost of maintenance in the Hall of Residence will be between £100 and £150 per annum.



Lounge in the Hall of Residence



Laboratories and Lecture Rooms

Academic Year

THE COLLEGE WILL OPEN on October 15th, 1946 and the Terms for the academic year 1946-47 will be as follows :

AUTUMN TERM ★ *Tuesday, October 15th to Thursday, December 19th.*

WINTER TERM ★ *Tuesday, January 7th to Thursday, March 20th.*

SPRING TERM ★ *Tuesday, April 15th to Thursday, June 12th.*

SUMMER TERM ★ *Tuesday, June 17th to Tuesday, July 29th.*

It is intended to devote the summer term primarily, but not exclusively to flying and flight experiments, but work in flight will continue throughout the year as opportunity permits.

CAREERS

A Careers Advisory Committee will be set up to guide students as to their professional prospects, and to deal as necessary with students' appointments on leaving the College.

Application for

ADMISSION TO COLLEGE

INTENDING STUDENTS should write, as soon as possible, to the Registrar, College of Aeronautics, Cranfield, Bletchley, Bucks, giving full particulars of their previous training and experience. An indication, where possible, of the direction in which they may wish to specialise would be useful.

Recommendations on

EARLY TRAINING

It is our view that students interested in the practical engineering side should in general spend two years in industry after obtaining the school certificate and before going to the University or elsewhere. There will, however, always be the exceptional student who is more attracted to basic research work and who may well go straight to the University and then be eligible to continue by taking the post-graduate course at the College of Aeronautics. The general student will find that the two years in industry before the University or its equivalent will be invaluable experience which will fit him for industrial employment after the post-graduate course in a far better way than if he had done some shop work during his University training or had left it until after his study at the College.

Although this may involve an increase of two years in the total period of training, this extended period is no longer than is found necessary in other professions and we consider that the extra time will be well worth while in these days when the technical complications of engineering are so much greater than they used to be. It is also felt that engineering students should take every opportunity to acquire facility in the use of their hands, and that for this reason it would be well if more attention were given to handicraft tuition in the early stages of education.

LONDON AND BEDFORD.