

Cranfield College
of Aeronautics
history



The History of the College of Aeronautics

The present day Cranfield University evolved from the original establishment of RAF Cranfield in 1937 and subsequently the founding of the College of Aeronautics on the site in 1946. Since that time a process of strong organic growth has seen the College spawn a succession of offshoots that have become the five Schools of Cranfield University as it exists today.

Over this period of time starting in 1946, the institution has repeatedly transformed itself - it was granted university status in 1969 becoming the Cranfield Institute of Technology and it changed its name to Cranfield University in 1993. The MOD awarded it a teaching and research contract in 1984 which led directly to today's College of Defence Management and Technology (DCMT) at Shrivenham and a continuity of its defence education mission through to 2027.

So the College of Aeronautics as it was in 1946 has become a much more diverse Cranfield University of 2006.

1937-1947

RAF Cranfield

The early days

The establishment of an RAF airfield at Cranfield dates back to the expansion scheme of the mid-1930s. The number of RAF squadrons had been very much reduced at the end of the First World War. However, the rearmament programme initiated by Adolf Hitler in Germany, and in particular intelligence reports estimating that the Luftwaffe would have nearly 600 front line aircraft by the end of 1935, finally persuaded the government in Britain of the need to strengthen the RAF.

The airfield was built on over 100 acres of farmland acquired by the Air Ministry in June 1935 and took over two years to complete.

The airfield was formally opened on 1 June 1937 and soon after became the home of numbers 62 and 82 squadrons of No.1 (Bomber) Group, which flew Hawker Hind bi-planes.

By the time of the Munich crisis of 1938 both squadrons had converted to somewhat more modern Blenheim Mk1s. For the record 62 squadron was transferred to Singapore in August 1939, where it was to be decimated in the hopelessly uneven struggle against the Japanese invasion of 1941-42.

RAF Cranfield during the war

With the outbreak of war, the facilities at Cranfield expanded quickly. Most significantly, throughout the winter of 1939-40 work was undertaken to replace the grass landing strip with three properly hardened surfaced runways.

It was in the late summer of 1940, during the Battle of Britain, that the airfield received its first serious attacks. High explosive and incendiary bombs fell on the airfield in August. In September Cranfield was attacked by a parachute mine, which caused damage to houses and shops in Cranfield village High Street.

Michael Bowyer, in his chapter on Cranfield in the Action Station series, reports that on 13 October, a second mine was found dangling from a tree in nearby Hulcote Wood, where it had hung undiscovered for some three weeks. According to one story, although this was successfully detonated, the explosion brought down the ceiling at the home of the station armaments officer, who had assisted in the bomb's disposal.



Hawker Hind bi-planes



Blenheim Mk1

No narrative account of the history of Cranfield at this time would be complete without mention of the extraordinary double act of heroism of Aircraftsman Vivian Hollowday . On two occasions in July and August 1940 he risked his life attempting to save aircrew from blazing crashed aircraft. For his gallantry Vivian Hollowday was awarded the George Cross. The graves of the crash victims can be seen in the churchyard in Cranfield village.

By August 1941, Cranfield had become a very well-equipped station and, with the arrival of No. 51 Night fighter Operational Training Unit (OTU)), it assumed perhaps its most famous wartime role.

Bowyer recounts the somewhat bizarre and, perhaps apocryphal story, of contemporary night fighter training methods, which involved scores of air crew equipped with dark glasses being forced to ride around the barracks square on 'stop me and buy-one' Walls ice cream tricycles. (There was of course a war on!)

Post war at RAF Cranfield

No.51 OTU eventually disbanded in June 1945, and all of Cranfield's aircraft had left by the end of August. Flying did return to the airfield in November 1945, when the Empire Test Pilots School (ETPS) transferred to Cranfield from Boscombe Down. By the time they moved on to Farnborough in 1947, the future of the airfield had already been assured by its selection as the site for the new College of Aeronautics. The departure of the ETPS in no way ended the RAF connection at Cranfield. As the new College was to develop its commercial activities the RAF and the Ministry of Defence (MOD) would become major customers for its services.

Cranfield has been involved in a number of notable projects with the RAF, including research and development on, for example, the Harrier. It was also awarded contracts to service those most valuable aircraft, the Spitfires and Hurricanes, of the Battle of Britain Memorial Flight.

Perhaps the best loved of all the aircraft which have been based at Cranfield since 1947, is Avro Lancaster PA474 – S which was rescued from photo survey work in Africa in order to participate in research at Cranfield. This aircraft, since its repossession by the RAF, has been the showpiece of the Battle of Britain Memorial Flight, where it remains as the sole flying example of its type in the UK, and a permanent memorial to all the RAF personnel who gave their lives during the Second World War.



Aircraftsman Vivian Hollowday



Night Fighter Operational Training Unit



Harrier



Avro Lancaster PA474-S

1942-1946

The Foundation of the College of Aeronautics

Traditionally, the College of Aeronautics has been viewed as the product of the enthusiasm and determination of a relatively small number of visionary individuals, amongst an otherwise rather conservative-minded British aircraft industry of the time. The ambivalence and, in some cases mistrust, or even hostility, shown by aircraft industry leaders to the whole concept of the College, was to prove one of the main challenges to its creation and subsequent development in the early years after 1946.

However, what is perhaps surprising, is the timing of these events, and the clear importance that the Government attached to the project from the outset. Given that at the time it was still far from clear that Britain would win the war, the Government's concern with planning a future aeronautical college does, in retrospect, seem either a little optimistic, very visionary or, more likely reflects some real need to place aeronautics high on the political agenda.

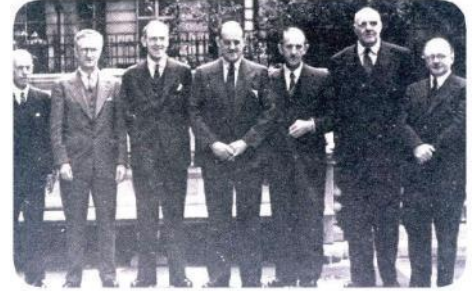
"The Mission" - fact finding in the United States

Of those who championed the cause of the College, one of the most influential and significant contributors was the notable aeroengine designer, Sir Roy Fedden. During the 1930's Fedden's design leadership had made the Bristol Aeroplane Company the leading aeroengine producer in the World. In 1942 he was appointed Special Technical Adviser to the Minister of Aircraft Production, and with the appointment of a new minister, Sir Stafford Cripps, Fedden was asked to lead an extended fact-finding mission to the United States.

The mission was given very broad terms of reference:
"To find out everything and anything of interest that could be learnt from the Americans about aircraft production and design."

Amongst the many visits that impressed Fedden's team were those made to leading US Institutes of Technology at Massachusetts and California. The institutes were turning out very high-quality graduates for industry and government. The mission reported these visits to be 'the high point of the whole tour. The mission produced an extraordinarily comprehensive seven-part report, of which one volume was devoted exclusively to education.

In Britain, industrialists who were unwilling to accept the notion that anything of value could be learnt from the US, dubbed the report 'Fedden's Folly'. It is interesting that most hostility was aroused by Fedden's claim that in comparison with their US counterparts, British companies were drastically short of qualified engineers. Fortunately, however, the report received enthusiastic support from the Minister, Stafford Cripps, who described it as "undoubtedly the greatest single volume that has been written about a single industry."



Significant College contributors



Fedden's team

Following the Mission's Report

The importance which Stafford Cripps attached to the recommendations contained in the Mission report is reflected in the speed of subsequent events.

On 6 May 1943, Cripps wrote to Professor Sir Brian Melville Jones, Chairman of the Aeronautical Research Council (ARC), in order to ask the ARC to investigate the concept of a School of Aeronautical Science. Throughout that summer the ARC obtained the views of leading industrialists and academics.

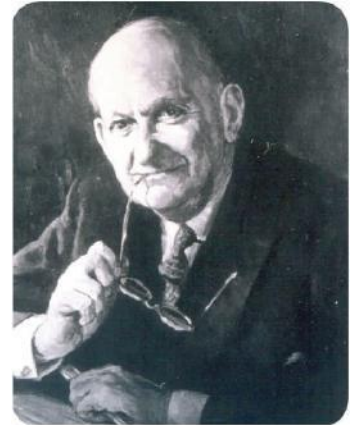
Against this background of investigation and some controversy the Royal Aeronautical Society held two open meetings on 25 June and 23 July 1943 on the subject of 'The education and training of aeronautical engineers'. The importance of these meetings is reflected in the eminence of the speakers who included leading figures in the industry such as Sir Frederick Handley Page, and the Chairman, Dr. Harold Roxbee Cox, who as Lord Kings Norton was to become the first Chancellor of Cranfield University.

The two most significant contributions to the debate were however made by Fedden and by Melville Jones. Both strongly advocated the need for a specialist postgraduate School for aeronautical education.

The Aeronautical Research Council's Report

Prompted by support from Sir Stafford Cripps, the ARC issued its report on the 10 August 1943, which laid out a series of recommendations for the future of aeronautical education. The main points included:

- Establish a central postgraduate aeronautical school.
- Provide two year courses, as well as short courses, but no undergraduates.
- Graduate-standard entry, but degree not essential.
- Principal subjects to include aerodynamics, structures, propulsion, design and construction.
- Research establishments to co-operate and exchange staff.
- To be affiliated to a University.
- Staff: Principal, 4 Professors, 8-10 Senior Lecturers, Flight Superintendent and Junior Staff.
- Must have own airfield and aircraft.
- Financed by state – all students to be given scholarships.
- The author of the report was Prof W J Duncan, who was to become the first Professor of Aerodynamics at Cranfield.



Sir Frederick Handley Page



Lord Kings Norton



Prof W J Duncan

The ARC's report and the accompanying proposal from Stafford Cripps to establish a postgraduate aeronautical school was referred in September 1943 to the Lord President's Committee of the War Cabinet. This was chaired by the Deputy Prime Minister, Clement Attlee, and also included other ministers such as Ernest Bevin and Herbert Morrison.

The future of aeronautical education

The Government's response was to establish an interdepartmental committee, charged with preparing and submitting to the Minister of Aircraft Production detailed proposals for a School of Aeronautical Science. The committee was chaired by Fedden himself.

In all the committee, which collected a mass of evidence from leading figures in the industry, met 16 times and in July 1944 submitted a report entitled 'A College of Aeronautics' which was in effect a blueprint for Cranfield.

The Fedden report, as the document is now commonly known, largely accepted the earlier ARC recommendations, with one extremely important exception. Fedden proposed that the new College should be totally independent of any other education body, having its own Board of Governors and should be financed by a grant from the Ministry of Education, rather than through the University Grants Committee.

Not surprisingly, in view of the amount of the sometimes contradictory evidence collected, some of the detailed provisions show differences in emphasis. Fedden's biographer, Bill Gunston, suggests that three editions of the report were written, one by Fedden himself, followed by two successive rewrites incorporating modifications in emphasis and phrasing, produced by civil servants.

In the end it appears something of a compromise was reached between Fedden's ambitions, and the more cautious view of the civil servants.

The primary plan outlined by the report called for an all new purpose built college, equipped from the outset, at a level not far below that of existing research establishments. The cost of this plan was estimated at £2.61 million, with an annual recurrent cost of £360,000.

Perhaps in anticipation of government rejection of such an ambitious plan, the report also outlined a second, short-term compromise proposal, which instead of providing for new buildings, suggested that the College could be located in a converted air station. This more conservative solution was costed at £200,000. As we shall see, the austere climate in which Britain found itself in 1945, ensured that this second solution would be the one adopted.



Design for Aeronautical College



Converted air station

There was still much criticism of the report. Some academics from existing universities were hostile to what they saw as Fedden's concept for a British equivalent of an American-style super Institute of Technology which would be independent of the University Grants Committee system. The most vitriolic critics of all, however, were aircraft industrialists, who lobbied Sir Stafford Cripps for three years, claiming the proposed postgraduate college would be a 'white elephant', an 'unwanted monstrosity' and a 'useless burden'. In all Cripps received formal protests from 24 academics and 18 industrialists but his continued support for the College – from 1944 onwards and through his ministerial influence in Attlee's first post-war Labour Government – was to prove crucial.

1946-1950

The period of development

Before outlining the challenges, problems and other factors which affected the evolution of the College of Aeronautics at Cranfield during the period from 1946 to 1969, it is important to appreciate the enormous effort that had to be expended in a very short time in order to ensure that the College was able to receive its first students in October 1946.

The initial stages of the college

Following the Government's acceptance of the compromise proposals outlined in the Fedden report, a Board of Governors was appointed under the Chairmanship of Sir Edgar-Ludlow Hewitt, and this met for the first time in June 1945. The Board established three committees responsible for finance, building and staffing, and selected the College's first Principal, E.F. Relf, a distinguished and experienced aerodynamist from the National Physical Laboratory.

As recommended by Fedden, the College received funding directly from the Ministry of Education, in the form of an annual Grant-In-Aid, which in the initial period from December 1945 to the end of March 1946 amounted to £3,126. 9s.11p. and this was followed by a grant of £271,740 to cover the year ending March 1947.

The allocation of college buildings took place at an Air Ministry meeting in February 1946. Initially two hangers were converted into large laboratories.

- The Airmen's Dining Hall (now Stafford Cripps Building) became a 'Hall of Assembly', providing space for the library, the main lecture hall, two common rooms and a recreation room for the use of teaching staff.
- Existing barrack blocks were converted into small laboratories, with lecture rooms and drawing offices fitted out on the upper floors.
- The first floor of the old RAF Headquarters building was re-arranged to provide offices for the Principal, the Registrar, the Bursar and other Clerical staff.
- The original Sergeants Mess was converted into a hall of residence for the first year's intake of students.

The subsequent departure of the Empire Test Pilots School in July 1947 placed more buildings under the College's control, and this enabled the accommodation of the increased student numbers when the second intake of students arrived to supplement the first in October 1947. Most significantly it enabled the conversion of the Officers Mess into a second Hall of Residence.

By 1948 the Sergeants and Officers Messes had been renamed Mitchell and Lanchester Halls respectively, in commemoration of two significant figures (R.J.Mitchell and F.W.Lanchester) in British aeronautical history.



Sir Edgar Ludlow Hewitt



E F Relf



Hanger conversion into laboratories



Hall of Assembly

The limited time available and the cost issue had rendered Fedden's ambitious plan for a purpose built college untenable. However, the need to convert and adapt existing buildings to the College's needs was to constitute one of the most serious problems to face the College in its early days. This was compounded by the fact that neither the land nor the buildings actually belonged to the College. In April 1947, the Air Ministry transferred responsibility for the College buildings to the Ministry of Works, for five years, with a view after this period, to ownership of the land, buildings and airfield passing to the College. This did not itself constitute a firm commitment and was to be the subject of prolonged negotiation.

The College's first Annual Report gives some indication of the scale of the problem in noting that "the lecturers are very dissatisfied with the accommodation at present provided for them in the old airmen's married quarters. The provision of adequate housing is a most urgent problem."

The College's structure

Initially the College had four departments covering the main aspects of aeronautics:

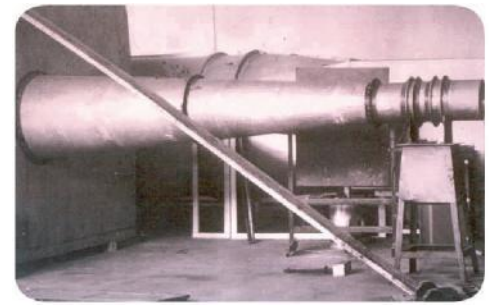
- Aerodynamics headed by Prof W J Duncan
- Aircraft Design headed by Prof R L Lickley
- Aircraft Propulsion headed by N S Muir
- Flight headed by Group Captain R C Hockey.

Equipment was scrounged from a wide variety of sources including:

- wind tunnels
- laboratory equipment
- aircraft
- a 3ft 6" diameter double flow wind tunnel a range of precision measuring machines, which had been
- liberated from Germany, in the form of war reparations
- aircraft operated by the Department of Flight for instructional flying, included two Halifax bombers
- four Anson transport aircraft.

The Principal, along with the four Heads of Department, was responsible for the recruitment of college staff. By 1947, the total staff of the College numbered some 220 teaching and other personnel. This was intended to cope with a student intake of 100 students, with around 50 in each year of a two-year diploma course. In addition 50 or more students were expected to attend short courses as soon as these could be established.

The first prospectus, issued in the spring of 1946, attracted 106 applications, of which 49 were finally selected. Of these, three failed to turn up in October and two left the course early. As a result of various delays and other problems, confronting the departments of Propulsion and Flight, the majority of students joined Aerodynamics and Aircraft Design.



Wind tunnel



First prospectus



First cohort of students

The educational offering

The Diploma was designed to give students a broad introduction to aeronautics in their first year and allowed for some specialisation through the writing of a thesis in the second year. Interestingly in the first year students were expected to attend all lectures provided by all departments. Mornings were taken up with lectures and these were followed by afternoon practicals in labs and drawing offices. They were supplemented by occasional Saturday morning special lectures (eg on Mathematics) and some general evening lectures. There were no free periods for private study.

The impracticality of this very heavy work programme was quickly recognised and subjected to a progressive series of modifications over subsequent years, in order to accommodate a growing need for more specialisation.

The first annual report provides an interesting evaluation of that first intake. Having noted that about half were graduates, while the remainder had good Higher National Certificates, the report commented: "...on the whole the average is not quite so good as had been hoped, it was necessary to alter the syllabus somewhat, in order to meet the needs of the students, nevertheless, the best students are distinctly good."

The first year comes to a close

To summarise the scale of the first year's achievement, again the first Annual Report provides a useful insight with its comment:

"... in spite of very considerable difficulties and delays in the early stages, the College was opened on the appointed day, October 15th 1946... there is every reason to be satisfied with the first full year's work...and there are signs that it will develop approximately on the broad lines defined by the Aeronautical Research Committee, the Fedden Report and the subsequent discussions of the Board of Governors."

Evaluation of the period

It is possible to characterise the period from 1946 to 1950 as one of development, albeit at a pace that was limited by the severe austerity of the times.

1951-1955

A period of crisis

By March 1951, there is evidence of pressure beginning to build on the College and the onset of a period of crisis and instability which seemed to threaten its future. The pressures, constraints and challenges imposed on the College in the period between 1951-55, are essentially the same as those facing higher education today: The need to seek ways to bring in additional revenue, through the promotion of commercial activities, in order to supplement public money and to demonstrate to the funding authority value for money in terms of the quantity and quality of productivity and output.

For the governors and staff at this time, this pressure manifested itself essentially in the need to reduce the College's costs per student. It also, for the first time, highlighted a debate that was to occupy much of the College's efforts up until 1969 of the need to move away from its original aeronautical interest into a greater diversity of areas for teaching and research.

The conclusion to the 1950-51 Annual Report gives expression to these concerns having noted that:

“During the year under review both the governors and the staff were very conscious of the need to make the widest and most economic use of the exceptional equipment and facilities available at Cranfield. Much consideration has also been given to the possibility of widening the scope of the College and the Departments, and to the extent and direction of such developments... The main objects which the Governors had in mind were...

- to extend the services which the College as a national institution could render the nation
- to utilise to better advantage the considerable quantity of apparatus and equipment available at the College
- to reduce the cost per student by increasing their number.

The bigger UK picture

These developments also have to be seen in the context of the country's worsening economic and political situation. A series of sterling crises, devaluation, fears over balance payments and the outbreak of the war in Korea had also increased the economic pressure on Attlee's Labour Government in which Stafford Cripps still served. The General elections of 1950 and 1951 saw firstly a massive reduction in the Government's majority, and then its defeat by the Conservatives under Churchill.

Staff changes and problems facing the college

During this uncertain period, the College's first Principal, Relf, retired and he was succeeded in September 1951 by Air Vice Marshal Sir R. Victor Goddard. The new principal faced a number of quite serious problems in tackling the cost per student problem. The essential elements of this conundrum were the need to finance major improvements in buildings and accommodation, in order to cope with larger student numbers, and the need to spend more money on attracting the right students and new staff with the appropriate level of qualifications and experience to permit diversification into a wider range of activities.

As early as 1950-51 it was recognised that a potentially very serious discrepancy had opened between salaries paid to academic staff at the College, compared to their University colleagues, because of Government imposed restrictions on the salaries of civil servants. Moreover the need for post-war reconstruction led to increased demands for high calibre staff in industry and the payment of salary scales with which the College could not compete. It was to take many years of protracted negotiation before the Ministry of Education was to recognise the Governors request that academic salary scales at the College should be brought into line with those of universities.

As far as accommodation was concerned, the previous Principal had been unable to obtain sufficient increases in the size of the Grant-in-Aid to finance the much needed building programme for staff housing and student accommodation, in particular a much delayed extension to Lanchester Hall.

As noted earlier, factors of cost and a shortage of building materials produced by post-war industrial and housing reconstruction programmes effectively ensured that the College had to make do with accommodation inherited from the RAF. This, however, increased costs because buildings which for defence reasons had been widely dispersed over a large area, were inherently more expensive to maintain. Most significant of all was the cost of maintaining and servicing a large airfield, with its full-sized concrete runways. Goddard clearly wanted to revise accounting procedures to show the cost of maintaining the airfield and its buildings separately from the cost of its academic activities.

The 1952-53 report also highlighted the consequent cost implications caused by the lack of adequate staff housing, noting that:

“... this shortage incurs the continuous expense of transport to convey staff to the College from the surrounding countryside, which is lacking in public transport and emphasises further the need for adequate financial provision for capital works.”



Sir R Victor Goddard

Even if it had the accommodation, the College appears to have been experiencing some difficulty in attracting sufficient candidates with the right qualifications. This, if anything, was to be exacerbated with the ending of National Service which until then had been acting as something of a stimulus in persuading students to seek postgraduate education.

The 1950-51 report includes a thinly veiled criticism of Government and its lack of support for technical education. Recognising the need to achieve maximum utilisation of College resources, the report comments:

“In the lack of any precise or even general direction from above it remains a subject which, while pregnant with possibilities, does not readily lend itself to any immediate practical solution. The need for the further development of technical education throughout the country is now generally realised and has been under consideration for sometime at high level, bearing this in mind, we at Cranfield feel the need for some indication as to the part which Cranfield should take in any development of this kind and particularly, how Cranfield, with its superb technical equipment and other potentialities, can best fit into a national scheme.”

The worst part of the crisis was reached in 1952-53 when at a request from the Treasury, the Ministry of Education forced the Governors to accept an independent review of the organisation and work of the College. This was followed by Cranfield having to go back to the Ministry for a supplement to its Grant-in-Aid before the end of the year.

Cranfield's strategies to move forward

A number of different strategies were adopted to deal with the various problems and the success of these were eventually to pave the way for achievement of university status.

In terms of these strategies, there is no doubt that the College responded with a well-orchestrated publicity campaign to win support and to raise its public profile. The work of the College began to appear in the technical press with a whole series of articles. Cranfield staff were quick to exploit the potential of the new broadcasting media and the college was the subject of a radio presentation in February 1953, and then appeared in a BBC television programme in July of the same year.

The biggest coup of all was the visit of HRH The Duke of Edinburgh in October 1952. Its importance is reflected in the memo which Goddard sent his Head of Departments immediately prior to the visit in which he stated.



HRH The Duke of Edinburgh
visiting in October 1952

"It is not only a great honour to this College to be receiving a visit by the Duke of Edinburgh, it is also a great opportunity for his Royal Highness who has become the leading patron of Technology....For the visit to be a success it is necessary that the Duke of Edinburgh should take away very lively impressions of the potentialities of the people of this College as well as its equipment. What is said of his visit by his Royal Highness to those whose influence can aid or impede the future of this College is vitally important."

Undoubtedly, however, the two major policy debates that lay at the heart of Cranfield's survival at this time were the questions of ownership of the College's land and buildings and the need to develop teaching and research activities in new areas in order to attract commercial sponsorship, particularly from the private sector, and to bring in more students.

The start of diversification

The Annual Report for the year ending March 1952 contains perhaps the first unequivocal statement in support of diversification:

"... should the College confine itself solely to research and teaching of aeronautical or near aeronautical subjects? If not, what other subjects can suitably be taught at Cranfield ... It is desirable for the happiness and health of Cranfield as a whole that the community should be increased in size and broadened in interest."

Whilst little progress had been made by 1953 on the building's issue, the beginning of a Work Study School, with funding from a range of industrial sponsors such as ICI, Hoover, and the British Institute of Management in January 1953 was a significant step on the path of diversification. The Work Study School was eventually to evolve into one of the activities which combined to produce the Cranfield School of Management at the end of the 1960s.

Real progress on these issues however came only after some major administrative changes at the College in 1953-54. The first of these changes actually occurred in October 1952 as a result of which the Principal became directly responsible to the Governors, and Senate was retained solely as an advisory body. In June 1953, the first Chairman of the Board of Governors, Ludlow-Hewitt resigned, and was replaced by the imposing aircraft industrialist, Sir Frederick Handley-Page. The constitution of the Board was altered to allow for the appointment of additional committees and three Deputy Chairmen, who along with Handley Page himself were effectively to lead the decision making process. In July 1954, Victor Goddard resigned his appointment as Principal. It was left to his successor, the distinguished metallurgist, Professor Alfred Murphy, who became the new Principal in October 1955, to steer the College towards university status.



Work study school



Professor Alfred Murphy

1955-1969

The period of diversification

Handley-Page and Murphy were undoubtedly assisted during the second half of the 1950s by an improvement to the country's economic situation. It was the comparatively affluent conditions of the 1960s which were to assist the expansion not only of Cranfield but also of higher education generally in Britain.

Following negotiations which had been taking place effectively with the Ministry of Works since 1951, the College in 1957 finally assumed responsibility for the management of the Cranfield site. Even greater security was afforded early in 1963 when a deed was made transferring the freehold of the property comprising Cranfield airfield from the Secretary of State for Air to the Governors of the College of Aeronautics. The importance of this development for the long-term financial security of the College cannot be over-estimated. The considerable area of land and extensive buildings which passed into the College's hands at this time, has continued to offer some proof against financial hardship over the years since.

It was the policy of diversification which brought the most significant developments in the period from 1955 to 1969. Among the most important of these were the creation of new Departments of Aircraft Electrical Engineering and of Mathematics in 1955 and in October 1958 the creation of a Department of Aircraft Materials.

The White Paper on Defence Policy and its effect on Cranfield

In 1957, the publication of the Government's infamous White Paper on Defence Policy, which seemed to auger the decline of manned aircraft, in favour of the development of missile technology was to have a profound effect on the British aircraft industry. It gave rise to the cancellation of a whole range of research and development projects which in turn began the process of mergers which were to re-shape the industry.

The White Paper sent a further ripple of alarm through the College, and gave greater urgency to diversification. In 1959-60 an amendment to the Deed of Trust on which the College was founded was implemented in order to broaden its terms and to enable Cranfield to engage in a wider range of activities. New courses were planned and introduced covering subjects such as fluid mechanics, control engineering, and automotive engineering. Finally in October 1961 the titles of the College's Departments were changed in order to drop the word Aircraft from the names:

- The Department of Aircraft Economics and Production became the Department of Production and Industrial Administration
- The Department of Aircraft Materials became the Department of Materials

The crucial phase of this period began in 1962-63 and ironically coincided with the death of Handley-Page in April 1962. Continuity was assured by the appointment of Sir Harold Roxbee Cox, as Chairman to succeed Handley Page, in August 1962.

National review of Higher Education

Early in 1963 the Cost Investigation Unit of the Ministry of Education carried out a detailed inquiry into the finance and organisation of the College and required the production of economies, in preparation for the replacement of the Grant-in-Aid by a new Direct Grant in 1963/64. The key moment was reached however with the national review of Higher Education conducted by a Committee of Inquiry under Lord Robbins, the recommendations of which were expected to determine the shape of Higher Education and with it the future of the College for years ahead.

The statement of evidence submitted by the College to the Robbin's Committee, was intended to substantiate its claim for recognition of its status as the nucleus of a new postgraduate Institute of Technology. For its part, the Committee, despite reporting favourably on many aspects of the College's work, concluded:

“We are not happy that a relatively small college of this kind should have the power to award its own degrees. We recommend, therefore, that if the College remains at about its present size and wishes its students to be eligible for higher degree, it should be urged to form an appropriate association with a university.”

When the Robbins Report was published in October 1963, it recommended that the College should be brought within the same funding arrangements as the Universities, and within the ambit of the University Grants Committee (UGC). Staff at the College received further encouragement from the fact that the report appeared to show that the staff/student ratio for which the College had been repeatedly criticised in the past, was now comparable with postgraduate courses in the universities, and the costs of the college were similarly not inconsistent with those generally incurred in the provision of postgraduate teaching and research.

Shortly after the Government showed its acceptance of the Robbins recommendations in the November 1963 White Paper on Higher Education, the UGC in consultation with the College authorities, established an Academic Advisory Committee to make specific recommendations for the future development of Cranfield. The main conclusions of the further round of planning and inquiry which accompanied the Advisory Committee's investigations were noted in the 1963-64 annual report in a comment that:

“..the strength of the College and its associated institutions lay in their specialised experience of teaching at postgraduate and post-experience level and in their exceptional facilities for experimental research, and that their best contribution to the national technological effort would be to develop as an exclusively or mainly postgraduate institution providing courses in engineering science, technology and management subjects directly related to the needs of industry.”

This statement encapsulates the essential characteristics of what was to become Cranfield Institute of Technology. However, it was to take six years of protracted negotiation with the Secretary of State for Education before this could be realised. During this time, the Ministry attempted to pressure the College into accepting affiliation with an existing University, such as Birmingham or the Council for National Academic Awards, which administered the new polytechnics.

The Royal Charter

In July 1967 the College presented the Privy Council with a Petition for the grant of a Royal Charter along with a draft charter for a new institution to be called Cranfield Institute of Technology. The objectives of the new Institution were:

- to advance, disseminate and apply learning and knowledge in the disciplines of the sciences, engineering, technology and management
- to promote and encourage the application of that knowledge and learning to the practices of design, development and manufacture and to the organisation of industry and the public services.

The development of the local area

Earlier that year, Cranfield's cause had been strengthened indirectly by a decision of the Minister of Housing to designate an area of North Buckinghamshire, the boundary of which lay only four miles from the College, as a site of the new City of Milton Keynes. The College authorities wasted little time in establishing contact with the principal officers of Milton Keynes Development Corporation. It is little surprise therefore that following the Grant of the Royal Charter in December 1969, the man who was to succeed Professor Murphy, as Vice-Chancellor, of the new Cranfield Institute of Technology and the man perhaps most responsible for its development since, was also in his time to be Chairman of Milton Keynes Development Corporation.

Evaluation of the period

Before bringing the history of Cranfield up-to-date with a brief review of its development under the direction of Professor A.H. (now Lord) Chilver, it has to be emphasised that by 1969, the Institute had grown enormously in the size and scope of its activities, since 1946. With a student population of 580, the Institute had a recurrent grant of £1,100,000, a capital grant of £311,00 and was organised into three faculties under the direction of a new Senate:

- Aeronautics
- Engineering Science and Technology
- Management.

For one man in particular though, this development represented the abandonment of an ideal. Sir Roy Fedden had continued to serve the College as a Governor and had made no secret of his opposition to diversification. According to his biographer, Fedden believed the vital ingredient for Cranfield to fulfil its purpose was its devotion to aerospace and quotes him as saying:

"You could have the most marvellous structure department in the world... but if the leadership is not centred in doing the impossible, as aviation has had to do throughout its history, the vital spark will be lost and there will be nothing to stop Cranfield degenerating into just another institute of technology."



Petition for the grant of a Royal Charter



New City of Milton Keynes

On the arguments which followed the Robbins Report, Fedden adds:

“I am not mesmerised by size. If we realise our goal of quality and only turn out 75 students a year, we should make our awards on our own and not beholden to anyone.”

The lessons of Robbins, however, were not lost on Sir Henry Chilver and it is possible to see how in the years following 1969, Chilver set out to ensure that the new Institute of Technology would not again be vulnerable to the reservations of size and funding level which beset the College in 1963.

1970-1994

Cranfield Institute of Technology

The Chilver years

While a rigorous appraisal of the Chilver years is now perhaps overdue, it is somewhat more difficult to distinguish history from current policy. As a result the analysis presented here is somewhat broader and more impressionistic than for the preceding periods.

Nevertheless it is possible to identify some of major themes which characterise the modern Cranfield. Commentators and critics of Chilver tend to divide fairly evenly into supporters and detractors. The former point to the undoubted growth of Cranfield, the enormous increase in its research and development income, the high reputation and esteem enjoyed by Cranfield's staff and students, the quality and relevance of its work and the extent of its activities and links overseas.

Critics of Chilver accuse him of expediency and a prevalence for planning for short-term advantage. He is credited, or blamed, (depending on your point of view) with creating an atmosphere of competition, and an unshakeable belief in the relevance of market forces to education and research, which earned Cranfield the reputation as a model Thatcherite University during the 1980's.

However Chilver's own philosophy might have affected the shape of Cranfield's evolution, his contribution must surely be seen against the background of Robbins and the years of subsequent struggle to maintain academic independence.

Additional campuses

First on Cranfield's agenda was the need in the post Robbins era to increase student numbers and spread its activities across more than one campus. This was achieved with spectacular success in 1975 when the National College of Agricultural Engineering at Silsoe became part of Cranfield Institute of Technology. In 1984 this process was completed when Cranfield bid successfully for the contract to run academic work at the Royal Military College of Science at Shrivenham, which became a third campus of the Institute.



Lord Chilver



National College of Agricultural Engineering at Silsoe



Royal Military College of Science at Shrivenham

Commercial revenue

Secondly, Chilver believed that for its long-term survival a culture had to be developed in which Government funding could be used to support Cranfield's mission but would not be used to dictate it. In other words Chilver sought to reduce the Institute's dependence on government funding by developing a vastly expanded research and development activity. In order to do this, he encouraged a devolved structure for the Institute in which staff in individual schools accepted responsibility for obtaining the resources needed to achieve their aims. The influence of centrally funded services were reduced wherever possible, as Head of Schools largely became responsible for managing their own resources. Again this policy of generating commercial revenue has to be seen as a spectacular success, with the majority of Cranfield's annual income now coming from fees and research contracts.

This emphasis on commercial activities at the time led to criticism that the Institute had been deflected from its prime mission. The establishment of Cranfield Biotechnology Centre in 1981, an area in which Cranfield had no traditional strength, is an often cited example of this process. Certainly too, activities which suffered a downturn in their fortunes were quickly dropped or sold-off.



Cranfield Biotechnology Centre

International activities

A third major theme in Cranfield's modern era was its pioneering pursuit of international activities and educational links with organisations worldwide. From its origins in 1979-80 with the inception of a double-degree course with the University of Compiègne, near Paris, these sort of programmes, which allow students to earn degrees from both participating organisations, have become the flagship of Cranfield's international activity. Double-degree courses are now offered with universities and other education institutions in many European countries.

Similarities to securing the College of Aeronautics

As noted earlier, the higher educational context in which these developments have been undertaken, i.e. the need to control costs, yet accommodate increasing student numbers and, above all, the need to demonstrate relevance and quality of output in order to ensure continuing success in the competition for resources, would not be too unfamiliar to those staff who had worked to secure the existence of the College of Aeronautics prior to 1969.

Cranfield's strengths

Most importantly, just as their predecessors had done, Lord Chilver and Professor Frank Hartley, who succeeded him as Vice-Chancellor in April 1989, attempted to emphasise the particular strengths which underline the uniqueness of Cranfield. These, as they always have been, are:

- Cranfield as a wholly postgraduate educational institution
- appointment of staff who are not only experts in their own academic fields, but maintain close contacts with industry, commerce or government
- students who are recruited on the strength of their practical work experience as well as their qualifications, and who typically graduate into industry or commerce, rather than academia
- an overriding concern with the application of knowledge rather than merely its acquisition.



Professor Frank Hartley

Cranfield's achievements

This commitment to meeting the needs of commerce have led in turn to a whole series of practical Cranfield achievements including:

- the development of widgets in canned beer
- the updating of management practice in business
- the development of clean water and improved farming methods in the Third World.



British Aerospace

Cranfield Technology Park and industry links

Perhaps the most obvious symbol of the strong links which the University has established with industry and commerce, is the Technology Park and the selection of Cranfield by Nissan for the site of its European Technology Centre, as well as the continuing collaboration with companies such as British Aerospace and Rolls-Royce.

Conclusion

Whether seen through the eyes of the visionary Fedden, or the pragmatic Chilver, these elements are the very essence of Cranfield, and provide the common thread which links the history of the institution which we now know as Cranfield University. Ironically, it was fear for the loss of this unique identity which caused some to oppose the adoption of the name Cranfield University in September 1993.



Cranfield Technology Centre in Performance Engineering with Rolls-Royce

Appendix 1

1977-2001

The School of Mechanical Engineering (SME)

In 1977 the Department of Aircraft Propulsion became independent of the College of Aeronautics. Within two years the Department became the School of Mechanical Engineering under the leadership of Arthur Lefebvre. The new school was comprised of three departments:

- Thermal Power
- Applied Energy
- Applied Thermodynamics

The school at this time had 76 staff and 186 students. It offered 38 short courses per year and managed 39 active research projects.

In 1980 the School (now led by Professor Ron Fletcher) secured funding from the Department of Education which enabled the extensive refurbishment and extension of Building 52.

When Professor Fletcher became Deputy Vice-Chancellor in 1984, Professor Barrie Moss, Deputy Head of School led the school for a year. Professor Phil Hutchinson joined as Head of School in 1985.

By 1988 the School was comprised of seven departments:

- Fluid Engineering
- Instrumentation
- Applied Mechanics
- Turbomachinery
- Thermal Power
- Applied Energy
- Applied Thermodynamics

SME continued to expand into new areas under Professor Hutchinson. These included Applied Mathematics and Computing, Nanomaterials, Optical Sensors and Automotive Engineering.

In 2001 Prof Hutchinson oversaw the merger of the School of Mechanical Engineering and the College of Aeronautics to form the new School of Engineering.

Appendix 2

Additional Information about Lord Kings Norton

Frank Hartley described Kings Norton as the “Twentieth Century Man”.

Born Harold Roxbee Cox in 1902, the man who was to become the University’s first Chancellor, was indeed one of the leading British scientists, engineers and administrators of the modern age.

Roxbee Cox, who was born some eighteen months before the Wright Brothers first powered flight, was responsible for the external design of Britain’s largest airship, the R101, made enormous contributions to the safety of aircraft design and air travel.

In 1943-44, as Director of Special projects for the Ministry of Aircraft Production he enabled Sir Frank Whittle to develop his jet engine.

In recognition of his various achievements, Roxbee Cox received a knighthood in 1953, and was created a Life Peer in 1965, with the title Baron Kings Norton of Wotton Underwood.

Incredibly, he also found time to make an indelible mark on the establishment and development of Cranfield.

In 1943 it was Roxbee Cox who chaired the two Royal Aeronautical Society meetings on the future of aeronautical education, and two years later joined the founding Board of Governors of the College.

In 1952 he became Vice-Chairman and then, following the death of Sir Frederick Handley Page, became Chairman of the Board of Governors 10 years later.

In 1969, when the College attained University status, he became Chancellor. Until his retirement, a few months before his death in December 1997, Lord Kings Norton had an incredible record of presenting degrees to every Cranfield graduate, as well as many famous honorary graduates, including Neil Armstrong, the Duke of Kent and the Duke of Edinburgh.

His devotion to Cranfield was summed up simply, when he said “Cranfield has the right philosophy. The more influence it has, the better we shall be.”