RICHARD CLARKSON

[illegible], OBE, aeronautical engineer, died on October 7 aged 92. He was born on July 14, 1904.

IN A career which began in the era of the piston-engined light aircraft and ended in that of the jet airliner, Richard Clarkson made a major contribution to the aerodynamic development of virtually every de Havilland aircraft between 1929 and 1959. As such, he contributed to the success of aircraft as different as the high-wing Puss Moth tourer of 1929; the incomparable wartime Mosquito bomber; the twin-boom Vampire jet of 1944; and the DH 106 Comet jet airliner of 1949.

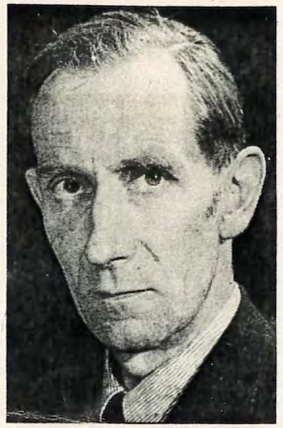
And when, in 1960 de Havilland was subsumed into Hawker Siddeley Aviation in one of the "shotgun marriages" which took place in the industry in the wake of the Duncan Sandys Defence White Paper of 1957, Clarkson continued to serve his new masters in the development of the HS125 executive jet. The outstanding advances in aircraft project conception represented by his work on this highly successful small airliner won him the Mullard Gold Medal of the Royal Society in 1969.

One of the most astute of the small band of aerodynamicists and "aero-elasticians" of the British aircraft industry during its formative years, Clarkson brought skill and imagination to bear on aircraft design at a time when intuition was first being allied to scientific research, when an "eye-for-line" was starting to be backed up by mathematical analyses.

Richard Milroy Clarkson was educated at Clayesmore School, Blandford, Dorset, and at the City and Guilds College, London. He started as an apprentice in de Havilland's fitting shop at Stag Lane, moving on two years later to the drawing office.

He also became de Havilland's flight-test observer and gained his pilot's A licence in the RAF Reserve. On his own admission he was "an inept pupil" who needed nearly 15 hours of dual instruction to go solo. During the next 15 years, until he gave up his licence in 1945, he logged a total of only 94 flying hours — just sufficient, as he said, "to keep my hand in".

Those were the days of a small, close-knit team under Geoffrey de Havilland and his brother-in-law, Frank Hearle. Indeed, many of its members were related. This brought to the company an unequalled esprit de corps under de Havilland's paternal leadership and flying expertise. De Havilland was a firm believer in "the creative process, uncontaminated by theoretical expertise". But Richard Clarkson was always exempted from his deep-seated suspicion of "figure workers".



This philosophy led to a succession of de Havilland aircraft renowned for their aerodynamic and flying characteristics. To all of them Clarkson and his team contributed essential performance data, estimates and, then, reports on their flying characteristics. Before the war, an outstanding de Havilland achievement was the design and completion, in only eight months, of three DH88 Comet racer aircraft for the 1934 MacRobertson International Air Race from Mildenhall, Suffolk, to Melbourne, Australia. Of the nine finishers out of the original 20 starters, four were de Havilland aircraft. One of the DH88s won the race.

From the DH88 came one of the outstanding aircraft of the Second World War, the wooden 387mph DH98 Mosquito bomber, and this was succeeded by the jet-powered DH100 Vampire, the first aircraft in the world to exceed 500mph in level flight. Between April and June 1944 Clarkson was a leading member of the British Jet Propulsion Mission to the United States. Shortly before the end of the war he visited Germany, to assess German aeronautical know-how, a trip which led to the unexpected revelation of the significance of swept wings for trans-sonic flight.

In July 1949 came the first flight of the DH106 Comet jet airliner and for it, Clarkson's group had to step into the unknowns of turbine-powered performance. But the disasters that were to afflict the Comet came from the new structural problems posed by aircraft pressurisation and not from the aerodynamics. Though these structural failures marred the Comet's early years the aircraft made history by doubling the speed of airliners.

After the takeover of de Havilland by Hawker Siddeley, Clarkson's final contribution to the success of British aircraft in world markets was to the HS125 executive jet which first flew in August 1962. Almost a thousand of this type and its developments have now been sold. In 1965 he was appointed Executive Director (Research) of Hawker Siddeley Aviation. He retired in 1969.

Richard Clarkson combined his deep involvement with aeronautical design and development with an equal enthusiasm for horsemanship and hunting — notably with the Sparkford Vale Foxhounds.

He is survived by his wife Sylvia and a daughter.

Puss Moth — 1929
DH 88 ~ 1930's
DH 100: Vampire ~ 1944
DH 106 Comet ~ 1949
Mosquito DH 98 ~ 1940's
HS 125 ~ 1962

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With best compliments from

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DH100: Vampire ~ 1944
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AIR COMMODORE SIR FRANK WHITTLE

Air Commodore Sir Frank Whittle, OM, KBE, CB, FRS; inventor of the jet engine, died at his home in Columbia, Maryland, on August 8 aged 89. He was born in Coventry on June 1, 1907.

Whittle and his brainchild the Gloster E28/39, Britain's first jet plane, on a proving flight in 1941

Although, thanks to a dilatory Air Ministry, it fell to Germany to fly the world's first jet aircraft in 1939, it was Frank Whittle who had patented the turbojet engine nine years before. But lack of official interest in this revolutionary method of propulsion meant that Whittle and his team of dedicated designers languished for years in the wilderness, and the chance to produce what might have been a war-winning aircraft was lost.

To the end of his life Whittle believed that had the Air Ministry listened to him earlier, the RAF could have had jet fighters in the Battle of Britain. As it was he had to wait until 1937 before he was able to test-run the world's first turbojet aero engine. But even then, official foot-dragging and poor funding let this marvellous opportunity slip. In the end Whittle and his team had to look on while both the Germans (Heinkel He178, August 1939) and the Italians (Caproni-Campini, August 1940) beat the British jet into the air. It was not until May 1941 that the Gloster Whittle made its maiden flight.

Frank Whittle was a man of undoubted genius, and of a typically English form of genius. Like other great inventors before him, he had an individuality and quixotism bordering at times on the eccentric, and it was not unnatural that he did not rise to the highest ranks in the Royal Air Force, in spite of his great devotion to the Service and to the air. Officialdom treated him in a manner ranging from gross clumsiness and insensitivity to wise perspicacity and generosity. His application of the gas turbine to the jet propulsion revolutionised air transport in a remarkably short time, and the Western world eventually acknowledged its debt to him by a profusion of honours and awards.

This remarkable man was born of modest parents in the engineering city of Coventry. His father was of an inventive turn of mind and a sound engineer and his eldest son was quick to take advantage of parental precept and example. At a very early age Frank Whittle had already begun to experiment with making things and very soon his bent lay all towards aircraft. From a council school he earned a scholarship to Leamington College, where he showed no outstanding qualities. At the same time his mechanical interests were being fostered by the practical experience that his father's small factory provided.

The young Whittle was determined to get into the Royal Air Force but financial considerations made it impossible for him to go to the RAF College at Cranwell. Instead he sought admission to the Service by apprenticeship. But here his stature and physique were against him and he failed to meet the medical and physical standards. This would have crushed such ambitions in a less determined boy; authority regarded inability to reach the minimum height as a permanent bar. But Whittle took an intensive course of physical development and put on three inches in height and a similar amount on his chest measurement. By keeping his previous attempt quiet he was accepted for an RAF apprenticeship in September 1923.

The RAF soon realised that it had gained a gifted recruit and from No 4 Apprentices' Wing he was granted a cadetship to the RAF College. Here the priority was to learn to fly. But in this pursuit, as later in his engineering life, his individuality made progress sometimes difficult. Rough handling by an unsympathetic flying instructor caused a temporary loss of confidence and there was a danger that he might not clear the essential hurdle for all cadets, the flying badge. But he was a naturally gifted pilot and his confidence returned. Indeed it flooded back in such measure that he was now marked down as "over-confident". Soon he was selected for the dual crazy flying event at the Hendon Air Display, an event which required the greatest skill and airmanship.

While still at Cranwell he set out his ideas on the way in which aircraft propulsion might develop in a thesis *Future Development in Aircraft Design* which he presented during his fourth term there. In it he considered the higher reaches of the atmosphere where, in the thin air, the piston engine and the propeller would be less efficient and new means of propulsion might give speeds then undreamt of. In July 1928 he passed out at Cranwell with the Abdy-Gerrard-Fellows Memorial Prize and was posted for flying duties with No 111 Squadron. In the following year, while undergoing a flying instructor's course at Wittering, he hit on the idea of using a gas turbine for jet propulsion.

A fellow officer on the course encouraged him to propound his theories. But much of what he said was dismissed as over-optimistic by the Air Ministry. Nevertheless, a provisional specification embodying the principles that led to the first gas turbine jet engine was filed at the Patent Office on January 16, 1930. Whittle was then 22.

No official interest was shown in the invention, and subsequent attempts to interest industry in the project were equally ignored. At that time the only use that could be envisaged for the gas turbine was to drive a shaft, and hence a propeller. Meanwhile Whittle's RAF superiors felt that his career as an inventor was detracting from his professional duties, and he was sent to be first a flying instructor and then to test seaplanes at Felixstowe.

There he had several brushes with death. On one occasion as he was being catapulted from a warship in a floatplane, his observer, Flight Lieutenant F. Kirk, was flung out of the rear cockpit and fell across the tail-plane. Kirk managed to get himself astride the fuselage with his back to the fin while Whittle struggled to keep the aircraft's nose down and stop it from stalling. Kirk kept his head and clung grimly on while Whittle skilfully battled to trim the aircraft, and eventually brought it down on the sea near a German ship. In the event, apart from the bruising sustained by Kirk, neither he nor Whittle was any the worse for this alarming experience.

In spite of these distractions Whittle's interest in engineering never wavered. Nor did his inventive energies, and on the strong recommendation from his commanding officer he was sent on a course at the RAF School of Aeronautical Engineering at Henlow.

In this much more appropriate atmosphere his remarkable gifts flowered and when he finished the Air Ministry arranged for him to go to Peterhouse, Cambridge, in 1934. There he took first-class honours in the Mechanical Sciences Tripos in 1936 and stayed on for a postgraduate course.

At Cambridge in May 1935 an old RAF friend of Cranwell days, Dudley Williams (later MP for Exeter), renewed his interest in Whittle's plans for a jet aircraft. With J. C. Tinling they founded Power Jets and the first steps towards the jet engine were taken at the works of the British Thomson-Houston company at Rugby. Whittle was transferred to the Special Duty List of the RAF to allow him secondment to this work.

Meanwhile, astonishingly, his patent for the jet engine had not been safeguarded by a security classification, and in 1932 it was published to the world. And when after a lapse of five years the patent came up for renewal, Whittle was so beset with domestic financial commitments that he debated whether he could afford the £5 to renew it.

Nevertheless, with finance its three directors raised from a merchant bank and with scant official encouragement, the tests went on at Rugby in ramshackle surroundings with the project often having to work with reclaimed scrap metal. (By contrast, Whittle's German rival Hans von Ohain was getting from the aircraft manufacturer Heinkel all the resources and support he needed.) Nevertheless, on April 12, 1937, the first run of a gas turbine jet engine under control was successfully accomplished. But successful though the test was, it still failed to secure the adoption of the jet engine by the Air Ministry, which was by then absorbed by its efforts to bring the RAF up to strength in the conventional aircraft then available, in the face of the threat from the Luftwaffe.

But Sir Henry Tizard, chairman of the Aeronautical Research Committee, had recognised the possibilities of this new power plant for aircraft. In June 1939 the Air Ministry decided to test-fly one of the engines and instructed the Gloster aircraft company to build an experimental aeroplane. By the following year the research and development side of the Air Ministry was convinced, somewhat belatedly, that it had before it a potentially war-winning device.

In the evening of May 15, 1941, the Gloster Whittle E28/39 first flew, aptly enough from the airfield at Cranwell. But even after this initial success, progress in the development stage was halting. Whittle's reserves of patience and resource were heavily strained and he struggled with inadequate financial means and with the inexperience of British firms in the machining of parts for the revolutionary new technology required.

It was not until 1944 that the operational offshoot of the Gloster Whittle, the twin-jet Meteor, was able to make its appearance. By that time the Luftwaffe already had its jet-powered Me262 in the air and in combat (although the Germans, too, had dithered and squandered the lead they had previously been handed by the British Air Ministry, coupled with the fact that Hitler later ordered that the new jet was not to be used as a fighter, in spite of its proven massive superiority over anything else in the air). The Meteor did not see air-to-air combat during the war but on August 4, 1944, it achieved its first "kill" — a V1 flying bomb off the south-east coast of England.

By that time Whittle had begun to experience the bitterness arising from the Government's handling of Power Jets. The firm was turned over to state ownership and told to make no more jet engines (the Meteor was powered by Rolls-Royce engines). What rankled most with Whittle was his feeling that those who had been associated with him were being dispossessed of their rights. He himself had already surrendered his assets to the Ministry of Aircraft Production. From 1944 the Government was to share British jet engine technology with the Americans, permitting them to develop the Lockheed Shooting Star and after 1945, with extraordinary naivety, the incoming Labour administration gave a Rolls-Royce jet engine to the Soviet Union, which as a result was swiftly able to produce the superb jet fighter the MiG15.

In January 1946 Whittle resigned from Power Jets and went to the Ministry of Supply as a technical adviser on engine design and production. But he was not happy in the restricting atmosphere of a ministry and his health was showing signs of wear and tear. In 1948 he retired from the RAF on the ground of ill-health. He had been appointed CBE in 1944 and CB in 1947 but had never reached beyond the rank of temporary air commodore. It appeared possible at one time that he would even leave without a knighthood — no air commodore had ever before received the accolade — but this was put right in the Birthday Honours of that year, shortly before his retirement. He had also been awarded in June £100,000 by the Royal Commission on Awards to Inventors, although he himself put forward no claim. He had been made a Commander of the US Legion of Merit in 1946.

Between 1961 and 1970 Whittle worked as a consultant to Bristol Siddeley Engines and Rolls-Royce on the successful development of a turbo-drill for deep sea oil and mineral exploration. Based on some of his earlier turbo-engine patents, the so called "dog-leg" drill enabled its operators to turn corners when sinking bore holes, a manoeuvre which until then had been a frequent cause of breakdown. At 80 he was working on his own Super Concorde designs — aimed at supersonic flights to Hong Kong in three and a half hours.

His first marriage, to Dorothy May Lee, was dissolved in 1976, but he married again the same year and settled in the United States with his American bride, Hazel. From there he frequently visited this country, often to receive another basket of honours. These continued to be showered upon him, culminating in the Order of Merit in 1986. Graham Greene was admitted to the order at the same time.

In 1988 he was at the Farnborough Air Show unveiling the latest Rolls-Royce RB211-524L engine. Capable of developing up to 72,000lb of thrust it was 72 times more powerful than his original brainchild. One of the main halls in the new Queen Elizabeth II Conference Centre in London was named after him. Universities queued up to confer honorary degrees. Among the prizes he won overseas was the 1965 Goddard award from the American Institute of Aeronautics and Astronautics. He had been elected a Fellow of the Royal Society in 1947.

Abundant recognition in the second half of his life must have helped him to forget the lack of it during the first half, when he and his engineering disciples were struggling to interest the aeronautical establishment in his ideas. He always denied any bitterness, acknowledging instead his debt to the RAF for his education and the opportunity it had provided him. But he regretted that the other members of his Power Jets team had not been better rewarded by the Government.

He is survived by his second wife Hazel and by the two sons of his first marriage.