
Memories of the Chudleigh Mess

Of a small group of young men engaged on aeronautics research at Farnborough during World War I, seven were to become Fellows of the Royal Society; four were later knighted; and another was the future Lord Cherwell, Mr. Churchill's scientific adviser in World War II

by R. MCKINNON WOOD

THE Royal Aircraft Factory—now the Royal Aircraft Establishment—grew from the Royal Engineers' Balloon Factory at Farnborough in Hampshire. At the time when I joined it in 1914 the Navy had taken over lighter-than-air craft and the Factory was concerned only with the development of the aeroplane, though the Navy continued to work at Farnborough for a short time after the first World War began. The Factory had been growing quite rapidly since, in 1909, the Government decided to take aviation seriously. The outbreak of war gave a fillip to expansion, and the Factory began to draw in scientists, mathematicians and engineers, particularly young Cambridge graduates.

Just "down" myself, I responded to a request from the Cambridge Appointments Board, and was called for interview by Edward Busk, head of the experimental department. "You do believe in aeroplanes?" "Yes." "When can you start work?" "Next Monday." Whereupon I was engaged as a "draughtsman" at 30s. a week, to the great indignation of a Cambridge colleague who, having missed a First, got only 20s. Busk's promising career was cut short in November, 1914, when the aeroplane he was piloting caught fire and he was killed.

Other recruits were of more standing, such as Melvill Jones and Geoffrey Taylor. One of the first assignments I recall was to assist Taylor in attacking a piece of stove-pipe with a ping-pong ball towed by a fine thread attached to an overhead travelling belt. Someone had thought up a "fiery grapnel", to be towed below an aeroplane, as a means of breaking into and setting fire to Zeppelins. This was probably my first introduction to the small-scale model experiment in which one must comply with the "laws of dynamic similitude", preserving a correct relationship between physical quantities. The ping-pong ball had about the right mass for our scale and speed, but we had much trouble over the strength of the thread and I have now forgotten if we ever got it weak enough. The grapnel was not used, and so we never knew whether the cable would have broken before the grapnel hit the airship.

I was to have much to do later with "laws of dynamic similitude" as a designer and operator of wind tunnels, and to be often in contact with Taylor in the course of

This article is the last of a short series whose authors were invited to recall their early scientific careers and the personalities—some of whom have since achieved eminence—with whom they worked. The articles have been published as an occasional variant to the weekly Profile.

aerodynamic research, to which he contributed much on the analytical side in papers which were models of lucidity and good style. He has always had a wide diversity of interests. He had been interested in meteorology, and he soon moved away to that work. In his hobbies he liked a spice of adventure; I recall him speaking with scorn of "people who play golf", and I think he was at his happiest sailing his yacht across the North Sea.

I was more permanently attached to Melvill Jones—"Bones" to his intimates—first in setting the "whirling arm" to work, a large structure rotating about one end, with means for driving a propeller at the other end and recording power input and thrust. I quickly realized how little the Mechanical Sciences Tripos course had taught me about the conduct of experiments, and of what a later generation would call the "gremlins" that lurk in one's path. The "gremlins" had to be tracked down when "efficiencies" soared to and passed 100 per cent! Shortage of power sometimes forced us to work at night, and I remember "Bones", with his usual enthusiasm and disregard of convention, arriving in pyjamas to watch me test a curiously-shaped propeller which its inventor had sent in for trial. It burst, and we did no more testing till we had rebuilt the measuring apparatus.

The Factory had a small wind tunnel, of the type developed by the National Physical Laboratory, but without balances. Pending the full equipment of this tunnel we were, however, able to get some useful work done in it and on one occasion our "string-and-sealing-wax" methods caught the NPL out in an error in their technique. This, and later experiences, convinced me of the risks of concentrating experimentation in one establishment.

"Bones" was shortish, long-armed and abnormally broad in the shoulder, and claimed to have the highest "ape ratio" of any of us—an allusion to the term "aspect ratio" used in describing the plan form of a wing. Although naturally careful he was occasionally guilty of rash statements, as when he said, "Cream is good with anything", and found himself served with sardines and cream at his next breakfast. He left us to study aerial gunnery problems, a field in which he was to do distinguished work in both wars.



CHUDLEIGH MESS 1917



- 1 F. A. Lindemann
- 2 George Thomson
- 3 Herman Glauert
- 4 Harold Grinstead
- 5 William Farren
- 6 David Pinsent
- 7 Ronald McKinnon Wood
- 8 H. Renwick
- 9 F. W. Aston

After the first war he was appointed to the newly founded Mond chair in aeronautics at Cambridge.

Taylor and Jones had been living in a group including Busk and Fred Green, the designer of the Factory's aeroplanes and engines, and, for a time, the naval airship officers. The group moved to a house called Chudleigh in North Farnborough. I was very happy to accept an invitation to fill a vacancy in this entertaining and stimulating community. I have a photograph of "Chudleigh Mess, 1917". It contains one future peer, F. A. Lindemann, Lord Cherwell; five future Fellows of the Royal Society—Sir George Thomson, Sir William Farren, F. W. Aston, Herman Glauert and Lord Cherwell. I was at Chudleigh with Taylor and Jones, but they had left before this photograph was taken. Including them, we had a total of seven future Fellows of the Royal Society and four knights. Two of the group lost their lives in flying accidents during the war. Glauert met with a fatal accident in 1934, in which year I abandoned aeronautics for politics; the score of distinctions might, perhaps, have been even higher.

Lindemann had just succeeded in making his way back from Berlin and had a somewhat roving commission in the Factory. Though not in any way part of the aerodynamics group, he learnt to fly and did some purely aerodynamic research as a pilot. The statements that he was ever head of any part of the organization and that he was the first to solve the problem of the spinning nose-dive, into which so many pilots fell through misjudging speed after turning down-wind, are both untrue. Credit for diagnosing the cause of spinning and demonstrating the action needed for recovery must be given to two chief test pilots, H. G. Hawker of Sopwith's and Frank Goodden of the Royal Aircraft Factory. But Lindemann, who had but recently learnt to fly, did throw himself courageously into further exploration of the spin. With his vegetarianism, his inevitable bowler hat, smart town-coat and umbrella and

air of distinction and authority, Lindemann was a bit of a "card". (It is not true that he flew in a bowler, but it was doubtless at hand when he left his plane.) He had a relish for making fools of people. That I was the son of a Liberal Minister seemed to draw him to me, and I could never decide whether he was sincere, or seeking to be provocative, in the political views he expressed to me. He was a first-class tennis player. Pressed to a round of golf, he pleaded that he had not played since he wore a sailor suit, when he had won a prize in a competition; yielding, he did the first five holes in bogey, after which blisters upset his game. He had a sharp eye for any chinks in one's mental armour and a facility for rapid mental arithmetic, which made him formidable in argument on scientific topics.

Aston had worked with the great J. J. Thomson. He, too, had a rather roving commission, wherever his genius for instrumentation could be of service. Though not without a sense of humour, he was peculiarly obtuse to "kidding" and an ideal butt for Lindemann's form of fun. On one occasion he pressed Lindemann to come skating and was met with "You know, Aston, I do nothing in public that I don't do well". Lindemann then yielded, having made Aston promise to hold him up, which Aston did (with some difficulty) until they reached the centre of the pond. There Lindemann pushed him aside and gave a fine exhibition of figure skating. Aston was later to win a Nobel prize for his work in connection with isotopes.

Farren was a young man of great energy and drive, with the useful gift of cat-napping. He took charge of the aerodynamic calculations required by the chief engineer, Fred Green, and of aerodynamic research conducted in flight; he soon learned to pilot himself. I looked after the work with models in the wind tunnels, of which we had finally three. I have already referred to the "laws of dynamic similitude" with which one must comply in small-scale

MEMORIES OF THE CHUDLEIGH MESS *continued*

studies. At the speeds with which we were concerned we could safely ignore the fact that air is compressible, but all the phenomena were governed by the fact that air is a viscous fluid and the law of dynamic similitude was violated by the reduced dimensions of the model unless some countervailing adjustment was made. The only practicable way of doing this is to work in dense air at several atmospheres' pressure, as proposed by the Frenchman Margoulis and first applied by the Americans at Langley Field and subsequently by us, first at the National Physical Laboratory; but that came later. There were other factors in the wind tunnel approach which could lead to error—disturbance of the flow by the means used to support the model, and constriction of flow by the tunnel walls. There was plenty of scope for research, both in the wind tunnels and, with more difficulty, in flight. There was also scope for a somewhat acrimonious battle between the upstart sceptic "full-scaler" at Farnborough and the vested interest of the "model" aerodynamicists at the National Physical Laboratory, of so much longer standing; but the challenge to over-confidence was all to the good.

Farren later became involved in the design of the last aeroplane—the one and only seaplane—produced by the Factory. The change in policy restricting the design of

airframes to the now well-developed industry led to the chief designer, Green, leaving Farnborough, and Farren followed him into industry. After the war he spent many years with Professor Melvill Jones at Cambridge, until he was dug out for posts of increasing responsibility in Government service as the prospect of the second World War loomed ahead. He was last at Farnborough as Director of the Royal Aircraft Establishment.

I have mentioned two other future Fellows of the Royal Society who were with me for a time at Chudleigh—George Thomson—now the Master of Corpus Christi, Cambridge; and Herman Glauert. Lieutenant Thomson had been brought back from the front, to which he once expressed to me a desire to return. He engaged in some of the flying research, and he learnt to fly. After the war he was appointed to a chair at Aberdeen and passed out of the aeronautical world. With Glauert, on the other hand, I was to work closely in post-war years; he was my right-hand man and my successor in 1934. Later that year he was struck by a piece of flying wood while watching sappers at work with explosives on Farnborough Common; it was this accident that caused his death. Glauert was useless with his hands, but he had a fine mathematical brain and a genius for approximate solutions of rigidly insoluble problems.

Many
aspects
—many
uses

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Sir William Farren
 CAMBRIDGE, England (AP) — Sir William Scott Farren, distinguished British aircraft engineer, died Sunday. He was 78.

Sir William pioneered experimental and design aspects of aerodynamics during World War I and after the war taught at Cambridge University.

During World War II, he worked for the British government in aircraft research and development. After the war, he went into private industry, but still concentrated on military aircraft. He retired in 1961.

Harold McGraw

NEW YORK (AP) — Publisher Harold W. McGraw, retired vice president of McGraw-Hill, Inc., and a longtime New York civic leader, died at a hospital Saturday after a brief illness. He was 80.

Mr. McGraw was the oldest son of the founder of McGraw-Hill and was vice president and director of the firm until his retirement in 1948.

Andre Philip

PARIS (AP) — Andre Philip, a former French deputy and cabinet minister, died Sunday night at his Paris home.

First elected a deputy in 1936, Mr. Philip went to London in 1942 to join Gen. Charles de Gaulle and was named national commissioner for the interior. When General de Gaulle moved to Algiers and formed his Committee for National Liberation, Mr. Philip was appointed commissioner for relations with the

... Sunday at 1 p.m. in the water...
 ... 11:30 a.m. in the secret heart...
 ... Home chapel, with burial in...
 ... Calvary Cemetery. Gasiorowski...
 ... Memorial is in charge of ar-...
 ... rangements.

... in the Robinson Mortu-...
 ... ary, Genoa, with burial in Lake...
 ... Township Cemetery. The body...
 ... will be in the mortuary after 7...
 ... tonight.

... The sheriff's department re-...
 ... ported 55 persons arrested. Those...
 ... arrested were to appear in the...
 ... local mayor's court or Bellefontaine...
 ... Municipal Court. Most posted...
 ... bond Saturday night or Sunday...
 ... on charges of curfew violation, de-...
 ... struction of property, inciting to...
 ... riot, and use of drugs.

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33-37 Superior St.	GROUND AND CHOPPED MEATS	Big Selection	
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FREE PARKING	MISCELLANEOUS MEAT ITEMS	33-37 Superior St.	

The sheriff's department reported 55 persons arrested. Those arrested were to appear in the local mayor's court or Bellefontaine Municipal Court. Most posted bond Saturday night or Sunday on charges of curfew violation, destruction of property, inciting to riot, and use of drugs.

Mayor Hines declined to estimate the amount of damage, but said it was extensive.

Patrol Cars Damaged
 Many store windows were broken, and "six or eight" patrol cars were dented and had windows shattered.

The rioting was appointment to Mayor Hines. "We bent over backward," the mayor said, "to get this is how they repaid us. No disturbances were reported Sunday as activity at the resort area returned to normal."

Nearly 150 Arrested In Put-In-Bay Disorder
 From The Blade Correspondent

PUT-IN-BAY, O. — 100 and 150 persons were arrested during the week-long disturbances. The youths gathered at the Erie resort on South Island.

Police Chief Eugene said the number of arrests about normal for a July end. He added that no damage was reported. Butler, 29, of Sandusky, man, was injured when struck on the head with one of the 35 spears hired to patrol the island the weekend. Mr. Butler treated at Magruder Port Clinton. He later returned to duty.

Chief Carroll said the charges ranged from charges of incitement and disorderly conduct to those of fireworks and indecent exposure.

A policeman said that Mr. Butler was injured while arresting a youth. "One guy threw a beer at the next thing you know was filled with them,"

Man Kills Self After Fatality

Driver Uses Gun Following Crash

From The Blade Correspondent

DEFIANCE, O. — A Defiance man shot himself to death Sunday after his car struck the rear of a minibus, killing a 4-year-old boy and seriously injuring the driver in Paulding County.

Sheriff's deputies theorize that Woody Lee Steele, 24, went into a state of shock after the accident, took a .38-caliber pistol from the trunk of his car, and shot himself.

Mr. Steele was driving north on Power Dam Road, a quarter-mile south of the Paulding-Defiance county line about 4:30 p.m., when his car struck the rear of a minibus being driven by Randolph Altshberger, 19, of

Principal S

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