

## Some British Aeronauts



Scientists ....



..... and Inventors.



Lords .....



..... and Ladies

Our sessions are more often than not about today's technology. But our ancestors could be pretty ingenious. A while back, Reg gave us an interesting talk on Thomas Telford. And later in the year, Steve is planning to talk about the Industrial Revolution. My talk today is about the early aeronauts. I'm going to concentrate on the British ones, in the period between the Montgolfier's first balloon flight in 1783 and the early days of the aeroplane. Some of these aeronauts were scientists, others were inventors. Some flew because they had money, others like the parachute queens, to earn money.



A WILTSHIRE PIONEER - EILMER OF MALMESBURY

Men have always wanted to fly, right back to Icarus. And in this part of England we had a pioneer 1000 years ago, a monk who strapped on wings and jumped off the top of Malmesbury church. It's said that he achieved a flight of a furlong but did himself serious injuries on landing.

So we quickly move on to France in 1783.

The Montgolfier brothers flew their hot air balloon. Only a few months behind came the first hydrogen balloon, built and flown by Jacques Charles, who some of us will remember for Charles' Law.

## British Aeronauts 1784 - 1911



James Tytler  
27 August 1784  
Edinburgh



Cecil Clayton  
15 July 1911  
Dursley, Glos

The British were not far behind, and my story of the British aeronauts will begin on 27 August 1784, when James Tytler made a flight at Edinburgh. And I shall continue for 127 years, closing when Captain Cecil Clayton was the very first to display an aeroplane to the people of Gloucestershire, more than 7 years after the Wright Brothers flight at Kitty Hawk.

## How men 'flew' before the aeroplane

Balloons - Hot-Air, Gas, Roziere, Smoke Balloons.  
(free and tethered)

Dirigibles

Parachutes

Man-lifting Kites

Gliders

These are the means by which aeronauts flew before powered winged flight arrived.

- and why they wanted to

Adventure and Sport

Entertainment

Science

Observation

Transportation

And these are the reasons why they flew

## First British Balloonists, 1784



James Tytler



James Sadler



Letitia Sage



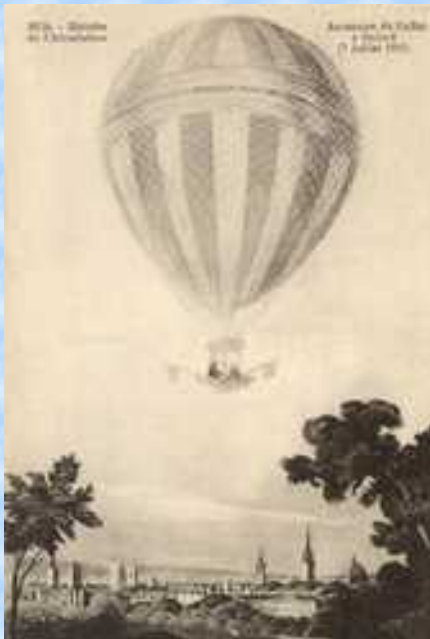
So here we are with James Tytler - the first flight by a native Briton in the UK. He didn't do much more. Only a month later came the series of successful flights by James Sadler, in both hot air and hydrogen balloons. He is often represented, as in these medallions, as Britain's first balloonist. He remained a notable balloonist for many years. And in 1785 this lady, Letitia Sage became the first englishwoman to fly! But there are ungallant reports that her weight was a problem. Also in 1785 came the first parachute descent from a balloon, but the aeronaut was a dog. Soon there were lots of pioneers, epic flights, and balloon-mania. And there were lots of casualties. The worlds first aviation disaster was in 1785, when much of the Irish town of Tullamore was burnt down by a hot air balloon . This kind of balloon, carrying it's own fire and fuel, disappeared from the scene for nearly two centuries, and gas balloons predominated, with obvious dangers

# Rev. Thomas Baldwin – Chester 1785

# Rev. Thomas Baldwin – Chester 1785



## James Sadler flights 1810/1811



In the next 30 years or so there were refinements, especially in balloon construction. But ballooning was pretty expensive because of the cost of producing all the hydrogen, usually by the action of sulphuric acid on iron. And furthermore, generating the hydrogen and filling a large balloon could take days.

Of course this period included the time when the French had a little local difficulty. Lavoisier himself, and the aristos, were guillotined, and this must have affected scientific progress in France.

James Sadler kept on flying as we see here.



## "The Air Balloon"

("New Inn" renamed, about 1790)



There were certainly local flights in these parts. Edward Jenner was interested. The "Air Balloon" got its name, though there is no reliable explanation.



## 1824 Martha Pocock's Flight over the Avon Gorge



I'll soon be back with balloons. But one man had another approach to flying.

He was George Pocock, a Bristol Schoolmaster whose early inventions included a spanking machine.

And kites were his thing. He made a man-lifting kite, and his daughter Martha was lifted 270 ft. in the air over the Avon Gorge. Martha Pocock would later become the mother of W.G. Grace.

George Pocock proposed other uses for large kites, and actually built carriages towed by kites which he called Charvolants



## Charles Green

(from 1821)

-Trail Rope; Coal Gas



1836 Epic flight to Germany



It was not until the 1820s that Charles Green came along with some significant new ideas about ballooning. First of all he adopted coal-gas rather than hydrogen and that was far cheaper and becoming widely available in any town. So filling a balloon was quick and easy. Those advantages fully offset the fact that the lifting capability of the more dense coal gas was very much poorer than that of Hydrogen.

Green's first flight with coal gas was on 19 July 1821, George IV Coronation. And down here in Cheltenham we had a brand new gas works, and a ballooning enthusiast in Mr Griffiths, proprietor of the Cheltenham Chronicle.

So Green brought his balloon to Cheltenham in 1822. But it was all a bit of a disaster.

It was perilous. The ropes broke under the basket, which Green reckoned was because some malicious person had cut them. Up they went, clinging to the ring attached to the balloon, and down they came with a crash which resulted in broken limbs for Griffiths. And there was still the gas bill to be paid!

Green was a clever man and had a lot more to contribute over the next 30 years.

There's the trail rope. Prior to this, height control was by throwing out ballast, or releasing gas. Green's trail rope made the height self-correcting to a degree without use of ballast or loss of gas. But actually

## Charles Green at Cheltenham, 1837



VIEW OF MONTPELLIER SPA, HOTELS, &c. THE MUSEUM, ST MARY'S CHURCH &c.  
The Royal English Ballroom as it appeared when ascending from Montpellier Gardens (Cheltenham)  
July 17<sup>th</sup> 1837 containing Mrs. Green, General Pitt Rivers, Dr. Brown, & others. The Ballroom was opened by  
at 10 and 11<sup>th</sup> Landed at Ashton, Dover & White Palace (Cheltenham) about 1837.

And in 1837 he returned to Cheltenham.

## Robert Cocking's Parachute, 1837



Green also made a flight in 1837 carrying the inventor Robert Cocking who made a fatal parachute descent.

## Charles Green - continued



1852 John Welsh, Meteorologist

And in 1852 came his scientific flights with the meteorologist John Welsh. Welsh made special instruments such as aspirating thermometers for the flights

Green also had ambitions for an Atlantic crossing which never took place. He designed a special trail-rope with floats and water bags. He also made flying models which included propulsion fans.

Green was not the only aeronaut of his time



Mrs Graham 1838 - Richard Gypson 1841



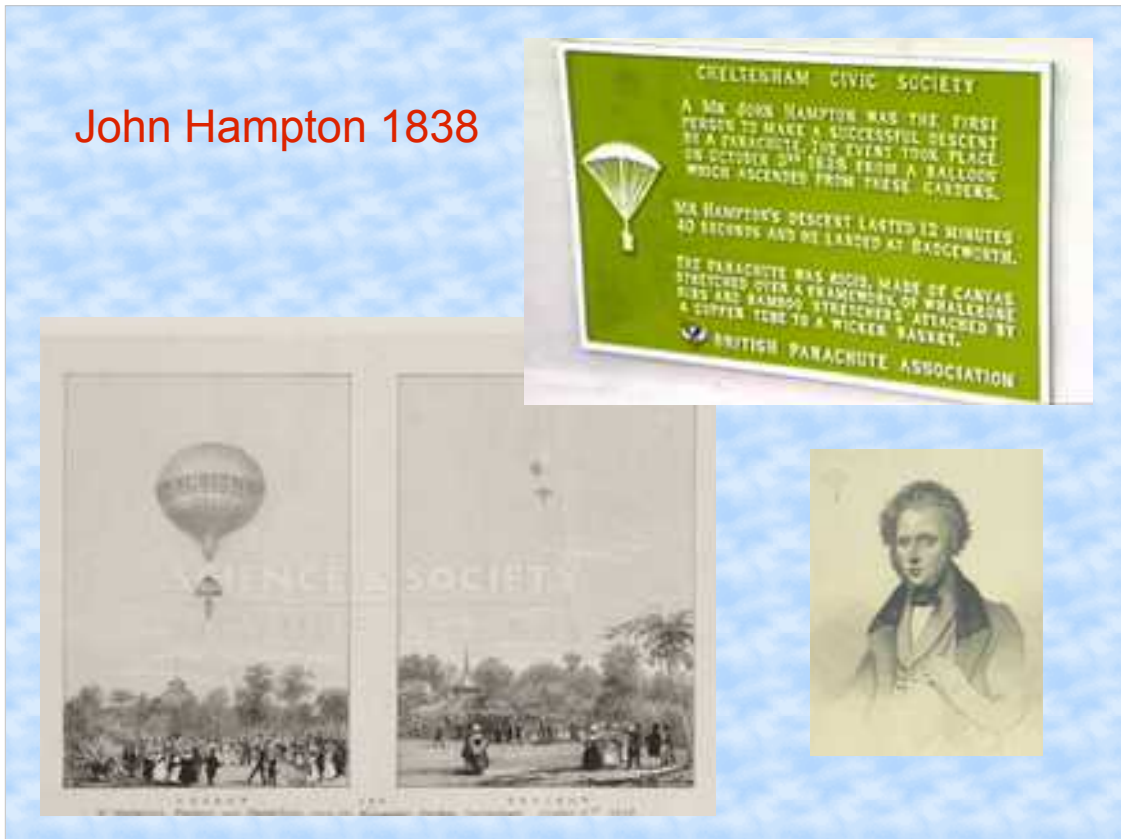
There's Richard Gypson.

And Mrs Graham.

And there was Edward Spencer. He was a close associate of Charles Green. And he was the founding father of the Spencer family who were important and innovative balloonists into the next century.



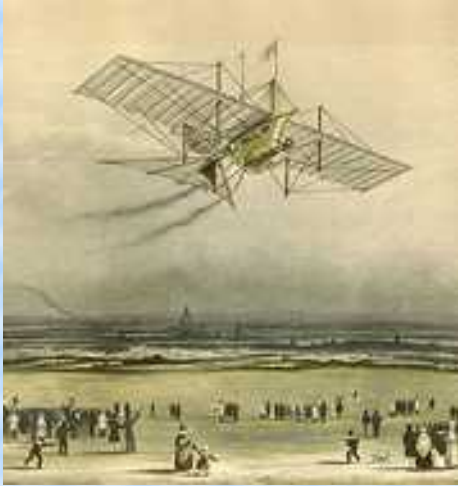
## John Hampton 1838



Now I'm going back to 1838. Robert Cocking's fatal descent in 1837 was followed in 1838 by John Hampton's successful parachute descent at Cheltenham and there is a commemorative plaque in Montpellier Gardens. When he arrived, the Magistrates tried unsuccessfully to prevent his venture by insisting that the balloon remain tethered. They had heard of Cocking's death, and didn't want this to be repeated. But Hampton cut the tether

- they had the right idea !

Henson & Stringfellow 1842 patent



Aerial Steam Carriage  
and the Aerial Transit Company



Matthew Watt Boulton  
(aileron-control)



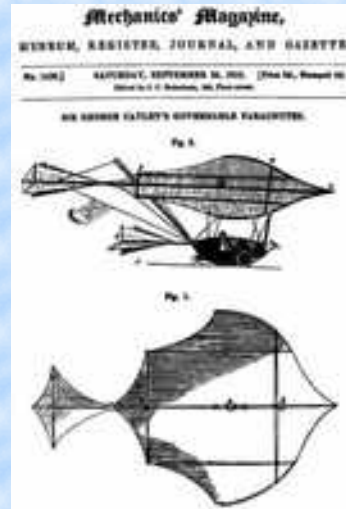
Even in 1842 there were people around with remarkable vision. They never actually flew, so I shall only mention them briefly. Henson and Stringfellow were partners for a while, aiming to build an Aerial Steam Carriage like this. They were obviously well aware that success depended upon obtaining a light enough engine. It is said that Stringfellow built a steam-engine driven model aircraft which achieved a short flight.

Watt Boulton came a bit later and did significant work on flight, including the invention of the aileron .

## 1853 – The Flying Coachman !



Sir George Cayley



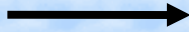
And Sir George Cayley was studying winged flight over a long period, leading to a practical glider and there's the famous flight in 1854 by his somewhat reluctant coachman who we can count among our aeronauts.

But we now have to return to ballooning, where there was a lot of activity

## The Crystal Palace Balloonists from 1859

Thomas Lythgoe

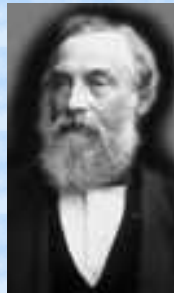
Henry Coxwell



Thomas Wright

William Dale

The Spencers



In 1851, the focus moved to the Crystal Palace. That was a showcase for British Science and Technology, balloons included. When Queen Victoria opened the Exhibition, Charles Green Spencer, son of Ernest, flew a balloon overhead.

Crystal Palace was moved from Hyde Park to Sydenham, and by 1859 ballooning was a daily activity there, and there was a professional balloonist, the first being Lythgoe, soon followed by Henry Coxwell.

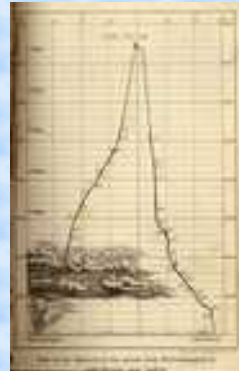
The Crystal Palace balloonist gave instruction, as well as piloting pleasure flights at about £5 a head. Ballooning was now a pretty safe activity in the hands of a professional pilot. Balloonists leaving Crystal Palace aimed to terminate the flight near a railway station so that passengers, pilot, and balloon could easily return to London.

## British Association for the Advancement of Science Observations in the higher atmosphere Coxwell & Glaisher - 28 Balloon Flights 1862-1866

- (1) to determine the temperature of the dew--point by Daniel's and Regnault's hygrometers, as well as by the dry and wet bulb thermometers, and to compare the results
- (2) to compare the readings of an aneroid barometer with those of a mercurial barometer up to the height of 5 miles;
- (3) to determine the electrical state of the air,
- (4) the oxygenic condition of the atmosphere, and
- (5) the time of vibration of a magnet;
- (6) to collect air at different elevations
- (7) to note the height and kind of clouds, their density and thickness;
- (8) to determine the rate and direction of different currents in the atmosphere; and
- (9) to make observations on sound.
- (10) Physiological effects

In 1859 the British Association for the Advancement of Science established a "Balloon Committee" for the purpose of initiating observations in the higher strata of the atmosphere by means of a balloon. Not much was achieved until 1862 when they came to an agreement with Henry Coxwell that he would construct a large balloon and that they undertook to use it, paying £25 plus the cost of gas for each flight. James Glaisher was the scientist who then made a total of 28 ascents between 1862 and 1866. He made a huge number of observations in about 10 different categories.

## Coxwell / Glaisher Epic Flight 1862



One epic flight in September 1862 was one of the greatest exploits in ballooning history when their balloon ascended to about 37,000 feet. Coxwell had to use his teeth to pull the gas release cord because his hands were so cold.



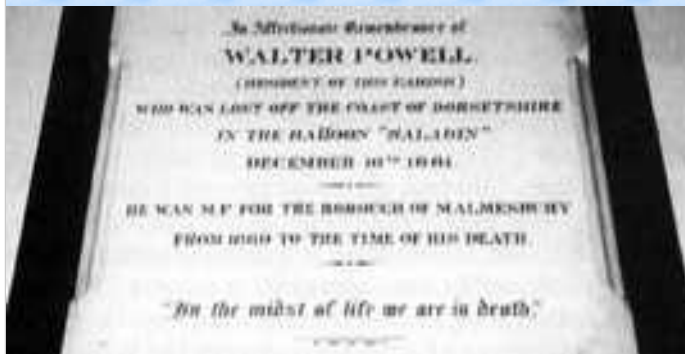
## 1863 The Story of Dr Samuel Fergusson



The public were fascinated by ballooning, and in 1863 they read about Samuel Fergusson, who had solved all the technical problems of ballooning, and made a 5 week trip across Africa. But this was fiction, the story written by Jules Verne. Soon afterwards he wrote "Around the World in Eighty Days" in which there was actually no ballooning in the original book!



## The Unfortunate Walter Powell M.P.



1881



Back to Crystal Palace, where Thomas Wright took over from Coxwell. One of many pupils was Walter Powell, MP for Malmesbury. Wright found Powell very enthusiastic, but too enterprising and not very careful.

Powell and Wright made a balloon trip from Malmesbury in 1881 in the "Eclipse", one of Wright's 4 balloons.

Later in 1881, Powell took a fatal trip across Somersetshire in the Saladin balloon. This was actually owned by the Army, and on loan to the Meteorological Society, so perhaps there was a scientific reason for the trip. Powell's companions were Captain Templer who was already in command of the Army Balloon Department, and Arthur Agg-Gardner, brother of our Cheltenham MP. On approaching the coast, they made a heavy landing. Templer and Agg-Gardner were thrown out, Agg-Gardner breaking an arm and a leg. The now lighter balloon now took off with Powell still aboard, and was never seen again.

Back at Crystal Palace, Wright's ballooning continued until he handed over the job to his assistant, William Dale. Dale tried to cut corners, and died when a balloon made up from old material failed. The Spencers took over.

## The Performers !



In the 1880s some new technology arrived which provided aeronauts with the ability to ascend at very low cost. This was a new form of smoke balloon. It did not provide for controlled descent, so the descent was by parachutes, which were now reliable.


This type of smoke ballooning starts with a fire pit dug into the ground, connected by a covered trench leading up to the balloon. The fire is built to a high state, and then covered with wet straw or some other covering agent, forcing the hot smoke towards the tethered balloon.

The balloon itself is a cheap contraption, a large bag built of cotton muslin, firmly tethered to the ground before the ascent.

When the balloon is full, the aeronaut is buckled to a parachute which is already rigged to the balloon. On release the balloon belching smoke rises 1,000 to 2000 feet or more, while the aeronaut entertains the crowd, often by a trapeze act. At the top of the descent the aeronaut releases the parachute and floats gently back to earth.

There is a weight, usually a sandbag affixed to the top of the balloon, and when the weight of the aeronaut is no longer at the bottom, the balloon inverts and falls to earth for recovery. Performer-aeronauts included attractive young ladies known as the Parachute Queens. It was a dangerous occupation for them, though obviously the organisers maximised the public's perception of the danger.

On the left we have a descent by Charles Fleet, known as "Professor Fleet". He was said to be dashing and handsome. He worked in association with Ernest Clayden, nephew of Thomas Wright the Crystal Palace balloonist. On the right is Dolly Shepherd, the most famous of the parachute queens.



## The Performers !

**MR. S. SMITH (Flintshire)** asked the Secretary of State for the Home Department, Whether his attention has been drawn to the performances on Whit Monday at the Crystal Palace of a female aeronaut, who ascended some mile and a-half into the air, hanging to a balloon by her teeth; and, whether he is prepared to take any steps for the suppression of such exhibitions?

Some ascents by parachute queens were by gas balloons, such as this one at Crystal Palace. This was probably the ascent which so alarmed this Member of Parliament . In fact the Secretary of State replied that he could do nothing, and also that he understood that the lady's security did not depend only on her teeth.

### More Scientific Flights - John Mackenzie Bacon.



Experimented with sound from balloon

Observed the Leonids

Wrote "The Dominion of the Air"

Took aerial photographs

Experimented with Wireless Telegraphy from balloon.

Pioneered a petroleum burner for hot-air Ballooning.



Back to some more serious scientific stuff. Rev John Mackenzie Bacon was an unconventional priest as is apparent from this picture. Because of his interest in science and his free thinking he fell out with the church. He was hooked on ballooning after his first flight in 1888, and he embarked on purposeful flights as shown here with his daughter Gertrude. His book, "The Dominion of the Air , the Story of Aerial Navigation" was a notable work.

# Army Observation Balloons

Operations in the African Campaigns



Let's now return to Captain Templer, who flew across Somersetshire with the unfortunate Walter Powell. He was the Army's principal exponent of aeronautics. He commanded the Royal Balloon Factory, which eventually became the Royal Aircraft Establishment.

The Army used observation balloons starting with African Campaigns. These were Hydrogen balloons, generally filled from cylinders supplied from a depot.

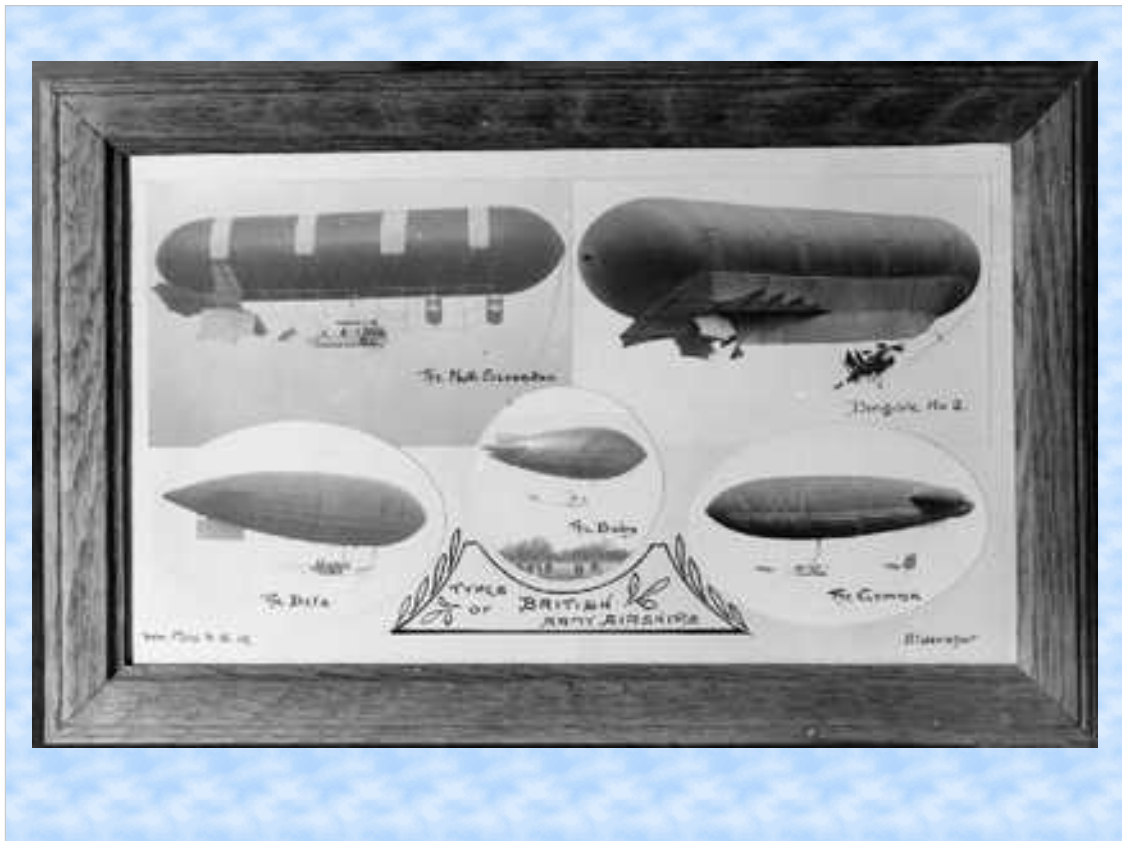




## Baden Baden-Powell's Levitor



Another approach to Observation Platforms was the man-lifting kite invented by another Army officer, Baden Baden Powell, brother of Robert.



And from about 1907, the Army had some dirigibles, either built by the Royal Balloon Factory at Farnborough, or purchased.

But of course we are now coming to the end of the story. The aeroplane was here and new names were on the scene, such as Verdon-Roe, Handley Page, Sopwith. The Spencers were soon forgotten.

A few people such as the Short Brothers crossed the gap from balloons to aircraft. And Charles Rolls was another.

But I'll finish with the story of two enterprising unknowns from the age of aeronauts



## Edith Maud Cook

(also known as  
"Viola Spencer",  
"Elsa Spencer",  
"Viola Fleet",  
"Viola Kavanagh",  
"Miss Spencer-Kavanagh")



## PARACHUTE QUEEN - and more



The first was one of the parachute queens, Edith Maud Cook, who performed under various stage names. She realised that the future lay in aeroplanes, and as soon as the Bleriot School opened in France in late 1909, she signed up for a flying course and became Britain's first female aviator. Unfortunately she was killed in a parachuting accident in 1910, just two days after the death of C.S. Rolls in an aircraft crash.



Ernest Clayden  
(known as  
"Captain Cecil Clayton")

Nephew of Thomas Wright

Associate of "Professor" Fleet  
& Ernest d'Artigan

Proprietor of Grand Theatre,  
Mansfield

### The Show Man from Mansfield



First Aeroplane Flight in Gloucestershire

Another of the old aeronaut/entertainers also learned to fly at the Bleriot School at the same time as Edith Maud Cook. This was the extraordinary Ernest Clayden, nephew of the Crystal Palace balloonist, Thomas Wright, and close associate of Professor Fleet the Smoke Balloon parachutist.

Clayden, or Clayton, was a showman. From the 1890s, he had provided entertainment for fetes, agricultural shows and so on in country areas. Balloon flights and parachute descents were part of his repertoire. He realised that the public were clamouring to see aeroplanes. So in 1910 he took his Bleriot from show to show even though he had no Aero Club flying certificate. It was not uneventful. At Worcester he allowed his mechanic Ernest D'Artigan to take the controls. D'Artigan's previous experience was as a circus loop-the-loop cyclist. D'Artigan veered into the crowd, killing a woman.

Despite critical comment, Clayton continued flying his Bleriot in 1910 and 1911. One appearance was at Dursley Fete – and that was the first aeroplane flight in Gloucestershire.

## Some British Aeronauts



Scientists ....



Lords .....



..... and Inventors.



..... and Ladies

So that's the end of the story of the first 127 years of aeronautics.

What an interesting time! Top Hats, lots of fresh air, and no noisy engines.

I came along too late!

