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THE MOON IS A BALLOON

The title of this oration I almost borrowed from that of a 1953 David Niven movie. But, when I looked it up, I was in error and thus the heading becomes my own by default. The actual title of the Niven movie was, *The Moon is Blue".*

The history of balloon ascents is just as fascinating as any book you've ever read that you just couldn't put down even to eat, sleep or go to work, as are the discoveries leading up to it.

Prior to 212 BC, Archimedes, the inventive and accomplished Greek mathematician, discovered the principle of specific gravity and suggested the concept of "rarefied air" that would float in the atmosphere.

The thirteenth century German scholastic philosopher Albertus Magnus offered a method of constructing a receptacle of papyrus and filling the container with a compound of sulfur, willow-carbon and rock salt to produce lift.

But, it wasn't until the fourth quarter of the 18th Century in France, that two well heeled brothers got things moving. While other Europeans joined in this *lighter than air* pursuit, the kudos for major achievements in the world of balloon flight go mainly to the French, English and Americans - in that order.

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Brian Jones, copilot of the ultimate balloon - the Breitling Orbiter 3 - which was the first to circumnavigate the world in 1999 - sums up the balloon experience in these words …
"To understand ballooning is to feel closer to nature. There is very little control in a balloon. One embarks on a journey with no know destination, no certainties of direction and *(knowing that there is)* no point in *attempting to control* or *fight against* what nature has in store".

Leapfrogging over the conventional rate of progression in the realm of human endeavors, six years before the French Revolution, in 1783, we zero in on the brothers Montgolfier in the small town of Annonay, near Lyons, and not too far from Paris, in the south of France. Here Joseph and his younger brother Etienne Montgolfiers went public with their discovery on the 5th of June - in the town square. In this same year, 1783, Ludwig van Beethoven was thirteen and Napoleon Bonaparte only one year old. It would be fifty years hence before the first railways set the industrial age in motion, and more than a century before the advent of powered flight.

The brothers Montgolfiers (the name literally means "master of the mountain") probably first got their inspiration for the balloon from a book entitled *Experiments and Observations on Different Kinds of Air,* which had been translated into French in 1776. They were without question the Wright Brothers of hot air ballooning.

From the very beginning there were two types of power sources for balloon flight. The first and simplest was the "hot air" envelope. The balloon was raised over an open flame, thus trapping the resulting hot air inside the structure. This was first produced by burning wood, damp straw, wool and even decomposing meat. These acrid smoke producing materials were thought to be the best fuels to coat and seal the interior of the early paper and fabric envelopes. Later kerosene was used, and then propane - which is used exclusively today as the power source for recreational hot air balloons

The second type is an envelope of lighter than air gas - at first hydrogen and later the much safer but more expensive inert helium, which was first used in 1934. Hydrogen had been discovered as early as 1766 by

the Englishman Henry Cavendish. He called it 'phlogiston' or 'inflammable air'. Highly explosive when mixed with even the smallest amount of oxygen, it is *at the same time* the most readily available of the gases possessing molecules which are less dense that air. . It is all too easy to forget that since the brothers Montgolfier are known for their successes with hot air balloons, that they initially made tests with hydrogen, and abandoned that path only because the tiny molecules of gas could easily escape through the skin of their paper and fabric envelopes.

The Montgolfier brothers were directors of the family's large paper factory, one of the oldest, finest and most prosperous in France. Canson & Montgolfier is still in operation today. They were also scientists, which is not surprising since in the eighteenth century wealthy gentlemen often had several sidelines in addition to their main vocation. In their town of Annonay there is still today a realistic yearly re-enactment of their first hot air balloon flight on the 5th of June in 1783.

Irving Berlin's words concerning the competitive spirit (*Anything you can do I can do better, I can do anything better than you)* were ringing in 18th century ears of men wanting to take to the air at precisely the same time that the Montgolfier's bag of hot air began to rise. The game was afoot.

The Parisian Academy of Sciences, skeptical of the two provincial papermakers' feat, initiated a rival line of aeronautical research. Professor Jacques Alexandre Cesar Charles began to experiment with hydrogen, as two more brothers enter the fray - Jean &Noel Robert, who had perfected an essential technique for coating fine silk with a solution of rubber to make it impermeable to gas.. These three quickly set to work on the world's first gas balloon.

Before Charles & Co. could get to the air however, the Montgolfier brothers (in Paris in September of 1783) launched the first living creatures ever to fly in a balloon (a cockerel, a duck and a sheep) . Louis XVI in the wake of this success decreed that the first human candidates for balloon flight would be supplied from the prison population - in exchange for their freedom.

The king was persuaded otherwise by daredevil and Academy member Jean Francois Pilatre de Rozier, who had recruited the assistance of fellow aristocrat Francois Laurent, Marquis d'Arlandes - and together the volunteered for the task. This power of his persuasion upon the King probably had more to do with the fact that Rozier was a member of the Parisian Academy of Science than it had with his reputation as a daredevil.

On the 21st of November in 1783 the first manned voyage in a hot air balloon was successfully undertaken de Rozier & d'Arlandes in a balloon designed and supplied by the Montgolfiers. The flight lasted for a brief 25 minutes and the estimated height of the ascent was between 2,000 and 3,000 feet. (*Discuss what it feels like to be in a wicker basket at 3,000 feet) (Add, at the same time feeding an open fire*)

After the flight the Marquis wrote, "The machine, say the public, rose with majesty. I was surprised at the silence and absence of movement which our departure caused among the spectators, believing them to be astonished and perhaps awed by the strange spectacle; they might well have reassured themselves. I was still gazing when M. Rozier cried to me - 'You are doing nothing, and the balloon is scarcely rising a fathom'. 'Pardon me' I replied, as I placed a bundle of straw upon the fire and gently stirred it."

DeRozier and d'Arlandes became instant icons in the history of balloon travel, and the name Rozier will appear again in two separate contexts - either of which would have made his name perhaps the most famous of all the aeronauts - past, present or future.

Not to be left behind in the dust during this milestone year, and furious at having been robbed of their place in history as the first aeronauts, only eleven days after the 21 of November "miracle", on the 1st of December 1783, Professor Charles and Noel Robert inflated their hydrogen gas balloon in the Tuileries gardens and took flight, thus creating another first. Charles' initial balloon design has served as a virtual blueprint for gas balloons ever since. The excitement surrounding this second manned balloon flight was sufficient to draw a crowd at the Tuileries estimated to be 400,000.

Hot air balloons can be launched rather quickly, but preparing a hydrogen balloon for flight is another matter entirely. Generating sufficient quantities of hydrogen is a long and tedious process involving the reaction of dilute sulphuric acid passed over iron filings, As the acid and iron mixture bubbles away the hydrogen fumes are piped into sealed casks, where they cool. They are then fed into the balloon's envelope. This process takes hours and is very expensive.

The excitement created by these "firsts" in balloon flight were greeted with amazement, disbelief, wonder and awe. They were the equivalent of the worlds fascination with early space travel.

John Christopher in his book Riding The Jetstream observes that … "Nothing in our modern lives, not even Lunar landings, begins to measure up to the phenomenal impact that these first balloon flights had upon informed society. Throughout France and the rest of Europe 'balloon mania' spread like wildfire." All of these early air travelers were immediate sensations, treated like the rock stars of today.

However, having blazed the trail to the skies, and satisfied their scientific curiosity, our pioneers in the arena of balloon ascent soon left the field open to others. Of the Montgolfier brothers, Joseph was the only one to ever fly, and then only once. Professor Charles likewise flew but once, his abandonment of the atmosphere perhaps being due to a painful earache sustained on his maiden voyage above the earth's surface.

Other notable firsts in these early years included …
In 1784 - The first woman to fly as a passenger in Lyon on 04 June
In 1784 - First ascent in England by Vincent Lunardi on 04 October
In 1785 - Mrs. Sage became the first English aeronaut on 29 June

MAJOR EVENT OF 1785

In 1785 - First Channel Crossing by Blanchard & Jefferies - on 07 Jan

This MILESTONE, the ENGLISH CHANNEL, was the next great hurdle to overcome …
There were three groups competing in this endeavor, the other two being James Sadler - the first Englishman to fly a balloon and de Rozier and

Romain

De Rozier and Romain entered the contest with a highly unconventional hybrid design, half hot air balloon and half hydrogen gas - shaped like a giant mushroom. This risky combination of a a highly flammable gas and a source of ignition worried de Rozier, and as he feared the balloon did in fact ignite in the air sending both de Rozier and Jules Pierre Romain to their deaths.

Sadly, the first aeronaut of all - Jean Francois Pilatre deRozier - a scant two years after his first ever manned hot air balloon ascent, along with his partner Romain became the first victims of air travel.

However, the hybrid design that he pioneered on this fatal first flight has in fact become the prototype for subsequent designs - and in fact bears his name today. It is known as the "Roziere".

BACK TO BALNCHARD & JEFFERIES

On a lighter note, the winners of this first MILESTONE in aeronaut competition didn't have a very smooth time of it. Because of a drop in temperature due to icy waters of the Channel, the balloon almost immediately began to sink. Ditching all non essential items did the trick for a while, but soon the balloon was losing height again. Everything else went overboard that was available to be tossed, including most of their clothes. Finally in what has been described as a "curious expedient" they literally pissed themselves out of danger. Nearly naked and freezing cold they were greeted warmly on French soil, feted as heroes and Blanchard was rewarded by King Louis XVI with a cash prize and pension.

Before the 18th Century came to a close, balloons were also used for military observation in 1794, and in in 1797 the first person parachuted from a balloon. This is now a common recreational pastime, which understandably requires FAA approval in each and every case.

In the 19th Century observation balloons were also used in the American Civil War, and during the Siege of Paris (1870-1871) over sixty balloons were used to air lift citizens to safety. As early as 1844 the NEW YORK SUN published a report of a successful trans Atlantic balloon

flight, but it turned out to be a hoax perpetrated by none other than Edgar Allen Poe. It was not until October of 1873 that the first unsuccessful attempt was made to cross the Atlantic in a balloon from New York.

The twentieth century would usher in the "Jet Stream Jockeys", trans Atlantic, trans Pacific and globe circumnavigation. But before all of that we must look at the pioneering efforts of Count Ferdinand von Zepplin at the turn of the 20th Century.

By turning the envelope horizontal and adding a large gondola, the world's first passenger carrying airline was established in the early 1900's. In 1926 explorer Roald Amundsen flew across the Artic Ocean in the dirigible *Norge.* In 1929, the *Graf Zepplin* was greeted in New York after her pioneering around the world flight. The *Graf* went on to establish the first transatlantic air service. This all came to a crashing halt on May 6th, 1937 when naughty children all over the world began to sing, *"There'll be a hot hot time in Lakehurst, New Jersey when the Hindenburg lands today".*

In 1978 the first trans Atlantic balloon crossing was made by the *Double Eagle II,* which was helium powered. The first crossing of the Pacific Ocean was accomplished in 1981 by American Ben Abruzzo's team with the helium balloon *Double Eagle V.*

As of 01 October of this year Ben Abruzzo's son Richard along with Carol Rymer Davis, were missing over the Adriatic Sea during a Gas Balloon Race. The Abruzzo name is synonymous with ballooning in America. The Albuquerque International Balloon Museum is named partly for the elder Abruzzzo, and Richard Abruzzo has plenty of wins under his own belt.

The next obvious frontier was circumnavigating the earth, and no fewer than 21 attempts were made before the task was successfully accomplished by the team of Bertrand Piccard and Brian Jones in 1999.

The most number of attempts (4) were made by American businessman Steve Fossett (an interesting story in and of itself), and 3 were made by

Virgin Airlines President and *Showman* Richard Branson. Before their successful voyage, Bertrand Piccard has also made 3 previous attempts.

Piccard & Jones famous Breitling Orbiter 3 balloon was built by the Cameron company and is called a Cameron Roziere, after our famous first hot air balloon pilot Jean Francois Pilatre deRozier.
Picard & Jones' book Around the World in 20 Days is a real page turner for anyone who finds the subject of more than moderate interest.

My interest in hot air balloons came about quite by accident. Somewhere in time during the late 1970's, we were trying to figure out some form of amusement for new houseguests in the Western Massachusetts countryside. It happened that a gynecologist by the name of Dr. Clay Thomas - a balloonist - lived in the nearby town of Palmer, Mass. His name may ring a bell with some of you doctors, as during the tampon toxic shock syndrome uproar, his product (Tampax?) was the only one on the market not affected, which of course made him an instant media hero. He was not unaccustomed to the limelight.

On inquiring about price, we were told that a balloon accent of short duration would cost $150.00, not exactly a throw away sum in the 1970's. Further discussion revealed that we were too many to go up in one balloon, so two would be required. The figure of $300 now loomed large over the event.

There are only two times during the day that recreational balloon ascents are desirable; one is at 7:00am (EST) and the other 5:00pm, as these are the times when the wind is considered calm enough to take to the air.

We had to be up at 5:00pm to get ready, as an hour's drive was involved to get to the launch site. For some inexplicable reason we had stayed up late the night before, and while of course not drunk or hung over, we had been as the Irish are wont to say "with drink taken".

As we were turning into the property in a vintage 1961 Rolls Royce Silver Cloud (which I hasten to add was not mine) I noticed in extremely fine print the notation "$150.00 per person". How does one

arrive for recreation now nearing the $1,000 mark in a Rolls and then sheepishly announce that he can't afford it? As I wondering how in the world I could easily cover the check I was about to write, the hymn "Come Labor On" did pop into my head.

As fate and luck would have it, there were still too many people in our party for the balloons allotted, and I - as host - was spirited away with Dr. Thomas to yet a third balloon. Fortunately we did not have to pay for that one, as his daughter's boyfriend wanted to go skydiving. After some discussion it was clear to both Dr. Thomas and to me that this boy had not gotten permission to sky dive from the FAA, although he protested that he had. Dr. Thomas begged him off, claiming that he had a paying customer to deal with. Did he ever!

To ready a modern hot air balloon for flight - and to retrieve both passengers and crew later in a truck - requires a crew consisting of a minimum of 3 people and 5 is recommended. The balloon is laid out on the ground and a giant fan - like they use at movie studios in wind machines - is blown into the envelope initially. The basket with its propane tanks and burners is similarly on its side and when enough air has been blown into the balloon the burners are ignited in short bursts. Soon the hot air puts the balloon upright. In its tethered position enough additional hot air is blown in to keep the balloon up while the pilot and passengers prepare themselves for the adventure.

Piloting a balloon is easy if the conditions are perfect, and there is neither too much or too little wind. But of course conditions are almost never perfect, and since one can only make a balloon go up or down it is quite tricky and can be fatally dangerous. When you want to rise you simply add bursts of flame to the air under the balloon and wait for it to rise. The delay from the time that one fires the blast until the balloon responds is at minimum about two minutes - which doesn't sound like much, until you consider how much time lag that would involve if you were accelerating or braking your automobile. When flying a balloon you MUST plan ahead, and it helps to have a built in clock in your head that tells you when to fire a blast or when not to.

As Clay Thomas and I took to the sky alone together that fateful morning, I realized something that one is not aware of from the ground.

Very soon you are above the tree line, even if you are in a mountainous area - as we were, and you have no visual point of reference. All you see is sky unless you look over the basket. Repeatedly Clay asked if we were going up or down. He told me that I had responded correctly every time, and asked me how I knew. "Well", I said, "it's the same sensation you get in an elevator". "That's just what I tell my students", he said. Finally after many more questions that I guess I answered to his satisfaction, he asked me if I would like to fly the balloon. The answer was an immediate YES. When the time came, he asked me if I would like to land the balloon by myself. "If you will tell me what to do, of course I would", came the eager reply. Then he said, "Of course if you wreck the balloon you'll have to pay for it". Without missing a beat I said, "I've paid for the (expletive deleted) thing already". At that time they cost $10,000, and I would not like to do the math now.

When conditions are deemed ripe for a landing, you of course have already ceased firing bursts of hot air into the envelope, and as you gauge your rate of descent, you are looking for power lines, buildings or terrain not commensurate with a landing. When the perfect spot is identified, there is a ripcord attached to a Velcro outfitted circular cloth panel at the crown of the balloon, which one yank will free, and - if all is well - you descend at a rapid but safe rate of speed. Sometimes the basket will overturn and be dragged a bit, but with a good landing that doesn't happen.

About twenty years later, for a birthday celebration, we again requested the services of Dr. Clay Thomas. This time the balloon was brought onto my property and readied for flight as the birthday boy and other guests slept. Again I was asked if I'd like to land the craft and again I replied in the affirmative. I wasn't so much concerned the second time about a safe landing, but another - potentially long lasting - problem seemed to be looming large as we neared the ground. We were about to land in a crop bearing field of a hard working farm family that I knew very well. I wondered if I'd have to pay for that portion of the year's harvest that we would destroy, and become forever *persona non grata* In their eyes.

Sure enough, out came the owners wife and several children in a state of high excitement. I could mentally see my bank account plummeting at

a faster rate than we had just done. To this day I am still surprised at what happened next. Far from being put out or even down right angry that we had landed in her field, she thanked us profusely for choosing her property to land on - saying that it would be an experience that she, her children and grandchildren would remember an cherish for years to come.

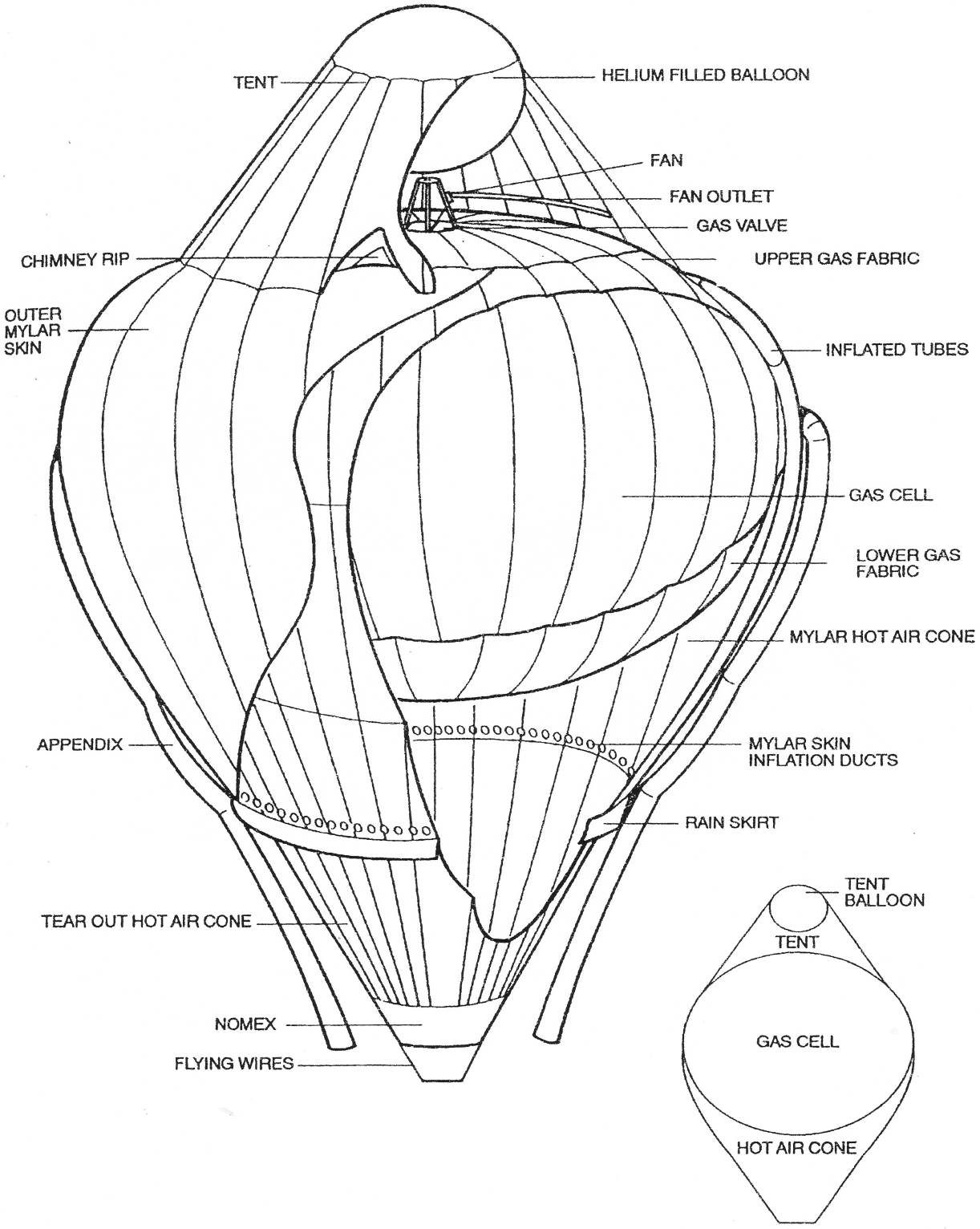
When I think about both of these exhilarating personal experiments in the laboratory life, the phrase "blind pig gets acorn … twice. " comes readily to mind. Would I risk a third launch and landing if the opportunity presented itself? You bet I would!

Ben Franklin on Ballooning

Our last words on ballooning today come from Ben Franklin, who developed an avid interest in the subject. Once, a skeptic asked him what was the use of it, he replied, "Of what use is a newborn baby" … thus terminating the criticism.

SOURCE MATERIAL

Riding The Jetstream, John Christopher	ISBN 0-7195-6051-9
Hot Air Balloons, Kalakuka & Stockwell	ISBN 1-56799-620-5
Around the World in 20 Days, Piccare/Jones	ISBN 0-471-27820-8
Hindenburg, Rick Archbold	ISBN 0-446-51784-4
The Joy of Ballooning, George Denniston	ISBN 0-7624-0475-2
The Dream Machines, Peter Haining	DD 629.1332 H1d Case



The anatomy of a modern Cameron Rozière, with the distinctive 'tent' balloon sitting at the top of the main helium cell to protect the valve from icing (*Breitling*)