

***CAMILLE
FLAMMARION***



***WONDERFUL
BALLOON
ASCENTS***

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Wonderful Balloon Ascents

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PREFACE.

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"LET posterity know, and knowing be astonished, that on the fifteenth day of September, 1784, Vincent Lunardi of Lucca, in Tuscany, the first aerial traveller in Britain, mounting from the Artillery Ground in London, and traversing the regions of the air for two hours and fifteen minutes, on this spot revisited the earth. In this rude monument for ages be recorded this wondrous enterprise successfully achieved by the powers of chemistry and the fortitude of man, this improvement in science which the great Author of all Knowledge, patronising by his Providence the inventions of mankind, hath graciously permitted, to their benefit and his own eternal glory."

The stone upon which the above inscription was carved, stands, or stood recently, near Collier's End, in the parish of Standon, Hertfordshire; and it will possibly afford the English reader a more accurate idea of the feelings with which the world hailed the discovery of the balloon than any incident or illustration drawn from the annals of a foreign country.

The work which we now introduce to our readers does not exaggerate the case when it declares that no discovery of modern times has aroused so large an amount of enthusiasm, has excited so many hopes, has appeared to the human race to open up so many vistas of enterprise and research, as that for which we are mainly indebted to the Brothers Montgolfier. The discovery or the invention of the balloon, however, was one of those efforts of genius and enterprise which have no infancy. It had reached its full

growth when it burst upon the world, and the ninety years which have since elapsed have witnessed no development of the original idea. The balloon of to-day—the balloon in which Coxwell and Glaisher have made their perilous trips into the remote regions of the air—is in almost every respect the same as the balloon with which "the physician Charles," following in the footsteps of the Montgolfiers, astonished Paris in 1783. There are few more tantalising stories in the annals of invention than this. So much had been accomplished when Roziers made his first aerial voyage above the astonished capital of France that all the rest seemed easy. The new highway appeared to have been thrown open to the world, and the dullest imagination saw the air thronged with colossal chariots, bearing travellers in perfect safety, and with more than the speed of the eagle, from city to city, from country to country, reckless of all the obstacles—the seas, and rivers, and mountains—which Nature might have placed in the path of the wayfarer. But from that moment to the present the prospect which was thus opened up has remained a vision and nothing more. There are—as those who visited the Crystal Palace two years ago have reason to know—not a few men who still believe in the practicability of journeying by air. But, with hardly an exception, those few have abandoned all idea of utilising the balloon for this purpose. The graceful "machine" which astonished the world at its birth remains to this day as beautiful, and as useless for the purposes of travel, as in the first hour of its history. The day may come when some one more fortunate than the Montgolfiers may earn the Duke of Sutherland's offered reward by a successful flight

from the Mall to the top of Stafford House; but when this comes to pass the balloon will have no share in the honour of the achievement. Not the less, however, is the story of this wonderful invention worthy of being recorded. It deserves a place in the history of human enterprise—if for nothing else—because of the daring courage which it has in so many cases brought to light. From the days of Roziers down to those of Coxwell, our aeronauts have fearlessly tempted dangers not less terrible than those which face the soldier as he enters the imminent deadly breach; and, as one of the chapters in this volume mournfully proves, not a few of their number have paid the penalty of their rash courage with their lives. All the more is it to be regretted that so little practical good has resulted from their labours and their sacrifices; and that so many of those who have perished in balloon voyages have done so whilst serving to better end than the amusement of a holiday crowd. There is, however, another aspect which makes at least the earlier history of the balloon well worth preserving. This is the influence which the invention had upon the generation which witnessed it. As these pages show, the people of Europe seem to have been absolutely intoxicated by the success of the Montgolfiers' discovery. There is something bitterly suggestive in our knowledge of this fact. Whilst pensions and honours and popular applause were being showered upon the inventors of the balloon, Watt was labouring unnoticed at his improvements of the steam-engine—a very prosaic affair compared with the gilded globe which Montgolfier had caused to rise from earth amidst the acclamations of a hundred thousand spectators,

but one which had before it a somewhat different history to that of the more startling invention. England, when it remembers the story of the steam-engine, has little need to grudge France the honour of discovering the balloon. After all, however, Great Britain had its share in that discovery. The early observations of Francis Bacon and Bishop Wilkins paved the way for the later achievement, whilst it was our own Cavendish who discovered that hydrogen gas was lighter than air; and Dr. Black of Edinburgh, who first employed that gas to raise a globe in which it was contained from the earth. The Scotch professor, we are told, thought that the discovery which he made when he sent his little tissue-paper balloon from his lecture-table to the ceiling of his classroom, was of no use except as affording the means of making an interesting experiment. Possibly our readers, after they have perused this volume, may think that Dr Black was not after all so far wrong as people once imagined. Be this as it may, however, in these pages is the history of the balloon, and of the most memorable balloon voyages, and we comprehend the story to our readers not the less cordially that it comes from the land where the balloon had its birth.

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CHAPTER I.

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INTRODUCTION.

The title of our introduction to aeronautics may appear ambitious to astronomers, and to those who know that the infinite space we call the heavens is for ever inaccessible to travellers from the earth; but it was not so considered by those who witnessed the ardent enthusiasm evoked at the ascension of the first balloon. No discovery, in the whole range of history, has elicited an equal degree of applause and admiration—never has the genius of man won a triumph which at first blush seemed more glorious. The mathematical and physical sciences had in aeronautics achieved apparently their greatest honours, and inaugurated a new era in the progress of knowledge. After having subjected the earth to their power; after having made the waves of the sea stoop in submission under the keels of their ships; after having caught the lightning of heaven and made it subservient to the ordinary purposes of life, the genius of man undertook to conquer the regions of

the air. Imagination, intoxicated with past successes, could descry no limit to human power; the gates of the infinite seemed to be swinging back before man's advancing step, and the last was believed to be the greatest of his achievements.

In order to comprehend the frenzy of the enthusiasm which the first aeronautic triumphs called forth, it is necessary to recall the appearance of Montgolfier at Versailles, on the 19th of September, 1783, before Louis XVI, or of the earliest aeronauts at the Tuileries. Paris hailed the first of these men with the greatest acclaim, "and then, as now," says a French writer, "the voice of Paris gave the cue to France, and France to the world!" Nobles and artisans, scientific men and *badauds*, great and small, were moved with one universal impulse. In the streets the praises of the balloon were sung; in the libraries models of it abounded; and in the *salons* the one universal topic was the great "machine." In anticipation, the poet delighted himself with bird's-eye views of the scenery of strange countries; the prisoner mused on what might be a new way of escape; the physicist visited the laboratory in which the lightning and the meteors were manufactured; the geometrician beheld the plans of cities and the outlines of kingdoms; the general discovered the position of the enemy or rained shells on the besieged town; the police beheld a new mode in which to carry on the secret service; Hope heralded a new conquest from the domain of nature, and the historian registered a new chapter in the annals of human knowledge.

"Scientific discoveries in general," says Arago, "even those from which men expect the most advantage, like

those of the compass and the steam-engine, were greeted at first with contempt, or at the best with indifference. Political events, and the fortunes of armies monopolised almost entirely the attention of the people. But to this rule there are two exceptions—the discoveries of America and of aerostatics, the advents of Columbus and of Montgolfier." It is not here our duty to inquire how it happened that the discoveries made by these two personages are classed together. Air-travelling may be as unproductive of actual good to society as "filling the belly with the east wind" is to the body, while every one knows something of the extent to which the discovery of Columbus has influenced the character, the civilisation, the destinies, in short, of the human race. We are speaking at present of the known and well-attested fact, that the discovery of America and the discovery of the method of traversing space by means of balloons—however they may differ in respect of results to man—rank equally in this, that of all other discoveries these two have attracted the greatest amount of attention, and given, in their respective eras, the greatest impulse to popular feeling. Let the reader recall the marks of enthusiasm which the discovery of the islands on the east coast of America excited in Andalusia, in Catalonia, in Aragon and Castile—let him read the narrative of the honours paid by town and village, not only to the hero of the enterprise, but even to his commonest sailors, and then let him search the records of the epoch for the degree of sensation produced by the discovery of aeronautics in France, which stands in the same relationship to this event as that in which Spain stands to the other. The processions

of Seville and Barcelona are the exact prototypes of the fêtes of Lyons and Paris. In France, in 1783, as in Spain two centuries previously, the popular imagination was so greatly excited by the deeds performed, that it began to believe in possibilities of the most unlikely description. In Spain, the *conquistadores* and their followers believed that in a few days after they had landed on American soil, they would have gathered as much gold and precious stones, as were then possessed by the richest European Sovereigns. In France, each one following his own notions, made out for himself special benefits to flow from the discovery of balloons. Every discovery then appeared to be only the precursor of other and greater discoveries, and nothing after that time seemed to be impossible to him who attempted the conquest of the atmosphere. This idea clothed itself in every form. The young embraced it with enthusiasm, the old made it the subject of endless regrets. When one of the first aeronautic ascents was made, the old Maréchal Villeroy, an octogenarian and an invalid, was conducted to one of the windows of the Tuileries, almost by force, for he did not believe in balloons. The balloon, meanwhile, detached itself from its moorings; the physician Charles, seated in the car, gaily saluted the public, and was then majestically launched into space in his air-boat; and at once the old maréchal, beholding this, passed suddenly from unbelief to perfect faith in aerostatics and in the capacity of the human mind, fell on his knees, and, with his eyes bathed in tears, moaned out pitifully the words, "Yes, it is fixed! It is certain! They will find out the secret of avoiding death; but it will be after I am gone!"

If we recall the impressions which the first air-journeys made, we shall find that, among people of enthusiastic temperament, it was believed that it was not merely the blue sky above us, not merely the terrestrial atmosphere, but the vast spaces through which the worlds move, that were to become the domain of man—the sea of the balloon. The moon, the mysterious dwelling-place of men unknown, would no longer be an inaccessible place. Space no longer contained regions which man could not cross! Indeed, certain expeditions attempted the crossing of the heavens, and brought back news of the moon. The planets that revolve round the sun, the far-flying comets, the most distant stars—these formed the field which from that time was to lie open to the investigations of man.

This enthusiasm one can well enough understand. There is in the simple fact of an aerial ascent something so bold and so astonishing, that the human spirit cannot fail to be profoundly stirred by it. And if this is the feeling of men at the present day, when, after having been witnesses of ascents for the last eighty years, they see men confiding themselves in a swinging car into the immensities of space, what must have been the astonishment of those who, for the first time since the commencement of the world, beheld one of their fellow-creatures rolling in space, without any other assurance of safety than what his still dim perception of the laws of nature gave him?

Why should we be obliged here to state that the great discovery that stirred the spirits of men from the one end of Europe to the other, and gave rise to hopes of such vast discoveries, should have failed in realising the expectations

which seemed so clearly justified by the first experiments? It is now eighty-six years since the first aerial journey astonished the world, and yet, in 1870, we are but little more advanced in the science than we were in 1783. Our age is the most renowned for its discoveries of any that the world has seen. Man is borne over the surface of the earth by steam; he is as familiar as the fish with the liquid element; he transmits his words instantaneously from London to New York; he draws pictures without pencil or brush, and has made the sun his slave. The air alone remains to him unsubdued. The proper management of balloons has not yet been discovered. More than that, it appears that balloons are unmanageable, and it is to air-vessels, constructed more nearly upon the model of birds, that we must go to find out the secret of aerial navigation. At present, as in former times, we are at the mercy of balloons—globes lighter than the air, and therefore the sport and the prey of tempests and currents. And aeronauts, instead of showing themselves now as the benefactors of mankind, exhibit themselves mainly to gratify a frivolous curiosity, or to crown with *éclat* a public fête.

Attempts in Ancient Times to fly in the Air

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CHAPTER II.

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ATTEMPTS IN ANCIENT TIMES TO FLY IN THE AIR.

BEFORE contemplating the sudden conquest of the aerial kingdom, as accomplished and proclaimed at the end of the last century, it is at once curious and instructive to cast a glance backward, and to examine, by the glimmering of ancient traditions, the attempts which have been made or imagined by man to enfranchise himself from the attraction of the earth.

The greater number of the arts and sciences can be traced along a chronological ladder of great length: some, indeed, "lose themselves in the night of time." The accomplishment of raising oneself in the air, however, had no actual professors in antiquity, and the discovery of Montgolfier seems to have come into the world, so to speak, spontaneously. By this it is to be understood that, unlike Copernicus and Columbus, Montgolfier could not read in history of any similar discovery, containing the germ of his own feat. At least, we have no proof that the ancient nations practised the art of aerial navigation to any extent whatever. The attempts which we are about to cite do not strictly belong to the history of aerostatics.

Classic mythology tells us of Dædalus, who, escaping with his son Icarus from the anger of Minos, in the Isle of Crete, saved himself from the immediate evil by the aid of wings, which he made for himself and his son, and by means of which they were enabled to fly in the air. The wings, it appears, were soldered with wax, and Icarus, flying too high, was struck by a ray of the sun, which melted the wax. The youth fell into the sea, which from him derived its name of Icarian. It is possible that this fable only symbolisms the introduction of sails in navigation.

Coming down through ancient history, we note a certain Archytas, of Tarentum, who, in the fourth century B.C., is said to have launched into the air the first "flying stag," and who, according to the Greek writers, "made a pigeon of wood, which flew, but which could not raise itself again after having fallen." Its flight, it is said, "was accomplished by means of a mechanical contrivance, by the vibrations of which it was sustained in the air."

In the year 66 A.D., in the time of Nero, Simon, the magician—who called himself "the mechanician"—made certain experiments at Rome of flying at a certain height. In the eyes of the early Christians this power was attributed to the devil, and St. Peter, the namesake of this flying man, is said to have prayed fervently while Simon was amusing himself in space. It was possibly in answer to his prayers that the magician failed in his flight, fell upon the Forum, and broke his neck on the spot.

From the summit of the tower of the hippodrome at Constantinople, a certain Saracen met the same fate as Simon, in the reign of the Emperor Comnenus. His

experiments were conducted on the principle of the inclined plane. He descended in an oblique course, using the resistance of the air as a support. His robe, very long and very large, and of which the flaps were extended on an osier frame, preserved him from suddenly falling.

The inclined plane probably suggested to Milton the flight of the angel Uriel, in "Paradise Lost," who descended in the morning from heaven to earth upon a ray of the sun, and ascended in the evening from earth to heaven by the same means. But we cannot quote here the fancies of pure imagination, and we will not speak of Medeus the magician, of the enchantress Armida, of the witches of the Brocken, of the hippogriff of Zephyrus with the rosy wings, or of the diabolical inventions of the middle ages, for many of which the stake was the only reward.

Roger Bacon, in the thirteenth century, inaugurated a more scientific era. In his "Treaty of the Admirable Power of Art and Nature," he puts forth the idea that it is possible "to make flying-machines in which the man, being seated or suspended in the middle, might turn some winch or crank, which would put in motion a suit of wings made to strike the air like those of a bird." In the same treatise he sketches a flying-machine, to which that of Blanchard, who lived in the eighteenth century, bears a certain resemblance. The monk, Roger Bacon, was worthy of entering the temple of fame before his great namesake the Lord Chancellor, who in the seventeenth century inaugurated the era of experimental science.

Jean Baptiste Dante, a mathematician of Perugia, who lived in the latter part of the fifteenth century, constructed

artificial wings, by means of which, when applied to thin bodies, men might raise themselves off the ground into the air. It is recorded that on many occasions he experimented with his wings on the Lake Thrasymenus. These experiments, however, had a sad end. At a fête, given for the celebration of the marriage of Bartholomew d'Alvani, Dante, who must not be confounded with the poet, whose flights were of quite another kind—offered to exhibit the wonder of his wings to the people of Perugia. He managed to raise himself to a great height, and flew above the square; but the iron with which he moved one of his wings having been bent, he fell upon the church of the Virgin, and broke his thigh.

A similar accident befell a learned English Benedictine Oliver of Malmesbury. This ecclesiastic was considered gifted with the power of foretelling events; but, like other similarly circumstanced, he does not seem to have been able to divine the fate which awaited himself. He constructed wings after the model of those which according to Ovid, Dædalus made use of. These he attached to his arms and his feet, and, thus furnished, he threw himself from the height of a tower. But the wings bore him up for little more than a distance of 120 paces. He fell at the foot of the tower, broke his legs, and from that moment led a languishing life. He consoled himself, however, in his misfortune by saying that his attempt must certainly have succeeded had he only provided himself with a tail.

Before going further, let us take notice that the seventeenth century is, *par excellence*, the century distinguished for narratives of imaginary travels. It was then

that astronomy opened up its world of marvels. The knowledge of observers was vastly increased, and from that time it became possible to distinguish the surface of the moon and of other celestial bodies. Thus a new world, as it were, was revealed for human thought and speculation. We learned that our globe was not, as we had supposed, the centre of the universe. It was assigned its place far from that centre, and was known to be no more than a mere atom, lost amid an incalculable number of other globes. The revelations of the telescope proved that those who formerly were considered wise actually knew nothing. Quickly following these discoveries, extraordinary narratives of excursions through space began to be given to the world. Those scientific romances were simply wild exaggerations, based upon the thinnest foundation of scientific facts. In order, however, to describe a journey among the stars, it was necessary to invent some mode of locomotion in these distant regions. In former times Lucian had been content with a ship which ascended to the rising moon upon a waterspout; but it was now necessary to improve upon this very primitive mode, as people began to know something more of the forces of nature. One of the first of these travellers in imagination to the moon in modern times was Godwin (1638), and his plan was more ingenious than that of Lucian. He trained a great number of the wild swans of St. Helena to fly constantly upward toward a white object, and, having succeeded in thus training them, one fine night he threw himself off the Peak of Teneriffe, poised upon a piece of board, which was borne upward to the white moon by a great team of the gigantic swans. At the end of twelve days

he arrived, according to his story, at his destination. A little later another writer of this peculiar kind of fiction, Wilkins, an Englishman, professed to have made the same ascent, borne up by an eagle. Alexandre Dumas, who recently wrote a short romance upon the same subject, only made a translation of an English work by that author. Wilkins' work is entitled, "The Discovery of a New World." One chapter of the book bears the title, "That 'tis possible for some of our posterity to find out a conveyance to this other world; and, if there be inhabitants there, to have commerce with them." It is thus that the right reverend philosopher reasons:—

"If it be here inquired what means there may be conjectured for our ascending beyond the sphere of the earth's mathematical vigour, I answer.—1. 'Tis not possible that a man may be able to fly by the application of wings to his own body, as angels are pictured, as Mercury and Daedalus are feigned, and as hath been attempted by divers, particularly by a Turk in Constantinople, a Busbequius relates. 2. If there be such a great duck in Madagascar as Marcus Polus, the Venetian, mentions, the feathers of whose wings are twelve feet long, which can scoop up a horse and his rider, or an elephant, as our kites do a mouse; why, then, 'tis but teaching one of these to carry a man, and he may ride up thither, as Ganymede does upon an eagle. 3. Or if neither of these ways will serve yet I do seriously, and upon good grounds, affirm it is possible to make a flying chariot, in which a man may sit and give such a motion to it as shall convey him through the air. And this, perhaps, might be made large enough to carry divers men at the same time, together with food for their *viaticum*, and

commodities for traffic. It is not the bigness of anything in this kind that can hinder its motion if the motive faculty be answerable thereunto. We see that a great ship swims as well as a small cork, and an eagle flies in the air as well as a little gnat. This engine may be contrived from the same principles by which Archytas made a wooden dove, and Regiomontanus a wooden eagle. I conceive it were no difficult matter (if a man had leisure) to show more particularly the means of composing it. The perfecting of such an invention would be of such excellent use that it were enough, not only to make a man famous but the age wherein he lives. For, besides the strange discoveries that it might occasion in this other world, it would be also of inconceivable advantage for travelling, above any other conveyance that is now in use. So that, notwithstanding all these seeming impossibilities, it is likely enough that there may be a means invented of journeying to the moon; and how happy shall they be that are first successful in this attempt!"

Afterwards comes Cyrano of Bergerac, who promulgates five different means of flying in the air. First, by means of phials filled with dew, which would attract and cause to mount up. Secondly, by a great bird made of wood, the wings of which should be kept in motion. Thirdly, by rockets, which, going off successively, would drive up the balloon by the force of projection. Fourthly, by an octahedron of glass, heated by the sun, and of which the lower part should be allowed to penetrate the dense cold air, which, pressing up against the rarefied hot air, would raise the balloon. Fifthly, by a car of iron and a ball of magnetised iron, which the

aeronaut would keep throwing up in the air, and which would attract and draw up the balloon. The wiseacre who invented these modes of flying in the air seems, some would say, to have been more in want of very strict confinement on the earth than of the freedom of the skies.

In 1670 Francis Lana constructed the flying-machine shown on the next page. The specific lightness of heated air and of hydrogen gas not having yet been discovered, his only idea for making his globes rise was to take all the air out of them. But even supposing that the globes were thus rendered light enough to rise, they must inevitably have collapsed under the atmospheric pressure.

As for the idea of making use of a sail to direct the balloon, as one directs a vessel, that also was a delusion; for the whole machine, globes and sails, being freely thrown into the air, would infallibly follow the direction of the wind, whatever that might be. When a ship lies in the sea, and its sails are inflated with the wind, we must remember that there are two forces in operation—the active force of the wind and the passive force of the resistance of the water; and in working these forces the one against the other, the