

## INTRODUCTION

The last decades of the eighteenth century witnessed an astonishing flurry of activity in the skies as savants and amateurs alike launched balloons into the air with great abandon much to the delight of the enormous audiences that gathered to watch and applaud their efforts. James Dinwiddie, for example, released a balloon with 'a peculiar form' near Buckingham Gate in London in late 1783 which resulted in an 'undulating serpentine motion'. This 'afforded great entertainment to the spectators'.<sup>1</sup> Mr Jackson, 'of the Hutton Rugby School, near Stokesley', set forth 'an elegant aerostatic globe' from the Market Place in Stockton in Durham, England in June 1784. The flight lasted only seven minutes but it ascended 'in a very pleasing manner the whole time it was visible'.<sup>2</sup> On 13 March 1785 Sieur Lhomond launched a globe from the Jardin des Tuileries in Paris. Three other balloons preceded the main globe; one represented the sun, the second golden thunder, while the third was without decoration but in which Lhomond experimenting with a mixture of hot air and hydrogen. The latter balloon exploded after take-off.<sup>3</sup> Throughout the second half of 1784 and into 1785 Monsieur Cailleau, from the town of Hauterive, released a series of small balloons. He and his assistant, Monsieur Rivière, used the Montgolfier balloon as their model.<sup>4</sup> In Florence the aeronaut Giard ascended in a balloon on 1 October 1811. He quickly rose to a great height and 'lost sight of the earth' leaving him 'numbed by the extreme cold, and himself nearly overpowered by sleep'. He eventually landed after nine hours aloft.<sup>5</sup>

These ascensions are not among the more famous typically described in books and articles about the genesis of ballooning. Most accounts of the origins of aeronautics begin with the moment when the Montgolfier brothers, Etienne and Joseph, released their hot-air balloon from the Place des Cordeliers in Annonay, France in 1783. The Montgolfiers chose their moment carefully, but not because of any scientific or technological factors. Instead, they picked that day and time because of the meeting of the local *Etats particulières*, a diocesan assembly in Annonay for their annual meeting. This group, composed of many local notables, acted as witnesses for the flight and attested to the efforts of the Montgolfiers in developing this new technology. They subsequently signed

a document describing the launch which the Montgolfiers sent to King Louis XVI and the members of the French Royal Academy of Sciences. In the end, the Montgolfiers hoped the state would reward them handsomely for their efforts and acknowledge their place among the scientific elite.

From the perspective of lauding the moment when a new invention is first displayed before the public, historians are right to select this event to initiate a conversation about ballooning. However, the focus usually remains on the first successful voyage. While this is, of course, important, the flight ultimately looked incredibly similar to most other ascensions: someone scheduled the launch, a crowd gathered, the balloon took off, it wandered away, and eventually landed and, perhaps, caught fire. The significance of the Montgolfiers' efforts was not their launch but the precedent it established. From this moment on, launches remained almost entirely public affairs and witnesses – often paying for the privilege – attended in droves. Aeronauts could not steer their balloons and experiments often ended with the destruction of the globe; even once manned balloons appeared and aeronauts could control their descent to a greater degree, the landing was often dangerous and at least partly a controlled crash. Many of these aeronauts hoped for recognition and rewards for their efforts, just like the Montgolfiers. Thus, while the Montgolfier brothers deserve praise and have often been the focus of attention in histories of aeronautics, this study explores instead the broader phenomenon of ballooning. As the driving force behind the first public launch, the Montgolfiers are important; but any analysis of the development of an age fascinated by balloons requires that we quickly leave them behind and examine the many other balloonists, and the hundreds of other launches, across Europe and North America who brought this new invention to the forefront of the cultural lives of people at the end of the eighteenth century.

One aspect of ballooning that appears common throughout this period was the general enthusiasm people felt for it. Aeronautics was the wonder of the age and people compared balloonists to other famous explorers, mythological and real, including Vasco de Gama, James Cook, and Christopher Columbus.<sup>6</sup> Simon-Nicolas-Henri Linguet suggested that while Jason and the Argonauts had sought to recover the Golden Fleece, the 'modern Argonauts devote themselves only to the progress of the sciences, [and] to the perfecting of a very honorable discovery'.<sup>7</sup> Supporters described balloonists as pioneers and treated them as such although their points of comparison varied widely. Some people involved in this enterprise probably did not like it when people associated them with Franz Anton Mesmer, a man at the center of some debate, or Comus, a scientific popularizer noted for his theatrical demonstrations. Similarly, comparing the invention of balloons to inoculation, a medical treatment seen in askance, probably did not always assist the cause of aeronautics.<sup>8</sup> However, relating them to electricity and the discovery of a method to determine longitude certainly did help.<sup>9</sup> 'Never', claimed the

author of the *Correspondance littéraire*, 'has a soap bubble occupied more seriously a troupe of children' than had the 'aerostatic globe'.<sup>10</sup> More positively, the distinctly partisan *Journal de Paris* claimed 'the success of aerostatic experiments in the capital [Paris], has produced a universal enthusiasm and all the cities in the kingdom have enjoyed this beautiful spectacle'.<sup>11</sup>

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Ballooning, like the Enlightenment, traversed Europe although historians have not always treated it so. In addition, ballooning initiated a massive cultural phenomenon that historians have rarely acknowledged beyond a few anecdotes. A full understanding of the importance of science during the age of the Enlightenment and Atlantic revolutions requires an explanation of how and why ballooning entered and stayed in the public consciousness. Spectacular by nature, ballooning has inspired historians to tell a few stories, but has not come under the intense scrutiny it deserves. Thus, rather than simply narrating a chronology of discovery, this book provides a cultural and social analysis of ballooning over the first quarter century after their invention. During this period, a paradox emerged that partially defined the cultural importance of this invention. On the one hand, a mass culture emerged surrounding ballooning. Aeronauts captured the hearts and imagination of the entire continent, and beyond, and balloons became a symbol of Enlightenment, state power, and scientific progress. People of all social levels, educational backgrounds, genders, and scientific ability lauded balloons. On the other hand, balloons completely failed to fulfill their potential during this period. A method of steering balloons never materialized thus transforming what might have been an exceptionally powerful tool into mere entertainment.

Books relating this story abound, starting with Tiberius Cavallo's *The History and Practice of Aerostation* which appeared in 1784.<sup>12</sup> While Cavallo wrote his history of aeronautics at a somewhat early stage, a number of other authors offered versions during the nineteenth century including Gaston Tissandier and Monck Mason, both of whom wrote narratives describing its development from the Montgolfiers to their own times.<sup>13</sup> A twentieth century account, written by L. T. C. Rolt, provides a brief, and broad, survey of ballooning from 1783 to 1903, the year the Wright brothers made their first flight near Kitty Hawk, North Carolina. Rolt's book enthusiastically relates many great stories about aeronautics.<sup>14</sup> A number of other broad surveys on this subject have also appeared in a variety of languages.<sup>15</sup> One of the best books on this subject is Charles C. Gillispie's monograph, *The Montgolfier Brothers and the Invention of Aviation, 1783-1784* which appeared, along with a few other books in France, around the bicentennial of the invention of ballooning.<sup>16</sup> Gillispie's book, based on

intensive research into the Montgolfier family papers and the documents in the Fonds Montgolfiers collected at the Musée de l'Air et de l'Espace, explores the early history of ballooning with a strong concentration on Etienne and Joseph Montgolfier. Other aeronauts appear in this study, but mostly as showmen who distract from the real importance of ballooning. In addition, Gillispie focuses his attention largely on the first two years of ballooning, discusses France almost exclusively, and really uses ballooning as a starting point for a larger conversation centered on nineteenth-century technological advances in steam engines and railways. Marie Thébaud-Sorger's recent contribution to this literature, *L'Aérostation au temps des Lumières*, also focuses on the first few years of aeronautics although she examines the broader cultural environment throughout France.<sup>17</sup>

Some authors tackle the subject through a national or regional approach. Tom D. Crouch's *The Eagle Aloft: Two Centuries of the Balloon in America* examines the North American case. However, in treating two hundred years in one volume, Crouch necessarily gives the earlier period short shrift.<sup>18</sup> J.E. Hodgson's tome, *The History of Aeronautics in Great Britain* provides a great national narrative, and an excellent collection of stories about various balloonists and their launches.<sup>19</sup> Davide Arecco's *Mongolfiere, science et lumi nel tardo settecento* begins with an account of the origins of aeronautics in France before turning to a case by case presentation of the efforts of various Italian balloonists in the eighteenth century.<sup>20</sup> John Penny's *Up, Up and Away: An Account of Ballooning in and around Bristol and Bath, 1784-1999* has a fairly narrow regional focus although it is chronologically very broad.<sup>21</sup> While some historians do offer some comparative analysis of ballooning in different locations most tend to treat each area as independent.<sup>22</sup>

Some balloonists have been the focus of biographical studies. The Montgolfier brothers, of course, have received much attention and even some general studies of aeronautics focus considerable attention on them. However, aeronauts such as Jean-Pierre Blanchard, Jean-François Pilâtre de Rozier, Vincenzo Lunardi, Wilhelmine Reichard, and James Tytler have also served as the subjects of books and other scholarly efforts.<sup>23</sup> So many historians have devoted attention to aeronautics that in the first half of the twentieth century several bibliographies were published to help researchers.<sup>24</sup> In contrast, this study uses a broad geographical but relatively narrow chronological approach that does not favor any particular balloonist.

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Although people had long imagined flight, hot-air and hydrogen balloons were new and it is this newness that makes them particularly fascinating. Aeronauts and their audience felt free to use and appropriate this invention in any way they wished. Historians have often studied changes in attitudes toward ideas or objects; but in this case, balloons represented a *tabula rasa* on to which people could form their own vision. Thus, people applied balloons to existing cultural forms – including novels and poems, furniture and clothes – but they also developed different venues in which balloons appeared; the most important of these new arenas consisted of the events surrounding a commercial launch. As a new object, entrepreneurs had to develop ways in which they could sell them, the state had to decide how to control something that was potentially dangerous, and savants needed to discover ways to use them. Examining how and why people appropriated this invention into their lives illuminates some aspects of their cultural mentalities. In this way, balloons are useful as objects onto which people can place their values and ideas.<sup>25</sup>

This book explores the ‘universal enthusiasm’ for balloons from the inception of aeronautics in 1783 until about 1820. The starting date is somewhat clear as it stems from the first flight of a lighter-than-air object. However, it can be seen as problematic. Other savants besides the Montgolfier brothers had been experimenting with using gases to fill globes and create floating objects. In addition, there were efforts by some individuals to develop mechanical craft that could fly through the air. A rich, literary tradition also existed in which human flight, through gases, machines, or other means, appeared as a possibility. From this perspective, the starting point of 1783 can be viewed as somewhat arbitrary. However, this book’s focus centers on flights and their impact on the culture of the times; as such, the moment when people first became aware of the existence of working aerostatic globes marks the logical beginning for this study. This study ends in approximately 1820. This period marks a shift in the ways in which balloonists inflated globes. At that time, Charles Green began using coal gas to fill balloons. Coal gas proved much cheaper compared to hydrogen although it had less lifting power. In addition, in London they began laying down gas mains for homes and businesses. This meant that an aeronaut could hook up their balloon to a gas main and fill it fairly rapidly and easily. Thus, the move toward coal gas changed the nature of aeronautics by lowering the cost and making it even easier to fill and launch a balloon.<sup>26</sup> This shift did not happen universally but it does mark an important change. Thus, this study ends at about the same time innovators introduce coal gas into the field of aeronautics. In addition to this technological change, the period of time under consideration – about thirty-five years – provides a decent snapshot of the field. Most historians focus on either

the first few years or explore the topic from the beginning up to the time they are writing. Thus, an examination covering the first few decades will provide an alternative view of how ballooning entered and stayed in the public consciousness.

Ballooning's international stature both as science and as entertainment, combined with the propensity of some aeronauts to travel around Europe and North America, encourages a broad geographical approach to this study. Just as with ideas and goods, aeronautics circulated freely and ignored national borders. The spread of ideas about and knowledge of ballooning is inseparable from the spread of actual balloons.<sup>27</sup> Thus, this study tends to cross from one state to the next, much as did aeronauts. In addition, this book examines how and why balloons came to occupy such a strong place within the culture of late eighteenth and early nineteenth century Europe and North America. Certainly, it might be enough to say that humans had conquered nature and to point out that a balloon soaring through the sky presents an awesome sight. However, for people not formerly inundated with examples of flight, and for whom a balloon was a wholly new notion and object, aeronauts and their supporters needed to exert some effort to demonstrate to people why they should attend launches and spend their money on such an ephemeral event.<sup>28</sup> Aeronauts only had to change their tactics once it became clear that people could not steer balloons and that this invention, as yet, served no useful purpose other than to entertain. The focus then shifted to include, sometimes entirely, entertainment. Even there balloonists had to sell their product, and all of the associated paraphernalia, and transform aeronautics into a desirable commodity.

Balloons came to occupy the hearts and minds of a wide variety of people. Men and women from the nobility to the peasantry all had the chance to view launches. Savants and amateurs alike felt they had something to say about aeronautics; the fact that individuals without scientific training conducted successful launches meant that scientific academies or their representatives remained unable to dominate this new field of study even if they had wanted to do so. At the same time, the funding of aeronautics, through ticket sales and subscriptions, meant the general public had much greater influence over the practice of ballooning than savants would have liked. Many governments, from nations to cities, felt the need to try and control this new invention and the people who thronged to see it even as they readily relegated the funding of experiments to the general public. The broad spectrum of people involved in aeronautics, as balloonists or witnesses, authors or merchants selling balloon-wares, necessitates a similarly broad approach to understanding the importance of this new invention in the culture of the period. It also necessitates a broad use of sources including newspaper accounts and advertisements along with memoirs and letters and scientific treatises.<sup>29</sup> Balloons became important intellectually, socially, politically,

economically, and culturally; thus, this study seeks to understand balloons at each of these levels.

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This book is divided into six substantive chapters. Chapter 1 offers an introduction to the history of flight in Europe. Starting with ideas of flight prior to 1783, the chapter explores the spread of ballooning across Europe and North America during the first years after its invention. The traditional narrative concentrates on France and England but, as this chapter demonstrates, ballooning spread much wider than historians usually acknowledge. Additional examinations of disasters and accidents, along with the invention of parachuting, help illuminate why aeronauts continued to keep the public's attention and the ways in which balloonists maintained their place within the culture of the day.

The second chapter discusses the relationship between balloons and Enlightenment. From the moment of their invention, balloons became symbolic of the enlightened age, the ability of mankind to conquer nature, and the ultimate utility of science to society. Commentators suggested a number of areas that might benefit from balloons: these included science, transportation, and commerce. More fancifully, some suggested that balloons might help thieves and lovers escape. Problems emerged, however, over exactly how balloons might be useful, especially since no one could devise a method for steering them. Thus, this chapter scrutinizes the problematic relationship between utility, Enlightenment, and aeronautics.

Chapter 3 analyses the social side of ballooning. This includes a discussion of the social position of balloonists as well as an exploration of who the audience for launches might have been. Aeronauts experienced difficulty controlling the area around their launches and how people viewed the balloons. This was particularly true once the balloon reached a certain height. This helps explain the importance of controlling access to the workshops where aeronauts manufactured their balloons as well as the desire of the local and state authorities to police the practice of ballooning. There is a strong element of elitism associated with ballooning that rarely gets mentioned in the existing literature; this elitism, in which peasants are isolated from this invention, contrasts significantly with the popular nature of aeronautics. How did savants try to maintain control of this invention and assert their special place in the intellectual hierarchy at the expense of amateurs?

The fourth chapter examines the place of ballooning within political culture. Almost immediately state authorities integrated balloons into royal, as well as republican and imperial, festivals. The military also targeted balloons as potentially useful. The French revolutionary government even created a Balloon Corps

which played an important role at the Battle of Fleurus and accompanied Napoleon on his campaign to Egypt. This chapter will also focus on efforts by states to control launches, perceived by some leaders as dangerous politically (because of their potential use by spies) and as risky (as fire hazards). Failed launches also led to riots, something the state always preferred to avoid.

Chapters 5 and 6 explore, broadly speaking, the economics and culture of aeronautics. The fifth chapter examines the selling of ascensions. Although balloons failed to prove particularly useful for savants conducting experiments, as a form of entertainment they excelled. In addition, they arrived on the scene at exactly the same moment as the so-called 'consumer revolution'. While this revolution is debatable, it is certainly true that the eighteenth century experienced an expansion of commercial choices.<sup>30</sup> The late eighteenth and early nineteenth century saw the development of the consumer marketplace in Great Britain and, to varying degrees, in France, North America and elsewhere. How did balloons fit into this emerging market with the related growth in commercial venues? As a new product, balloons offer an excellent case study into questions of product innovation, the role of advertising, and national characteristics of a consumer society. Chapter six discusses the material culture surrounding the invention of balloons. Manufactured goods with balloon-related themes, such as plates, clocks, furniture, clothes, and so on, became enormously fashionable in the late eighteenth century. Literary and artistic culture more generally, in the form of broadsides, paintings, poems, novels, almanacs, and scientific treatises, produced enormous numbers of cultural artifacts related to aeronautics. The ways in which literary works discuss, and artistic works depict, the practice of ballooning help demonstrate the breadth of impact ballooning had on European culture.

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