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“BALLOON MADNESS”:
POLITICS, PUBLIC ENTERTAINMENT, THE TRANSATLANTIC
SCIENCE OF FLIGHT, AND LATE EIGHTEENTH CENTURY
AMERICA

In this wild, romantic Age,

What fantastic Whims engage!

High and low and old and young.

All with balloon Madness stung!

The Carrier of the American Herald's Congratulation to his Customers (1785)

During the early summer of 1789, the arrival in the United States of a British-born mechanic called Joseph Deeker prompted the publication of a broadside in New York. Declaring that Deeker “is perfectly acquainted with the nature and construction of AIR BALLOONS,” the broadside then went on to announce that: “As the novelty of an exhibition of this nature may afford some amusement to the Public, at the request of a number of respectable characters in this city, he proposes to open a SUBSCRIPTION for supplying the materials necessary for constructing and filling one of twenty-five feet diameter.”¹ Despite the anonymous author’s faith in the generosity, and curiosity, of the American public, however, Deeker’s visit to the new republic was not universally welcomed. In late July, for example, an exasperated citizen of Pennsylvania wrote a letter to the *Freeman's Journal* which addressed itself “To the Air-Balloon Maker.” “Confound you and your ballooning – had you built such a thing and gone off in it to Nova-Scotia, Rhode Island, or to old nick, it would not signify sixpence to me,” the author complained, “but you are so full of your

invention, that nothing less than the public papers must give information of your intended flight; by which you have set my whole house in confusion.”² Although clearly shot through with comic hyperbole (the author goes on to describe how he lost his wife after she built her own balloon and disappeared into the heavens), this essay in the *Freeman's Journal* is nonetheless making a very serious point. Ballooning in late eighteenth century America was not only hugely popular and much discussed, it was also a source of persistent anxiety.

Thus when an anonymous correspondent wrote to *The Salem Gazette* about an “aerostatick balloon” he had seen on display in Maryland it was with a mixture of optimism and trepidation. “I am pleased in reflecting how much our countrymen have done to improve the various branches of science, and doubt not our being as much distinguished for works of genius in times of peace, as our patriot army have been for their success and sufferings during the war,” the correspondent enthused, before rather apprehensively noting of the balloon itself that: “So novel an appearance had an odd effect on the ‘gazing multitude’ – Silent admiration – the stare of surprise – the grin of ignorance – and a wild tumultuous joy – sufficiently indicated that all were pleasingly disappointed.”³ The Pennsylvania-born diplomat Jonathan Williams, Jr., meanwhile, expressed a similar ambivalence in his account of those carrying out the “late Aerostatic Experiments.” Writing to his great uncle, Benjamin Franklin, in May 1785, Williams, Jr. celebrated the fact that “now the Safety of the navigation is demonstrated,” only to conclude: “I think it very much to be regretted that this Pursuit has been undertaken by so many ignorant Adventurers. ... It seems to have shut the Door against men of Science, for Balloons and Aerial Travellers are now on a footing with Rareshows and Ropedancers.”⁴ The public interest in ballooning, as both these

writers suggest, had changed it into a form of spectacle, enlarging its remit from education to entertainment, and pushing it beyond the realm of scientific investigation into the hands of a rapidly commercializing, increasingly mercurial urban populace. Indeed, the “balloon Madness,” as my epigraph from the *American Herald* calls it, was an historical episode in which one of the public’s primary concerns was with its own capacity to be infatuated, dissatisfied and misled.⁵

Thus the story of ballooning in America connects with the trend toward popular validation which recent scholarship has identified as a key component of eighteenth-century science. Building on Simon Schaffer’s seminal 1983 article “Natural Philosophy and Public Spectacle in the Eighteenth Century,” historians such as Jan Golinski, Larry Stewart, Geoffrey Sutton, James Delbourgo, and Michael R. Lynn, working across a range of national contexts, have all noted how the scientific discourses of the Enlightenment were produced, to one degree or another, within a social framework.⁶ Discussing the development of chemistry in Britain, Golinski, for example, emphasizes the complex and increasingly problematic relationship between natural philosophers and those they sought to inform. “Because of the close relationship between scientific practice and the forms of public life,” he observes, “the development of chemistry was shaped by dramatic changes in the constitution of civic culture at the end of the eighteenth century. ... Arguments about methods of reasoning, about the use of certain instruments, and about the situation of audiences in relation to experiments were all interconnected.”⁷ And the same might be said of ballooning. Far from being obscure or laboratory-bound, the science of flight is perhaps most accurately positioned at the centre of a series of interrelated arguments, events, and objects, which ran the gamut from technical pamphlets and public

experiments to laudatory poems and satirical stories, political debates and private letters to clothing designs and fashionable novelties. These multiple responses to human flight in fact testify to the ongoing dependence between technological progress and popular utility in the eighteenth century – a dependence which generated the kinds of epistemological friction that historians such as Joyce Appleby, Gordon S. Wood, and Christopher Grasso have all identified within Revolutionary America’s changing socio-political order.⁸ As Michael R. Lynn has suggested, albeit in relation to France, ballooning represents “one of the first examples ... of a truly mass culture” – no other Enlightenment phenomena connected quite so directly with the aspirations of an only recently empowered public: “People could acquire cultural capital from knowledge of balloons, from possession of aeronautic goods, or even from simply attending balloon launches. ... With the advent of ballooning, popular science soared to new heights, literally and figuratively, and established itself as a crucial component of eighteenth-century urban life.”⁹

The capacity of ballooning to glide through so many different discourses as “symbol, simile, and metaphor” (in the words of Richard P. Hallion), confirms that, as significant as it may or may not have been scientifically, ballooning had a larger importance as a catalyst for the more general apprehensions and ambitions of the period.¹⁰ In fact, the extremity and ambiguity of the public’s response to ballooning was in many ways a reflection of the tension between the two ruling ideologies of the post-Revolutionary era, both of which pivoted on the idea of progress. To put it rather crudely, the classical republican world-view which lingered into the late eighteenth century tended to understand history in cyclical terms which emphasized the threat of national decline, while the economic-liberal world-view which was increasingly

gaining purchase during these years tended to understand history in linear terms which emphasized the promise of national growth.¹¹ As Samuel Miller astutely recognized in his reflections on American politics in *A Brief Retrospect of the Eighteenth Century* (1803): “Nothing is more common than to hear men express an opinion, that the country and the period in which their lot is cast are more awfully degenerate, or more extensively enlightened, according to the occurrence, or the object which happens to occupy their minds, than the world ever before witnessed.”¹² Whether their attitude was positive or negative, however, commentators on both sides of the political divide could agree that ballooning was a revealing emblem of the social upheaval that was transforming American life in the wake of independence.

Indeed, my claim that ballooning can be used to represent America’s volatile experience of modernity is not simply the result of historical retrospection. In “Nature” (1844), for example, Ralph Waldo Emerson saluted ballooning as an important exemplar of the post-Revolutionary *Zeitgeist*. “We anticipate a new era from the invention of a locomotive, or a balloon,” he wrote. “[I]t is a symbol of our modern aims and endeavors, - of our condensation and acceleration of objects.”¹³ As Emerson well knew, the combination of daring and unpredictability that characterized early balloon experiments was not just restricted to these ventures. Ballooning kindled the same sense of heroic risk and disquieting instability that lay at the core of America’s burgeoning consumer society, a new financial and cultural order that often seemed to be based on nothing more than hot air. To borrow some words Emerson wrote in 1842:

The sturdy capitalist, no matter how deep and square on blocks of Quincy granite he lays the foundation of his banking-house or Exchange, must set it, at

last, not on a cube corresponding to the angles of his structure, but on a mass of unknown materials and solidity, ... which rounds off to almost perfect sphericity, and lies floating in soft air, and goes spinning away, dragging bank and banker with it at a rate of thousands of miles an hour, he knows not whither. And this wild balloon, in which his whole venture is embarked, is a just symbol of his whole state and faculty.¹⁴

The figure of the balloon, which is “unmanageable, and flies away from the aeronaut,” summoned up for antebellum Americans the fear and excitement of a newly democratic society in which, as Alexis de Tocqueville put it, “the extreme fluctuations of men, and the impatience of their desires, keep them perpetually on the move.”¹⁵

In this respect then, Larry Stewart’s suggestive argument that during the eighteenth century “natural philosophy could not remain a narrow academic, intellectual issue or one confined to the miasma of metaphysical speculation; rather it reflected more prescient economic and social tensions within Britain,” might be effectively extended by investigating how the political and cultural transformations of the post-Revolutionary era tested prevailing definitions of scientific knowledge in the New World.¹⁶ In *Curiosity: A Cultural History of Early Modern Inquiry*, Barbara Benedict notes that “scientific or mechanical innovations like the hot-air balloon offered, if not an escape to a lunar ideal, at least a global perspective from which man seemed nestled within a civilized nature or a naturalized culture.”¹⁷ But as Gordon S. Wood points out in *The Radicalism of the American Revolution*, such universal perspectives were not without accompanying concerns in the late eighteenth century. Indeed, Wood argues that the ethical crisis many post-Revolutionary thinkers read

into the spread of capitalism (with its substitution of self-interest for disinterest) was matched by an even more startling crisis in American society's cognitive assumptions. The consequence of the Revolution's wide-ranging assault on genteel values, Wood notes, "was a dispersion of authority and ultimately a diffusion of truth itself to a degree the world had never before seen. With every ordinary person being told that his ideas and tastes, on everything from medicine to art and government, were as good as, if not better than, those of 'connoisseurs' and 'speculative men' who had college degrees, it is not surprising that truth and knowledge became elusive and difficult to pin down."¹⁸

Balloons, which floated free from the earth and seemed to have a sense of direction all their own, then almost inevitably called to mind this epistemological transformation, wherein social authority was wrested away from its civic humanist grounding in private property and made vulnerable to the oscillating interests of the public at large. Perhaps, the loyalist sympathizer Ann Timothy reflected in 1784, the recent war with Britain had been nothing more than the whim of a personified Fancy, who has "been much accustomed to sail over the ocean of philosophical hypothesis in an Air Balloon, [so] she can ebb and flow with the tide of popular opinion."¹⁹ Certainly, when read as an emblem of the wider cultural concerns emanating from America's political revolution, balloons often seemed to be full of the "wind of doctrine" satirized in the fifth edition of Washington Irving's *A History of New York* (1809) – that hot air which inspired cobblers "to give lessons on political economy" and tailors "to criticize the measures of government." As Irving put it in his devastating attack on the democratization of knowledge in the first edition: "Plodding souls, like myself, who jog along on the two legs nature has given them, are sadly put

to it ... to toil through the mud and mire, and to remove the continual obstructions, that abound in the path of science. But your adventurous philosopher launches his theory like a balloon, and having inflated it with the smoke and vapours of his own heated imagination, mounts it in triumph, and soars away to his congenial regions in the moon.”²⁰

Moreover, as this irresistibly vivid imagery might suggest, the discourse surrounding human flight not only offers an insight into the connection between science and its social context, it also tells us something important about the construction and contingency of scientific language. Rejecting the assumption that scientific texts are neutral and unmediated representations of an empirical practice, numerous historians over the last two decades have emphasized the degree to which such texts are shaped by the demands of communicating with or appealing to an audience (whether this audience is composed of other natural philosophers or the public at large).²¹ To quote just one of these historians, Geoffrey Cantor:

Scientific narratives in general and experimental reports in particular are rhetorical, in the accepted sense of the term, since they aim to persuade or influence. ... Every successful (and unsuccessful) theory in the history of science has had to be argued, sometimes against strenuous opposition. If, as many philosophers have claimed, theories are underdetermined, then we need to understand how theories come to be accepted by scientists, both individually and as a community.²²

Bearing this point in mind, the article which follows could easily have paid closer attention to the rhetorical strategies which the practitioners of aerostation used to promote and legitimate ballooning. But it is worth emphasizing that human flight, in

the eighteenth century at least, is an example of one of those unsuccessful theories which Cantor, like many historians of science, relegates to a parenthesis. Thus, I am rather more interested in how the case against ballooning was made and what happens to an empirical practice when it exceeds the bounds of scientific decorum. Texts like the one by Washington Irving, I would suggest, are revealing precisely because they display a linguistic motility which can help to delegitimize emergent technologies. In this regard, the examination of ballooning in America offers a useful corrective to those studies which consider the interface between natural philosophers and the public largely from the perspective of the former. Jan Golinski's argument that an awareness of the rhetoric of eighteenth-century chemistry "offers a rationale for empirical studies of the ways in which audiences are constructed and transformed in changing historical contexts," for example, positions this audience as essentially passive; whereas in the case of ballooning it is more obviously the public who have the upper hand in shaping the terms of the debate.²³ The complex interrelationship between experimental endeavor, communal spectacle, and political rhetoric which is visible through the "balloon Madness" tells us much, in short, about the intellectual ferment which both prefigured and prompted the emergence of scientific disciplinarity in the nineteenth century. The fact that the public played such a prominent role in the debate over ballooning can perhaps be attributed to the peculiarly democratic culture of the United States but, it should be added, this cultural egalitarianism has ironically led the subject of science to be largely neglected among historians of the Revolutionary period. As James Delbourgo notes in his exemplary account of electricity in eighteenth-century America, "in sharp contrast to early modern European ... studies, early American history all but ignores the concept of the Enlightenment. The very notion seems elitist, socially irrelevant, anachronistic, and Eurocentric. The result is

that we have no cultural history of science and enlightenment in America.” Building on Delbourgo’s own suggestion that “American science came to life as a culture of experimental performance in a commercial public sphere spanning the Atlantic Ocean,” this article is a tentative attempt to address that absence.²⁴

I.

The “balloon Madness” began to take hold in the United States in June 1783, when news crossed the Atlantic that the French inventors Joseph and Jacques-Étienne Montgolfier had successfully launched a balloon containing a duck, a sheep and a cock at Versailles.²⁵ This initial experiment then led swiftly to the first manned balloon flight on 21 November, as a Montgolfier construction carrying Pilatre de Rozier and the Marquis d’Arlandes set off from the King’s hunting lodge in the Bois de Boulogne in front of a crowd of thousands. Amongst those present at these early ascensions were numerous Americans, including Benjamin Franklin and John Quincy Adams, and their letters home soon inspired their fellow countrymen to try their hand at making balloons.²⁶ In May 1784, for example, Francis Hopkinson reported to Franklin from Philadelphia that “we have been diverting ourselves with raising Paper Balloons by means of burnt Straw – to the great Astonishment of the Populace,” and by the next month Dr John Foulke was offering public lectures on the science of ballooning to audiences in the nation’s capital.²⁷ Meanwhile, an attempt by a wealthy Baltimore land-owner, Peter Carnes, to stage the first manned flight on American soil in June 1784, further heightened public interest in the United States. Moreover, Carnes’ endeavor also gave notice of the mixture of commercial showmanship and practical deficiency that would be the hallmark of the fashion for ballooning over the

next two decades. Carnes bombarded the press with promotional notices and vigorously sought financial assistance; but when he attempted to ascend from the yard of Philadelphia's New Work House on July 17, the balloon struck the prison wall, throwing Carnes clear only minutes before it caught fire and exploded.²⁸ Nonetheless, such mishaps don't seem to have put off other aspiring aeronauts. Five years later, for example, Joseph Deeker (whose experiment ended much as Carnes' did) can be found fostering support for his intended flight in a very similar way.

In fact, the enthusiasm which ballooning continued to arouse in the public often seemed to observers to be a remarkable phenomenon in itself. "The balloon influenza rages with more violence than ever," the *New-Jersey Gazette* noted in November 1784, while a correspondent of the *New York Packet* complained in 1785 that: "I have got a balloon wife. She was the first in our parish that was affected with the balloon mania: and what a life I have had since! ... For God's sake, mention [ballooning] no more in your papers, otherwise, I am afraid, we shall have balloon bedlams in every part of the country."²⁹ Certain inhabitants of Philadelphia who should be "past the time of life for balloon or whimsical experiments," the *Massachusetts Mercury* agreed in 1793, "are daily growing more and more fit for a lunatic hospital."³⁰ Moreover, the craze for ballooning was not restricted to the shores of America.³¹ "The Dutch and Flanders mails received at the Post-Office on Saturday, state that the Balloon-Mania has reached as far as Constantinople," the *Providence Gazette* reported in 1785, the same year that a British correspondent to the *South-Carolina Weekly Gazette* could be found bemoaning "how great and prevalent the balloon madness is in this infatuated country."³² Wherever its geographic location then aeronautic activity seemed to inspire the same reactions. Over and over again,

discussions of ballooning's ubiquity drew on a lexicon which evoked the capricious and potentially fatal power of disease and insanity. Yet while ballooning was often regarded as ominous by its critics, for many ordinary citizens it was something more along the lines of an unusual pleasure.

Certainly there seems to have been a strong demand for balloon-related material and, as the number of ascensions multiplied and public fascination grew, publishers were quick to jump on the bandwagon. The Balloon Almanac, which appeared annually between 1787 and 1801, was essentially a run-of-the-mill calendar of events and phenomena, but its name, and its engraved frontispiece depicting a balloon in flight, were obviously deemed appealing enough to be retained for a decade and a half (Fig. 1). Similarly, many plays and novels, including Frederick Pilon's *Aerostation; or, The Templar's Stratagem* (1784), *The Aerostatic Spy; or Excursions with an Air Balloon* (1786), *Harlequin Balloonist* (1794), and James West's *The New-York Balloon; or, A Mogul Tale* (1797) also exploited the celebrity of dirigibles through their titles. Numerous other plays and novels, meanwhile, from Mercy Otis Warren's *Sans Souci: Alias Free and Easy* (1785) and William Dunlap's *Darby's Return* (1789) to Fanny Burney's *Camilla* (1796) and John Minshull's *He Stoops to Conquer* (1804) used balloons as a source for jokes and songs. And, in a rather more serious vein, widely reprinted poems such as Philip Freneau's "The Progress of Balloons" (1784) and Erasmus Darwin's *The Botanic Garden* (1791) applauded human flight as a miracle of scientific enlightenment.

Perhaps more important, though, at least for those Americans who aspired to fly themselves, is the fact that notable journals such as the *Boston Magazine* and the

American Museum published lengthy articles on ballooning, and frequently used these articles as a way of imparting technical information to their readership. The Boston Magazine, for example, began its discussion of ballooning in February 1784, and during the next six months included detailed features on the subject excerpted from European journals, as well as eyewitness accounts from Americans resident in France. The magazine also commissioned John Norman, one of the leading engravers of the period, to produce an illustration of the animals aloft in the Montgolfiers' first balloon – an illustration which, despite its rather fanciful nature, accurately conveys something of the amazement provoked by such ascensions (Fig. 2). Newspapers, meanwhile, were also keen to provide their readers with balloon-related material, and although their reports lacked the thoroughness of those found in the journals, these reports had the advantage of circulating more widely. The edition of the New-York Gazetteer for April 1, 1785, for instance, carried a notice from Boston which started with the declaration that: “The Balloon rage increases rapidly in this town.”³³ Just a day later the Providence Gazette then printed the same report with some minor alterations (among them, adding the word “very” before the word “rapidly” to re-emphasize the scale of the hysteria). Characteristically for the American press of this period, neither newspaper acknowledged that the source for their report was an article that had originally appeared in the Independent Ledger on March 28.

So strong, in fact, was the demand for “balloon intelligence,” and so eager were publishers to supply it, that literary hoaxes became commonplace. *An Account of Count D’Artois and his Friend’s Passage to the Moon, in a Flying Machine, Called an Air Balloon* (1785), despite much technical jargon, was fairly obviously a work of the imagination, and made only the most cursory of attempts to reassure its readers

about the veracity of “a subject many will think fabulous, or incredible.”³⁴ But other hoaxes were rather more convincing. In March 1784, for example, the *Pennsylvania Packet* reprinted a fictitious article from a London newspaper which reported that one Joseph Fathom, “an American amanuensis of the celebrated Dr Franklin,” had died in a ballooning accident in France.³⁵ While in May of the same year, an American correspondent of the *Journal de Paris* submitted a false report claiming that Francis Hopkinson and David Rittenhouse had sent up a carpenter called James Wilcox in a cage attached to forty-seven small balloons.³⁶

Importantly, the attention paid to France in these articles is not merely coincidental. For at the heart of America’s “balloon Madness” during the late eighteenth century was a Frenchman: Jean-Pierre Blanchard.³⁷ Born in Normandy in 1753, Blanchard initially made his name by capitalizing on the success of the Montgolfier brothers and launching a series of balloons in and around Paris during 1784. The first illustration of a balloon to appear in an American newspaper, for example, depicted Blanchard’s self-made contraption and accompanied the translation of an extract from his *Description of a Machine, Proper to be Navigated Through the Air* (1783).³⁸ But perhaps Blanchard’s most famous early exploit was a successful flight across the English Channel in January 1785, in the company of the American physician John Jeffries. It was this singular feat which effectively sealed the Frenchman’s reputation as the most daring and innovative aeronaut of his generation. Thus when Blanchard set sail for the United States in 1792, after being the first to launch balloons in a range of European cities, he was already uncommonly famous. “I beg leave ... to congratulate those of our fellow citizens who are sensible of the dignity of genius, on the honor which this visit confers upon our country,” a

correspondent to the Federal Gazette enthused a few days after Blanchard's arrival. "I hope that Americans will vie with each other in convincing the world that they can show a proper regard to a man who has so widely enlarged the sphere of human experiments."³⁹

And indeed, the inhabitants of the New World did strive to outdo one another in offering up tributes to their guest. The New York Diary, for instance, compared Blanchard to an "angel ... that rules the spreading storm, / And smiles aloft, a fair celestial form."⁴⁰ And similarly, the anonymous author of *The Forty-Fifth Aerial Flight of the Universally Celebrated Mr. Blanchard, at Philadelphia (1793)*, compared the Frenchman to various Greek Gods before stating that:

He often saw kingdoms and states to his feet,
 And millions he left on the earth,
 Struck like former Indians by Columbus' visit
 When thunder of cannons they heard.

What thanks will for Bl-----d for ever remain.
 Will not immortal be his name?
 That human can travel through clouds and obtain
 More wisdom in nature and fame.⁴¹

Such doggerel has an air of hyperbole about it, of course. But there was also a genuine basis in reality for the feverish adoration which the press assigned to Blanchard. Blanchard himself, for example, after successfully carrying out the first manned flight in the New World, commented in his journal on the unprecedented excitement that greeted his ascent. "Accustomed as I have long been to the pompous scenes of

numerous assemblies,” he noted, “yet I could not help being surprised and astonished when, elevated at a certain height over the city, I turned my eyes towards the immense number of people, which covered the open places, the roofs of the houses, the steeples, the streets and the roads. ... What a sight!”⁴² The public and the poets alike seem to have shared a passionate fascination for Blanchard’s endeavor.

Certainly it was hard for those who were inclined to regard ballooning through the teleological lens of the Enlightenment to be critical. Blanchard’s ascension from the yard of Philadelphia’s Walnut Street Prison in January 1793, in the company of the American impresario Gardiner Baker, appeared to many to herald a new age of scientific progress. In this respect, balloons not only represented a technological leap forward on their own terms, they were also a significant new way of furthering the quest for knowledge in other areas. As Blanchard was careful to emphasize in the prospectus for his first American flight, while he was “employed in the direction of the balloon,” Baker would “make meteorological observations, by noting the changes observable on the barometer, thermometer, hydrometer, electrometer, and other instruments, which will be properly disposed before him.”⁴³ Indeed, in their basic essence, balloon flights were connected with the pioneering research into the atmosphere being disseminated through much-discussed texts like Henry Cavendish’s “On Factitious Airs” (1766), Joseph Priestley’s *Experiments and Observations on Different Kinds of Air* (1774), and Antoine Lavoisier’s “Memoir on Combustion in General” (1777).⁴⁴ As the *New-Haven Gazette* remarked in 1784: “Mons. Montgolfier’s ingenuity is particularly observable in his having substituted for the ... vacuum the gas, or inflammable air, as its specific lightness and elasticity had been recently discovered and ascertained by Mr Cavendish, and published by Dr

Priestley.”⁴⁵ Jean-Pierre Blanchard, meanwhile, in an uncharacteristic moment of modesty, confessed in a letter to the *Independent Gazetteer* that “the process which I propose to make use of, to fill my great Balloon with inflammable air, ... is not an invention of my own, but of Doctor Priestly [sic] and Mr Lavoisier – and I have done no more than to bring it to greater perfection.”⁴⁶ Borrowing liberally from contemporary scientific developments, balloons offered both a practical way to apply the discoveries of early modern chemists and an opportunity to test their hypotheses in the higher regions of the atmosphere.

In his *Narrative of the Two Aerial Voyages with Mons. Blanchard* (1786), for example, John Jeffries notes that “the very ingenious and philosophical Mr. Cavendish” had supplied him with a number of phials “to be emptied at different heights in the atmosphere; and to be afterwards corked up, to bring back samples of the air at different elevations.” And, moreover, the *Narrative* itself is full of detailed analysis of conditions in the upper atmosphere, based on readings from “a Thermometer; a Barometer; one of Nairn and Blunt’s pocket Electrometers; [and] an Hydrometer.”⁴⁷ To a twenty-first century reader, of course, such information may seem to be of purely academic interest, but importantly, during the eighteenth century, it also had a wider significance. For as Jan Golinski has pointed out:

Climate featured prominently in Enlightenment accounts of national character and historical progress that related specific customs and institutions to the environmental conditions in which people lived. ... Studies of air and its effects echoed both the successes and the failures of the enlightenment and thus its uneven progress in eighteenth-century society. It is this which makes attitudes

toward the weather an index of the often conflicting tendencies of cultural change.⁴⁸

Given this tendency to read the atmosphere as an indicator of the progress of civilization newly emergent scientific technologies then inevitably fed into the debate, perhaps most notably via the short-lived field of “eudiometry.” Following Joseph Priestley’s development of the “nitrous air test” in 1772, which was designed to verify the breathability of air, the technique was seized on by an Italian physicist, Marsilio Landriani, whose apparatus for performing the test, the eudiometer (“measure of good air” in Greek), became widely used. Implicitly correlating the health of the atmosphere with the morality of the public, the eudiometrical surveys of European cities which sprang up over the next decade prompted many thinkers to place the enhancement of air quality at the heart of their programs for social reform. But, by the mid-1780s dispute among its practitioners and the unreliability of the apparatus had largely discredited eudiometry.⁴⁹

Even as this instrument for analysing the air was fading into obscurity, though, the balloon was rising to take its place, with the promise of a much closer insight into the heavens. Indeed, in America, the possibilities for more detailed atmospheric measurement offered by the balloon came at a crucial moment in the debate over the cultural effects of climate. For the ex-colonists had recently launched a concerted defence of their nation in response to the Comte de Buffon’s claim that the cold, damp weather of the New World led its animal life (among which Native Americans were included) to be smaller and weaker than that in Europe.⁵⁰ In the most famous riposte to Buffon, for example, Thomas Jefferson insisted in *Notes on the State of Virginia* (1784) that “America, running through the torrid as well as the temperate zone, has

more heat collectively taken, than Europe. ... They are equally endowed then as to animal productions.” But, Jefferson was forced to add, when it came to the issue of whether America was “comparatively more humid” he was not “furnished with observations sufficient to decide this question.”⁵¹ Thus, it is perhaps no surprise that when writing to Philip Turpin in the same year Jefferson heaped praise upon the balloon for “throwing new lights on the thermometer, barometer, hygrometer, rain, snow, hail, wind & other phenomena of which the Atmosphere is the theatre.”⁵²

Taking note of such possibilities, optimistic commentators could then position ballooning as a symbol for the grand intellectual advancements of the age. Thomas Dobson’s monumental Encyclopedia, for example, published in Philadelphia between 1798 and 1803, featured an engraving of an air balloon in the frontispiece to its first volume. Although relatively small, the image of the balloon is nonetheless prominent, floating above - and looking down on - a distinguished gathering of renowned thinkers as well as a wide array of scientific instruments and artistic accomplishments. The suggestion was that ballooning was key to what the Preface to the first volume called the “progress of philosophical research,” and that – like the other subjects treated in the book – its importance would be “acknowledged by every man who is not immersed in the grossest ignorance.” “The philosophical uses, to which these machines may be subservient, are numerous indeed,” the Encyclopedia then confirmed in its multi-page entry on “Aerostation.” “Hardly anything which passes in the atmosphere is known with precision, and that principally for want of a method of ascending into it.”⁵³ Louis Sebastien Mercier’s wide-ranging reflections on man and his environment in *The Night Cap* (1788), meanwhile, granted ballooning an equally privileged status. The prevalence of stories about human flight in classical mythology,

Mercier notes, has often led later thinkers to dismiss aerial ascension as a senseless fantasy. But, he goes on, the recently invented balloon, “already so curious, will teach mankind they should never despair of their powers, that their understanding is given to them to dive into all the secrets of nature, and that they may appropriate them for their wants. ... The ascension of Montgolfier’s globe has given me an idea of a new philosophical system, more rational I think than any of the former, and which explains all the critical points of nature.”⁵⁴

Despite Mercier’s plaudits, however, it was still the case that, as the Salem Gazette put it, “some indolent minds harass us with the question, To what does all this conduce?”⁵⁵ The preface to the first volume of the American Philosophical Society’s Transactions pointedly asserted that: “Knowledge is of little use, when confined to mere speculation. But when speculative truths are reduced to practice; when theories, grounded upon experiments, are applied to the common purposes of life; and when ... the increase and happiness of mankind [is] promoted; knowledge then becomes really useful.”⁵⁶ Functional fitness, in other words, was the primary measure of significance for new technologies in the late eighteenth century. And for numerous observers, it was hard to discern how balloons, in their current condition, could have anything other than a limited efficacy. Even a steadfastly confident proponent of the Enlightenment like Samuel Miller felt compelled to concede that “the invention of balloons, though far-famed and brilliant, cannot be considered as having hitherto added much to the comfort or utility of man.”⁵⁷

Such assertions that “this species of navigation labours under difficulties which appear at present insurmountable” did not, of course, deter the more fervent

champions of ballooning from stating their belief in its usefulness.⁵⁸ Louis Sebastien Mercier, for example, took time off from celebrating the symbolic importance of balloons to insist that: “This discovery will certainly be of utility on many occasions; but was it only a mere curiosity, this assumption would always be a brilliant, and beautiful experiment.”⁵⁹ If nothing else this was a strategically effective claim: balloons were sure to have momentous practical applications in the years to come; and even if they didn’t they were of use simply because they mirrored the inventiveness of the times. Indeed, both these strands of argument were reiterated by other defenders of ballooning. Thus Thomas Jefferson, writing to Philip Turpin in April 1784, predicted that aerostation had a vital future. In his view, along with “throwing new lights on ... the Atmosphere”:

The uses of this discovery are suggested to be 1. transportation of commodities under some circumstances. 2. traversing deserts, countries possessed by an enemy, or ravaged by infectious disorders, pathless & inaccessible mountains. 3. conveying intelligence into a beseiged place, or perhaps enterprising on it, reconnoitring an army &c. ... 5. the discovery of the pole which is but one day’s journey in a balloon. ... 6. raising weights; lightening ships over bars. 7. housebreaking, smuggling &c.

“Some of these objects are ludicrous,” Jefferson added, but others were “serious, important & probable.”⁶⁰ The Salem Gazette, meanwhile, echoed Jefferson’s list of potential benefits, pointing out that “the present machine may teach us many new circumstances relative to the upper regions of the air,” and could also be “applied by navigators and travellers to reconnoitre tracts of country.” But it also emphasized that “all philosophical facts well established, are of use,” before concluding that as well as

being “used as a landmark; or as a signal,” the balloon “may serve in another way as a signal to animate ambition and science, and spread a desire of knowledge.”⁶¹

Not everyone, though, was satisfied by such ingenious arguments. Noting that birds have a natural capacity for flight which human inventiveness cannot match, the *New-Haven Gazette* asserted, with reference to recent events in France, that the mechanical difficulties facing balloon-makers were insuperable. “Notwithstanding the number of those balloons which have been launched from different places ... not the smallest advantage has yet accrued from them to science,” it declared in July 1784. “The unsteadiness of that vehicle renders it totally improper for the purposes of making astronomical or meteorological observations; and as for the ordinary business of life, it is equally inconvenient and unfit, considering the variety of imminent dangers to which it must be continually exposed from electric and culinary fire, from whirlwinds, and from its own complicate and extremely frail texture.”⁶² The process of perfecting new technologies is a slow one, the *National Gazette* acknowledged nearly a decade later. Yet this did not alter the reality that balloons are “mere childish baubles, and at best but objects of curiosity, and incapable of ever answering the purposes of real utility.”⁶³

The fundamental question for many commentators was whether balloons could be steered or whether they were simply at the mercy of the elements. “To give at pleasure a progressive motion to air balloons, in any required direction, is a problem of great importance in this newly discovered art of penetrating into the superior regions of the atmosphere,” William Nicholson noted in *An Introduction to Natural Philosophy* (1788). “Many wild and absurd schemes for this purpose have

been offered to the consideration of the public; and some that have been carried into effect have served only to evince the ignorance or the artful quackery of their projectors.”⁶⁴ Indeed, the challenge of how to control a balloon seems to have attracted more than its fair share of quixotic solutions. In June 1786, for example, the *Charleston Evening Gazette* reported that an Englishman had built and was exhibiting a balloon “to be drawn in the air by live Eagles.” In the words of the *Gazette*’s correspondent: “It is now universally admitted, that every attempt to steer balloons in the air by any power of mechanism, will always prove fruitless, as there is no possibility of finding a point d’appui, or point of resistance. . . . Instead, therefore, of making use of ineffectual sails, oars, wings, &c. [Mr. Uncles] is determined to employ living force to combat the wind and guide himself through the regions of the sky.”⁶⁵ Suffice to say, Mr. Uncles’ experiment was not a success: when he attempted to launch his balloon in Dublin a month later it rose only a few feet in the air before falling ignominiously back to earth.

Taking a slightly more sober line, the *Federal Gazette* backed up its claim that “directing balloons . . . may not be considered as unattainable,” by pointing out that “Mr Blanchard’s experience has led him to entertain the most sanguine hopes, that by means of the different currents of air that prevail at different heights in the atmosphere, the object may be accomplished.”⁶⁶ The *Providence Gazette*, however, while noting that “experience has taught Mr Blanchard, that at all times there are, at different heights in the atmosphere, different and contrary currents of air,” went on to conclude that “even if . . . wings could be made to move of a size proportionate to the tenuity of the air, yet as the prodigious velocity of the wind would [have] to be overcome, this mode of propelling the aerostat may be looked upon as impossible.”⁶⁷

And similarly, David Daggett, having singled out balloons as an example of the futility of modern philosophy in *Sun-Beams May be Extracted from Cucumbers*, but the Process is Tedious (1799), also declared himself unconvinced by such schemes: “A flaw of wind, regardless of the principles of this machine, might destroy it, or, by the giving way of one philosophical pin, peg or rope it might be let into the sea, or dashed against a rock, and thus its precious contents miserably perish.”⁶⁸

Nonetheless, the defenders of ballooning continued to discuss the problem of navigation, and for many the solution lay in the overall design of the craft. “The Parisians are now changing the form of their aerostatic machines from perpendicular to horizontal shapes,” the *Independent Journal* eagerly reported in November 1784. “They find that the immense globe obstructs their navigation in the atmosphere, and a Chevalier de la Motte has contrived one which presents a much smaller surface to the wind, and which promises therefore to be more under control.”⁶⁹ Francis Hopkinson, meanwhile, confidently asserted that there “may be many mechanical Means of giving the Balloon a progressive Motion, other than what the Current of Wind would give it.” Writing to Benjamin Franklin in May 1784, he suggested that “the Balloon be constructed in an oblong Form, something like the Body of a Fish, or a Bird, or a Wherry - & let there be a large & light Wheel on the stern. ... If the Navigator turns this Wheel swiftly round, by means of a Winch, there is no Doubt but it would (in a Calm at least) give the Machine a progressive Motion, upon the same Principle that a Boat is scull'd thro' the Water.”⁷⁰ The conventional way of designing balloons was potentially counter-productive, the entry on “Aerostation” in Thomas Dobson’s *Encyclopedia* concurred: “In fact, it has been found, that aerostatic machines ... made of the shape of a parallelopiped, or even one deviating still more from the shape of a

globe have answered the purpose. . . . In regard to the shape of these machines, it is by no means necessary to adhere rigidly to that of a sphere.” But, the Encyclopedia also cautioned, attempts to imitate other modes of transport by attaching oars or rudders to a balloon were likely to “have no effect when a machine is only moved by the wind alone, because the circumambient air is at rest in respect to the machine. The case is quite different with a vessel at sea, because the water on which it floats stands still while the vessel goes on.”⁷¹

The difficulty of controlling balloons, even if they were modeled on boats or animals, remained an issue well into the nineteenth century. Yet the ungovernable nature of these contraptions, which was so persistently highlighted by critics, did nothing to mitigate the American public’s passion for aerial events. Reporting on Peter Carnes’ initial trials with an unmanned craft in Baltimore, the Salem Gazette noted that Carnes had “made his curious aerostatick experiments . . . in the presence of a numerous and respectable congress of people, whom the fame of his superb BALLOON had drawn together from the east, west, north and south, [and] who generally appeared highly delighted with the grandeur of so novel a scene.”⁷² Moreover, as I’ve already suggested, Jean-Pierre Blanchard’s maiden flight in Philadelphia attracted a degree of attention virtually unrivalled in the young republic. At a time when the population of the nation’s capital was estimated at around thirty thousand people, some forty thousand spectators turned out to hail Blanchard, almost double the number that were present at the Grand Federal Procession six years earlier.⁷³ “It was indeed a spectacle as magnificent as it was new to us, to see this intrepid aeronaut majestically rise from the earth,” the Federal Gazette confirmed. “Immense crowds not only from this city, but from the neighboring states, filled the

streets adjacent to the place of ascension.”⁷⁴ Even those aspects of aerial technology which might be thought to underline the precariousness of ballooning were, in fact, greeted by the public with much acclaim. Commenting on Blanchard’s tests with a prototype parachute, for example, the *Daily Advertiser* recorded that: “The effect of the whole Exhibition was very fine, and gave infinite satisfaction to a great concourse of citizens who attended the experiment.”⁷⁵

Sceptics who attacked balloons for their lack of manoeuvrability, on the other hand, tended to see the whole phenomenon as a recklessly dangerous folly. And indeed they were supplied with a steady flow of evidence to support this position, including regular accidents and explosions, such as the one depicted in the frontispiece to the fifth edition of *Weatherwise’s Town and Country Almanack* (1785), which was accompanied by an explanatory poem (Fig. 3):

Readers behold a Plate design’d,
 To lend a moral to Mankind,
 Survey the tow’ring AIR BALLOON,

 Which ALL IN FLAMES is tumbling down,

 So ’tis my friends, with all who ride,
 On Fortune’s car, at Frenzy’s side –
 They soon or late will meet a fall,
 And sad confusion seize on all.⁷⁶

Similarly, the death of Pilatre de Rozier during an experiment with hydrogen inflation in the same year led the *Pennsylvania Packet* to conclude that this “most melancholy

event ... will, it is hoped, put an effectual end to the very idle prevalent practice of essaying the element of air in balloons.”⁷⁷ As well as these solemn discussions of aeronautical disaster, meanwhile, the negative coverage of ballooning was also characterized by more comic accounts designed to highlight both the unexpected hazards of human flight and the woeful capriciousness of the public. “Every one remembers the celebrated Balloon for which the late Mr DEEKER set a subscription on foot,” the National Gazette declared in July 1793:

It is almost needless to bring into view the fate of that immense unwieldy smoke-bag. It was attempted to be filled by means of fire being set to several substances spread under it ... but through some mismanagement, or the inadequacy of the means, it was never completely inflated. ... [The] balloon (which was made of raven’s duck) took fire, and it was with some difficulty the aeronaut escaped from the conflagration with the loss of his whiskers, a skin considerably scorched by the blaze, and the pursuing curses, menaces, and execrations of one or two thousand subscribers.⁷⁸

Jean-Pierre Blanchard, who had arrived in the United States only six months before this article appeared, was, of course, both a more skilful and a more renowned balloonist than Deeker. Yet he too was vulnerable to what many insisted were the inevitable perils of the balloon madness. While descending from his initial American flight, the National Gazette claimed in January 1793, “he was espied by two Jersey farmers, ... one of whom was so terrified, that taking the aeronaut for some sky-man, hostilely inclined, he ran to his house for a gun, to defend himself. It was in vain that Mr Blanchard called to them for assistance in mooring his balloon; their fears conquered every other consideration; and it was not until some citizens of

Philadelphia came up, who had followed him on horseback, that he was safely landed.”⁷⁹

For critics, incidents of this kind simply highlighted the inherent ridiculousness of ballooning. They revealed the inner workings of a phenomenon completely disconnected from the noble pursuit of scientific knowledge, a phenomenon within which the democratic tendencies of the age unavoidably led to the free rein of an ignorant and wilful public. As the *Gazette of the United States* ruefully observed: “Is it possible to prevent a crowd from gathering to see a horse-race, a ship-launch, a wild-beast, a rope dancer, a balloon? Morals and good sense have not more to say for these than for the play-house. ... [But] if all are forbidden there is a gloomy and absurd despotism, which, even the debasement of Turkey would not fit us to bear, nor all the Janizaries enable the government to enforce.”⁸⁰ Aerostatic displays were, in short, evidence of a society increasingly devoted to pleasure and increasingly driven by a passion for marvels. Whether it was Joseph Deeker’s farcical attempt to raise a balloon or Jean-Pierre Blanchard’s daring experiments with a parachute, the critics made little distinction: both were seen to appeal to the public’s desire for amusement in exactly the same way that an acrobat or a performing animal did. Indeed, ballooning and theatregoing were often closely associated in the press as symbols of economic squander and vice-inducing idleness. “Better is it for thee, O poor man, to stay at home, educating and maintaining thy children, than to impoverish a purse already scanty, by paying a juggler’s fees,” the *Otsego Herald* advised in 1796. “Better it is for thee, O son of riches, to succour genius, to relieve the miserable, and shelter the naked, than to enjoy the glorious privilege of a Balloon in flame.”⁸¹

Ballooning was clearly understood by many to be a remarkable human accomplishment, but for others it was little more than a cheap and pernicious distraction. Certainly it isn't hard to discern in which category the *Columbian Herald* would have put "the flight of the enterprising Mr Tytler" which had taken place in Edinburgh in August 1784. "The Balloon being completely inflated, it ... was at last loosed from the mast, when it was found its force of ascension could scarcely support itself, much less carry up Mr Tytler, who, after having ... taken his seat, was obliged to leave it," the *Columbian's* Scottish correspondent wrote:

The Balloon having rolled about a short time like an over-grown porpoise, at last rose slowly and heavily to the height of about a hundred yards. ... It is impossible to conceive with what contempt and derision the multitude beheld the balloon ascend without Mr Tytler. Some of the crowd on the Calton Hill indeed asserted, that he had got into the inside, and others swore that they saw him peeping out of a hole at the bottom. There were also a few unbelieving, discontented spectators, who asserted, that there did not appear to be any fixed intention to ascend, and that the whole was a trick.⁸²

As this article suggests, the range of responses to ballooning was wide. The ultimate implication, however, is that balloonists are "modern conjurers" (as another newspaper put it), their exploits being inextricably linked to the activities of impresarios and swindlers, who were equally skilled at enticing a gullible audience with extravagant yet empty spectacles.⁸³

To his detractors, for example, it was a telling coincidence that Jean-Pierre Blanchard (who had been briefly imprisoned by the Austrian authorities for

distributing Revolutionary propaganda) should make his first American ascension from the environs of the Walnut Street penitentiary. “We are told that you had chosen the jail yard to rise from, but that you were on the point of looking out for another spot, upon the suggestion made to you, that several ladies of this city would hesitate being present at the experiment if it were made there,” the General Advertiser observed sarcastically. “As the name of the square has no relation to the experiment, and that children only are to be frightened by the word Jail, don’t change your original plan, Sir.”⁸⁴ Adopting a similar tone of mock outrage, meanwhile, the National Gazette played even more broadly on the suspicion that there was a connection between balloonists and brigands - casting Blanchard in the role of a minor Satan trespassing on the domain of God. “It was remarkable,” the Gazette noted, “upon the late occasion, that many persons reprobated the aerial ascension as somewhat profane, and asserted that the aeronaut was intruding into regions where he had no business; these persons not considering that the air is our legal property.”⁸⁵ Given the thinly veiled hostility of these articles and the widespread insinuation of dishonesty they tapped into, it is then hardly surprising that Blanchard felt compelled to defend himself against the idea that he was a charlatan. Thus, in July 1794, he wrote a long letter to the Daily Advertiser complaining about his reception in New York, which begins by pointing out that:

The reputation of your taste for the polite arts, has induced me to come to this city, and to bring with me two Automatons alive, fictitious personages, as large as life, which have been the admiration of Philadelphia, where they were constructed. ... [But] this surprising exhibition, has been considered in the same light with those tricks, with which jugglers and mountebanks, so often deceived the public, and very few persons have attended the room.⁸⁶

As much as he may have attempted to justify his ventures by complimenting the public or criticizing other performers, however, Blanchard continued to be a contentious figure, as likely to be treated with scepticism as with approbation. Indeed, the negative press surrounding him only intensified when his former colleague Gardiner Baker wrote a series of letters to the press accusing the Frenchman of making off with the profits from their aerial displays.⁸⁷ Reflecting on this charge in May 1797, the *New York Diary* effectively summarized the attitude of at least one half of the public when it declared that: “Mr Blanchard is accounted a man unworthy of confidence; and ... should the citizens patronize him, deceit and ill-treatment would be the certain consequences.”⁸⁸

II.

Evidently, even a balloonist as illustrious as Blanchard found it difficult to separate his activities from those of more dubious showmen. But as my passing reference to his arrest for supporting the French Revolution might suggest, his image problems were also tied up with some wider historical developments in the late eighteenth century. Indeed, if, in its most reputable forms, ballooning represented a monument to human achievement, its more suspect elements not only smacked of low artifice, but of dangerous political excesses. Echoing Ann Timothy’s use of the image of a balloon to represent the fanciful autonomy which she saw as the ill-judged aim of the American Revolution, the *Pennsylvania Packet*, for instance, reversed the metaphor to condemn the mother country for its high-handed lack of attachment to the needs of its former subjects. “If we go back in our history but a space of time amounting to twenty years, we shall find many examples of the power of inflammable

air,” the Packet declared in 1784. “What but inflammable air provoked the riots at Boston, and the subsequent American war? Was it not inflammable air which sent up the British cabinet as far as the lofty idea of conquering America?”⁸⁹ Meanwhile, as international tensions eased somewhat in the wake of the Treaty of Paris, and the new republic turned to the question of how to establish its future political institutions, the figure of the balloon also migrated into a more domestic context.

In particular, the heated argument over the adoption of a federal constitution in the late 1780s was accompanied by a rash of aerostatic imagery. Protesting against the unchecked judicial powers of the North Carolina legislature, the author of *The Independent Citizen* (1787), for instance, encouraged those who felt the need for a national government to “leave your homes and attend the movements of our political balloon, guided by the God of error, whether he rest on the summit of the Appalachian hills, or on the verge of the Atlantic ocean.”⁹⁰ Fittingly for an object which was so unfixed in real life, the trope of the balloon was mutable, however, and an even more striking use of it appears in a cartoon from 1787 called “Zion Besieged and Attacked” (Fig. 4). Published at the height of the ratification debates, this print depicts an anarchic scene in which the Pennsylvania state constitution, “represented by a Fortification built on a Rock, and defended by the Friends of Liberty,” is being attacked by “The Balloon Army, in 3 grand Divisions.” Leading the offensive are pro-Constitution printers like John Dunlap, Mathew Carey, and Francis Bailey, who - according to the explanatory broadside which was published alongside the picture - are all “chymically employed at ... preparing Inflammable Gaz [sic] for the Independent Balloon, which soars aloft under the Flag of the A-r-al Standard.” The second wave of the assault, which consists largely of assorted demons and witches, is

dominated by the financier Robert Morris astride a braying donkey, his rallying standard, which carries the slogan “Aerostatic Machine,” surrounded by “Two Troops of A-r-al Guards (sent by the Prince of the Power of Foul Airs).” Bringing up the rear is a “BAND of Aristocrats” headed by Benjamin Rush and Alexander Hamilton. And finally, looming at the centre of this side of the print, is the aforementioned balloon, emblazoned with the words “Independent Gas” (a pun on the title of Eleazer Oswald’s *Independent Gazette*, which published many influential articles in favor of the Constitution).⁹¹ The balloon, in short, is presented here as an appropriate emblem for the bloated elitism and disconnection from the public which many saw as the inevitable consequence of centralizing political authority.

While the image of the wayward balloon was an important reference point during the contest over the Constitution, however, the real heyday of aerial symbolism occurred in the 1790s. For it was during this period that the increasing popularity of ballooning was fed into the emergence of a two-party system, and the phenomenon came to reflect the concern of people on both sides of the political divide about the future of democracy and the influence of foreign powers. Increasingly visible during George Washington’s first term as president, the ideological differences between Alexander Hamilton and Thomas Jefferson over fiscal policy were then expanded and given new depth by the question of how best to respond to the fledgling French republic’s declaration of war on Great Britain in 1793. Driven by a fierce combination of political optimism and instinctive Anglophobia, numerous Americans were already inclined to see the French Revolution as an extension of their own struggle and the new republic as a natural ally against the forces of monarchical oppression. But now they also came to share with Jefferson and the other leaders of the burgeoning

Republican party a belief that the Washington administration's distancing of itself from France through the Proclamation of Neutrality and acquiescence to Britain through the Jay Treaty threatened the United States' hard-won independence. The adherents of Hamilton's nascent Federalist party, on the other hand, saw such measures as the simplest way to avoid being sucked into an expensive and debilitating conflict, and they shared a growing sense of unease over the political direction of the French Revolution. Sundry citizens lent their support to the Jay Treaty not only because of their close economic ties to Britain but because, in the wake of Louis XVI's execution and the Reign of Terror, the former mother country seemed to stand as a bastion of civilized order when compared to the radicalism and brutality of France's democratic experiment.⁹²

Focusing a long tradition of xenophobic stereotypes into one potent ideological cocktail, the bitterly partisan struggle between the Federalists and the Republicans over the future identity and course of the nation was played out in and through a wide range of cultural practices. And ballooning was no exception. Indeed, the image of the balloon is revealingly manifested in the two texts which would in many ways shape the contours of the subsequent political divide: Edmund Burke's *Reflections on the Revolution in France* (1790) and Thomas Paine's *Rights of Man* (1791).⁹³ Convinced that the state originates not in a free contract but in necessity, Burke held that the rights of the individual rested upon institutions embodied in law or established by long usage. For him, the radical idealism of the Jacobins thus threatened to overturn the concrete, reciprocal bonds of tradition which assured the nation's health. "A politic caution, a guarded circumspection, a moral rather than a complexional timidity were among the ruling principles of our forefathers in their

most decided conduct,” he argues at one point. “Let us imitate their caution, if we wish to deserve their fortune, or to retain their bequests. Let us add, if we please, but let us preserve what they have left; and, standing on the firm ground of the British constitution, let us be satisfied to admire rather than attempt to follow in their desperate flights the aeronauts of France.”⁹⁴ Thomas Paine, on the other hand, asserted that the individual held possession over his natural rights even after entering into civil society. We may cede certain powers to the state in order for them to be more efficiently managed. But because the state is the guardian not the granter of these prerogatives, the public can at any time abolish governments which no longer accord with the will of the majority. Appropriating the avational rhetoric which *Reflections on the Revolution* uses to damn the utopian schemes of the French, and turning it back on his antagonist, Paine therefore charges Burke with being the one who is recklessly disconnected from reality. “Had Mr Burke possessed talents similar to the author of ‘On the Wealth of Nations’ he would have comprehended all the parts which enter into, and, by assemblage, form a constitution,” Paine writes. “Even his genius is without a constitution. It is a genius at random, and not a genius constituted. But he must say something. He has therefore mounted in the air like a balloon, to draw the eyes of the multitude from the ground they stand upon.”⁹⁵

Importantly, in both cases, the key word implicitly buttressing the writer’s criticism is “enthusiasm.” Originally a term of abuse directed at those who claimed direct access to God during England’s Civil War and America’s Great Awakening, by the end of the eighteenth century the notion of “enthusiasm” had migrated from the religious sphere to become an all-embracing term for perilous delusion, though one with particular resonance in the realm of natural philosophy.⁹⁶ Such resonance was

stirred by the fact that before the nineteenth century the empirical approach to nature remained embedded in other epistemological assumptions and the validation of new techniques was still tied to a mass audience. The practice of mesmerism which swept Europe in the 1780s, for example, was predicated upon an invisible fluid which permeated the human body, and its presence was verified by publically pushing individuals into fits or trances. As Robert Darnton points out in his classic account of this craze:

To claim that mesmerism did not seem absurd in the context of eighteenth-century science is not to claim that scientific thought from Newton to Lavoisier was a collection of fictions. At the popular level, however, it entangled the ordinary reader in a jungle of exotic *systèmes du monde*. How was he to separate fiction from truth, especially among the monisms that made up the biological sciences? ... The progressive divorce of science from theology in the eighteenth century did not free science from fiction, because scientists had to call upon the imagination to make sense of ... the data revealed by their microscopes, telescopes, Leyden jars, fossil hunts, and dissections. ... Mesmer's invisible fluid seemed no more miraculous, and who could say that it was less real, than the phlogiston that Lavoisier was attempting to banish from the universe.⁹⁷

The ascent of a balloon, of course, had a more concrete cause than a hypnotic trance and this spectacle could not be dismissed as the result of collective hysteria (as mesmerism eventually was). But the excessive emotions and far-reaching conjectures which were prompted by human flight did smack of "enthusiasm." Thus, Paine, who was highly sympathetic to the rationalist dimension of natural philosophy, rhetorically rejects ballooning for its tendency to exceed earth-bound structures of knowledge.

Burke's rhetoric, on the other hand, has a slightly different wellspring. For as well as deploying the aeronaut metaphor to attack the political immoderation of the French Revolution, he elsewhere fastens on to natural philosophy itself as an example of dangerously fanciful thinking. Closely connected to the Dissenters and republicans who were pushing for social reform in Britain at the time, experimentalists like Joseph Priestley and Thomas Beddoes saw their discoveries as heralding widespread enlightenment and revolutionary new forms of selfhood. But for Burke such promises of progress took too little account of those values which made a society humane. As he put it in 1796: "The chemists bring, ... from the soot of their furnaces, dispositions that make them worse than indifferent about those feelings and habitudes, which are the supports of the moral world. ... These philosophers, consider men in their experiments, no more than they do mice in an air pump, or a recipient of mephitic gas."⁹⁸ Committing themselves to theoretical constructs at the expense of practical consequences thinkers like Priestley and Beddoes, in other words, showed the rationalist dimension of natural philosophy to be another instance of "enthusiasm." Thus when Burke uses scientific imagery to write about political issues in his *Reflections* (as he often does), it has a much broader and more sceptical range than Paine's use of similar language.

These important differences notwithstanding, however, Burke and Paine's debate about the French Revolution, which was subsequently employed to fuel the dispute between the Federalists and the Republicans over the value of social hierarchy and the ability of the mass to govern, crucially helped to secure the viability of ballooning as a bi-partisan metaphor for political quixotism. Indeed, this viability was effectively confirmed when Paine himself provocatively revived the image in *The Age*

of Reason (1794), another attack on those long-established institutions which serve to repress the individual's right to the free exercise of his conscience. Echoing his earlier depiction of Burke as a self-inflated patrician, Paine here applies the aerostatic analogy to another figure with an undeservedly lofty reputation (namely Jesus) as part of his argument for the pernicious dishonesty of the Bible. "The resurrection and ascension, supposing them to have taken place, admitted of public and ocular demonstration, like that of the ascension of a balloon, or the sun at noon day, to all Jerusalem at least," Paine observes. "A thing which everybody is required to believe, requires that the proof and evidence of it should be equal to all, and universal; and as the public visibility of this last related act was the only evidence that could give sanction to the former part, the whole of it falls to the ground, because that evidence was never given."⁹⁹

Not unsurprisingly, Paine's ruthless Deism caused an uproar among conservative thinkers on both sides of the Atlantic, and these lines on the Ascension in particular featured prominently in the dozens of rebuttals which swiftly issued from the press.¹⁰⁰ Just as Paine's book was seen by the Tories in Great Britain as an attempt to inculcate the working classes with a Jacobin contempt for authority, so it was seen by the Federalists as characteristic of a French-born infidelity that had infected Thomas Jefferson and his followers. In *The Age of Reason Unreasonable* (1798), for example, G. W. Snyder censures the Republicans for abandoning "the duties they owe to honor and virtue, that they may receive the homage of a multitude," before dismissively declaring that: "I leave it to Thomas Paine ... to demonstrate by Euclid's Elements, or any other elements, how far an air balloon, or an orrery, may make nations and people true worshippers of God, and lovers of justice, honesty, truth and

mercy.”¹⁰¹ With its painstaking dissection of Paine’s individual arguments, Snyder’s refutation was, in fact, rather restrained in comparison with other responses to the radical doctrines of the late Enlightenment. For many commentators greeted the criticism of traditional social and religious mores with a hyperbolic paranoia which found its clearest manifestation in the hysteria over the purported conspiracy of a secret society called the Illuminati. In this respect, Joseph Priestley, who emigrated to the United States in 1794, was only half-joking when he told the inhabitants of Northumberland, Pennsylvania that the Federalists believed “an army of French cannibals may cross the Atlantic in a fleet of balloons, land on the blue mountain, and eat up all your children for their first breakfast.”¹⁰²

The perceived connection between ballooning and this fear of physical and ideological invasion was intensified, no doubt, by rumours of Jean-Pierre Blanchard’s shadowy past as a propagandist, as well as by his tendency to promote himself in nationalistic terms that were more closely associated with the realm of power politics than the world of science. “France, is the glorified country, where Arts and Knowledge have been proved through the many examples of their great experiments, to the surprise of the whole world, and to a true rejoice of human eyes,” Blanchard declared in his preface to *The Forty-Fifth Aerial Flight of the Universally Celebrated Mr. Blanchard, at Philadelphia*, which also featured an engraving of the balloonist wielding the tricolore.¹⁰³ This pride in Gallic modernity was almost an habitual motif in Blanchard’s public statements. And, indeed, he was not alone in identifying the daring novelty of his aerial voyages with the experimental tendencies of his countrymen. Two poems which were published shortly after his arrival in America,

for example, made explicit the negative connotations of the link between ballooning's innovativeness and the visionary ingenuity of French thinkers.

The first of these poems, which appeared in the *National Gazette* in January 1793, contrasts the venerable figure of James Blanchard, a veteran of the War of Independence, with his transatlantic namesake, in order to critique the radical ideology of the French Revolution:

Sing to the wandering stars thy wondrous name,
 And make them scowl with envy at thy fame.
 As late thy namesake in his airy car,
 Hail'd by their Christian names each well-known star,
 Told them the glorious news, that France was treating
 The wicked Austrians to a woeful beating;
 And since such bright examples France had given
 'Twas time to talk Equality in heaven –
 Nor did he fear the important point to gain
 If means could be contriv'd to bring up Paine.¹⁰⁴

The second poem, meanwhile, which appeared in *The Gazette of the United States*, was characteristic in aligning J-P Blanchard with those controversial philosophes whose theories about the degeneration of nature in the New World had first provoked Franco-American enmity in the late 1780s:

Good Monsieur B----, sure 'tis somewhat strange,
 That after having gull'd us of our change,
 By eagles, chariots, balloons, puppet shows;
 You then should twit us of our ignorance,

Say we don't know so much as folks in France,
That Science here's a babe, without her shoes.

.....

When o'er th' Atlantic, Buffon cast his eye,
And swore our people were but three feet high;

.....

A single poet, or a man of science,
To show – he bid America defiance,
The mind and stature both, were so “belittled.”

Buffon we could forgive – a slave at home;
But kinder fate permitted you to roam –

Here you may see, if not a partial elf,

Some men, not one whit smaller than yourself.¹⁰⁵

In effect, such works play on Blanchard's national identity with the intention of blurring the line between his aerial exploits and the quixotic schemes of French social theorists. Hugh Henry Brackenridge's picaresque novel *Modern Chivalry* (1792-1815), for instance, depicted its stand-in for Sancho Panza, the illiterate Irish immigrant Teague O'Regan, taking a flight with Blanchard. The connection between O'Regan and Blanchard here is clearly grounded in the widely-shared assumption that civic harmony and Jacobin egalitarianism are mutually incompatible. Throughout the novel O'Regan is portrayed as a democratic upstart who doesn't know his place, and shortly before this amateur balloonist's fantastic account of a whirlwind tour to the moon, Brackenbridge notes that in the newly formed United States: “Politicians say, that though they have no learning, they have no want of it. ... Will you reject a good piece of stuff because it came through the hands of an aristocratic weaver? These are

false ideas of what is right, and useful to mankind.”¹⁰⁶ O’Regan’s deluded hunger for social authority and his vivid pipe dream of conquering the skies are two sides of the same coin, *Modern Chivalry* suggests. Anxieties about the dissolution of traditional class structures chimed with more general debates about the value of ballooning because in both cases there was a suspicion that American virtue was being corrupted by French excesses.

The texts I’ve just been discussing offer a series of stark analogies between aerial exploration and French philosophy. A letter written to the *New-Haven Gazette* in July 1784, on the other hand, puts the association of ballooning with the French into a larger frame of reference – one which emphasizes a shared entanglement in the lures of fashion.¹⁰⁷ The letter to the *New-Haven Gazette*, drawn up by an American residing in Paris, advances some carefully considered criticisms of the potential for human flight. But before expressing his “doubts [over] whether it would contribute to the extension of natural knowledge,” the author reflects upon the reasons why such a frivolous activity had been taken up with so much zeal by his hosts. “I cannot help thinking myself singularly fortunate to be in this country at a period when its inhabitants seem not only in thoroughly good humour, but even transported, at the discovery of a volatile air-bladder!” he notes with a barely concealed irony. “Do not imagine that this account is dictated by patriotic prejudices, far from it: I entertain a high respect for the virtues and admit greatly the talents of the French whom I consider as a very enlightened and most amiable people. To give a general and just idea of them, however, it may be necessary to add, that they are passionately fond of novelty, easily elated, and strongly national.”¹⁰⁸ Notwithstanding the author’s protestations of impartiality, the implication, of course, is that a congenital desire for

amusement renders the French peculiarly susceptible to the idle charms of ballooning. As William Cobbett observed in a brief discussion of the Montgolfiers' first ascension: "Those who know what power novelty has on the French; with what enthusiasm, or rather fury, they adopt whatever is in vogue, may guess at the effect that this ... produced."¹⁰⁹ Irrespective of the claims some made for the ideological symbolism of ballooning, it represented for many commentators an extension of the high-spirited flightiness at the heart of the French character.¹¹⁰

Given the firmly entrenched nature of this negative association, defenders of ballooning were then frequently compelled to claim that other nations would soon be outstripping the French in their aerial endeavors. "With this the Gaul the populace amuses, / New acts of wonder to the eye produces," the Independent Ledger noted dismissively, before going on to assure its readers that "greater wits don't disregard, / The elements ... ; / From simple things, attentively explor'd, / The greatest powers of Nature will afford."¹¹¹ In this respect, though, it was rather worrying that France's main rival for scientific supremacy seemed to be displaying little interest in ballooning. Conventionally assigned those qualities of hard-headed practicality the French supposedly lacked, the English were widely perceived to be lagging behind in the race to explore the heavens. As the Political Intelligencer remarked in December 1784: "While even the ladies in France are making their visits to the ethereal regions, [there is] not a single Briton, as we can find by the last English papers, who chooses to quit his beloved terra firma. Whither or not the declining state of the nation, absorbed in every distress, has damped the ardour of individuals, is a question to be solved."¹¹² Slyly suggesting the effeminacy of French attempts at aviation, this article also manages to have a poke at England by attributing the mother country's disinterest

in ballooning to its recent defeat in the War of Independence. The Connecticut Courant, however, was probably a little closer to the mark when it credited this disinterest to that jingoistic disdain for France which would later spread to America. “The English pride has been too apt to affect a contempt for the productions of their neighbors, particularly in their favorite science of philosophy,” it argued in March of the same year. “Their literati have lately poured their ridicule very liberally on the French, for the attempts of several gentlemen to invent a mode of aerial navigation.”¹¹³ Still, not everyone was so pessimistic about England’s willingness to contribute to the progress of ballooning. Federalist-leaning journalists, especially, continued to express the hope that human flight was about to take on a more sober aspect. The editor of the Massachusetts Spy, for example, insisted that: “Though the French claim the honour of the new invention of air-globes, there is little doubt that the English will be the men to make a rational use of them. Dr Priestley is said already to have made some collateral discoveries on the subject, which will excite greater astonishment than the original invention itself.”¹¹⁴

Unfortunately, though, the troubling links between aerial travel and French frivolity were only strengthened by a parlaying of ballooning’s fashionable status into the fashion industry itself, an industry which American critics saw as characteristically Gallic. “The taste for air balloon matters has grown to such an extravagant pitch, that nothing can pretend to have any intrinsic value in it, unless it has this name as an appendage,” the Pennsylvania Gazette declared in July 1784, while the Independent Journal observed six months later that: “The very name of balloon ... begins to be completely surfeiting.”¹¹⁵ Hats designed to resemble an inflated air bag, in particular, were a hugely popular item. “Balloon hats, of the azure

hue, are the rage,” the Virginia Journal noted in April 1784, and indeed advertisements for “ladies’ elegant balloon hats of the newest style, just arrived from France” are almost ubiquitous in the newspapers of this period.¹¹⁶ Thanks to this penetration of aerostatic imagery into the world of fashion it was then easy for sceptical commentators to identify ballooning with the vacuous giddiness often ascribed to young girls. The New-Jersey Gazette, for example, declared that in addition “to balloon hats, balloon bonnets, balloon caps, balloon ribbons, and balloon pins, the ladies now have double balloon ear-rings, and balloon side-curls; so that there are no less than seven balloon articles appertaining to the decoration of the most beautiful balloon in nature – the head of a pretty woman.”¹¹⁷ Moreover, this reciprocal connection between feminine pursuits and the art of flying also allowed the press to play a new variation on the Francophobic stereotypes of the era. For as well being used to indict the French as a nation of featherbrained pleasure-seekers, ballooning could be used to present them as a nation of debauched libertines.¹¹⁸ Thus the Massachusetts Centinel deployed some politically-charged sexual innuendo in an article which claimed that: “Air balloon dress is so much the fashion, and so generally fancied, that some ingenuous temptresses from France have it in their contemplation to establish a balloon petticoat, so constructed as that a very heavy person may go up in it with safety.”¹¹⁹ And similarly, a contributor to the New-York Packet complained about “balloon hats, balloon trimmings, in short balloon everything,” before noting with a mixture of relief and anxiety that: “By the bye I took a sly peep at my wife’s garters, but that devil of a fellow, Blanchard, has not got thither yet.”¹²⁰

Be that as it may, ballooning’s infiltration of American popular culture was not just limited to the late eighteenth-century wardrobe. “The gentleman and ladies

upon the bon ton are not the only objects that can boast of this aerial bombastick insignia to their ornaments,” the Pennsylvania Gazette remarked, “as a countryman was heard [to say] one day last week – ‘Fine balloon string beans.’”¹²¹ Astutely pinpointing the financial rationale behind such renaming, meanwhile, the South-Carolina Weekly Gazette observed that as well as being applied to everything “from a hat to a shoe” the “epithet of balloon” had also been affixed to “walnuts, apples, gingernuts &c. for which to be sure you pay an additional something, as you get nothing for nothing here.”¹²² Bearing no discernible relevance to the object being labeled, the use of the adjective “balloon” here suggests the sheer mobility of that word as a cultural signifier. But perhaps even more intriguing is the evidence these articles furnish for the argument that a modern consumer economy first flourished in America during the post-Revolutionary period.¹²³ In tracing the impact of ballooning on the American public, the writers quoted above not only identify a thriving market for non-essential goods. They also implicitly agonize over the potentially debilitating effect of possessive individualism on morality and civic virtue. To borrow once more the words of Michael R. Lynn: “As a new object of potential commodification, the way in which savants and entrepreneurs treated balloons offers insights into the manner in which new thinking about luxury and economics, as well as the role of scientific innovation in the marketplace, had evolved at the end of the age of Enlightenment.”¹²⁴

III.

In a telling reflection of the rapid commercialization of ballooning, just a few months after he declared “the present day, which has opened a road in the Air, an

epoch from whence [an] increase of the stock of real Knowledge ... must take its date,” Sir Joseph Banks was hardening his position.¹²⁵ Tired of the money-hungry showmen who had latched onto the Montgolfiers’ invention, Banks wrote to Benjamin Franklin in November 1783 that he detected “an inclination in the more respectable part of the R[oyal] S[ociety] to guard against the Ballomania ... till some experiment likely to prove beneficial either to Society or Science is proposed to be annexed to them.”¹²⁶ This argument for intellectual circumspection, however, was greeted by Franklin with some unease. “I am sorry this Experiment is totally neglected in England where mechanic Genius is so strong,” he replied from his home in Paris:

Your Philosophy seems to be too bashful. In this Country we are not so much afraid of being laughd at. If we do a foolish Thing, we are the first to laugh at it ourselves, and are almost as much pleased with a Bon Mot or a good Chanson, that ridicules well the Disappointment of a Project, as we might have been with its Success. It does not seem to me a good reason to decline prosecuting a new Experiment. ... When we have learnt to manage it, we may hope some time or other to find Uses for it, as Men have done for Magnetism and Electricity, of which the first Experiments were mere Matters of Amusement.¹²⁷

In fact, the French were not the only nation to consider the public trial of new technologies a worthwhile process. Franklin’s fellow Americans too laid much emphasis on the participation of both official and unofficial institutions in the progress of scientific knowledge. The Virginian agronomist Thomas Ewell, for example, was hardly alone in arguing that as well as being “generally addressed to the comprehension of professional and learned men,” information about natural philosophy should also be available to “those of the humble walks of life, for whose

use this science might be made most essentially to contribute, by [them] adapting it to their capacities.”¹²⁸ The American critics of aviation, for their part, often accepted the beneficial potential of this democratic premiss. But, they added, in the case of ballooning this principle of inclusive participation had teetered over into a slew of trivial diversions that actually hindered the diffusion of knowledge.

Significantly, scholars such as Brooke Hindle, John C. Greene, and James Delbourgo have all suggested the great importance which individuals such as Franklin, and organizations such as the American Philosophical Society, attached to positioning scientific knowledge at the heart of American culture.¹²⁹ Through emphasizing the value of readily reproducible experiments, and embracing a discursive style which prioritized functional implementation and simple formulas, these apostles of American science intended to promote that spread of information deemed vital to a republican community. But while these attempts to engage with the public were sometimes not as effective as their champions might have wished, the course of ballooning in the late eighteenth century strikes an altogether more dissonant chord. It suggests that occasionally what could be most disappointing about these efforts to disseminate empirical knowledge was the remarkable degree to which they fulfilled their aim. The ideal of an American Enlightenment, in this respect, depended less on the active promotion of public interest in science and more on the careful supervision of this curiosity. Commentators who questioned the merits of ballooning often did so not only because they had doubts about its technical viability or practical usefulness, but because they felt it was garnering too much interest from too many ordinary people.

Perhaps inevitably, the principle of devolving expertise to the masses, which was so central to American science in the late eighteenth century, could not escape accusations of collusion with that putative corruption of post-Revolutionary culture which, for some critics, reached its awful apotheosis in the senseless triviality of “balloon madness.” Seen from this perspective, Samuel Miller’s claim that, through the diffusion of knowledge, “various departments of learning have been purged of the dregs, and rescued from the rubbish with which ... former ages had encumbered them,” is, to some extent, simply the optimistic counterpart to David Daggett’s complaint that “the modern Literati are attempting to extract sun-beams from Cucumbers – to travel without exertion – to reap without sowing – to educate children to perfection – to introduce a new order of things as it respects morals and politics ... and to establish [a] strange species of credulity.”¹³⁰ Indeed, for the Federalists at least, these ostensibly antithetical narratives were actually more like the reciprocal manifestations of a consumer-driven modernity, within which the democratization of knowledge could never be securely shielded from a more ruthless and irresponsible vision of social progress rooted in unchecked ignorance. “To diffuse and establish among us that useful knowledge, and those habits, ... which are eminently the basis and soul of a republic, ... is among the first of human rights and enjoyments. But this liberty may be as effectually destroyed by its own excesses or abuse, as by exterior oppression,” David Tappan warned in 1795.¹³¹ And similarly, a few years earlier, John Adams had noted of the idea that “the world grows more enlightened”:

Some truth there is in it; and if the opportunity were temperately improved, to the reformation of abuses, the rectification of errors, and the dissipation of pernicious prejudices, a great advantage it might be. But, on the other hand, false inferences may be drawn from it, which may make mankind wish for the

age of dragons, giants, and fairies. If all decorum, discipline, and subordination are to be destroyed, and universal Pyrrhonism, anarchy, and insecurity of property are to be introduced, nations will soon wish their books in ashes.¹³²

Importantly, David Jaffee's recent analysis of the process of "Village Enlightenment" which shaped the construction and distribution of public information in the late eighteenth century points toward the crucial role which ordinary citizens played in the instrumentalization of scientific learning.¹³³ But this post-Beardian insistence on the proletarian dimension of cultural production needs to be qualified by a corresponding emphasis on the extent to which salient scientific enterprises were perceived to be vulnerable to degradation by provincial pedlers and impresarios.

This contiguity between enlightenment and vulgarity (with each term serving as a sort of signifier for larger models of social development or decay) gave rise to discontents which were then further magnified by anxieties about the deterioration of "the people" as a coherent category through which specific strains of intelligence could be disseminated. The people, as far as they could continue to be identified at all, had not only begun to imitate the manners of the well-born, they had also fragmented into interconnected but distinct classes whose behavior and ambitions were not readily consolidated. As Richard L. Bushman has put it: "The line that once divided gentry from the rest of society now dropped to a lower level and separated the middle class from workers and marginal people. ... Genteel culture became an independent variable, cutting across society, and leading ... to the confusion about class that has long been characteristic of American society."¹³⁴ Ballooning, by blurring the distinction between enlightenment and vulgarization, and by engaging "the attention and admiration of all orders of people," then underlined the serious challenges that

accompanied any effort to turn science into a publicly certified endeavor.¹³⁵ The problem is not so much that it was difficult to popularize science, and more that this enterprise was only rarely immune from the threat of a more degraded popularity whose riotous frivolity bore no relation to the standard of gentility, irrespective of the extent to which that standard was being rewritten to suit the demands of a burgeoning middle class. Jean-Pierre Blanchard may have taken care to stress that those who turned out to see him in Philadelphia were the “enlightened citizens of this metropolis,” but the more critical accounts of the press indicate that Blanchard’s emphasis on the decorousness of his public might best be understood as a tactical effort to mute widely shared concerns about the fragility of the boundary between cultural edification and mere entertainment.¹³⁶ Reporting on an aerial excursion by one Monsieur Le Chat, Joseph Dennie, for example, directly compared “a Pennsylvania mob” to “the London mob, who have ... run gaping after this madcap, and have given him all the pence they could rake, or they could steal, to see his flimsy, tiffany globe of inflation.” For Dennie, who was dedicated to defending Federalist values against the encroachment of mass democracy, Le Chat’s “adventure into the upper regions,” like “the vain flights of Blanchard,” smacked not of scientific progress, but of the public’s “asinine stupidity” and “sheepish inclination to throng together.”¹³⁷

Given the judgments of their critics, in other words, it is hardly surprising that balloonists like Blanchard were careful to leaven their appeal to the cruder instincts of the public with assurances of sober intent, with references to respectable thinkers such as Joseph Priestley and Antoine Lavoisier, and with reminders that aerial displays were in fact a very effective way of disseminating knowledge. Eighteenth-century

aeronauts, even at their most exploitative and uncouth, positioned themselves as the successful culmination rather than the parodic inverse of attempts to install science as a part of civic life. Responding to Benjamin Franklin a week after he reprimanded the English for their neglect of ballooning, Sir Joseph Banks noted that “I laught when Balloons of scarce more importance than Soap bubbles occupied the attention of France but when men Can with safety pass and do pass more than 5 miles in the first Experiment I [will] begin to fancy that I espy the hand of the Master in the Education of the infant of Knowledge.”¹³⁸ Banks’ tentative acknowledgment of the practical potential for ballooning, however, only serves to highlight the serious obstacles which confronted those who tried to stimulate scientific learning at the same time as trying to insulate it from more contentious cultural trends. For the relationship between the domain of science and the realm of the market was typified more by rhetorical and organizational intersection than by any safe mode of antithesis.

Perhaps the simplest way to manage the implications of this conflation of legitimate science and idle fashion was to peremptorily repudiate ballooning as an intellectual delusion which had nothing in common with the high-minded ambition of those who had pioneered natural philosophy in the seventeenth century. In this respect, ballooning not only provided its detractors with a symbol for the defilement of useful knowledge by the public, it could also serve as a symbol for those activities and values which were deemed to be wholly unscientific. A poem called “The Lunar Travellers,” for example, published in *The South-Carolina Weekly Gazette* in November 1785, insisted that:

Could Bacon, Boyle, or mighty Newton see,
Such wretched spawn of new philosophy,

Mere children, of their air blown bubbles proud,
 No aim but to delight the gaping crowd;
 Such mere men-monkeys, in mortal shape,
 ‘They’d view these heroes as we view the ape.’¹³⁹

And similarly, in *Sun-Beams May be Extracted from Cucumbers*, David Daggett also attacked those “speculatists” who had “mounted in balloons” for their perversion of scientific tradition. Not content with exploiting the “utter astonishment and mortification of those poor illiterate wretches who were doomed to tug and sweat on the earth,” balloonists, he argues, have deified modernity and in the process set themselves up as the paragons of genuine knowledge: “The credulity of the present age has become truly astonishing. ... It is believed that ... Bacon, Newton, and Locke, and all who lived and died prior to the commencement of the French Revolution, were either fools or slaves.”¹⁴⁰ The central problem with ballooning, for many, was its apparently inescapable vulnerability to manipulation and debasement. Thus, rather than trying to quarantine human flight from the trivializing tendencies of the public, it could seem safer to exclude ballooning from the domain of science altogether. The two texts I have just quoted may look like frantic overreactions, but to eighteenth-century thinkers the issue was a grave one, not least because the diverse forms of investigation coalescing under the disciplinary banner of science were commonly regarded as a crucial barometer of the nation’s political wellbeing. “The introduction and progress of freedom have generally attended the introduction and progress of letters and science,” John Gardiner declared in 1784. “In despotick governments the people are mostly illiterate, rude and uncivilized; but in states where CIVIL LIBERTY hath been cherished ... learning and knowledge have prevailed, and the arts and sciences have flourished.”¹⁴¹

The desire to expel ballooning from the category of the scientific represents a radical solution to the problem of epistemological instability which this new technology presented to its audience. But for those unwilling to abandon aerostation to the vagaries of fashion a series of pressing questions remained. Were balloons “a signal to animate ambition” or were they “mere childish baubles”? Was the discovery of aviation an indication of intellectual advancement or mental debility? Was the public interest in aeronautics evidence of an appetite for knowledge or a hunger for distraction? Or was it ultimately the case that ballooning was all of these things simultaneously? Scientific exhibitionists and lecturers during the Enlightenment often argued that practical knowledge could originate from entertainment - that captivating spectacles were valuable as an initial, discrete stage in the process of refining an invention and educating the masses. Advertising the “entertaining and astonishing Wonders of Nature” to be seen during his demonstrations of electricity, Ebenezer Kinnersley, for example, argued that such public exposure to science “tends to enlarge the human Mind, and give us more noble, more grand and exalted Ideas ... and if well pursu’d seldom fails producing something useful to Man.”¹⁴² And, in the same vein, William Hooper’s *Rational Recreations* (1782-83) notes of the easily reproducible experiments collected in its pages that “the reader will readily discover, at the same time he admires the phenomena, the source from whence they proceed, and learn, that far from being marvellous or incomprehensible, they are the regular and necessary effects of the laws of nature.”¹⁴³ For numerous critics in the post-Revolutionary period, however, ballooning manifested the propensity of an increasingly market-driven culture to obscure or eliminate the distinctions between pleasure and learning, upsetting their hierarchical relationship. An essay about ballooning published in the

Weekly Museum in June 1797, for instance, neatly pinpoints this confusion in its final line, which observes that: “Such is the depravity of the age, such the influence of fashion, that Vice receives the homage due to Virtue; while Ridicule, become the test of Wit, aims her successful shaft at Merit.”¹⁴⁴

The dilemma hinted at here, of course, is that if worthwhile knowledge could not be simply or cleanly extricated from intellectual iniquity, then it became hard to decide on what grounds any scientific undertaking could be regarded as admirable. How, amongst the change and disorder of a rapidly democratizing society, did one detach “a signal to animate ambition” from “mere childish baubles”? The author of the article in the Weekly Museum was perceptive in acknowledging the challenges present in preserving the line between ostensibly separate principles, but he was not the only writer to recognize the anxiety caused by aerostation’s blurring of boundaries. Facing the pervasive encroachment of witness accounts and hoaxes into the description of human flight, the practitioners of aerostation often sought to legitimize their own reports by appealing to particular forms of scientific authority, on both an institutional and a rhetorical level. John Jeffries, for example, notes that his *Narrative of the Two Aerial Voyages with Mons. Blanchard* was delayed in order to be put before the Royal Society, “that [it] might afterwards be ushered into the world under the sanction of those distinguished Judges and Patrons of Philosophical Discoveries and Experiments.” And similarly, the table of figures which Jeffries places at the start of the book, showing the “state of the Thermometer, Barometer, Hydrometer, and Electrometer, at the time of Ascension; with the several changes during our first voyage,” is also intended to implicitly validate the reliability of his observations.¹⁴⁵ Such indications of objectivity were complicated, however, by the

fact that the epistemological assumptions governing natural philosophy were in flux at this time. As Jessica Riskin has pointed out, before disciplinary formation led to the consolidation of modern scientific techniques in the nineteenth century, “empirical knowledge was not a matter of impassive adherence to the hard facts of sensory experience, but rather one of sensibility.”¹⁴⁶ It was assumed, in other words, that the natural realm could not be detached from the inner self, and that the sentiments which this realm prompted were an important way of understanding it. Accordingly then, Jeffries quite readily mentions “my sensations, arising from the mingled passions of joy and exultation” or “a certain kind of stillness ... that could be felt” as a means of reinforcing the highly detailed enumeration of temperature or height which appears elsewhere in his report.¹⁴⁷ Yet, even as Jeffries was writing, the excessive forms of emotional subjectivity which were seen to be induced by practices such as ballooning and mesmerism were leading many to question this sentimental empiricism. To quote Stuart Walter Strickland, during the late eighteenth century experimentalists were becoming ever more aware of “the difficulties anticipated and encountered in trying to convey knowledge rooted in a particular body to a scientific community that was, for ideological reasons of its own, coming increasingly to esteem general over particular truths.”¹⁴⁸ Thus, while Jeffries himself may still deploy a degree of intuitive evidence, his apology “for having presumed (with the little knowledge I have in such researches) to hint at any opinions or remarks of my own” gestures toward the tensions beginning to emerge as a result of the Enlightenment’s ambiguous procedures.¹⁴⁹

Given that the problem of epistemological blur affected those who were actually carrying out balloon flights, it is then hardly surprising that the critics of

aerostation so readily latched on to the intellectual ambiguities surrounding it. Comparing the “floating bubbles” blown through a pipe to the “silken ball” of Montgolfier, a poet in the *Federal Observer*, for example, found it telling that “so near approach / The sports of children and the toils of men.”¹⁵⁰ And as Tom D. Crouch has pointed out, John Adams’ reaction to ballooning was marked by a similar mixture of delight and derision.¹⁵¹ Like many of his contemporaries, Adams eagerly sought out information about ballooning at the same time as casting a suspicious eye on the whole enterprise. He earnestly expressed the hope that someone would send Jean-Pierre Blanchard “back to Europe,” and was generally uninterested in the advancement of science, but this did not stop him from speculating at length about experiments with soap bubbles and hydrogen designed to produce “a series of Balloons aerostatiques, which would ascend like those of Montgolfier.”¹⁵² Few texts then illustrate this equivocation more clearly than the “Extract of a Letter from London,” which was published in the *South-Carolina Weekly Gazette* in February 1785. Written shortly after the Italian aeronaut Vincent Lunardi carried out the first manned flight in England, the letter starts by bemoaning “how great and prevalent the balloon madness is in this infatuated country.” Like John Adams, the author of this missive at first appears inclined to reject ballooning as an imported folly, intended to delude and distract the public. “You will be astonished to be told, that ... the love of novelty and fondness for bubbles, should influence every class of people to that ridiculous degree, as to cause a temporary depopulation whenever a balloon is to be launched,” he notes. “From the statesman ... to the shoe black, all leave their occupations however necessary or important, to gaze at the wonder of a moment.” But, the correspondent of the *Weekly Gazette* too, is unable to resist the widespread fascination with aerial experiments that followed in the wake of the Montgolfiers. As

he adds a few lines later: “You will imagine, no doubt, from the style of my description, that I was the only man exempt from the raging folly; not so, I assure you, for I mingled with the throng, and gazed with as much astonishment and as wide a mouth as any of the million that surrounded me.” Swept up in the excitement of personally witnessing an ascension, the soberly rational correspondent ultimately finds himself implicated in the fashionable preoccupations he wished to distance himself from. Thus it is unsurprising that he abruptly ends his letter by trying to cast a veil over his infatuation, stating that: “I will say no more to you on this subject, for fear you set me down as being many degrees madder than I allow myself to be.”¹⁵³

In fact, in an age when, as the *Continental Journal* put it, “fashion changes so fast, it is almost impossible to keep pace with it,” the desire for restraint on the subject of ballooning expressed in the pages of the *Weekly Gazette* was soon realized.¹⁵⁴ Balloons remained a source of public entertainment long into the nineteenth century, making regular appearances during 4th of July celebrations and county fairs, but by the end of Thomas Jefferson’s first term as President they had lost their novelty value and the treatment of them in the press had consequently become less impassioned.¹⁵⁵ Tellingly, the always astute Jean-Pierre Blanchard, no longer able to turn a profit on his ascensions, had already quit the scene by 1797, returning to France, where he continued flying until his death in 1809.¹⁵⁶ Meanwhile, these changes in the popular attitude toward ballooning were compounded by parallel changes in the intellectual attitude toward ballooning, both of which served to finally expel the activity from the domain of science. On the one hand, the continuing failure of balloonists to master navigation and to make practical use of their technology led utilitarian philosophers to at last dismiss human flight as unproductive. On the other hand, the continuing

association of ballooning with civic amusement led theoretical scientists to distance themselves from human flight as crudely populist. Indeed, ballooning seems to have played an important rhetorical role in encouraging nineteenth-century thinkers to move away from the publicly-oriented experimentation of the Enlightenment toward the principles of pure science. Benjamin Franklin may now be perceived as a utilitarian at heart but his famous riposte to those who questioned the value of the Montgolfiers' balloon – “What use is a newborn baby?” – was repeatedly borrowed by scientists like Michael Faraday to defend their speculative investigations into the natural world.¹⁵⁷ Perhaps the most visible legacy of the post-Revolutionary period's “balloon Madness,” however, lies in the symbolic value it bequeathed to the object at its centre. Washington Irving, Ralph Waldo Emerson, Edgar Allan Poe, Mark Twain, Henry James and many others in the nineteenth century turned to the balloon as a metaphor for intellectual delusion and social upheaval. In this respect, maybe the last word can then be left to James, whose use of the metaphor not only suggests its persistence in American culture, but also captures something of the epistemological anxiety which had attended the invention of aerostation a century earlier. “The balloon of experience,” James wrote in his preface to *The American* (1907), “is in fact of course tied to the earth, and under that necessity we swing, thanks to a rope of remarkable length, in the more or less commodious car of the imagination; but it is by the rope we know where we are, and from the moment that cable is cut we are at large and unrelated.”¹⁵⁸

FOOTNOTES:

1. Air Balloon (New York, June 10, 1789). Joseph Deeker, also known as Joseph Decker, remains a rather mysterious figure, but the broad contours of his career can be traced through the press, beginning with the assistance he lent to Jean-Pierre Blanchard in crossing the Channel by balloon and his first attempts at an ascension in England, through to his death by drowning while returning home in 1790. See “London, January 11,” *Maryland Journal*, March 29, 1785; [Joseph Deeker], *The Royal Balloon* (Norwich, England, 1785); “Extract of a Letter from Norwich,” *Maryland Journal*, August 13, 1785; [Joseph Deeker], “Air Balloon,” *Daily Advertiser*, June 16, 1789; “Mr Deeker’s Balloon,” *Daily Advertiser*, August 8, 1789; “New-York, September 24,” *Connecticut Journal*, September 30, 1789; “New-York, February 18,” *New-York Packet*, February 18, 1790.
2. “To the Air-Balloon Maker,” *Freeman’s Journal*, July 29, 1789.
3. “Baltimore, June 22,” *Salem Gazette*, July 20, 1784.
4. Jonathan Williams, Jr., Letter to Benjamin Franklin, May 4, 1785, <http://www.franklinpapers.org/franklin/framedVolumes.jsp>.
5. The Carrier of the *American Herald’s Congratulations to his Customers*, Presenting the Following Balloon Wish! (Boston, January 1, 1785).

6. See Simon Schaffer, "Natural Philosophy and Public Spectacle in the Eighteenth Century," *History of Science* 21 (1983): 1-43; Jan Golinski, *Science as Public Culture: Chemistry and Enlightenment in Britain, 1760 – 1820* (New York, 1992); Larry Stewart, *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660 – 1750* (New York, 1992); Geoffrey V. Sutton, *Science for a Polite Society: Gender, Culture, and the Demonstration of Enlightenment* (Boulder, Colo., 1995); James Delbourgo, *A Most Amazing Scene of Wonders: Electricity and Enlightenment in Early America* (Cambridge, Mass., 2006); and Michael R. Lynn, *Popular Science and Public Opinion in Eighteenth-Century France* (New York, 2006).

7. Golinski, *Science as Public Culture*, 8.

8. Joyce Appleby, *Capitalism and a New Social Order: The Republican Vision of the 1790s* (New York, 1984); Gordon S. Wood, *The Radicalism of the American Revolution* (New York, 1992); Christopher Grasso, *A Speaking Aristocracy: Transforming Public Discourse in Eighteenth-Century Connecticut* (Chapel Hill, N.C., 1999).

9. Lynn, *Popular Science and Public Opinion in Eighteenth-Century France*, 136, 126.

10. Richard P. Hallion, *Taking Flight: Inventing the Aerial Age from Antiquity through the First World War* (New York, 2003), 58.

11. Stow Persons, "The Cyclical View of History in Eighteenth Century America," *American Quarterly* 6 (1954): 147-63; John R. Howe, *The Changing Political Thought of John Adams* (Princeton, 1966); Drew R. McCoy, *The Elusive Republic: Political Economy in Jeffersonian America* (Chapel Hill, N.C., 1980), 13-47; Joyce Appleby, *Liberalism and Republicanism in the Historical Imagination* (Cambridge, Mass., 1992).
12. Samuel Miller, *A Brief Retrospect of the Eighteenth Century* (New York, 1803), I, 6.
13. Ralph Waldo Emerson, "Nature," in *Essays and Lectures*, ed. Joel Porte (New York, 1983), 554.
14. Ralph Waldo Emerson, "The Transcendentalist," in *Essays and Lectures*, 194.
15. *Ibid.*; Alexis de Tocqueville, *Democracy in America*, trans. Henry Reeve, ed. Francis Bowen (Cambridge, 1864), II, 91.
16. Stewart, *The Rise of Public Science*, xxvii.
17. Barbara Benedict, *Curiosity: A Cultural History of Early Modern Inquiry* (Chicago, 2001), 205.
18. Wood, *The Radicalism of the American Revolution*, 362.

19. [Ann Timothy], *The Travels of Fancy: Being a Political, Historical, and Moral Account of Her Adventures During the Late War* (New-Brunswick, N.J., 1784), 24.

20. Washington Irving, *A History of New York*, eds. Michael L. Black and Nancy L. Black (Boston, 1984), 148; Washington Irving, *A History of New York*, in *History, Tales, Sketches*, ed. James W. Tuttleton (New York, 1983), 397.

21. For representative examples dealing with the Enlightenment era see Steven Shapin, "Pump and Circumstance: Robert Boyle's Literary Technology," *Social Studies of Science* 14 (1984): 481-520; Geoffrey Cantor, "The Rhetoric of Experiment," in *The Uses of Experiment: Studies in the Natural Sciences*, eds. David Gooding, Trevor Pinch, and Simon Schaffer (Cambridge, 1989), 159-80; Charles Bazerman, "How Natural Philosophers Can Cooperate: The Literary Technology of Coordinated Investigation in Joseph Priestley's *History and Present State of Electricity* (1767)," in *Textual Dynamics of the Professions: Historical and Contemporary Studies of Writing in Professional Communities*, eds. Charles Bazerman and James G. Paradis (Madison, 1991), 13-44.

22. Cantor, "The Rhetoric of Experiment," 161.

23. Golinski, *Science as Public Culture*, 4.

24. Delbourgo, *A Most Amazing Scene of Wonders*, 6, 7. The lack of detailed attention paid to the transatlantic currents and public dimensions of natural philosophy by earlier historians of American science is evident in Brooke Hindle's discussion of

ballooning in his seminal survey of science in the colonies, where – after insisting that “America was not able to keep abreast of all the scientific advances made in Europe” – he simply dismisses aerostation as one of a number of “scientific fads” popular in the late eighteenth century. See Hindle, *The Pursuit of Science in Revolutionary America, 1735 – 1789* (Chapel Hill, N.C., 1956), 339. Happily there are signs of a revival of interest in the scientific dimension of the American Enlightenment, though as yet these works largely concentrate on natural history. See, for example, the essays collected in *Empire’s Nature: Mark Catesby’s New World Vision*, eds. Amy Meyers and Margaret Beck Pritchard (Chapel Hill, N.C., 1998); Susan Scott Parish, *American Curiosity: Cultures of Natural History in the Colonial British Atlantic World* (Chapel Hill, N.C., 2006); Sara Stidstone Gronim, *Everyday Nature: Knowledge of the Natural World in Colonial New York* (New Brunswick, N. J., 2007).

25. For a detailed account of how the Montgolfiers made their breakthrough, and its initial impact, see Charles Coulston Gillespie, *The Montgolfier Brothers and the Invention of Aviation, 1783 – 1784* (Princeton, 1983).

26. The experience of early American witnesses of ballooning in France, and the initial flow of aerostatic information across the Atlantic, is described in Tom D. Crouch, *The Eagle Aloft: Two Centuries of the Balloon in America* (Washington, D. C., 1983), 13-41. The process of knowledge transferral described in the American press a few months after the first manned flight in Paris seems to have been typical. “Extract of a Letter,” *Independent Gazette*, 20 March, 1784, notes that: “A gentleman in Boston, a few weeks ago, received from his friend in France, who is a native of

Boston, a model of an air balloon, which, we are told, is exceeding curious, and gives the beholder a just idea of the construction of this new invented machine.”

27. Francis Hopkinson, Letter to Benjamin Franklin, May 24, 1784, in *The Life and Works of Francis Hopkinson*, ed. George Everett (Chicago, 1926), 338. The initial reception of ballooning in America and Foulke’s involvement in it is discussed in Sidney I. Pomerantz, “George Washington and the Inception of Aeronautics in the Young Republic,” *Proceedings of the American Philosophical Society* 98 (1954): 131-38.

28. For a detailed sketch of Carnes’ career see Crouch, *The Eagle Aloft*, 60-70.

29. “Foreign Intelligence,” *New-Jersey Gazette*, November 22, 1784; “Foreign Advices,” *New-York Packet*, February 22, 1785.

30. “Philadelphia, April 6,” *Massachusetts Mercury*, April 16, 1793.

31. For useful accounts of how the vogue for ballooning manifested itself in Europe see Richard Gillespie, “Ballooning in France and Britain, 1783 – 1786: Aerostation and Adventurism,” *Isis* 75 (1984): 249-68; John T. Alexander, “Aeromania, ‘Fire-Balloons,’ and Catherine the Great’s Ban of 1784,” *The Historian* 58 (1996): 498-516; Barbara Traxler Brown, “French Scientific innovation in Late Eighteenth Century Dublin: The Hydrogen Balloon Experiments of Richard Crosbie (1783 – 1785),” in *The French Enlightenment and Eighteenth-Century Ireland*, ed. Graham Gargett and Geraldine Sheridan (London, 1999), 107-26; Paul Keen “The

'Balloonomania': Science and Spectacle in 1780s England," *Eighteenth-Century Studies* 39 (2006): 507-35.

32. "London," *Providence Gazette*, September 3, 1785; "Extract of a Letter from London," *South-Carolina Weekly Gazette*, February 5, 1785.

33. "Boston, March 28," *New-York Gazetteer*, April 1, 1785.

34. *An Account of Count D'Artois and his Friend's Passage to the Moon, in a Flying Machine, Called an Air Balloon* (Litchfield, Conn., 1785), 1. Such fake stories have a long afterlife in American culture. See, for example, Lynda Walsh's discussion of the excitement caused by Edgar Allan Poe's "The Unparalleled Adventure of One Hans Pfall" (1835) and "The Balloon Hoax" (1844) in *Sins Against Science: The Scientific Media Hoaxes of Poe, Twain, and Others* (New York, 2006), 60-97.

35. "London, October 22," *Pennsylvania Packet*, March 20, 1784.

36. "Amérique," *Journal de Paris*, May 13, 1784. For more background on the *Journal de Paris* hoax and its subsequent influence see George E. Hastings, "Notes on the Beginnings of Aeronautics in America," *The American Historical Review* 25 (1919): 68-72.

37. For a detailed account of Blanchard's early life and career see L. T. C. Roulton, *The Balloonists: The History of the First Aeronauts* (Gloucestershire, 2006), 82-90.

38. Jean-Pierre Blanchard, "A Description of a Machine, Proper to be Navigated Through the Air," *Massachusetts Centinel*, May 12, 1784.

39. "For the Federal Gazette," *Federal Gazette*, December 17, 1792.

40. "Aerostatism," *New-York Diary*, January 17, 1793.

41. *The Forty-Fifth Aerial Flight of the Universally Celebrated Mr. Blanchard, at Philadelphia* (Philadelphia, 1793), 7.

42. Quoted in Carroll Frey, *The First Air Voyage in America: The Times, The Place, and the People of the Blanchard Balloon Voyage of January 9, 1793* (Philadelphia, 1943), 24.

43. Jean-Pierre Blanchard, "Plan of the Voyage," in *The Principles, History, and Use of Air-Balloons: Also, a Prospectus of Messrs Blanchard and Baker's Intended Aerial Voyage From the City of New York* (New York, 1796), 44.

44. The initial influence of these works in America can be traced through Edgar F. Smith, *Chemistry in America: Chapters From the History of the Science in the United States* (New York, 1914), 1-146; D. I. Duveen and H. S. Klickstein, "The Introduction of Antoine Lavoisier's Chemical Nomenclature into America," *Isis* 45 (1954): 278-92; Robert Siegfried, "An Attempt in the United States to Resolve the Differences Between the Oxygen and the Phlogiston Theories," in *Early American Science*, ed. Brooke Hindle (New York, 1976), 151-60; Michael Conlin, "Joseph Priestley's

American Defense of Phlogiston Reconsidered,” *Ambix: Journal of the Society for the Study of Alchemy and Chemistry* 43 (1996): 129-45.

45. “For the London Magazine,” *New-Haven Gazette*, July 29, 1784.

46. Jean-Pierre Blanchard, “Balloon,” *Independent Gazetteer*, April 9, 1794.

47. John Jeffries, *A Narrative of the Two Aerial Voyages of Doctor Jeffries with Mons. Blanchard* (London, 1786), 13.

48. Jan Golinski, *British Weather and the Climate of Enlightenment* (Chicago, 2007), 5.

49. See Simon Schaffer, “Measuring Virtue: Eudiometry, Enlightenment and Pneumatic Medicine,” in *The Medical Enlightenment of the Eighteenth Century*, eds. Andrew Cunningham and Roger French (Cambridge, 1990), 281-318.

50. The most detailed study of this controversy (and those that followed) is still to be found in Antonello Gerbi’s *The Dispute of the New World: The History of a Polemic, 1750 – 1900*, trans. Jeremy Moyle (Pittsburgh, 1973), but insightful recent contextualizations can be found in Golinski, *British Weather*, 170-202, and Alan Bewell, “Jefferson’s Thermometer: Colonial Biogeographical Constructions of the Climate of America,” in *Romantic Science: The Literary Forms of Natural History* (New York, 2003), 111-38.

51. Thomas Jefferson, Notes on the State of Virginia, in Writings, ed. Merrill D. Peterson (New York, 1984), 171.
52. Thomas Jefferson, Letter to Philip Turpin, April 28, 1784, in Writings, 796.
53. "Preface," Encyclopedia; or, A Dictionary of Arts, Sciences, and Miscellaneous Literature (Philadelphia, 1798), I, iii; "Aerostation," Encyclopedia, I, 205.
54. Louis Sebastien Mercier, The Night Cap (Philadelphia, 1788), 152, 154.
55. "London, September 22," Salem Gazette, November 27, 1783.
56. "Preface," Transactions of the American Philosophical Society I (1769-1771), i.
57. Miller, A Brief Retrospect, I, 47.
58. Ibid.
59. Mercier, The Night Cap, II, 151.
60. Jefferson, Letter to Turpin, in Writings, 796.
61. "London, September 22," Salem Gazette, November 27, 1783.
62. "For the London Magazine," New-Haven Gazette, July 29, 1784.

63. "Reflections on Balloons," *National Gazette*, January 19, 1793.
64. William Nicholson, *An Introduction to Natural Philosophy* (Philadelphia, 1788), II, 336.
65. "Following Extraordinary Advertisement," *Charleston Evening Gazette*, June 28, 1786.
66. "Philadelphia, 19 December 1792," *Federal Gazette*, December 19, 1792.
67. "Aerostation," *Providence Gazette*, January 12, 1793.
68. David Daggett, *Sun-Beams May be Extracted from Cucumbers, but the Process is Tedious* (New-Haven, 1799), 7.
69. "London, Sept. 24," *Independent Journal*, November 13, 1784.
70. Francis Hopkinson, Letter to Benjamin Franklin, May 24, 1784, in *Life and Works*, 338.
71. "Aerostation," *Encyclopedia*, I, 207.
72. "Baltimore, June 22," *Salem Gazette*, July 20, 1784.

73. These figures are drawn from Richard G. Miller, "The Federal City, 1783 – 1800," in *Philadelphia: A 300 Year History*, ed. Russell Weigley (Philadelphia, 1982), 172; Lewis Leary, "Phaeton in Philadelphia: Jean-Pierre Blanchard and the First Balloon Ascension in America, 1793," *Pennsylvania Magazine of History and Biography* 67 (1943): 54; Laura Rigal, *The American Manufactory: Art, Labor, and the World of Things in the Early Republic* (Princeton, 1998), 24.

74. "Philadelphia," *Federal Gazette*, January 9, 1793.

75. "Philadelphia, June 7," *Daily Advertiser*, June 10, 1793. Blanchard is often credited with inventing (or at least perfecting) the parachute. For a more detailed account of his early experiments with this piece of technology see "Mr Blanchard," *Independent Gazetteer*, June 8, 1793.

76. "An Explanation of the Plate," in *Weatherwise's Town and Country Almanack, for the Year of Our Lord, 1785* (Boston, 1784), n.p.

77. "Further Particulars Respecting M. Pilatre de Rozier," *Pennsylvania Packet*, September 15, 1785.

78. "For the National Gazette," *National Gazette*, July 17, 1793. Importantly, the press often emphasized that the risks of frustrating the fickle public were almost as great as the risks of ballooning itself. "Extract of a Letter from Gibraltar," *South-Carolina Weekly Gazette*, July 30, 1785, for example, notes that: "A person who offers to go up in a balloon for the entertainment of the public, has a double chance of

meeting with death. If he does not go up at the time appointed, he must fly to avoid being knocked on the head by the mob. And if he does go up he has the one chance of succeeding to balance all the dangers of the voyage.” For a more detailed account of the socio-cultural significance of public disorder in eighteenth century America see the essays collected in *Riot and Revelry in Early America*, eds. Matthew Dennis, Simon P. Newman, and William Pencak (Philadelphia, 2002).

79. “Philadelphia, January 23,” *National Gazette*, January 23, 1793. Interestingly, although this mode of treating Blanchard’s exploits as farce became more persistent in the mid-1790s it had some prehistory. He had been painted in an equally ridiculous light almost a decade earlier, for example, when an article in the Rhode Island press described him being forced to lighten his craft by throwing everything overboard, causing him to descend “without any clothes on but his breeches and stockings” See “London, January 8,” *Newport Mercury*, April 23, 1785.

80. “Theatre,” *Gazette of the United States*, December 28, 1793.

81. “From the Farmer’s Weekly Museum,” *Otsego Herald*, September 8, 1796. For a more detailed discussion of the forms of popular entertainment with which ballooning was often compared see Charles Coleman Sellers, *Mr. Peale’s Museum: Charles Willson Peale and the First Popular Museum of Natural Science and Art* (New York, 1980); Ann Fairfax Withington, *Toward a More Perfect Union: Virtue and the Formation of American Republics* (New York, 1991); Eric Leigh Schmidt, *Hearing Things: Religion, Illusion, and the American Enlightenment* (Cambridge, Mass.,

2000), 135-98; Heather S. Nathans, *Early American Theatre From the Revolution to Thomas Jefferson: Into the Hands of the People* (Cambridge, 2003).

82. "Extract of a Letter from Edinburgh," *Columbian Herald*, March 10, 1785. Given my later argument about the intersections between ballooning and radical politics it is perhaps worth noting that Tytler subsequently became a militant republican before fleeing from the Scottish authorities to Boston in 1795, where he fades into obscurity. See Michael Durey, *Transatlantic Radicals and the Early American Republic* (Lawrence, Kansas, 1997), 70-71. Tytler was also the editor of the second edition of the *Encyclopedia Britannica*, and so may have written its entry on "Aerostation," largely reprinted by Thomas Dobson in his *Encyclopedia*.

83. "A Discourse on Popular Magic," *Litchfield Monitor*, March 16, 1791. Importantly, changes in communal structures and economic relations during the eighteenth century mark it out as the first period when the confidence man becomes a figure of concern in American culture. For further discussion of the emergence of this figure see Steven C. Bullock, "A Mumper Among the Gentle: Tom Bell, Colonial Confidence Man," *William and Mary Quarterly* 55 (1998): 231-58; Stephen Mihm, "The Alchemy of the Self: Stephen Burroughs and the Counterfeit Economy of the Early Republic," *Early American Studies: An Interdisciplinary Journal* 2 (2004): 123-59.

84. "For the General Advertiser," *General Advertiser*, December 26, 1792.

85. "Reflections on Balloons," *National Gazette*, January 19, 1793.

86. Jean-Pierre Blanchard, "Address to the Citizens of New York," *Daily Advertiser*, July 25, 1794. Balloonists often seem to have exhibited automatons alongside their aerial contraptions, perhaps as a way of drawing in paying customers to see a machine that they could otherwise see for free on the day of the flight. Joseph Deeker, for example, as well as placing notices for his balloon, advertised a wax automaton which could move (thanks to air pressure) and speak (thanks to a colleague hidden behind it). See "Speaking Figure," *Connecticut Courant*, March 16, 1784. Blanchard's other extra-aerial attractions are mentioned in "Curious Carriage," *General Advertiser*, April 28, 1784; "Aerostatical Laboratory," *Columbian Centinel*, February 6, 1793.

87. For more detail about this dispute see Gardiner Baker, "Extract of a Letter," *Daily Advertiser*, November 14, 1796, and Jean-Pierre Blanchard, "Observations on Mr Baker's Letter," *Daily Advertiser*, November 14, 1796. Baker's career is usefully discussed in Robert M. McClung and Gale S. McClung, "Tammany's Remarkable Gardiner Baker: New York's First Museum Proprietor, Menagerie Keeper, and Promoter Extraordinaire," *New York Historical Society Quarterly* 42 (1958): 142-69. Blanchard, it should be added, had a history of promoting himself at the expense of his co-pilots and subscribers. Shortly after crossing the channel with John Jeffries, for example, he was displaying a painting in which "Dr Jeffries is seen emptying his bottles of brandy in order to forget the danger, whilst his captain is calculating and working." See "Curious Carriage," *General Advertiser*, April 28, 1785.

88. "Communication," *New-York Diary*, May 11, 1797.

89. "Foreign Intelligence," Pennsylvania Packet, December 13, 1784.
90. *The Independent Citizen, or, The Majesty of the People Asserted Against the Usurpations of the Legislature of North-Carolina* (New-Bern, N. C., 1787), 17. Tellingly, a writer using the pseudonym "Daniel Shays" (in honour of the Massachusetts farmer whose rebellion in August 1786 had exposed the weakness of the Articles of Confederation) warned those who supported state power against the proposed Constitution "you may depend upon it your wheelbarrow, and the new flying machine, cannot travel along the same road together." See "To the Anti-Federal Junto in Philadelphia," *Independent Gazetteer*, September 25, 1787. For a useful account of the role of such mechanical imagery in the ratification debates see John Fabian Witt, *Patriots and Cosmopolitans: Hidden Histories of American Law* (Cambridge, Mass., 2007), 62-70.
91. *Just Published, a New, Humorous Copperplate Print ... Zion Beseieg'd and Attacked 1787* (Philadelphia, 1787).
92. Richard Buel, *Securing the Revolution: Ideology in American Politics, 1789 – 1815* (Ithaca, N. Y., 1974); James Roger Sharp, *American Politics in the Early Republic: The New Nation in Crisis* (New Haven, 1993); Lloyd S. Kramer, "The French Revolution and the Creation of American Political Culture," in *Global Ramifications of the French Revolution*, ed. Joseph Klaitz (New York, 2002), 26-54.
93. The impact of Burke and Paine's debate on Anglo-American political thought can be traced through Julian P. Boyd, "The Rights of Man: The 'Contest of Burke and

Paine in America',” in *Papers of Jefferson*, ed. Boyd (Princeton, 1982), XX, 268-313; Harvey J. Kaye, *Thomas Paine and the Promise of America* (New York, 2005), 91-117; Gregory Claeys, *The French Revolution Debate in Britain: The Origins of Modern Politics* (Basingstoke, 2007).

94. Edmund Burke, *Reflections on the Revolution in France*, ed. L. G. Mitchell (New York, 1993), 248.

95. Thomas Paine, *Rights of Man*, in *Collected Writings*, ed. Eric Foner (New York, 1995), 472.

96. The development of the term can be traced via the essays collected in *Enthusiasm and Enlightenment in Europe, 1650 – 1850*, eds. Lawrence E. Klein and Anthony J. La Vopa (San Marino, 1998).

97. Robert Darnton, *Mesmerism and the End of Enlightenment in France* (Cambridge, Mass., 1968), 15, 12.

98. Edmund Burke, *A Letter From the Right Honourable Edmund Burke to a Noble Lord* (London, 1796), 62. For a comprehensive discussion of such passages see Maurice Crosland, “The Image of Science as a Threat: Burke versus Priestley and the ‘Philosophic Revolution’,” *British Journal for the History of Science* 20 (1987): 277-307.

99. Thomas Paine, *The Age of Reason*, in *Collected Writings*, 670. Interestingly, Paine frequently uses technological metaphors and scientific methodology to make his case. This aspect of his discourse is further explored in Edward Larkin, *Thomas Paine and the Literature of Revolution* (Cambridge, 2005), 114-48.

100. See, for example, Thomas Williams, *The Age of Infidelity* (Boston, 1794), 37; Gilbert Wakefield, *An Examination of the Age of Reason* (Worcester, Mass., 1794), 24; and Elhanan Winchester, *Ten Letters Addressed to Mr Paine* (Boston, 1794), 24. On the general impact and influence of Deism and *The Age of Reason* in the United States see James H. Smylie, "Clerical Perspectives on Deism: Paine's *The Age of Reason* in Virginia," *Eighteenth-Century Studies* 6 (1972): 203-20; Gary B. Nash, "The American Clergy and the French Revolution," *William and Mary Quarterly* 22 (1965): 392-412; Kerry S. Walters, *Rational Infidels: The American Deists* (Durango, Colo., 1993); Robert M. S. Macdonald, "Was There a Religious Revolution of 1800?" in *The Revolution of 1800: Democracy, Race, and the New Republic*, eds. James Horn, Jan Ellen Lewis, and Peter S. Onuf (Charlottesville, Va., 2002), 173-98.

101. G. W. Snyder, *The Age of Reason Unreasonable, or, The Folly of Rejecting Revealed Religion* (Philadelphia, 1798), 98, 116.

102. Joseph Priestley, *Letters to the Inhabitants of Northumberland on Subjects Interesting to the Author* (Northumberland, Pa., 1799), 9.

103. Jean-Pierre Blanchard, "Preface," in *The Forty-Fifth Aerial Flight of the Universally Celebrated Mr. Blanchard, at Philadelphia* (Philadelphia, 1793), 3.

104. "Echo No. XI," National Gazette, January 12, 1793.

105. "Mr Fenno," Gazette of the United States, May 22, 1794.

106. Hugh Henry Brackenridge, *Modern Chivalry*, ed. Claude M. Newlin (New York, 1937), 370. Brackenridge's depiction of O'Regan's adventure probably owes something to the hugely popular and widely reprinted narratives about Baron Munchhausen, in which that Quixotic figure shoots down a balloon and "finds a French experimental philosopher suspended from it," before going on to construct a machine of his own, which he uses to play various tricks on the public. See Baron Munchhausen's *Narrative of His Marvellous Travels* (Newport, R. I., 1787), 2, 30-31.

107. For a perceptive discussion of the ideological tensions over fashion during the late eighteenth century see T. H. Breen, *The Marketplace of Revolution: How Consumer Politics Shaped American Independence* (New York, 2004). The socio-cultural significance of fashions in clothing is explored in Linda Baumgarten, *What Clothes Reveal: The Language of Clothing in Colonial and Federal America* (Williamsburg, Va., 2002).

108. "For the London Magazine," New-Haven Gazette, July 29, 1784.

109. William Cobbett, *The Bloody Buoy Thrown Out as a Warning to the Political Pilots of America* (Philadelphia, 1796), 170.

110. The eighteenth-century stereotype of French frivolity and excess, and Anglo-American reaction to it, is further discussed in Howard Mumford Jones, *America and French Culture, 1750 – 1848* (Chapel Hill, N. C., 1922); David Simpson, *Romanticism, Nationalism, and the Revolt Against Theory* (Chicago, 1993), 64-83; Susan Branson, *These Fiery Frenchified Dames: Women and Political Culture in Early National Philadelphia* (Philadelphia, 2001), 55-101.

111. “On Air Balloons,” *Independent Ledger*, October 11, 1784.

112. “New-Brunswick, December 7,” *Political Intelligencer*, December 7, 1784.

113. “Anecdote,” *Connecticut Courant*, March 16, 1784. Something of this English pride is evident in a song reprinted in the *Independent Ledger* in the same year, which begins: “That Blanchard’s been puffing and puffing again, / I hope my good friends you’ll agree, / He promis’d manœv’ring, alas! all in vain! / The duce of manœv’rer is he. / So Lunardi’s balloon, the English / Balloon, Lunardi’s balloon for me.” See “Lunardi’s Balloon,” *Independent Ledger*, December 13, 1784.

114. “Extract from a Letter,” *Massachusetts Spy*, January 29, 1784.

115. “Boston,” *Pennsylvania Gazette*, July 28, 1784; “December 14,” *Independent Journal*, February 16, 1785.

116. “Extract of a Letter,” *Virginia Journal*, September 23, 1784; “Advertisement,” *United States Chronicle*, December 9, 1784.

117. "Foreign Intelligence," *New-Jersey Gazette*, November 22, 1784.
118. This stereotype is further explored in William L. Chew, "'Straight' Sam Meets 'Lewd' Louis: American Perceptions of French Sexuality, 1775 – 1815," in *Revolutions and Watersheds: Transatlantic Dialogues, 1775 – 1815*, eds. W. M. Verhoeven and Beth Dolan Kautz (Amsterdam, 1999), 61-86.
119. "London, September 17," *Massachusetts Centinel*, November 24, 1784.
120. "Foreign Advices," *New-York Packet*, February 21, 1785.
121. "Boston," *Pennsylvania Gazette*, July 28, 1784.
122. "Extract of a Letter from London," *South-Carolina Weekly Gazette*, February 5, 1785.
123. For more detailed discussion of the emergence of consumerism in the eighteenth-century Anglo-American world see the essays collected in *The Birth of a Consumer Society: The Commercialization of Eighteenth-Century England*, eds. Neil McKendrick, John Brewer, and J. H. Plumb (London, 1982); *Consumption and the World of Goods*, eds. John Brewer and Roy Porter (London, 1993); *Of Consuming Interests: The Style of Life in the Eighteenth Century*, eds. Cary Carson, Ronald Hoffman, and Peter J. Albert (Charlottesville, 1994).

124. Michael R. Lynn, "Consumerism and the Rise of Balloons in Europe at the End of the Eighteenth Century," *Science in Context* 21 (2008): 73.

125. Sir Joseph Banks, Letter to Benjamin Franklin, September 13, 1783, in *The Letters of Sir Joseph Banks: A Selection, 1768 – 1820*, ed. Neil Chambers (London, 2000), 62.

126. Sir Joseph Banks, Letter to Benjamin Franklin, November 7, 1783, <http://www.franklinpapers.org/franklin/framedVolumes.jsp>. The Royal Society was not alone in treating ballooning with suspicion. Its New World equivalent, the American Philosophical Society, also sought to distance itself from the more populist aspects of the phenomena in order to preserve its scientific authority. See Michael E. Connaughton, "'Ballomania': The American Philosophical Society and Eighteenth Century Science," *Journal of American Culture* 7 (1984): 71-74. That the Philosophical Society had good reason to fear ballooning would damage its reputation is evident in a fictional letter to the *American Herald* by "Democritus" about one Dr Bubble, who is obsessed with testing "the inflammability of bowel air" for possible use in balloons. Accompanying Bubble to a meeting of the American Philosophical Society, Democritus is perplexed to see Bubble and his colleagues crowd around a volunteer who has "been fed upon PEAS for a fortnight," only for this human guinea pig to give "such premature and precipitate compression to his bowels, as to produce an expulsive explosion equal to that of an eight and forty pounder. Seven white periwigs lay smoking on the floor. This disaster, however, had no effect on their enthusiastic proprietors, who, regardless of cold or ridicule, remained eagerly intent

on the catching each his respective quantum of the precious effluviium.” See “From the Pennsylvania Journal,” *American Herald*, April 5, 1784.

127. Benjamin Franklin, Letter to Sir Joseph Banks, November 21, 1783, in *The Writings of Benjamin Franklin*, ed. Albert H. Smyth (New York, 1907), IX, 117.

128. Thomas Ewell, *Plain Discourses on the Laws or Properties of Matter* (New York, 1806), 8.

129. Hindle, *The Pursuit of Science in Revolutionary America*; John C. Greene, *American Science in the Age of Jefferson* (Ames, Iowa, 1984); James Delbourgo, *A Most Amazing Scene of Wonders: Electricity and Enlightenment in Early America* (Cambridge, Mass., 2006).

130. Miller, *A Brief Retrospect*, I, 11; Daggett, *Sun-Beams*, 17.

131. David Tappan, *Christian Thankfulness Explained and Enforced* (Boston, 1795), 23.

132. John Adams, “Discourses on Davila: A Series of Papers on Political History,” in *The Works of John Adams*, ed. Charles Francis Adams (Boston, 1851), VI, 274.

133. David Jaffee, “The Village Enlightenment in New England, 1760 – 1820,” *William and Mary Quarterly* 47 (1990): 327-46.

134. Richard L. Bushman, *The Refinement of America: Persons, Houses, Cities* (New York, 1992), 326.

135. William Gordon, *The History of the Rise, Progress, and Establishment, of the United States of America* (New York, 1789), III, 356.

136. [Jean-Pierre Blanchard], "Aerostation," *National Gazette*, December 22, 1792.

137. [Joseph Dennie], "Levity," *The Port-Folio* 2 (1802): 322

138. Sir Joseph Banks, Letter to Benjamin Franklin, November 28, 1783, <http://www.franklinpapers.org/franklin/framedVolumes.jsp>.

139. "The Lunar Travellers," *South-Carolina Weekly Gazette*, November 3, 1785.

140. Daggett, *Sun-Beams*, 7, 16. A useful variation on this argument for those who were not completely opposed to ballooning was to claim that contemporary philosophers had simply stolen the technology of flight from their more illustrious predecessors (and subsequently debased it). The *Daily Advertiser*, for example, argued that "our modern virtuosi frequently assume the merit of invention which properly belongs to the ancients," and that the Trojans had actually created the balloon. See "New York, July 24," *Daily Advertiser*, July 24, 1786.

141. John Gardiner, *An Oration, Delivered July 4, 1785, at the Request of the Inhabitants of the Town of Boston* (Boston, 1785), 10.

142. Ebenezer Kinnersley, "Notice is Hereby Given to the Curious," *Boston Evening Post*, October 7, 1751.

143. William Hooper, *Rational Recreations, in Which the Principles of Numbers and Natural Philosophy are Clearly and Copiously Elucidated, by a Series of Easy, Entertaining, Interesting Experiments* (London, 1782-83), I, ii.

144. "The Dangers of Delay," *Weekly Museum*, June 17, 1797.

145. Jeffries, *Narrative*, 5, 8.

146. Jessica Riskin, *Science in the Age of Sensibility: The Sentimental Empiricists of the French Enlightenment* (Chicago, 2002), 1. The relation between self and scientific fact in the eighteenth century is also usefully explored in Simon Schaffer, "Self Evidence," *Critical Inquiry* 18 (1992): 327-62, and Stuart Walter Strickland, "The Ideology of Self-Knowledge and the Practice of Self-Experimentation," *Eighteenth-Century Studies* 31 (1998): 453-71. For a compelling discussion of the emergence of the idea of scientific detachment in the nineteenth century see Lorraine Daston and Peter Galison, *Objectivity* (Boston, 2007).

147. Jeffries, *Narrative*, 16, 52.

148. Strickland, "The Ideology of Self-Knowledge," 454.

149. Jeffries, Narrative, 52.

150. [Anna Letitia Barbauld], "Washing Day," Federal Observer, December 6, 1798. This poem's response to ballooning is further explored in Elizabeth Kraft, "Anna Letitia Barbauld's 'Washing Day' and the Montgolfier Balloon," *Literature and History* 4 (1995): 25-41.

151. Crouch, *Eagle Aloft*, 26.

152. John Adams, Letter to Abigail Adams, January 9, 1793, in *Letters of John Adams, Addressed to His Wife*, ed. Charles Francis Adams (Boston, 1861), II, 119; Adams, *Diary and Autobiography of John Adams*, ed. L. H. Butterfield (Cambridge, Mass., 1961), III, 169. For a more general discussion of Adams' attitude toward science see I. Bernard Cohen, *Science and the Founding Fathers: Science in the Political Thought of Jefferson, Franklin, Adams, and Madison* (New York, 1995), 196-236.

153. "Extract of a Letter from London," *South-Carolina Weekly Gazette*, February 5, 1785.

154. "A Dialogue Between Two Modern Wives," *Continental Journal*, January 4, 1787.

155. For an exhaustive account of ballooning in the nineteenth century see Crouch, *The Eagle Aloft*, 119-529. The fact that from 1800 onward the creation of balloons in

exotic shapes begins to proliferate perhaps confirms that the problem of navigation is no longer central, that ballooning has become a mere entertainment, and that impresarios needed something new to attract a jaded public. “The Great Mustapha, ... a Wonderful Aerostatique Machine in the Shape of A GIANT, Thirty Feet high, dressed in a Turkish Habit,” promoted in the Daily Advertiser, July 11, 1800, is typical of this new breed of balloons.

156. Blanchard’s financial situation had always been somewhat precarious. As noted in “Philadelphia, Saturday, June 6,” General Advertiser, June 6, 1793, it was difficult for Blanchard to fulfill the subscriptions he offered to support his flights when they could be seen by anyone who happened to be nearby, his ascensions often taking place “in the presence of ... few paying, but a vast concourse of non-paying spectators.” The New-York Diary, however, blamed his departure on his own financial delinquency, observing that “Blanchard has at last taken his flight – not in the air, as he had proposed, but on dry land. ... [A]nd this circumstance is proof that his conduct toward Mr Baker lost him the confidence of the citizens.” See “Communication,” New-York Diary, May 11, 1797.

157. For a detailed discussion of the circulation and influence of Franklin’s maxim see Seymour L. Chapin, “A Legendary Bon Mot?: Franklin’s ‘What is the Good of a Newborn Baby?’,” *Proceedings of the American Philosophical Society* 129 (1985): 278-90. Faraday concluded an 1816 lecture on chlorine by declaring that: “I will point out its history, as an answer to those who are in the habit of saying to every new fact, ‘What is its use?’ Dr Franklin says to such, ‘What is the use of an infant?’” See *The Life and Letters of Faraday*, ed. Bence Jones (London, 1870), I, 218. The changes

which took place in American science during the nineteenth century are discussed in George H. Daniels, *American Science in the Age of Jackson* (Tuscaloosa, 1994).

158. Henry James, "Preface to the New York Edition of *The American*," in *The American*, ed. James W. Tuttleton (New York, 1978), 10.