

Benjamin Franklin and the American Enlightenment

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America's revolutionary leaders, though wary of excessive personal ambition, were nevertheless acutely conscious of their claim to *fame* with posterity. What they sought had little in common with *celebrity*, the fame we associate with Britney Spears, Posh Spice or Donald Trump, indeed, it was nearly its antithesis. The pursuit of fame, in the eighteenth-century meaning of that word, had a dynamic quality, encouraging one to make history, to leave the mark of one's deeds and ideals on the world. And unlike the momentary glories of celebrity, fame, as historian Douglass Adair has noted, was thought to be "more public, more inclusive, looking to the largest human audience, horizontally in space and vertically in time."¹

As things turned out, many of America's revolutionary leaders achieved their goal: they have been elevated to a stature, at least within America, that transcends the individual details of their day-to-day lives as mere mortals and have been made to serve as models of virtue and correct behavior for subsequent generations of Americans. The primary exemplar has of course been George Washington: raised to the stature of a deity in the American consciousness even before his death, as the nineteenth century progressed, he was elevated even higher. Whether in the school-book homilies of Parson Weems or in the hagiographic biography penned by Chief Justice John Marshall in 1832, Washington emerged in the American consciousness as larger than life, a figure, in the English historian Marcus Cunliffe's words, "entombed in his own myth, a metaphorical Washington monument."²

Thomas Jefferson, though his claim to enduring fame took longer to establish, is now presented to us in almost equally imposing fashion. If Washington is the American "Cincinnatus" – the heroic citizen who trades the ploughshare for the sword when liberty is threatened – then Jefferson has become the philosopher statesman, the intellectual leader of the revolutionary experiment. Though in recent years there has been more emphasis on some of Jefferson's obviously more human qualities – the speculations, now perhaps confirmed by DNA evidence about his relationship with his mulatto slave, Sally Hemings, being the most obvious example– it is the force of his intellect that causes him to endure in the public mind.³

Benjamin Franklin, no less than Washington and Jefferson, was consistently preoccupied with posterity's views of his life and accomplishments. As early as 1728, when he was just beginning his career as a printer, he took advantage of his skill in his trade to compose one of America's most famous epitaphs:

The body of
B. Franklin,
Printer:
Like the cover of an old Book,
Its Contents torn out,
And stript of its Lettering and Gilding,
Lies here, Food for Worms,
But the Work shall not be wholly lost:

For it will, as he believ'd, appear once more,
Corrected and amended
By the Author.⁴

The job of revising and amending the plan of his life would be a constant one for Franklin. In his multiple roles as printer, politician, scientific investigator, humorist, and, most self-consciously, autobiographer, Franklin would work all of his life to insure that his fame would be lasting. Unlike that of his contemporaries, Washington and Jefferson, however, Franklin's public image – in the eighteenth century as well as in the twenty-first – was neither austere nor forbidding: indeed, the historical Franklin not only seems more accessible to posterity, but also more affable. This accessibility and affability – in part the consequence of a sense of humor that Jefferson, in particular, lacked – have insured Franklin's popularity with subsequent generations of Americans, while, in a peculiar way, detracting from his *fame*. There are, after all, imposing monuments in the nation's capital to Washington and Jefferson – a towering 555 foot obelisk somehow representative of Washington's forceful, but impersonal, presence in our historical consciousness and a miniature replica of the Pantheon in Rome symbolizing Jefferson's dual role as republican citizen and philosopher – but none to Franklin. Rather than appearing heroic, Franklin has tended to be presented as one of us-- the embodiment of many of our aspirations and our failings – as Americans.

Our best-known images of Franklin reinforce our sense of both his character and that of the young American society in which he was raised. Indeed, Franklin's life story is often presented as nearly a surrogate for the history of America in the age in which he lived. Few stories are better known, or better told, than Franklin's own account of his initial arrival in Philadelphia at the age of 17. "I was dirty from my journey, my pockets were stuff'd out with shirts and stockings, and I knew no soul nor where to look for lodging. I was fatigued with Travelling, rowing, and want of rest: I was very hungry; and my whole stock of cash consisted of a Dutch dollar and about a shilling in copper." Armed with that meager store of personal possessions, he purchased "three great puffy rolls" which he carried with him as he made his entry into the city whose social, political, and intellectual life he would do so much to transform over the next three-quarters of a century.⁵

That account of humble beginnings – truthfully, but self-consciously constructed by Franklin nearly fifty years later when he began work on his *Autobiography* – has been accepted as the tale of America's first Horatio Alger. It is one in which, far from hiding his humble beginnings, the author boasts about them in order to demonstrate that the attributes of industry, independence, and innovativeness are far more important indicators of self-worth than inherited wealth or hereditary privilege. Those are of course precisely the values that have been most championed as distinctly "American" from Franklin's time down to the present, and even if America's promise of prosperity and success for the industrious has not always been fulfilled in reality, it has nevertheless exerted a powerful hold on the imagination of millions of Americans and prospective immigrants to America.⁶

Some of our most enduring images of Franklin come from his activities in the field of natural science, yet even these have tended to move toward caricature. The best known comes from his famous kite-flying experiments, which garnered for him an international reputation as the man capable of making "the very heavens obey him".⁷ The scholarly literature on Franklin's contributions to our understanding of both the scientific

properties and practical uses of electricity does, in fact, confirm his claim to lasting importance in the history of science: but the popular image is far more simplistic – a kind of cross between Rube Goldberg and Mr. Wizard, tinkering in his homemade laboratory and succeeding in spite of his ignorance of European principles of science. His accomplishments in those areas have been depicted as of a peculiarly “American” variety. Daniel Boorstin, for example, has commented: “on rare occasion, an American could discover something, even in physics, simply because he was less learned than his European colleagues.” According to Boorstin, it was Franklin’s and by implication, America’s “Naiveté” which permitted him to cut through the clutter of past hypotheses to obtain genuinely fresh insights.⁸

Franklin’s own ability to identify himself with a set of values and aspirations that were quintessentially “American” has not been an unmixed blessing with respect to posterity’s view of him. While many have lauded him as a shining exemplar of the virtues of American capitalism, others are less complimentary. Perhaps the most oft-quoted disparagement of Franklin came from the pen of D. H. Lawrence. Reacting to what he believed to be the self-righteousness underlying many of Franklin’s moralisms in the *Poor Richard’s Almanack* series, Lawrence complained that “Franklin made a list of virtues, which he trotted inside like a grey nag in a paddock. . . . I do not like him.” Even Franklin’s remarkable accomplishments as a civic leader in Philadelphia have not escaped criticism. The literary critic Charles Angoff, assessing Franklin’s activities as Philadelphia’s leading citizen, described him as a “cheap and shabby soul. . . . He represented the least praiseworthy qualities of the inhabitants of the New World: miserliness, fanatical practicality, and lack of interest in what are usually known as spiritual things. Babbitry was not a new thing in America, but he made a religion of it, and by his tremendous success with it he grafted it upon the American people so securely that the national genius is still suffering from it.”⁹

Whether we accept the assessment of Boorstin or of Lawrence and Angoff, we are left with a set of caricatures. In either case, Franklin’s very accessibility – his standing as a “typical American” – has tended to reduce his stature.

In turning Franklin into a caricature, we obscure the substance of his contributions to what historians have termed “the Age of Enlightenment,” which was, in reality, not so much an “age” as an “impulse,” fuelled by a heightened sense of optimism about the ability of men and women to use their rational powers not only to understand the laws of the universe, but also to devise means by which to use those laws for the betterment of mankind.

Franklin’s contributions to enlightenment thought far transcended the boundaries of his own country: his reputation as a scientist and as a philosopher was, deservedly, an international one. Yet we must not, in our urge to free Franklin from the baggage associated with his image as “typical American,” divorce him entirely from his American upbringing and experience. Despite the fact that he spent nearly 27 years of his life outside the boundaries of North America, his temperament and habit of mind were shaped in countless ways by the natural landscape and social structure of America. The extraordinary novelty and variety in that landscape would give to Franklin, in common with many other American enlightenment figures a sharpened sense of empirical observation and induction: the more open-ended social structure of eighteenth century America encouraged in Franklin an optimism about humanly-created institutions – be they legislatures or fire companies or colleges – that citizens of European societies, more

heavily encumbered by tradition, would have found difficult to share. Perhaps more important, Franklin's own life experiences and accomplishments would serve as models – as he wished them to do – for countless Americans both in his age and in subsequent generations.

Franklin lived a long and extraordinarily varied life, but the remainder of this essay will focus on the period of Franklin's life from 1723-1756. During that period, Franklin began his career as a tradesman in Philadelphia, achieved striking financial and public success, and then, 'retiring' from purely commercial pursuits at the age of 42, he began, in a purposeful, self-disciplined, and self-conscious fashion wholly typical of him, to devote himself to "such points as may produce something for the common Benefit of Mankind."¹⁰

Unlike those whose success is the result of a single minded devotion to a goal, Franklin brought to his quest for achievement a remarkable diversity of interests. Throughout his entire career, however, there were particular aspects of his personality that sustained him. One of these, a substantial personal ambition, a drive for success, generated the enormous emotional and intellectual energy necessary for the diverse challenges he was to undertake. It was of course that personal ambition that led critics like Angoff and Lawrence to denounce Franklin as a symbol of the American bourgeois mentality. If it had been ambition alone that drove Franklin that charge might perhaps have some merit. Joined to it, however, was an intellectual curiosity more vital, more catholic than that of any man or woman of Franklin's era or any other. And while Franklin was notably successful in channeling his curiosity toward utilitarian ends, it is impossible, as one watches him pursue his interests over the course of his life, to ignore the sheer pleasure that he took in the thrill of intellectual discovery for its own sake.

Unlike most mortals, Franklin was able to generate an enthusiasm that caused his intellectual curiosity to grow rather than diminish over time, and it would be that curiosity and intellectual openness, more than any other aspect of his personality that came to define his greatness. Joined to his curiosity and his ambition, there was a remarkable sense of humor both about himself and the condition of the world around him. In the hands of a more self-serious individual, Franklin's moralisms and maxims might have seemed self-righteous and tendentious, but his gift for self-deprecation – his willingness to admit that he himself frequently fell short of the ideal – served as a leavening agent in all of his many endeavors. Franklin's wit, like his intellectual curiosity, seemed to grow rather than diminish over time, while the young Franklin may have been overly-earnest in his quest for success, the mature Franklin was more apt to temper his ambition with irony and self-deprecation.

In the beginning there was ambition, the ambition that made him impatient of the constraints imposed upon him as an apprentice printer working under the supervision of his brother James in Boston. At the age of sixteen, fearing 'that my Brother would object to printing any Thing of mine in his Paper if he knew it to be mine, I contriv'd to disguise my Hand; and writing an anonymous Paper, I put it in at Night under the Door of the Printing House.'¹¹ Thus was born *Silence Dogood*, Franklin's first successful entry into the public prints, very much in the prevailing mode of satiric writing currently appearing in London newspapers – particularly that of Joseph Addison in the 'Spectator' but with distinctly American touches.

Introducing herself to her readers in Letter No.1 in the April 2, 1722 edition of James Franklin's New England 'Courant' the pseudonymous Ms. Dogood observed 'that the Generality of People, now a days, are unwilling either to commend or dispraise of what they read, until they are in some measure informed who or what the Author of it is, whether he be POOR or RICH, OLD or YOUNG, a SCHOLLAR or a LEATHER APRON MAN, ETC. The description she gives of herself sounds very much like the young Franklin – born in humble circumstances, bound out as an apprentice t an early age, and taking 'more than ordinary delight in reading ingenious books'. Perhaps most telling, Silence Dogood characterized herself as one, who 'never intended to hide my Talent in a Napkin,' signalling her intention of making her mark on the public consciousness.¹² The particular targets of Silence Dogood's wit were the wealthy and prominent of Boston and the eminences of Harvard College; as Esmond Wright has noted, "Silence Dogood was obviously derivative: an unpolished 'Spectator' bred on the Yankee frontier...but for one whose trade was words this was a rich apprenticeship: it taught the merits of a plain style and of irony as a weapon."¹³ To the late twentieth century, and with the knowledge that they were written by an earnest sixteen year old, the Silence Dogood pieces seem not only precocious, but a little precious as well, they nevertheless announce the entrance on the public stage of a young man of considerable literary and journalistic ambition.

The same ambition that motivated Franklin to embark on the Silence Dogood series impelled him, just a year later, to leave Boston altogether, journeying first to New York in search of employment and, when prospects there looked less-than- promising, on to Philadelphia. After little more than a year in Philadelphia, he was off again to London to purchase for himself the necessary items to begin his own printing business. Franklin returned to Philadelphia in October, 1726, first to work as a clerk in Thomas Denham's merchant house and shortly thereafter to return to the printing shop of his original employer, Samuel Keimer. He could claim much valuable experience, but an ambition largely unfulfilled. This was the point at which he began in earnest his 'multiple life' – as journeyman printer, businessman, and, increasingly, community organizer and publicist.

One of the most important developments at this stage of his career, both in purely practical and intellectual terms, was his central role in creating the Junto, or Club of Leather Aprons.¹⁴ The Junto is an excellent expression of the way in which ambition and intellectual curiosity combined to propel Franklin to prominence. Composed of a group of Franklin's fellow tradesmen and friends, its purpose was both practical and high-minded. In today's parlance the Junto would certainly be termed a good example of 'networking' – the coming together of individuals of complementary business and public interests for their mutual benefit. But it would be a mistake to categorize the Junto merely as an outlet for Franklin's practical ambitions. The topics of discussion at their meetings ranged from the purely practical ('Hath any citizen in your knowledge failed in business recently, and what have you heard of the cause?') to civic-minded (e.g. proposals for a city police force and a fire company) to purely speculative (e.g. 'Can a man arrive at perfection in this life, as some believe, or is it impossible, as others believe?')

The Junto, though it began as a society composed of ambitious, enterprising, but primarily young and poor men, flourished under Franklin's leadership, so much so that other clubs fashioned after it soon sprang up in imitation. When, in May, 1743, Franklin proposed the creation of the American Philosophical Society (an idea not entirely his own, as his friend John Bartram, the botanist, had for several years been urging the creation of a society of "ingenious and curious men") he had in mind a sort of inter-

colonial Junto. Noting that “the first Drudgery of Settling new Colonies... is now pretty will over; and that there are many in every Province in Circumstances that set them at Ease, and afford Leisure to cultivate the finer Arts, and improve the Common Stock of Knowledge,” Franklin proposed that a society of “Virtuosi of ingenious Men residing in the Several Colonies” form themselves into a Society and maintain a “constant Correspondence” with one another. The range of subjects about which the members were to correspond illustrates nicely Franklin’s ambition and interests, and, in particular, reflects the way in which the American landscape acted as a stimulus to his thinking. Many of the Society’s concerns were to be focused on natural history-- to cataloguing and understanding the vast array of “Plants, Herbs, Trees, Roots & their Virtues, Uses, & Methods of Propagating them, and making such as are useful, but particular to some Plantations, more general.” Similarly, Franklin was interested in propagating “New and Useful improvements” in Mathematics and Chemistry and in encouraging the systematic surveying and mapping of America’s vast and, as yet, largely uncharted domain. Ever the enterprising tradesman, Franklin also called for investigation into “all new Arts, Trades, Manufactures etc that may be proposed or thought of.” The underlying rationale behind all of these varied inquires, though, was to ‘let Light into the Nature of Things” and “to increase the Power of Man over Matter, and multiply the Conveniencies or Pleasures of Life.”¹⁵

This emphasis on “useful knowledge,” so striking in many of Franklin’s writings, has led historians to underscore the practical and “American” quality of Franklin’s thoughts and deeds. But his advocacy of the useful in no way limited his appreciation or comprehension of the theoretical. Certainly, one of his most “useful” and “practical” inventions was the so-called Pennsylvania fireplace, a piece of equipment that he was fashioning at the time he was organizing the American Philosophical Society. Franklin’s description of his invention appeared in pamphlet form in order to enable Robert Grace to sell the stoves that he was manufacturing according to Franklin’s plan; but Franklin the savvy businessman often gives way to Franklin the scientist. The pamphlet begins, not with a sales pitch, but with a learned scientific treatise, complete with notes, on the manner in which heated air rises and cold air replaces it. After describing the elemental properties of air and fire, Franklin moves into a lengthy discussion of the construction of chimneys and of the way in which light, heat and smoke interact in a chimney. Only when the science underlying his invention has been dealt with does Franklin the salesman take over; what follows is a fearsome catalogue of the dangers and inconveniences of conventional fireplaces, a carefully illustrated guide to the construction principles of his own, improved version, and then a listing of fourteen advantages, complete with answers to anticipated objections, of the Franklin stove over its competitors.¹⁶

By 1748, Franklin the printer and businessman had made a substantial fortune that would permit him the luxury of retiring from purely commercial pursuits. In a purposeful, self-disciplined, and self-conscious fashion typical of him, he would devote himself to those projects aimed at “the common Benefit of Mankind.” The major focus of his activities for the next decade would be in the field of natural science, with the crowning achievement of his efforts in that field a result of his famous kite-flying experiments. By the time he wrote his “Experiments and Observations on Electricity made at Philadelphia, in America (1751),” the Royal Society of London, which had earlier declined to publish his findings, had begun to take notice; within a year, Franklin’s work was being lauded throughout the continent, and by 1756 he became the first American admitted to the Royal Society. ¹⁷

Both the experiments and his manner of describing them amply illustrate the combination of the practical and the theoretical in his scientific method. Though others had already theorized that lightning and electricity had identical properties, it was Franklin the tinkerer who designed the experiment that lent empirical substance to those theories. Once he had successfully conducted his experiments he wasted no time in putting his newly-discovered ‘practical knowledge’ to good use in the design, promotion, and distribution of the lightning rod, a device that gained rapid acceptance throughout America and Europe.

Franklin could say that he, with Silence Dogood, was never one ‘to wrap my Talent in a Napkin.’ Thus, with little difficulty, Franklin the scientist became Franklin the promoter and popularizer of the lightning rod. (He utilized the pages of the 1753 edition of *Poor Richard’s Almanack*, a medium certain to gain maximum exposure for his device, to reveal the secrets of ‘How to Secure Houses, etc. from Lightning.’) On the other hand, Franklin never patented his lightning rod nor attempted to profit from its manufacture; it was curiosity in its purest form that motivated him in a long series of electrical experiments between 1746 and the kite-flying experiment in 1752. His new house on the corner of 2nd and Race Streets was filled with a jumble of electrical equipment, and he issued forth a constant flow of communication to his friends about his progress. Throughout it all, intellectual curiosity was leavened by the irrepressible Franklin wit. Writing to Peter Collinson in 1749, Franklin noted his chagrin that thus far no-one had been able to find any practical uses for electricity. He went on to propose a “party of Pleasure on the Banks of the Schuylkill” in which “Spirits are...to be fired by a Spark sent from Side to Side thro the River. A turkey is to be killed for our Dinners by the Electric Shock, and roasted by the electrical jack, before a Fire kindled by the Electrified Bottle; when the Healths of all the famous Electricians in England, Holland, France, and Germany are to be drank in Electrified Bumpers, under the discharge of Guns from the Electrical Battery.”¹⁸

Historians of science have devoted countless volumes to analyses of the character of Franklin’s accomplishments in the field of science. Though they continue to argue over some of the details, there does seem to be pretty universal agreement over Franklin’s genius in this area. It is certainly true that Franklin was always alert to the practical value of his scientific experiments, constantly fashioning useful “instruments”—the Franklin stove, the lightning rod, bi-focals, and innumerable other improved devices—from his scientific observations, but he was not merely a gadgeteer; he had, as Adrienne Koch has observed, “a full appreciation of the intrinsic value of knowledge as a supreme expression of human delight.”¹⁹ His contemporary, Sir Humphrey Davy, in perhaps the most balanced judgment of the quality of Franklin’s science, wrote:

“A singular felicity of induction guided all his researches and by very small means he established very grand truths. The style and manner of his publication are almost as worthy of admiration as the doctrine it contains. He has endeavored to remove all mystery and obscurity from the subject: he has written equally for the uninitiated and for the philosopher; and he has rendered his details amusing as well as perspicacious, elegant as well as simple. Science appears in his language in a dress as wonderfully decorous, the best adapted to display her native loveliness.”²⁰

If Humphrey Davy has perhaps best captured the character of Franklin’s scientific contributions, it is Franklin himself who gives us the most vivid sense of the spirit that

guided his inquiries. The year was 1755, he was one year short of his 50th birthday. He was out on horseback in Maryland with his friend and host, Colonel Tasker. As they were riding along he spotted “a small whirlwind beginning in the road and showing itself by the dust it raised and contained.” True to his scientific spirit, Franklin recorded his impressions of the whirlwind in great detail. It appeared, he recalled, “in the form of a sugar loaf, spinning on its point, moving up the hill toward us, and enlarging as it came forward. When it passed by us, its smaller part near the ground appeared no bigger than a common barrel, but, widening upwards, it seemed at 40 or 50 feet to be 20 or 30 in diameter. But Franklin was not content merely to stand aside and describe the superficial properties of this natural phenomenon.

“The rest of the company stood looking after it,” he recalled, “but my curiosity being stronger, I followed it, riding close by its side, and observed its licking up, in its progress, all the dust that was under its smaller part. As it is a common opinion that a shot, fired through a water-spout, will break it, I tried to break this little whirlwind, by striking my whip frequently through it, but without any effect. Soon after, it quitted the road and took into the woods, growing every moment larger and stronger, raising instead of dust, the old dry leaves with which the ground was thick covered, and making a great noise with them and the branches of the trees, bending some tall trees round in a circle swiftly and very surprisingly. . . . By the leaves it was now filled with, I could plainly perceive that the current of air they were driven by, moved upwards in a spiral line; and when I saw the trunks and bodes of large trees envelop’d in the passing whirl, which continued entire after it had left them, I no longer wondered that my whip had no effect on it in its smaller state. I accompanied it about three quarters of a mile, till some limbs of dead trees, broken off by the whirl, flying about and falling near me, made me more apprehensive of the danger; and then, I stopped, looking at the top of it, as it went on, which was visible by means of the leaves contained in it for a very great height above the trees.”²¹

Franklin, well into his middle-age in 1755, had been chasing whirlwinds all of his life; propelled by a powerful and consistently good-natured curiosity, he would continue to do so for forty-five years after that encounter in Maryland. What a wonderful lesson for all of us as we contemplate the most satisfying manner in which to spend our days on this fascinating planet.

¹ Trevor Colbourn, ed., Fame and the Founding Fathers: Essays by Douglass Adair, (New York, 1974,) pp. 10-11.

² Marcus Cunliffe, George Washington: Man and Monument (Boston, 1958), p. 14. A number of Washington biographers have picked up on the themes articulated by Cunliffe. One of the most provocative is Garry Wills, Cincinnatus: George Washington and the Enlightenment (New York, 1984).

³ The body of literature on Jefferson’s intellectual and personal lives continues to grow. Among the best recent biographies are: Joseph Ellis, American Sphinx: The Character of Thomas Jefferson (New York, 1996) and R.B. Bernstein, Thomas Jefferson (New York, 2003).

⁴ Leonard Labaree, William Willcox, et.al, eds. The Papers of Benjamin Franklin (29 vols. To date, New Haven, Conn., 1959--), I, 111 (hereafter cited as Franklin Papers).

⁵ Benjamin Franklin, Autobiography, in J. A. Leo LeMay, Benjamin Franklin: Writings (New York, 1987), p. 1329.

⁶ Parson Weems, in addition to his work in mythologizing George Washington, composed an equally flattering portrait of Franklin. Of Franklin's entry into Philadelphia, Weems writes:

“Here was a sad prospect for poor Ben—not a dollar in his pocket—and no appearance of any employment to get one—But having, from his childhood, been accustomed to grapple with difficulties and to overcome them, Ben saw nothing here but another trial of courage and another opportunity for victory and triumph.”

Mason Locke Weems, The Life of Benjamin Franklin (Philadelphia, 1845), p. 51.

⁷ The description comes from William Pierce, on the Franklin's fellow delegates to the Constitutional Convention in 1787, and is printed in Max Farrand, Records of the Federal Convention of 1787 (4 vols. New Haven, Conn., 1911), III, 91.

⁸ Daniel Boorstin, The Americans: The Colonial Experience (New York, 1958), pp. 251-52.

⁹ Both Lawrence's and Angoff's assessments are quoted from Esmond Wright, Franklin of Philadelphia (Cambridge, MA and London, 1986), pp. 2,3.

¹⁰ Franklin announced his intention to Cadwallader Colden, September 29, 1748, Franklin Papers, III, 318.

¹¹ Lemay, ed., Autobiography, p. 1323.

¹² Franklin Papers, I, 8-46.

¹³ Wright, Franklin of Philadelphia, p. 23.

¹⁴ These early entrepreneurial aspects of Franklin's life can be followed in any of a number of Franklin biographies. The most recent of these is Walter Isaacson, Benjamin Franklin: An American Life (New York, 2003), esp. pp. 52-102. The best and most comprehensive biography of Franklin remains Carl Van Doren, Benjamin Franklin (New York, 1938).

¹⁵ Franklin Papers, II, 380-83..

¹⁶ *Ibid.*, II, 419-21.

¹⁷ The best work on Franklin's science remains I. Bernard Cohen, Benjamin Franklin's Science (Cambridge, MA, 1990) and Franklin and Newton (Philadelphia, 1956).

¹⁸ Franklin to Collinson, Franklin Papers, III, 364-65.

¹⁹ Adrienne Koch, The American Enlightenment (New York, 1965), p. 53.

²⁰ Quoted in Wright, Franklin of Philadelphia, p. 72.

²¹ Franklin to Peter Collinson, August 25, 1755, Franklin Papers, VI, 167-68.