

*Cultures of Invention: Exploring  
Tom Paine and his Iron Bridge  
in the Digital Age*

EDWARD GRAY

**J**OHN HENCH ASKED ME to participate in this panel because he believes that I am young and a product of the digital age. (The latter assumption no doubt comes from my work as editor of *Common-place*, the interactive journal of early American life co-sponsored by AAS and Florida State University.<sup>1</sup>) Clearly I've fooled him. I am not that young—forty-one to be exact. And I am not a product of the digital age. I wrote my first college papers on a typewriter and when I got to graduate school way back in 1989 nobody had e-mail and next to nobody had heard of the World Wide Web. When I first began working on my dissertation, the most technologically advanced research tool at my disposal was the microfilm reader. I even remember fantasizing about owning one and actually called a few dealers to price used machines. This quickly cured me of that particular fantasy.

I am now a tenured professor at a large state university, and now—you can take my word for it—everybody has heard of the

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1. I arrived at *Common-place* as editor too late to claim credit for commissioning the three articles about Readex that have appeared in the journal: Katherine Stebbins McCaffrey, 'American Originals'; Cathy N. Davidson, 'From Movable Type to Searchable Text'; and Jay Fliegelman, 'An MRI of Early America.' *Common-place*, vol. 3 (April 2003). <http://www.common-place.org/vol-03/no-03/>.

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World Wide Web and pretty much everybody has e-mail. I can not even begin to tell you what the most technologically advanced research tool at my disposal is. I suppose it has to do with digitization and web-based applications and HTML and all that. What I can tell you is that in the fifteen or so years since I began serious historical research and writing, my entire research world has changed and it has done so mostly for the better. Much of this is owing to the evolving partnership between Readex and AAS. But more on that later.

Before I describe for you how the digital age has begun to shape my own research, let me make one confession: I used the old Evans opaque cards when I was in graduate school but only when the John Carter Brown Library (JCB)—the institution where I did most of my dissertation research—did not have a hard copy of what I was interested in. I'm sure if I had not had ready access to the JCB, I would have developed techniques for enduring hours before the micro-card reader. Perhaps something involving ice-packs and espresso. Thankfully, this was not a hardship I had to endure.

I should also confess that my inclination to turn to the JCB stacks instead of the AAS-Readex/Evans micro-cards owed something to a peculiar affliction. Like many historians, I am a bibliophile. I love books. I love to hold books; I love to smell them; most of all, I love to buy them. Unfortunately, John Eliot's *Algonquian Bible* (an extremely scarce seventeenth-century book that was integral to my dissertation research) was not something I could afford. Fortunately, Brown owned several copies, one of which is annotated with a yet-to-be decoded shorthand. As far as I know, this copy would be unavailable to users of Early American Imprints. When I was young, this fact would have confirmed what I believed at the time: that the micro-card AAS/Readex Early American Imprints collection was a fine reference tool but no way to do serious research.

I say all this by way of indicating that I was once the worst possible spokesman for Readex—averse to physical suffering and in love with real books. Now, I believe, I am one of the best.

How do I account for this about-face? Much of this is owing to my change of circumstances. I now live hundreds of miles from the sort of institution that is likely to own an original Eliot Bible. My university does own the micro-card set of Early American Imprints, and when I first arrived I used it several times. This was not a pleasant experience: squinting at tiny, dimly lit words projected through a cloudy lens onto a reading surface smudged by ill-use and neglect. I suspect if I had used it more I would have found additional problems. If the reshelving of micro-cards is anything like the reshelving of books in our library, I would have spent hours searching for that one card I needed.

I have been fortunate not to have to face these problems. My university subscribes to the Digital Evans and just this year began subscribing to the digital Shaw-Shoemaker. My colleagues and I are hoping that Early American Newspapers will be added to our list of databases, but this seems unlikely given our all-too-familiar budgetary woes.

So, rather than dwell on the negative, let me instead give you some sense of how these resources have shaped my own research. As a time-saving technology, the benefits are endless and obvious. Simple things like checking quotes or citations become not a matter of a trip to the library but a few points and clicks with the mouse. Of much greater significance, it seems to me, are the ways the Digital Evans allows me to think about my subject matter. I consider myself a cultural and intellectual historian. I am interested in past thoughts and cultural habits from a kind of anthropological perspective: I like to find what is peculiar and distinctive about them; what makes them emblematic of their age. The ability to search an entire corpus of early American printed matter serves this interest spectacularly.

Take for example one of my current areas of research: Tom Paine's iron bridge. As some of you know, Paine devoted much of his later life to designing and promoting an iron bridge. What interests me about this project is what it says about the broader culture of invention in the era of the American and

French revolutions. My working hypothesis is that if understood in terms of a broader culture of invention (what at the time was sometimes called a 'projecting' spirit), the bridge becomes more than simply the hobbyhorse of a notable American. It also becomes a richly meaningful cultural artifact from a unique age.

The search functions of the Digital Evans immediately help confirm this hypothesis. Consider the results of the most basic search for the phrase 'Iron Bridge.' This produces several titles. One is *The American Oracle* by the Worcester Loyalist astronomer and physician Samuel Stearns that was published in 1791. It is unlikely that in the days of micro-cards my research would have led me to this title. There is nothing in the bibliographic entry that obviously speaks to Paine's iron bridge. The book is about useful knowledge generally, but there are many such books. And I probably would not have turned to a Loyalist to learn something about the radical Paine's project.

Yet, buried in the sixty-third chapter on page 623 is a list of 'Notable Discoveries, Inventions, and Opinions.' The list includes the following, in this order:

Air Balloons invented in France

Dr. [Joseph] Priestley's Discoveries of the qualities of the air—  
in England.

The Hon. Baron Swedenborg's Theology.—Great Britain

The strange mode of worship adopted by the *Shaking Quakers*,  
in America.

A remarkable *Iron Bridge*, built over the river Severn, at  
Colebrooke-Dale. . . , near Wales, in England

Turn the page, and the list continues:

Animal Magnetism

The American Constitution, framed by the Federal Conven-  
tion, at Philadelphia

The Albion Grist-mills, with 20 pair of stones, carried by a steam of fire, near Black Friar's bridge near London.

The *Radix Ginseng*, [Ginseng Root, a staple of the new China Trade] in Canada, Vermont and Pennsylvania.

And then finally, on the third page the list concludes:

A new *washing-mill*, London.

A curious iron bridge, to be placed over the Schuykil, near Philadelphia, invented by Mr. Thomas Paine, in England.

What a remarkable and rich artifact: here we have the American Constitution, the new gold of the China Trade (Ginseng), the theology of a Swedish natural theologian and mystic, and Paine's proposed bridge lumped together as among the age's most notable innovations. What is the significance of this? Clearly, it shows that Paine's was an era where the organization of knowledge remained fluid and uncertain. The invention of governments, the invention of bridges, the invention of theologies—these were all acts of invention and thus of a piece. But it also shows that something as seemingly mundane as an iron bridge could sit comfortably among the greatest human achievements of the day. In other words, it shows that in Tom Paine's world, a bridge was never just a bridge. Not unlike the personal computer in our own day or the automobile in the 1950s, the iron bridge became something far greater than simply an engineering marvel. It became a symbol for revolutionary change in everyday life.

But what else might Stearns's list reveal? Might there be something more, for instance, to the juxtaposition of technological and theological innovation?

I click on the next item on my list of results. It is entitled *Posthumous pieces of the Reverend John William de la Flechere . . .* published in 1793. De la Flechere, also known as Fletcher, was the Swiss-born curate of Madeley, the parish in Coalbrookdale where the

iron master Abraham Darby built Britain's first iron bridge. Again, I instantly discover something about the iron bridge. In this book, on page 57, is printed a letter de la Flechere wrote to an English friend. In it he laments his inability to 'shake the dry bones' of his parishioners into revival. Then, in the same paragraph, he thanks his friend for an image of the iron bridge linking his parish to the parish of Benthall across the Severn River Gorge and concludes with this striking passage: 'I hope the word, and the faith that works by love, will erect a more solid and durable bridge, to unite those who travel together towards Sion.' Here we have another interesting juxtaposition: an image of perhaps the greatest technological icon of the time and the use of the 'solid and durable' bridge as a metaphor for the evangelical reconstruction of heaven on earth.

How curious that something the world's most famous deist—Tom Paine—invested so much of himself in would become an appealing metaphor for these evangelicals. More questions arise: was the iron bridge one of those things—like the railroad or the machine gun—whose significance was in the eye of the beholder? Was it, that is, something of an empty vessel, an ambiguous icon ready to serve all who attached themselves to it? And, if so, can one really speak about a single *culture of invention*? Perhaps there were many such cultures in Paine's world. And perhaps that is precisely the point. Perhaps what I am looking for are a series of conflicting attitudes embodied in the many meanings of the iron bridge. And perhaps those conflicting attitudes reflect something greater about the conflict underlying an extraordinary era of invention.

The point is simply that with a few points and clicks I am able to check my hypotheses and begin to weave the fabric of my backstory: the cultural uses of the bridge in Tom Paine's world. I can hardly imagine a more intellectually valuable tool for an historian of my particular disposition. Thank you, Readex. Thank you, AAS.

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