

MIT Open Access Articles

Our Technological Age, from the Inside Out

The MIT Faculty has made this article openly available. **Please share** how this access benefits you. Your story matters.

Citation: Williams, Rosalind. "Our Technological Age, from the Inside Out." *Technology and Culture* 55, 2 (April 2014): 461–476 © 2014 Society for the History of Technology

As Published: <http://dx.doi.org/10.1353/TECH.2014.0047>

Publisher: Johns Hopkins University Press

Persistent URL: <http://hdl.handle.net/1721.1/116129>

Version: Final published version: final published article, as it appeared in a journal, conference proceedings, or other formally published context

Terms of Use: Article is made available in accordance with the publisher's policy and may be subject to US copyright law. Please refer to the publisher's site for terms of use.





PROJECT MUSE®

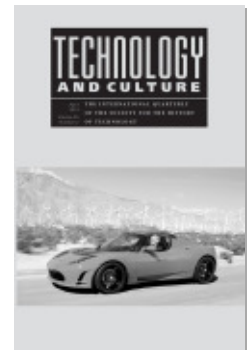
Our Technological Age, from the Inside Out

Rosalind Williams

Technology and Culture, Volume 55, Number 2, April 2014, pp. 461-476 (Article)

Published by Johns Hopkins University Press

DOI: <https://doi.org/10.1353/tech.2014.0047>



➔ *For additional information about this article*

<https://muse.jhu.edu/article/546872>

DA VINCI MEDAL ADDRESS

Our Technological Age, from the Inside Out

ROSALIND WILLIAMS

From Context to Big Questions

The spirit of come-one-come-all has long pervaded our fair society. It is evident in the warm hospitality of our annual meetings, in the carefully chosen title of our journal *Technology and Culture*, and in founding father Melvin Kranzberg's tireless invocation of the "contextual history of technology" without specifying any limits or rules as to what context might include.

Nevertheless, I have to admit that at times I feel like an imposter among my friends and colleagues here. I may come from a family of engineers, but I myself majored in a combined history and literature program as an undergraduate, wrote a senior thesis on Methodist hymns and Romantic poetry, got a doctorate in intellectual history, avoided math and science courses, never took a course in the history of technology, and never studied with a historian of technology.

The ways I have pursued the history of technology work around these embarrassing deficiencies and all too obviously display my apparently unrelated obsessions. Consequently, being awarded the da Vinci Medal feels like an out-of-body experience: this can't be happening to me! My great pleasure and privilege is to accept this medal on behalf of all SHOT members who also wonder if they belong here. If the society so honors me, then it reaffirms that the SHOT tent is bigger and stronger than ever, and that your deficiencies and obsessions are still welcome here. The remarks that follow are intended to promote such inclusion by suggesting that some humanistic obsessions—notably consciousness and language—do not necessarily result in weak versions of the history of technology but in different and arguably sometimes stronger versions.

Rosalind Williams is the Bern Dibner Professor of the History of Science and Technology at the Massachusetts Institute of Technology.

©2014 by the Society for the History of Technology. All rights reserved.
0040-165X/14/5502-0007/461-76

APRIL
2014
VOL. 55

A generation ago, in the early 1990s, SHOT's generous spirit of inclusion gave rise to a debate about contextualism that has never really reached a conclusion, and probably never should. It arose from the publication in 1988 of an edited volume titled *In Context: History and the History of Technology—Essays in Honor of Melvin Kranzberg*, edited by Stephen Cutcliffe and Robert Post and published upon Mel's retirement by Lehigh University Press. Three years later, in 1991 (the wheels of the academy can turn slowly), my MIT colleague Leo Marx published a review of the book in the pages of *Technology and Culture*. At the end of the first paragraph, Leo rather disingenuously raised what he claimed to consider a simple question: What is the rationale for distinguishing the history of technology from history? More generally, what is the rationale for distinguishing specialized histories from general history?

Leo Marx was not arguing that *technology* is unimportant in history. On the contrary, he was arguing that it is so pervasive and influential that it cannot be bracketed off as a special category in the same way that, say, the history of music, or of mathematics, or even the history of science, could be so distinguished. The boundaries of *technology* are unusually obscure, he proposed, for there is no human activity that does not involve it: "If we grant the claims of the contextualists, how can we justify segregating the history of technology . . . from the history of the societies and cultures that shape it?"¹ Broadening the concept of technology to that of "technological systems," as had been done in the 1980s, only underscored (in Leo's view) the lack of a rationale for making this a specialized inquiry. He quoted a remark made by Mel Kranzberg: "We call ours a 'technological age.' . . . How did it get that way? That indeed is the major question that the history of technology attempts to answer."²

Leo agreed with the centrality of the question. He did not, however, accept Mel's tacit assumption that its answer would be found in artifacts or processes commonly referred to as technological. Instead, Leo claimed, the most respected scholars who had taken up this question—he listed among others Lewis Mumford, Jacques Ellul, and Thomas Parke Hughes—were open to the possibility that the answer lay in "a culturally nurtured propensity to mechanize as many aspects of life as possible." Marx was especially intrigued by Hughes's concept of technological momentum, in which Hughes avoids the trap of technological determinism but "asks us to imagine a critical point, or moment of tilt, when a people's dependence on such a [technological] system, or system of systems, becomes the chief determinant of their behavior."³

A year later, in April 1992, Mel responded to Leo's review in a Communication to *Technology and Culture*. He was understandably upset,

1. Leo Marx, Review of *In Context*, 395.

2. Marx, quoting Kranzberg, in *ibid.*, 396.

3. Marx, *ibid.*

given that his core professional mission in life had been to define the history of technology as a distinct branch of historical studies. In responding, Mel repeated his conviction that for historians of technology “truly to understand our technological age,” they needed to study machines “both internally and externally—that is, contextually.” He concluded with a remark that suggested how wounding Leo’s comments had been: “Leo,” he wrote, “let’s not change ‘the machine in the garden’ to ‘the snake in the grass.’”⁴

Leo’s counter-response followed in the same Communication. He ignored the allusion to personal betrayal and repeated his point: the disagreement is not about the importance of the role of technology in history, but about the appropriateness of a separate teaching and research program for it. He went on to suggest that “all this is, in the telling phrase, merely academic.” He proposed an alternative approach that would be less so: “The history of technology is here to stay, so why not opt for a bolder, more interesting, if more problematic, rationale? Why not start with the intuitively compelling idea that technology may be *the* truly distinctive feature of modernity?”

Historians of technology could adopt Mel’s concept of a “technological age” as a central hypothesis and then build a teaching and research agenda around it: “The aim would be to understand all of the ways that technological knowledge, processes, and behaviors in fact distinguish modernity from other ages—other societies and cultures. Such a program could open many avenues of investigation, too many in fact to enumerate here.”⁵

Well, why not? Why not take the history of technology up a notch, or two? Why not turn up the volume to 11? Why not clear some new avenues of investigation, and swagger a bit in self-importance? If the history of technology is worth our efforts as a separate program and distinct branch of the historical discipline, we should ask some really big questions, and also make sure other people know what we are up to.

At the time Leo and Mel were jousting in the pages of *Technology and Culture*, I had just published a book titled *Notes on the Underground*, which begins with this sentence: “What are the consequences when human beings dwell in an environment that is predominantly built rather than given? This book seeks to answer that question. It explores the psychological, social, and political implications of living in a technological world.”⁶

I thought then and still think that examining the advent of a “technological world” is a big and important question. I now think it is an even bigger and more important question, at least for a historian, to ask about the advent of a technological age, as both Mel Kranzberg and Leo Marx were discussing it. More specifically, this big question is the one Leo attrib-

DA VINCI
MEDAL
ADDRESS

4. Melvin Kranzberg, “Communications,” 406–7.

5. Leo Marx, “Communications,” 407.

6. Rosalind Williams, *Notes on the Underground*, 1.

APRIL
2014
VOL. 55

utes to Tom Hughes in asking us “to imagine a critical point, or moment of tilt,” when conditions of history were altered, “when a people’s dependence on such a [technological] system, or system of systems, becomes the chief determinant of their behavior.”⁷

Asking this question shifts the focus from space (underground or otherwise) to time. Examining the advent of this technological age of ours does not take for granted that its defining characteristic is the physical environment of human life. It leaves that question open. If we test this hypothesis, we are not giving up context; we are, however, defining contextualism as a method rather than an end in itself. My most recent book is dedicated to Leo Marx and Tom Hughes, and it represents my best effort to answer the big question they raised, as did Mel, in asking how our technological age got that way.⁸

From Technological World to Technological Age

When we wonder when and why history tipped toward a “technological age,” we commonly look to material surroundings for the answers. We do this not only as historians but also as ordinary human beings living in a material world that is full of sharp sense-based contrasts between past and present. So, for example, when Jules Verne was asked to write a brief autobiographical sketch for a Boston-based children’s magazine in 1891, he looked back over the decades to his hometown of Nantes, on the river Loire, where he had been born in 1828. He wrote:

I have seen the birth of phosphorus matches, fake collars, cuffs, letter paper, stamps, the overcoat, the opera-hat, the ankle boot, the metric system, steamboats on the Loire, called “inexplosible” because they blew up a little less often than the others, omnibuses, railways, tramways, gas, electricity, the telegraph, the telephone, the phonograph! I am of the generation between these two geniuses, [George] Stephenson [inventor of the steam locomotive] and [Thomas] Edison!⁹

On the whole, like Verne, historians of technology are struck by human-built artifacts like these as primary evidence of technological change, especially in what we all agree is a critical period between the age of steam and that of electricity. For layman and professional historian alike, material artifacts define the history of technology—items such as tools, gadgets, and consumer products, as well as larger systems of transportation and communication and power. These are the black boxes that we open, con-

7. Marx, Review, 396.

8. Rosalind Williams, *The Triumph of Human Empire*.

9. Jules Verne, “The Story of My Boyhood.” For further bibliographical details, see Williams, *The Triumph of Human Empire*, 2n2 and also 8.

textualize, and analyze as to their motivation, design, construction, maintenance, and even that ugly commonplace word “impact.” In all this we assume the world of technological reality is out there: we are users, spectators, even the creators, but the real thing is material and external to us. The world of our own inner experience may have its power and interest, but it is not the stuff of technological reality.

Such assumptions are by no means limited to historians of technology. In an 1899 essay William James discusses “a certain blindness in human beings,” which keeps us from entering into “the feelings of creatures and people different from ourselves.” We are constantly aware of the strength of our own feelings, James writes, but this inward world is largely hidden from and unappreciated by others. “The subject judged knows a part of the world of reality which the judging spectator fails to see, knows more while the spectator knows less.”¹⁰

In his essay James quotes, with high praise, another essay, by Robert Louis Stevenson, published in 1888 and titled “The Lantern-Bearers.” The sport of lantern-bearing, Stevenson explains, occupied himself and his friends during black nights on the coast north of Edinburgh in those precious autumn days just before they returned to school. The boys would equip themselves with a tin bull’s-eye lantern, available at that season in any general grocery store. After being lighted with lamp oil, it remains dark until the bearer opens its door: then it shines forth a focused light, the rough equivalent of switching on a flashlight. The boys would put the lighted lanterns under their topcoats and venture out after dark. If two or more of them met, they would ask each other if they had their lanterns. If the answers were affirmative, the boys would start gathering in some isolated place on the shore, unveiling their lanterns to each other and indulging “in inappropriate talk.” “The essence of this bliss” of lantern-bearing was to walk as a “mere pillar of darkness in the dark,” all the while knowing “you had a bull’s-eye at the belt, and to exult and sing over the knowledge.”

Stevenson drew the lesson that what is most real and powerful in human experience is not the external material reality of the lantern but “the mysterious inwards of psychology” of its bearer. Those “inwards” are missed, Stevenson wrote, by “the observer (poor soul, with his documents!)” who is deceived if he looks at the coated person and misses the “true realism” of the intense inner experience: “The true realism, always and everywhere, is that of the poets to find out where joy resides, and give it a voice. . . . For to miss the joy is to miss all.”¹¹

10. William James, *On Some of Life’s Ideals*, 3, 4, 6. I also discuss James’s essay in Williams, “The Lantern-Bearers of the History of Technology.” I was finishing work on this article when I learned that I would be receiving the da Vinci Medal. Its themes were relevant to what I wanted to say in the da Vinci lecture, so there is some overlap between the two works.

11. Robert Louis Stevenson, “The Lantern-Bearers,” 144, 149.

DA VINCI
MEDAL
ADDRESS

APRIL

2014

VOL. 55

So here we are, we historians, poor souls with our documents, looking intently at lanterns but much less intently, usually, at lantern-bearers. What if we seek to understand our technological age beginning with subjective experience of the world rather than with the objects in it? What if the black box we pry open is first and foremost the human one? What if we seek “true realism” and examine what we like to call *technology* from the inside out?

I have tried to do something like this in my just-completed book *The Triumph of Human Empire*. The title is lifted from Francis Bacon, who used it in the early 1600s in a utopian tale in which he imagines the discovery of a new Atlantis. This make-believe island is not an *empire* in the usual sense of territorial control. Instead, it is the center of a vast, general expansion of human knowledge and power centered in a research foundation called Salomon’s House. Its leader describes its mission in a single sentence: “The End of our Foundation is the knowledge of Causes, and secret motions of things; and the enlarging of the bounds of Human Empire, to the effecting of all things possible.”¹²

Bacon’s tale is a work of imagination, and the reorientation of human imagination is the fundamental element of the advent of our technological age: a new historical condition of reorientation toward “technological knowledge, processes, and behaviors,” to quote Leo’s description of the critical point of tilt. Such imagination becomes the dominant site for human creativity and goals. This is more than technological enthusiasm for particular inventions or devices. It is a redirection of human energies and desires toward inquiry into and manipulation of the material world for all sorts of utilitarian and non-utilitarian purposes. It is an event of consciousness.

In *The Triumph of Human Empire* I have chosen three writers, from numerous possibilities, who more than most provide insight into this reorientation. Their imaginative works comprise an archive of consciousness for probing this crucial event of consciousness. These three writers—Jules Verne (1828–1905), William Morris (1834–1896), and Robert Louis Stevenson (1850–1894)—are all active in that epoch between Stephenson and Edison. They all set out on literary careers intending to write romances, defined as stories not too constrained by fidelity to the externals of material and social realism, stories featuring (in Henry James’s wonderful definition of romance) “experience liberated.”¹³

But all are frustrated by the mismatch between the inherited traditions of romance and the world emerging in their lifetimes. They reorient their work through encounters with what we would now call science and technology—encounters that redirect their story telling and allow them to reinvent romance for a technological age. In doing this, each of them became an influential artist in his own time and ever since, with a deep effect in

12. Francis Bacon, “New Atlantis,” 574.

13. William James in *The Americans*, quoted by Gillian Beer, *The Romance*, 12.

shaping modern consciousness with no end to their influence in sight. I will give a very brief description of how each writer accomplished this, before ending with some general observations on writing the history of technology as a history of consciousness, from the inside out.

Three Inventors

DA VINCI

MEDAL

ADDRESS

Jules Verne left Nantes in the revolutionary year of 1848, at the age of twenty, setting out for Paris to become a playwright. As the upheavals subsided into the Second Republic and then the Second Empire, Verne headed for “the whole Romantic coterie” (his expression) then dominating the theatrical world of the capital and started composing romantic comedies for the stage.¹⁴

However, his theatrical career never took off. While he was trying to hold body and soul together (with the help of his father and later with a job on the Paris stock exchange), Verne became more and more interested in exploration, engineering, and the science of his day. He read everything he could find on these subjects in newspapers and magazines of what was then called the “scientific press.” He made friends with like-minded souls such as Nadar (Félix Tournachon), the much-publicized photographer-balloonist. For fifteen or so years after 1848, living in the Paris of the Second Empire, Verne made many moves from one cheap apartment to another, allegedly taking with him a writing desk having two drawers, one labeled *theatre* and the other *science*.¹⁵

Verne merged the two drawers, so to speak, in the early 1860s, beginning with the publication of an adventure story, *Five Weeks in a Balloon*. With encouragement and sometimes heavy-handed guidance from editor Pierre-Jules Hetzel, Verne invented what he called the *geographical romance*, which led to a life-consuming project of mapping the globe and beyond in eighty-odd “extraordinary journeys.” These adventure stories are packed with information about inventions and expeditions of the type Verne had written about in nonfiction or lightly fictionalized articles for popular magazines. At the same time, the stories are staged like romantic comedies, featuring witty dialogue and racy innuendo on an especially imaginative set. About eight of Verne’s novels were actually staged in his lifetime, some of them running for hundreds of performances and reaping enormous profits. To this day Verne’s imaginary journeys are routinely restaged in the movies, while the basic plotlines and décor are endlessly recycled into steampunk mash-ups.

Verne’s fascination with the new material of contemporary science and engineering is evident through his works. Words, numbers, names, facts—

14. Marguerite Allotte de La Fuÿe, *Jules Verne*, 39.

15. *Ibid.*, 89. Allotte de La Fuÿe is not a very reliable biography, and this may be one of those stories that is too good to be true. There is no doubt that Verne took with him many unpublished manuscripts in his frequent moves.

APRIL
2014
VOL. 55

the narrative voice creates the story from detailed, precise, often specialized information, lovingly collected and assembled in unexpected combinations, with “vertiginous precision.”¹⁶ Futurist poet Guillaume Apollinaire is reputed to have exclaimed of Verne, “What style! Nothing but nouns (*substantives*)!”¹⁶

Verne composed his novels through the grafting and collage of textual fragments from scientific reports, myths, and popular tales, methodically recording them on index cards (supposedly 20,000 unused cards remain in his archives) and then folding them into a secondary world of text. Critic Timothy Unwin calls Verne “the inventor par excellence.” Verne might also be called a textual engineer. He was acutely aware of the constructed character of his works and of his own active role in building them from pieces of information produced by others. He has one foot in the Renaissance age of exploration and the other in the information age.

A similar pivot may be seen in the experience of William Morris. As an artist he came of age nourished on the romances of medievalism, but he outgrew their constraints to invent new forms of romance ranging far beyond the ur-text of medievalism, the King Arthur stories. Morris’s passion for the Middle Ages began with his boyhood obsession with story telling, his adolescent wonder at Gothic cathedrals, and his discovery as a young man of a talent for design through his connections with other Pre-Raphaelite artists. Eventually this talent led to the establishment of a manufacturing company that became known simply as the Firm, engaged in flexible production and marketing for a specialty trade in the decorative arts, with an emphasis (especially at the outset) on motifs from the Middle Ages.

Thus Morris evolved from a youthful medievalist into what we would now call an innovator, entrepreneur, or maker. He could also be called a lay engineer, reminding us that in that remarkable epoch between Stephenson and Edison, the ancient profession of engineering was complicated in ways that have largely been forgotten. It was a time when engineering was becoming routinely and tightly connected with scientific research: in Bacon’s terms, power and knowledge were being methodically joined. But it was also a time when engineering was still a “mirror twin” of art as well as of science. As Eric Schatzberg has reminded us, “Before ‘applied science’ and ‘technology’ became keywords, the concept of art was central to discourse about material culture and its connections to natural knowledge.”¹⁷

For Morris, art was central because, as he proclaimed in an 1883 lecture, “ART IS MAN’S EXPRESSION OF HIS JOY IN LABOR.” The occasion for the speech was to announce his conversion to revolutionary socialism: the capital letters are in the written text, which Morris delivered to a hushed audience, shocked that a respectable manufacturer would support

16. Quoted by Timothy Unwin, *Textes réfléchissants*, 120. Unwin in turn cites Peter Costello, *Jules Verne*, 53.

17. Eric Schatzberg, “From Art to Applied Science,” 555.

this cause. But Morris, like Stevenson, felt that the “true realism” was to be found in giving a voice to art as the place where joy resides in human beings.

One way he did this was through manufacturing beautiful things. So, for example, while he understood the appeal of new aniline dyes for ease of use and durability in manufacturing fabrics and wallpapers, he believed they were unforgivably ugly. The more he worked with them, the more he became convinced that this was because they were supposed to last indefinitely. The mortality of the dye, Morris believed, was a primary source of its beauty; its graceful aging should be accepted, not resisted. This conviction led him to test a range of old dyes, working with craftsmen who had tacit knowledge of processes of matching colors and controlling fermentation in the vats, adjusting the process for different fabrics. Morris used similar approaches in developing production processes for weaving, carpet-making, and tile- and glassmaking. In all these forms he was a sort of archeo-engineer, methodically researching techniques of the past to design a more beautiful home for humankind.

Morris also sought to give an artistic voice to joy through story telling. As a young man he developed an “encyclopedic approach to romance,” with an “ambition to collect every major story in literature and retell or translate it.”¹⁸ Later in life he published such stories in books that he himself designed and made by starting yet another manufacturing activity, the Kelmscott Press. Also later in life, Morris invented a new kind of romance, set in an indeterminate time and in an indeterminate setting—what J. R. R. Tolkien would later call a Secondary World.¹⁹ These late stories (such as *The Story of the Glittering Plain* and *The Well at the World’s End*) originated the modern genre of fantasy, with Tolkien himself as a crucial link between Morris’s reinvention of romance and the present day.²⁰

If Morris was a lay engineer, Robert Louis Stevenson was a professional one. He was of the family of the “lighthouse Stevensons,” a dynasty established by his grandfather Robert and carried on by his father Thomas and his two brothers.²¹ Collectively they constructed dozens of lighthouses around the northern coast of Scotland and enjoyed a thriving practice in less glamorous river and port improvements throughout Scotland and England. When Louis (as his family called him) entered the University of Edinburgh in the fall of 1867, it was taken for granted that he was headed

DA VINCI
MEDAL
ADDRESS

18. Northrop Frye, *The Secular Scripture*, 4.

19. Tolkien routinely capitalized the term. J. R. R. Tolkien, “On Fairy-Stories.” This essay is an expanded version of a lecture first given by Tolkien in 1939. It was further expanded for publication in Tolkien, *Tree and Leaf* (London: George Allen and Unwin, 1964).

20. Frye, *Secular Scripture*, 4. See also John Clute, “Secondary World” and “J. R. R. Tolkien”; also David Langford, “William Morris.”

21. See the SHOT Hacker Prize-winning book by Bella Bathurst, *The Lighthouse Stevensons*.

APRIL
2014
VOL. 55

for a career in engineering. He studied with Fleeming Jenkin, an outstanding electrical engineer of the time, and did summer internships at building sites associated with the family firm. Shortly after graduation, Louis received a prize for his senior thesis on intermittent lighthouse illumination.

Soon thereafter he renounced the family business (to the bitter disappointment of his father) to pursue his ambition of becoming a writer. But Louis maintained a deep, lifelong respect for the skills and hard work of engineers, and in his own work engineering and romance were constantly in dialogue. He was keenly alert to the romance of civil engineering—the open air, the dangers of the coast, the demands for dexterity, ingenuity, even heroism—while also recognizing the engineering skill required by writing. Whether the design is for a breakwater or a story, Louis explained in some of his critical essays, the designer needs the simplifying powers of symbolic expression to clarify the otherwise bewildering complexities of the world.

By the 1880s Stevenson had achieved a worldwide reputation as a writer of what we would now call genre fiction, including bestsellers such as *The Strange Case of Dr. Jekyll and Mr. Hyde*, *Treasure Island*, and *Kidnapped*. He expanded and reconfigured his understanding of romance when he journeyed to a new (for him) part of the world, the South Pacific. Not long after his father's death, in the early summer of 1888, Louis set forth from San Francisco with his wife, her two children, and his mother. It was basically a business deal: the South Seas cruise was paid for by a New York publisher in return for letters in which the famous author would recount adventures and picturesque encounters there. Stevenson himself hoped the warm, humid climate would help restore his precarious health.

Nothing could be more romantic than Stevenson's account of the July morning when the chartered sailing vessel approached an island of the far Marquesas: "The first experience can never be repeated. The first love, the first sunrise, the first South Sea island, are memories apart and touched a virginity of sense."²² But almost immediately the Edenic romance began to fade and history began to reassert itself. A few days later, Louis and his wife Fanny paid a visit to some natives of the Marquesas, the son and daughter-in-law of Tari, a native of Hawaii. The couple, who brought their infant daughter with them, asked Louis to tell them about England. He tried to describe, with gestures and props such as shells, "the over-population, the hunger, and the perpetual toil." There was a pause; he was not sure they understood. Then the mother held out her baby, who had been suckling at her breast, saying, "Tenez—a little baby like this; then dead. All the *Kanaques* [people] die. Then no more." Stevenson was taken aback by "so tranquil a despair" on the part of a mother who foresaw this same fate for her own flesh and blood. Suddenly he had a vision of universal death, global

22. Robert Louis Stevenson, *In the South Seas*, 6.

extinction, not just of the people of the South Pacific but of people and cultures everywhere:

in a perspective of centuries I saw their case as ours, death coming in like a tide, and the day already numbered when there should be no more Beretani [whites], and no more of any race whatever, and (what oddly touched me) no more literary works and no more readers.²³

DA VINCI
MEDAL
ADDRESS

From that point on, he began to write a journal, intending it to be turned into publishable letters, to bear witness to this extinction. In it Stevenson tried to piece together, from a multiplicity of discrete events, encounters, and observations, the historical forces at work that were decimating the native Polynesians—history from the inside out, beginning from the natives’ own perception of their doom, not just inevitable but already enveloping them.

After leaving the Marquesas, Stevenson and his wife spent some months in Hawaii, which gave them what he considered a glimpse of an ugly but inevitable future, in which the “complications of civilization” submerge and drown every other possible way of life. Here he began to show the first signs of political engagement in South Seas affairs. He visited a leper colony on the island of Molokai and had conversations with the native king (Kalakaua) at a time when it was becoming clear that the Hawaiian monarchy was soon to be replaced by American rule.

When Stevenson eventually published some letters about the South Seas, they were short on the supposed romance of the region. Instead, he wrote about the experiences of loss and sorrow. In one letter he mentions the Hawaiian Tari, grandfather of the baby whose mother assumed it would soon die:

I wonder what [Tari] would think if he could be carried there indeed, and see the modern town of Honolulu brisk with traffic, and the palace with its guards, and the great hotel . . . or what he would think to see the brown faces grown so few and the white so many; and his father’s land sold for planting sugar, and his father’s house quite perished, or perhaps the last of them struck leprous and immured between the surf and the cliffs on Molokai. So simply, even in the South Sea Islands, and so sadly, the changes come.²⁴

Stevenson spent the rest of his too-brief days in the South Pacific, taking three extended cruises and eventually settling in 1890 in Samoa. Once there he began experimenting with new forms of romance, trying to craft ones adequate to expressing the collective effects of these simple, sad changes. He pioneered what in the mid-twentieth century would be known

23. *Ibid.*, 22–23.

24. *Ibid.*, 20–21.

APRIL
2014
VOL. 55

as “new journalism” in his polemical account of a dirty little colonial war in Samoa (*A Footnote to History*).²⁵ He reworked Polynesian tales for a global audience (“The Isle of Voices” and “Something in It”) and wrote dark, gritty romances of colonial encounters (“The Beach of Falesá” and *The Ebb-Tide*).²⁶

These works, like Stevenson’s few published letters from the South Seas, were largely ignored or even ridiculed by his contemporary readers. Only in the last generation have they begun to be appreciated as accounts of a historical turning point, where “our” (as seen from the West) “technological age” became “theirs” too, irrevocably altering both Europeans and Polynesians. This event is summed up in the first sentence of *The Ebb-Tide*: “Throughout the island world of the Pacific, scattered men of many European races and from almost every grade of society carry activity and disseminate disease.”²⁷

Conclusion

In a feat of condensation, this unforgettable sentence implies a set of interactive processes now routinely described by a flock of abstract terms. Some of these terms imply “activity” of a beneficial kind: such as globalization, mobility, progress, development, innovation. Others have the negative connotation of “disease”: not just epidemics but also human trafficking, environmental collapse, and militarism.

These remarks began with the observation that historians of technology, like nearly everyone, suffer from a “certain blindness” that keeps us from apprehending the inner world of other creatures. In our particular case, this means that when we consider the history of technology, we are more likely to look at objects rather than the lived experience of human beings. In other words, we should resist the habit of identifying *technology* only with external objects.

These remarks come to a close with the observation that we face an equal if not even greater challenge in resisting the temptation to identify *technology* with abstract entities seemingly dissociated from objects and humans alike. As Leo Marx has contended, the concept of technology is “hazardous” because it “has been endowed with a thing-like autonomy and a seemingly magical power of historical agency. We have made it an all-purpose agent of change.”²⁸ The same could be said of other abstract concepts mentioned above, both positive and negative in valence. Like the wizards in Stevenson’s short story “The Isle of Voices,” based on a Polynesian tale, processes like globalization and innovation may seem like invisible

25. Robert Louis Stevenson, *A Footnote to History*.

26. All these are found in Robert Louis Stevenson, *South Sea Tales*, 123.

27. Stevenson, “Ebb-Tide,” in *South Sea Tales*, 123.

28. Leo Marx, “Technology: The Emergence of a Hazardous Concept,” 577.

but powerful forces, scooping up shells and setting fires on the beach while filling the air with loud but senseless babble.

One defining characteristic of our technological age is our crisis of language. How can we possibly understand this age when there is such a profound mismatch between lived experience and symbolic representation? On the one hand, we habitually discuss the *technology* of our technological age as an assemblage of material objects—a representation that deceives not by being untrue so much as by being incomplete, in omitting the reality of subjective experience. On the other hand, we also use the language of surrealism to point to historical forces that seem beyond our understanding, ghostly presences even if we ourselves have created them.

In “The Lantern-Bearers” Stevenson remarks on the “haunting and truly spectral unreality” of so-called realist novels, which miss the “true reality” of an individual, who dwells “in the warm, phantasmagoric chamber of his brain, with the painted windows and the storied walls.”²⁹ Such “truly spectral unreality” also characterizes the language of particulars of the computer age where reality is assumed to be hardware, software, systems, and information, all exterior to the individual user. A similar unreality characterizes the never-ending discussions of disembodied processes such innovation and globalization, treated as fictive superselves engaged in neo-epic struggles, also acting outside and beyond the minds and powers of individuals.

Neither neo-realism nor neo-epics enable us to think clearly about our world and our age. Both individuals and history need plot, characters, and settings to make sense of who we are and where we are headed. Verne, Morris, and Stevenson all turned to imaginative literature for this understanding, using language that is allusive, rich, integrative, and value-laden. They revived and reoriented romance to fuse story line, characters, gestures, events, and the visible world into “a single, unified conscious field, a subjective awareness of the total conscious experience.”³⁰

Verne’s geographic romances of exploration, Morris’s tales set in fantasy worlds, and Stevenson’s yarns of outlaw adventures all fed into the great revival of romance that began in the last half of the twentieth century. This revival continues to swell, with no end in sight, as science fiction, genre fiction, and fantasy all mix together in a seemingly boundless reservoir of imagination. These three writers have been enormously influential in defining our technological age, by giving it a story.

Or rather stories, given the underlying contradictions of the age. In many ways Verne, Morris, and Stevenson express the progressive understanding of history that has dominated the West since the time of Bacon: the conviction (to borrow Bacon’s language) that knowledge of causes and secret motions of things will lead to the enlarging of the bounds of Human

DA VINCI
MEDAL
ADDRESS

29. Stevenson, “Lantern-Bearers,” 149.

30. John R. Searle, “Can Information Theory Explain Consciousness?”

APRIL
2014
VOL. 55

Empire and to the effecting of all things possible. Verne, Morris, and Stevenson are excited by these possibilities, and each of them, in his own way, explores the frontiers of science and engineering in his time.

But they see another pattern in the history of their time, one of spreading centers of loss and calamity, reinforcing each other in intersecting circles of unpredictability and uncertainty. Their belief in progress endures, but it is increasingly in conflict with their perception of history as rolling apocalypse. Stevenson foresaw the “unjust but inevitable extinction” of the Polynesians. Morris wondered if all the beautiful old cathedrals would be allowed to crumble and if all joy in labor would be crushed by the tyranny of wealth. As a young man in Paris, Verne bitterly concluded that bankers and business were sweeping away all the old languages and literatures. As an older man, visiting his hometown of Nantes one last time after the death of his parents, he lamented the destruction of the green hillsides running down to the Loire.

All of them faced, in the spirit of true realism, the prospect that what they most treasured in the world was disappearing. In this new historical condition, crisis is no longer imminent, out there on some future horizon. It has become immanent, incorporated into ongoing history. Verne, Morris, and Stevenson know that the end of the world in space is nigh. They also worry that this new condition of history might lead to the end of the world in time, as humankind runs out of room for error, evasion, and discard. How can we continue in the path to peace and prosperity when there is no relatively unsettled space for people to take their quarrels, or dump their refuse, or find new markets or cheap labor?

The lanterns of consciousness in Verne, Morris, and Stevenson project a deep and fundamental contradiction in historical consciousness. They are excited by a realm of new possibilities, while also preemptively mourning the inevitable losses it entails. This contradiction has become only more acute in our own age, where excitement about the latest software application coexists with a sense of environmental doom. This deeply conflicted inward experience of history—more than any technological object or process—is a defining quality of our technological age.

This contradiction runs through history and through ourselves as individuals. Verne, Morris, and Stevenson turned to literature as a supremely sensitive register of historical change and as a source for understanding, if not necessarily reconciling, these conflicting historical patterns. Like these writers, we historians turn to symbols—maps, numbers, images, and above all words—to try to understand the complexities of history. Like them, we discover that we have to keep reorienting ourselves and our work as we live through the very changes we are trying to understand and express. In doing this, we go where they have gone before, living in our technological age, asking the big questions, from the inside out.

Bibliography

- Allotte de La Fuÿe, Marguerite. *Jules Verne*, trans. Erik De Mauny. New York: Coward-McCann, 1956; Paris: Hachette, 1953 [1928].
- Bacon, Francis. "New Atlantis." In *Selected Writings of Francis Bacon*, edited by Hugh G. Dick, 543–84. New York: Modern Library, 1955.
- Bathurst, Bella. *The Lighthouse Stevensons*. New York: HarperCollins, 1999.
- Beer, Gillian. *The Romance*. London: Methuen & Co., 1970.
- Clute, John. "Secondary World" and "J. R. R. Tolkien." In *The Encyclopedia of Fantasy*, edited by John Clute and John Grant, 847, 950–55, respectively. New York: St. Martin's Griffin, 1997.
- Costello, Peter. *Jules Verne: Inventor of Science Fiction*. New York: Scribner, 1978.
- Frye, Northrop. *The Secular Scripture: A Study of the Structure of Romance*. Cambridge, MA: Harvard University Press, 1976.
- James, William. *On Some of Life's Ideals*. New York: Henry Holt, 1912 [1899, 1900].
- Kranzberg, Melvin. "Communications: Comment and Response on the Review of *In Context*." *Technology and Culture* 33, no. 2 (1992): 406–7.
- Langford, David. "William Morris." In *The Encyclopedia of Fantasy*, edited by John Clute and John Grant, 664–66. New York: St. Martin's Griffin, 1997.
- Marx, Leo. "Review of *In Context: History and the History of Technology—Essays in Honor of Melvin Kranzberg*." *Technology and Culture* 32, no. 2 (1991): 394–96.
- _____. "Communications: Comment and Response on the Review of *In Context*." *Technology and Culture* 33, no. 2 (1992): 407.
- _____. "Technology: The Emergence of a Hazardous Concept." *Technology and Culture* 51, no. 3 (2010): 561–77.
- Schatzberg, Eric. "From Art to Applied Science." *Isis* 103, no. 3 (2012): 555–63.
- Searle, John R. "Can Information Theory Explain Consciousness?" Review of Christof Koch, *Consciousness: Confessions of a Romantic Reductionist*. *New York Review of Books*, 10 January 2013, 54.
- Stevenson, Robert Louis. *South Sea Tales*, ed. Roslyn Jolly. Oxford: Oxford University Press, 1996.
- _____. *In the South Seas*, ed. Neil Rennie. London: Penguin, 1998 [1896].
- _____. "The Lantern-Bearers." In *Stevenson on Fiction*, edited by Glenda Norquay, 139–50. Edinburgh: Edinburgh University Press, 1999.
- _____. *A Footnote to History: Eight Years of Trouble in Samoa*. Rockville, MD: Serenity Publishers, 2009.
- Tolkien, J. R. R. "On Fairy-Stories." In *Essays Presented to Charles Will-*

DA VINCI
MEDAL
ADDRESS

APRIL
2014
VOL. 55

- iams*, edited (anonymously) by C. S. Lewis, 38–89. Grand Rapids, MI: William B. Eerdmans, 1966; Oxford: Oxford University Press, 1947.
- Unwin, Timothy. *Textes réfléchissants: Réalisme et réflexivité au dix-neuvième siècle*. French Studies of the Eighteenth and Nineteenth Centuries, vol. 6. Bern: Peter Lang, 2000.
- Verne, Jules. “Souvenirs d’enfance et de jeunesse,” translated and published as “The Story of My Boyhood,” in *The Youth’s Companion* 64 (9 April 1891), 211.
- Williams, Rosalind. *Notes on the Underground: An Essay on Technology, Society, and the Imagination*. Cambridge, MA: MIT Press, 1990.
- . *The Triumph of Human Empire: Verne, Morris, and Stevenson at the End of the World*. Chicago: University of Chicago Press, 2013.
- . “The Lantern-Bearers of the History of Technology,” *History and Technology* 29, no. 3 (2013): 262–77.