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A SHOT Dilemma

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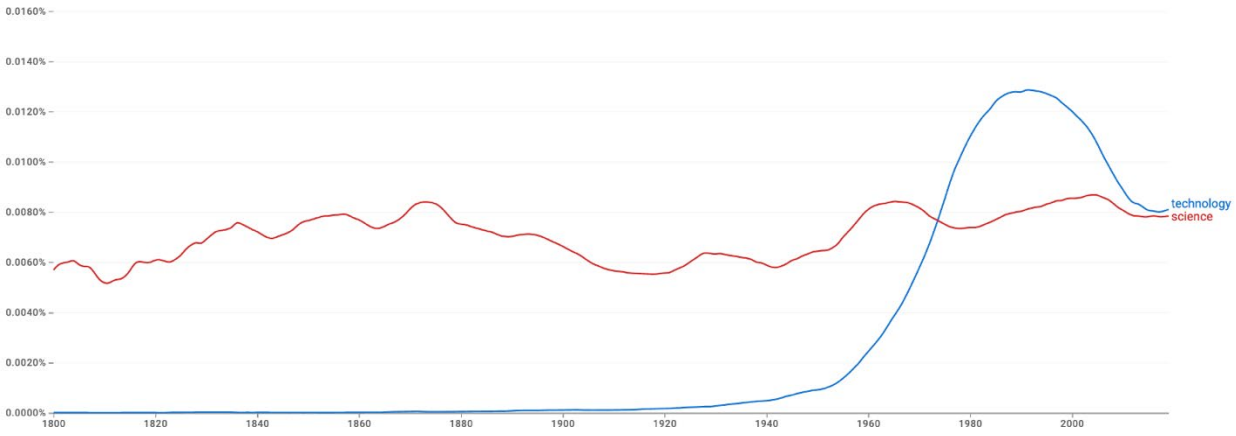
I want to begin with my one and only visual, which I want to leave up while I am talking. This is for you to contemplate when you grow bored about what I'm talking about. For those of you who aren't familiar with Google Ngrams, they are counts of the number of times that a word appears in an American book that is in the public domain that Google is systematically copying and making available digitizing. This chart is a tabulation of the word, "science" and the word, "technology" in American books over the last 200 years.



Google Ngram for "technology" and "science," 1800-2019[1]

What does it say?

[1] A Google Ngram (or N-gram) is a data base of books in the public domain gathered in the Google Books search engine. It recognizes a dozen languages, American or British English, and capitalization. Six degrees of smoothing can be applied to the plots.

Now, of course, because it's only in the public domain, it won't capture modern copyright books, which now go back 70 years after the death of the author. So it does not capture modern literature that's copyrighted, but it captures something. So, when you get bored with what I'm saying, try and think about what it is that this graph captures.

I want to thank Roe Smith for discerning the timeliness of such a symposium and for inviting me to join such a distinguished group. He draws our attention not just to SHOT but to the broader history of technology. On occasions such as this I feel a strong gravitational pull toward celebration and congratulations. There is ample cause for both. But I want to sound a cautionary note to suggest that the history of technology, and SHOT in particular, may have lost their way.

We are a small scholarly society (1500 members) within the American Council of Learned Societies, modest by the standards of the American Historical Association, with 10,000 members, and an order of magnitude smaller than the American Political Science Association (15,0000) and the Modern Language Association (25,000). In our own realm, we are larger than the Society for Social Studies of Science (1,200) but smaller than the History of Science Society (3,000). We are not in a bad place, but I fear that we may have plateaued, and I worry about the old saw that if you are not growing you are dying. It might behoove us to map out our membership over time, track attendance at our annual meetings, and plot the drift of our collective discourse in *Technology and Culture* and our annual meetings in the first quarter of the twenty-first century. I have had neither the time nor the resources to do that for this gathering, but I have observed some warning signs that I find troubling.

If we are, as I suspect, stalling--or even losing ground--the problem may reside at the heart of our foundational goals. I believe that Mel Kranzberg and his fellow founders had two goals in mind when they formed SHOT. The first was to demonstrate that technology was an important historical force that merited more study and understanding, both in the public at large and within the scholarly community. They believed that they could never make such a demonstration within the History of Science Society, where technology was widely perceived as applied science. Thus, their second goal was to create an independent society to publish the best scholarship in the field and share the field's best research in papers with like-minded colleagues. In other words, they had an institutional goal designed to serve their larger, epistemological goal.

In my view, we have succeeded institutionally, but epistemologically not so much. Both within the scholarly community and in society at large, I would argue, technology is both misunderstood and under-appreciated. Both trends seem to me to be on the increase, even though

technology is a more important agent of change than ever. It should be, in my view, among the primary categories of analysis applied to any broad historical study of modern history, if not before. Leo Marx even broached "the intuitively compelling idea that technology may be the truly distinctive feature of modernity."[2] In my own subfield of military history I have argued that technology has been, throughout recorded history, the most important agent of change in warfare. The variables that shape the so-called principles of war--strategy, tactics, communication, logistics, training, etc.-- are timeless, save for technology. If ever public understanding of technology was in demand, it is now.

But we historians of technology have been increasingly talking to ourselves. We are not, I would argue, even reaching our fellow historians. The last time I spoke with Tom Hughes, my mentor in the history of technology, he told me that he knew of only one regular history department in the U.S. that had ever chosen a historian of technology to serve as chair. We are not yet in the mainstream of the U. S. history profession, to say nothing of the international practice, though my observations are aimed primarily at the situation in the United States.

But wait, you say, aren't our meetings well attended and our panels lively and substantial? And is not our journal well regarded and filled with high quality articles? Well, maybe. But these are the institutional goals, designed to serve the larger epistemological goal of promoting the study and understanding of technology. It is in that latter realm that I think we might be falling short. As the first secretary of SHOT and the first editor of its journal, Mel Kranzberg instilled in us his own worries about attracting enough members and articles to sustain the society and its journal. Thereby, he also planted unwittingly a prioritization of institutional over epistemological goals. It may well behoove us to consider that bias.

It was easier in the second half of the twentieth century to address big questions and propose new ways of thinking about technology. The field was then dominated--with a few important exceptions--by internalist works, narrative descriptions of who invented what machines and how they worked. In that environment, SHOT was at the center of pathbreaking studies that introduced such profound questions as autonomous technology, technological imperatives, technological systems, progress, the science-technology relationship, social construction of technology, research and development, and the nature of technological change, to name just a few. But the social turn, invited by our journal's title, *Technology **and** Culture*, brought in its train a steady stream of what I call "technology **and**" articles for the journal and papers for the meetings. These have certainly enriched our field, while filling the pages of our journal and the

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[2] Leo Marx, "To the Editor," *Technology and Culture* 33/2, (Apr. 1992): 407.

panels of our meetings, but they have also dispersed the focus of our project. Many of those articles and papers tell us more about the "**and**" topics that they do about technology. I suspect, for example, that an article on technology and justice has more to say on justice than technology. If it is on the technology **of** justice, the odds rise sharply. In any of those fields of study, there will be technology, however the author understands that term. But that does not mean it will say much about the origins, workings, and impact of technology.

In short, our determination to grow our society and its journal may have distracted us from our more fundamental goal of promoting the study and understanding of technology. One indicator of this trend is the reluctance of SHOT to pay more attention to what we mean by technology. By ignoring this problem, both in the journal and in our annual meetings, we have contributed to a general misappropriation of the term in society at large, a topic I addressed in a recent paper at SHOT's 2023 annual meeting. "Technology" in modern society has become what Leo Marx called "the accepted name for the realm of the instrumental," and "an all-purpose agent of change."[3] Eric Schatzberg has called out the fashionable practice of substituting technology for technique, "equating bodily practices with 'technologies of the self,' and bureaucratic methods with 'technologies of power.'" (232). He labels such usage "academic pretense."[4] I have found many more examples, including the technology of enchantment, the technology of kindness, the technology of governance, and the technology of the law. This usage, at least in the United States, is now so common that the term is becoming banal.[5] By failing to address this problem, SHOT is not only neglecting its commitment to promote *understanding* of technology, but also contributing to the **mis**understanding of technology. As Shatzburg has asked, "If academics who specialize in the study of technology can't figure out what it means, how can we expect others to do so ?"[6]

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[3] Leo Marx, "The Idea of 'Technology' and Postmodern Pessimism," in *Does Technology Drive History: The Dilemma of Technological Determinism*, ed. by Merritt Roe Smith and Leo Marx (Cambridge, MA MIT Press, 1994), 248; idem, "Technology: The Emergence of a Hazardous Concept," *Technology and Culture*, 51/3 (July 2010), 569.

[4] Eric Schatzberg, *Technology: Critical History of a Concept* (Chicago: University of Chicago Press, 2018)., 232-33.

[5] A longer list of examples appears in Alex Roland, da Vinci Lecture, "A Centrifugal Maelstrom," forthcoming, *Technology & Culture*, Oct. 2024. While preparing these remarks, I encountered even so sophisticated a wordsmith as Ross Douthat deploying the term "religion as a social technology." "Is there a Post-Religious Right?" *New York Times*, 10 May 2024. If it is any consolation, other disciplines have similar problems. The 2023 annual meeting of the History of Science Society presented a paper on "The Technicity of the Anal Sphincter: Physiology and the Queer use of Muscle." A historian of culture has identified cultural histories of "longevity, the penis, barbed wire, climate, ghosts and masturbation." Peter Burke, *What is Cultural History?* 3d ed. (Medford, MA: Polity Press, 2019), 3. He concludes with an observation that could well apply to SHOT: "The frontiers of the subject have certainly been extended, but it is becoming more and more difficult to say exactly what they enclose."

[6] Schatzberg, *Technology*, 7.

This does not mean that SHOT should formally adopt an official definition of technology. Not only would such an effort fail to control the natural evolution of language in society, but it would also fracture our community. Let me propose instead a model that we might endorse and promote. The example I invoke most often when trying to explain our field to other historians is Ruth Cowan's *More Work for Mother*. I think it teaches us as much about technology as it does about gender. It illuminates both subjects with equal brilliance, offering, to my mind, a stellar example of the best "technology **and**" scholarship--the kind we should seek to encourage. When I told Ruth I was going to embarrass her with this encomium at our symposium, she insisted that I also cite the work **she** always assigned her students: Roe Smith's *Harper's Ferry Armory and the New Technology*. She prizes it for seamlessly blending the technical history of the emerging American System with a cultural history of the craftsmen challenged by the new technology.

We can also promote works that address the issue of what technology is. Several distinguished SHOT members, such as Leo Marx, Eric Schatzberg, Pamela Long and Bob Post have ventured possible components of a definition. Long and Post--along with Mel Kranzberg and Carroll Pursell--have explicitly rejected the early notion that technology is simply how or what "things are done or made,"[7] Long and Post opted for "the sum of the methods by which a social group provides themselves with the material objects of their civilization."[8] Eric Schatzberg has ventured "the set of practices humans use to transform the material world, practices involved in creating and using material things."[9] In my teaching, I tell my students that technology is the application of force through some machine or tool by some technique to alter the material world for human purposes. Out of these individual efforts can be seen the makings of an umbrella conception of technology that most of us could embrace. All stress human purpose, a process or practice, and the material world, what Leo called "the distinctive material tangibility of the machines."[10]

The Nobel laureate Herbert Simon advised me once that the best way to understand a scholarly field was not to read its journal regularly but rather to survey it at five-year intervals. This practice reveals the content, drift, and connectedness of the community's discourse, the energy and vitality in the threads of discussion, the frequency and impact of new ideas, and the

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[7] Charles Singer, et al., *A History of Technology* (London: Oxford University Press, 1954), I, vii.; Melvin Kranzberg and Carroll Pursell, jr., eds., *Technology in Western Civilization*, 2 vols. (New York: Oxford University Press, 1967), I, 5.

[8] "Series Introduction" in Alex Roland, *The Military-Industrial Complex* (Washington, DC: The American Historical Association, 2001), viii.

[9] Schatzberg, *Technology*, 7.

[10] Leo Marx, "Technology: The Emergence of a Hazardous Concept," *Technology and Culture*, 51/3 (July 2010), 566.

tenor of the normal science and the possibility of paradigm shifts. We need a new John Staudenmaier to undertake such an appraisal of *Technology and Culture* in the first quarter of the twenty-first century.

It is possible to imagine us as a community articulating what we mean by the term in our public discourse. And we could also request that articles and papers submitted to our journal and our program committees include a clear statement of what the author understands by the term. Such statements need not be consonant with SHOT's view of technology. They might even challenge it. But that challenge, well made, could only stimulate further study and understanding. Think of Roz Williams' da Vinci address on technology from the bottom up. In both venues we might also advise prospective authors that we favor works that focus on the technology in the articles or papers that we accept for our journal or our annual meetings. What contribution, we would be asking, does this study make to our understanding of technology? That seems to be a reasonable request from a society created to promote the study and understanding of technology.