

Technology as a social collective experience of nation building: David Nye's American Technological Sublime

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Introduction

David Nye's *American Technological Sublime*¹ published in 1994 is one of the recommended books for the basic bibliography in history of technology by the Society for the History of Technology, in particular for American historiography of technology.² In 1995, a review in *Technology and Culture* presented it has a “new synthesis of the meaning of technology in American culture,”³ but, according to its reviewers, its audiences were not only History of Technology or American Studies' academics. It was also a recommend book for environmental historians, as well to professionals of technical areas and general readers.⁴ What may justify this range of audiences is not only the elegant and clear writing but the relations explored by David Nye between technology, nature, and people. Moreover, the book raises important historiographical and methodological questions and covers several levels of analysis and themes, providing a challenging regard on different socio-technological phenomena.

American Technological Sublime follows a previous book by David Nye, *Electrifying America: Social Meanings of a New Technology, 1880-1940*,⁵ getting back to it in the two chapters on the electrical sublime, and also working on a social construction of technology,⁶ a contextualized approach in *History of Technology*.⁷ The narrative is made using several levels of analysis: the actors that Nye gives voice to range from participants in public events to American corporations. He gives the readers the “flavor” of each epoch using citations from historical actors and showing how it is possible to undertake an analysis at a micro level based on a detailed work on coeval sources drawn from secondary and primary sources, such as newspapers, official speeches, ego-documents (for instance, letters or diaries). He portrays both how Americans related to the technological sublime and the European foreigners' regard on aspects of American culture, society, and technology. Nye also covers topics as diverse as gender, class, and racial issues, and also economic, cultural, and ethnographic aspects.

Giving an emphasis to the discontinuities rather than the continuities (which is an important debate within the historiography of technology, although not addressed explicitly by Nye), the book is chronologically organized, following Nye's proposal of presenting a diachronic approach to a set of cases of technological sublime in the United States of America (will be named simply as "America"), from 1820 to the 1990s. The technological sublime surpassed the natural sublime of the American landscapes when machines such as the railways, telegraph or the steam boat triumphed over space and time.⁸ Besides the railroad, other cases of technological sublime analyzed by the author go from the skyscrapers, the factories and the electrified city, to the 1939 New York World Fair, the atomic bomb and Apollo XI, the Statue of Liberty and, finally, the consumer's sublime. He opted for analyzing the appearance of new ways of sublime, each case a chapter, which emerged and validated new social and technological conditions.⁹

While revisiting this book a special attention will be given to the words of its title: the concept of sublime, and particularly of technological sublime, is presented as defined and limited by the author; and its "American" character and the construction of national identity will be discussed through the "lens of technology."¹⁰ With this selection I am interested in the way David Nye positions his work in the History of Technology, how he thinks the relation between nature and technology and the differences between European and American technological cultures.

The assumption that the American technological sublime "experienced in a crowd"¹¹ is present in all these themes and allows Nye to give voice to generally silent historical actors and relate the construction of the American national identity with its technological culture, which is the basis for the thesis of the book. Because he defines the sublime in America as a collective phenomenon, most of the examples¹² given have to do with events, including "public demonstrations," such as: tourism travel; the sightseeing of American natural beauties (natural sublime); the inaugurations of new technologies or architectural forms (railways, bridges, skyscrapers - dynamic and mathematical technological sublimes); tours to the factories (industrial sublime); other type of mass events, for instance the celebrations of the National Day of American Independence, July 4, or the World Fairs. The analysis of the emergence of a nationalist sentiment lies beyond the study of the positions of the ruling elites or other politically active groups. It is not only about a "top-bottom modernization,"¹³ but it is about how the average American has related himself or herself with this modernization.

“Technological sublime” and its “American” character

The sublime concept

Rather [than other definitions of sublime, the concept of sublime here explored], it is about repeated experiences of awe and wonder, often tinged with an element of terror, which people have had when confronted with particular natural sites, architectural forms, and technological achievements. This book is about the social construction of certain powerful experiences in industrial society, which is to say it is about the politics of perception. It does not primarily concern literature or the arts, but rather the public's experience of particular technologies.¹⁴

The proposed definition of the American sublime by Nye in this book, discussed in the first couple of chapters, is initially framed in two ways. On the one hand, he frames the concept of the sublime in American historiography through the survey of works that dealt with, in particular, the technological sublime. This term was baptized by Perry Miller in *The Life of the Mind in America* and later resumed by Leo Marx in *The Machine in the Garden*.¹⁵ Other American authors who studied the sublime were John Kasson, Barbara Novak, Roland Marchand and John Sears, who analyzed the technological sublime in relation to American tourism in the nineteenth century.¹⁶ On the other hand, Nye does a kind of "History of Ideas" to the concept of the sublime. It begins by tracing the historical evolution of what was considered sublime in various periods in antiquity, in the Middle Ages, and during Renaissance (with the marginalization of the sublime in literature), during the discovery of new worlds (and its association with wonder), during the birth of American nationality and its identification with the landscape, the Enlightenment (the primacy of reason, the desacralization of nature and the birth of modern science), and how nature has not been interpreted as sublime in the centuries that mediate Antiquity and the Enlightenment.¹⁷ Then, Nye dialogues with works by two eighteenth-century philosophers who thought about the sublime, the Irish philosopher Edmund Burke (*Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful*) and the German philosopher Immanuel Kant (*Critique of Judgment*), structuring from there some notions he returns to throughout the book. From Burke he worked the association of the sublime to nature and the necessary experience of shock and awe before the sublime; from Kant, the distinction between beautiful and sublime (defined as a gendered distinction) and the

notions of dynamic sublime and of mathematical sublime (which is also called by Nye as geometric or arithmetic).¹⁸ Nye used these references to better define the particularities of American forms of sublime.

Initially, the European influence, particularly the ideas of fine arts, literature and philosophy in Europe, dominated a particular American notion of the sublime accessible to the elite,¹⁹ which would detach from this model in mid-nineteenth century.²⁰

In the United States the sublime took a different turn, for a variety of political and economic reasons. (...) Engineers, rather than architects, built the first man-made objects that Americans regarded as sublime, and what particularly distinguished their response from that of the classical age or the English Enlightenment was the focus on moving machines.²¹

... the reemergence of the natural sublime in the eighteenth century soon led to technological versions of the sublime that have persisted down to the present. Nineteenth-century engineers, architects, and inventors were hardly rational technicians, and they often embraced transcendental ideas. Along with clergymen, writers, and artists, they imbued technology with moral values. Likewise, ordinary Americans repeatedly demonstrated en masse their love of technological objects, from the Erie Canal and the first railroads to the space program of the 1960s and the 1987 celebration of the Golden Gate Bridge.²²

Apart from the this feeling of the sublime (dynamic and mathematical) based on the contact with the natural world (such as the immensity of the Grand Canyon) or on the influence of the European elite culture, Nye develops the various types of technological sublime appreciated by Americans - the dynamic, the mathematical the industrial and electric - and a final form of the sublime, the sublime of the consumer.

The division that Kant made of the experience of the sublime in mathematical and dynamic is based on the subjective experience between subject and object, namely on the subject's perception of something larger than himself.²³ The mathematical sublime is an encounter with something extremely large or of great magnitude, i.e., it is the idea of the infinitely large (which in reality is finite) that one has before things of unique dimensions of or considered huge. Referring to Kant's work once more, Nye relates this with the subject's experience: "In the presence of this apparent infinity, Kant's subject experiences weakness and insignificance, but then recuperates a sense of superior self-worth, because the mind is able to

conceive something larger and more powerful than the senses can grasp."²⁴ The dynamic sublime has to do with the contemplation of scenes that may raise the element of terror, without one feeling in real danger. This is the kind of sublime that happens when one witnesses (in safety) forces of nature such as floods or explosions of volcanoes. Nye appropriates these concepts and applies them both to the natural and the technological sublimines. The examples the author uses to the dynamic technological sublime are trains and telegraphs and the mathematical technological sublime are bridges, skyscrapers, and dams.

Besides these two types of technological sublime, Nye proposes two others: the industrial and the electrical technological sublimines. The industrial sublime has to do with the sublime image created by organized and disciplined labor in American factories, whose evolution between 1830 and 1930 was marked by the different sources of energy used (water, steam and electricity), the various architectural forms and work models associated, culminating in the assembly line and in production of automobiles.²⁵ The electrical sublime partially overlapped the mathematical sublime,²⁶ by eliminating familiar spatial relations, as happened with the metropolis lighted at night.²⁷ The first chapter on the electric sublime is about how it interacts with the natural and the technological sublimines and what seems to create bonds of social solidarity, albeit fragile. The second places the electrical sublime in a specific context, the city. With the significant development of lit advertisements, a "geography of everyday life" incorporated spectacular effects possible with electricity, which initially were only seen in International Exhibitions.²⁸ The last form of the sublime presented by David Nye, the consumer's sublime, is quite different from the technological sublime, regardless the genre (mathematical, dynamic, industrial or electrical), because this later celebrates rationality, work and human achievements, while the consumer's sublime privileges irrationality, chance and discontinuity, placing the emphasis on fantasy.²⁹

The popular sublime, experienced by a mass audience differs from the sublime defined by Philosophy, because it is articulated in a less clear way and is based on the perceived experience.³⁰ This perception is accompanied by a relatively specific palette of emotions and states: excitement, enthusiasm, fear (without, nonetheless, sense of threat to its own life), religious feeling, sense of social cohesion,³¹ temporary feeling of transcendence, expectations. Expectations about the object of sublime define the experience. If there are none, there will be a psychological progression: firstly, there is a normal behavior, because one does not anticipates that will witness something extraordinary; secondly, the subject realizes that something extraordinary is going on, which disrupts the normal perception; and thirdly, the subject

recovers from the shock and establishes a new relationship with the object of the sublime.³² However, in most natural and technological sublime experiences there is no psychological progression, because there are pictures, stories, and therefore, the subject has already raised expectations, as it happens with tourist places. Moreover, dialogue between expectations and what is seen in fact, will be part of the tourist experience.³³ Every so often, these expectations interfere with the experience of the sublime, as Nye exemplifies with the Niagara Falls or the Grand Canyon, either retarding the direct experience of the sublime to take place by overlapping the prejudices and expectations that tourists bring, or preventing this experience to occur. However, despite the expectations and prejudices, sublime is still accessible to modern tourists, although the fact that its need to have everything well labeled, packed and easy to use is a clear expression of the triumph of the consumer's vision.³⁴

The limits of the technological sublime: ambivalence and the naturalization of technology

During each generation the radically new disappeared into ordinary experience.³⁵

The ephemeral character of the technological sublime raises questions about its way of acceptance and rejection, about domestication and naturalization processes, which occur when new technologies are part of new social relations.

Technology materializes relations of power and conflict, opposing social, cultural,³⁶ and political groups. Power relationships created through technology contain in themselves ambiguities that reveal the technological sublime's internal contradictions, which results from the expansion of human power, as an assertion of rationality, and simultaneously provokes feelings in the individual of insignificance and impotence. Also, depending on the positioning of the actors, one verifies that the distribution of power is unequal: "... those who have the greatest political, economic, and social power are more likely to find themselves inside the panopticon,³⁷ surveying the vast surround."³⁸ Technology becomes the mediator of power relations between people and between what surrounds them, and of the power relations embodied in the new landscapes created, as in the case of the skyscrapers (mathematical sublime) and trains (dynamic sublime):

Within a generation, many considered the tall building to be sublime, particularly seen from the top, just as the railroad was popular when considered from the passenger's point of view. In each case, using a new technology, Americans defamiliarized a known landscape and invested it with new meanings. The geometrical sublime, like the dynamic technological sublime before it, provided an olympian sense of perspective that could be immediately translated into a sense of power over nature. In each case, the human cost of achieving that power was literally invisible to the inhabitants of the new technological structure.³⁹

Nye refers to the invisibility of the human and other costs of new technological to stress the little resistance manifested by people when experiencing a new technological sublime. For instance, in 1939 New York World Fair, the highways of the future showed in pavilions of corporations such as General Motors and Ford⁴⁰ were utopist visions of a landscape dominated by automobility, which erased all the factors that would represent the costs of the use of these systems' technology to society, such as noise, pollution, road safety, poverty, war or unemployment.⁴¹ The exhibition of new consumption goods in twentieth century World Fairs (which was not made in the nineteenth century International Exhibitions) was made through the representation of ideal landscapes without people or problems. Another example of the limited resistance to new technologies, or the initial invisibility of its costs is the railways. Nye argues that during the initial expansion of railroads in America⁴² there was a broad consensus on the fact that they were sublime, and that they contributed to the unification, enrichment and expansion of the nation,⁴³ despite rejection, caused either by social conflicts over defrauded expectations (railways contributed to uneven regional growth), or by accidents involving steam engines.⁴⁴ On the skyscrapers, Nye says the struggles over its location repeated a pattern similar to other technological innovations: "As in the case of the railroad, a technological innovation excited the popular imagination at its inception and overcame all opposition."⁴⁵ Although there are several studies in the History of Technology that reflect the reality of resistance to the introduction of new technologies in the social fabric in its initial phase,⁴⁶ including some of David Nye's works,⁴⁷ this stance is probably due to the choice of the theme of the book, the sublime, which presupposes a more triumphant view of technology. The argument made by Nye about the little importance of resistance to new technologies goes together with the assumption that, initially, Americans did not necessarily see a contradiction between nature's conservation and technological development, whilst recognized the existence of tensions and

sought the sublime in both nature and technology.⁴⁸ For example, Nye compares the landscapes created by the initial location of factories in England and America, due to the use of different energy sources, respectively, in cities (steam) and the country (water).⁴⁹ For Americans, at the outset, the presence of factories in rural areas did not excite a feeling of contradiction, as it did for the English: “As with the railroad, Americans at first believed that factories might not pose a contradiction to the natural world but might extend and complete it.”⁵⁰

Linked to the relationship between nature and technology, is the question of "naturalization" of technology in the sense that technology is made an element of nature, addressed promptly. According to Nye, there is sometimes even a lack of clarity regarding the definition of the two domains: “The assumption of human omnipotence has become so common that the natural world seems an extension of ourselves rather than vice versa.”⁵¹ The naturalization of technology, in the sense of technology becoming a "natural" part of the world, also assumes that it ceases to cause awe: each object exceeds its predecessor, which is in the meantime naturalized. Both naturalization and replacement are constituents of the sublime.⁵² One could say that what Nye defines as “life-world” becomes a life-techno-world. The dialogue ceases to be between man and nature to be between man and his accomplishments, i.e., the manifestations of reason, placing a new emphasis on the role of engineers: “The awe induced by seeing an immense or dynamic technological object became a celebration of the power of human reason, and this awe granted special privilege to engineers and inventors.”⁵³ This naturalization of technology also contains an assumption about the neutrality of technology that, according to Nye, was only called into question with the atomic bomb, which was “the ultimate dead end of any attempted representation of the technological «thing in itself».”⁵⁴ This assumption on the harmony between nature and technology would have lasted in America between 1820 and 1945, the year the atomic bomb showed the other side of technology. But as “history is not a philosopher's argument,”⁵⁵ instead being made by factors that do not necessarily converge to a rationality,⁵⁶ Americans of the late twentieth century forgot the impasse posed by the technological sublime, and did not stop to enjoy it after the atomic bomb dropped on Hiroshima.

The naturalization of technology is also perceived as vulgarization and domestication of technology: in every object considered sublime, this quality is ephemeral and the object becomes vulgarized. This process is visible in the examples of technological sublime presented by David Nye, like the railways, bridges, public lighting, or the skyscrapers. However, no matter the efforts made, the atomic bombs will never be tamed or vulgarized: they will always be “a

permanent, invisible terror that offers no moral enlightenment”⁵⁷ and therefore serve as limit to the definition of technological sublime. The domestication of technology is associated by Nye to a process of feminization, reinforcing a notion of separate spheres according to gender. Although women had been marginalized, but not totally excluded from the production of the technological sublime (it was were mostly a product of the “male gaze”⁵⁸) Nye claims that they “played a vital part in the incorporation of the technological object into ordinary life” and that this process of “feminization transformed the alien into the familiar and implied the emergence of a new synthetic realm in which the lines between nature, technology, and culture were blurred if not erased.”⁵⁹ According to this perspective, women have played an active role in the "naturalization," "domestication" or the "appropriation" of technology.

Subjacent to the naturalization of technology is the concept of continuous improvement and the belief in technological progress: what was considered technological sublime ceases to cause such admiration and expectations are created about a faster, bigger or more complex technology.⁶⁰ This cycle (virtuous or vicious?) seems a paradox. The technological sublime contains both the idea of reason in constant evolution and the idea of permanent dissatisfaction. This idea of continuous progress was also conveyed during the international exhibitions, including New York World Fair in 1939: “This mingling of the marvelous and the real prepared visitors to see new consumer goods in terms of an inevitable march of progress toward a technological future.”⁶¹

The evolution of forms of sublime also undergone a change of discourse: in America in the late twentieth century, words were no longer needed to explain that technological objects were sublime, and were replaced by non-verbalized performances, unlike the initial celebrations of the first forms of technological sublime, as the trains, which were accompanied with explanatory speeches that helped to create meanings. Nye makes this general appreciation about the centennial celebration of the Statue of Liberty:

... the history of the technological sublime is that of the movement from word to spectacle, from individual to crowd, from nature to the machine, from substance to electric image. Its history records a shift in emphasis from natural to artificial landscapes, a shift that simultaneously transformed the position of the subject in relation to the sublime object. (...) ... by the late twentieth century the omnipotence of engineering had been internalized. It was no longer necessary to declare that machines were sublime.⁶²

There were continuities in this evolution of the technological sublime, such as the creation of a feeling of personal and national transcendence, which includes the feeling of community cohesion, though ephemeral. To witness the sublime was also a break from the ordinary everyday life, it was something extraordinary. But there were also discontinuities: “Gone were the visible links between work and product, between commerce and politics, between technology and human agency.”⁶³ The way sublime was celebrated also changed. People became more spectators, tourists and consumers than active participants.⁶⁴ “To the public, the technologies that Ronald Reagan put into play by pushing a button at the 1986 event [the centennial of the Statue of Liberty] were anonymously spectacular.”⁶⁵ And here is one possible conclusion from the technological sublime’s developments and changes in general, regarding the relationship between people and technology: the button has become the mediator between technology and human agency.

To finish the delimitation of the concept of the sublime it is necessary to address what Nye calls the "life world" and "death world." The sublime is an experience associated with self-preservation and therefore also associated with a "life-world," which means that nature and human existence are taken for granted in a world full of possibilities.⁶⁶ The atomic bomb is the unique example of sublime that David Nye provides in his book that puts into question this world, creating the possibility of a "death world," i.e., the possibility of world destruction and the extinction of the human species.⁶⁷ However, this did not prevent that a kind of atomic tourism existed,⁶⁸ or that the discussion of the use of nuclear energy for peaceful purposes, namely to solve energy problems, occurred. But the sublime that could be inspired by the nuclear energy and the atomic bomb is in contradiction with the classical sublime, for it contains the possibility of annihilation of nature, and also contradicts the technological sublime, which is manmade, because by containing this possibility, it destroys the collective feeling of human achievement.

Technological sublime and the construction of American identity

David Nye defines the “American” character of the technological sublime through the comparison with the “European” case, and also by revealing the relationship between American technological culture with politics and religion.

Nye uses Europe as a counter-example of identity from which the Americans have distinguished themselves from, making a very interesting reflection on the role of technology to the Europeans and the Americans. Being an American historian who has lived and taught in several European countries, the current being Denmark,⁶⁹ David Nye acknowledges what might not be enough said, although explored by a recent European project in the History of Technology that studies the “Americanization” of European consumer society,⁷⁰ which is the statement that “American” and “European” technological cultures are different. Either by studying the “Europeanization” of American and the way American culture gradually differentiated from the European, or studying the “Americanization” of twentieth century Europe, the assumptions are the same: there were mutual influences and differences of their technological cultures. Stating this difference, Nye emphasized the Americans’ relationship with technology (and with the technological sublime) to the construction of America’s identity as a nation, and presented it as an American exclusivity.

Americans have long found the sublime more necessary than Europeans, so much so that they have devised formations of the sublime appropriate to their pluralistic, technological society. Precisely because American society is so pluralistic, no single religion could perform that function. Instead, ever since the early national period the sublime has served as an element of social cohesion, an element that was already quite evident when the first canals were dug and steam engines were first harnessed to trains.⁷¹

Europeans neither invented nor embraced the vertical city of the skyscraper. Europeans banned or restricted electric signs, and rightly saw the landscape of Times Square as peculiarly American. Europeans did not see atomic explosions as tourist sites. Europeans seldom journeyed to see rockets go into space, but Americans went by the millions. There is a persistent American attraction to the technological sublime.⁷²

This provocative stance of the American exclusivity of the experience of the technological might be debatable. An example is the relationship between landscape and the development of tourism and the discovery of the country, which was not an American exclusive experience. According to Nye, the Americans turned to the landscape in search of the national

character, stressing that few monuments were erected before the Civil War.⁷³ The American landscape was perceived with pride when compared with Europe, which had no such wonders:⁷⁴ “As Americans became tourists in their own country, interest in sublime landscapes became not an idle diversion but an act of self-definition.”⁷⁵ However, this presentation of tourism as an American nationalist distinctive feature when compared to the European experience is something worth questioning. Actually, Europe had monuments and other heritage in this period that were signaled for protection and conservation, but Europeans also enjoyed the countryside and natural landscapes and associated it with a discovery of their own country: “visiting the countryside, appreciating the scenery was a patriotic duty as well as a pleasure.”⁷⁶ Another example, perhaps more general, is the recognition of recent historiography of the role of science and technology in the construction of nineteenth century European liberal States.⁷⁷ During the nineteenth and twentieth centuries, the transformation of the landscape was quite marked by the relationship between nature and technology and the technological achievements that represent both dynamic sublime, like trains and telegraphs, and mathematical sublime as dams, bridges, or skyscrapers. Transport infrastructures, such as railways, have reshaped the country and created new nodal points, including cities, producing a landscape that reflected the marginalization of rural issues.⁷⁸ Considering how the development of communications contributed to the construction of national identity is more than assessing how they allowed the central government to reach all parts of the territory, as Eric Hobsbawm suggests.⁷⁹ David Nye specifically proposes an approach that goes beyond, by considering the intrinsic value of cultural representations of these technologies and how they were perceived. But again, he insists on the difference of European and American technological cultures affirming that the ambivalence towards technology was always greater in England than in the America,⁸⁰ which always manifested greater resistance to new technologies. There were differences (for instance, in general, railways in Europe connected pre-existing cities while in America, mostly in the West, railways contributed to establish new cities)⁸¹ and specificities of each technological culture, which does not mean that Europeans have not experienced technological sublimines.⁸²

The “American” character of the technological sublime is also reflected in the relation between its technological culture and politics. David Nye makes other associations between objects perceived as technological sublime and values such as democracy, exemplified by the inauguration of the Erie Canal in 1825:

The citizen who contemplated such public improvements became aware of the power of democracy and saw himself as part of the moral vanguard, leading the world toward universal

democracy. (...) American democratic virtue could not be based on a state religion – that was forbidden by the constitution... (...). Nor could it be based on adherence to ancient traditions, since there were none. But democratic virtue could be invigorated by the powerful experience of sublimity.⁸³

Nye goes even further and reflects on the importance of natural and technological sublimities to the cohesion policy and adherence to Republican values: “Since, politics was expected to inspire vigorous debate and continual self-examination rather than automatic patriotism, another realm of unquestioned allegiance was needed to unite the citizenry. Hence, the centrality of the natural and technological sublimities.”⁸⁴ The celebration of July 4 also exhorted democratic values and, once again, the counter-examples were the models of European undemocratic governments.⁸⁵ Regarding international relations, Nye also related the American technological sublime to American hegemonic power: World Fairs in America were a means to contextualize American technological achievements in an international perspective and to include them as part of the American identity.⁸⁶

The “American” character of the sublime is also deeply rooted in religion, for the religious feeling is at the basis of the notion of the sublime, linked to nature.

Protestants increasingly looked for God in “the mirror of his works.” Americans would later incorporate this view in a powerful version of the natural sublime. The central point is that the sublime was not part of a static view of the world, nor was it part of a proto-ecological sensibility that aimed at the preservation of wilderness. Rather, to experience the sublime was to awaken to a new vision of a changing universe. The reemergence of the sublime was part of a positive reevaluation of the natural world that by the eighteenth century had become a potential source of inspiration and education.⁸⁷

Later on, this religious feeling in the relationship with the natural sublime was also suitable for the technological sublime. Nye quoting Leo Marx states that “... the awe and reverence once reserved for the Deity and later bestowed upon the visible landscape is directed toward technology, or rather the technological conquest of matter.”⁸⁸ This sense of re-bonding is explained by Nye as a counterpoint to the increasing desacralization of the American society:

The technological sublime is an integral part of contemporary consciousness, and its emergence and exfoliation into several distinct forms during the past two centuries is inscribed within public life. In a physical world that is increasingly desacralized, the sublime represents a way to reinvest the landscape and the works of men with transcendent significance.⁸⁹

A final comment

This book offers a challenging overview of the relation between technology, society, and nature, by using the concept of technological sublime as a tool to analyze a set of technological topics. Its richness is truly inspiring for historians of technology, who keep revisiting it.

David Nye brings the feeling of awe, wonder, and often terror, experienced in the presence of a new technological device, to the forefront of the history of technology, exploring its role as a critical tool in the construction of both the concept of modernity and national identity. On the one hand, Nye gives voice to the people (not the elites) who experienced the “popular sublime,” an innovative “bottom-top” analysis of modernization; on the other hand he analyzes the role of technology as an important feature for the construction of national identity, both in the material and the representational levels (force shaping the landscape and of social cohesion).

Although acknowledging the differences between “European” and “American” technological cultures and technological sublimines, David Nye’s *American Technological Sublime* provides an exciting general conceptual framework which can be used in different scenarios still to be explored.

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¹ David E. Nye, *American Technological Sublime*, (Cambridge, Mass./London: The MIT Press, 1994).

² See <http://www.historyoftechnology.org/bibliography.html> (accessed on the 27th November 2010).

³ Jeffrey L. Meikle, "Review: American Technological Sublime by David Nye," *Technology and Culture*, 36, no. 4 (1995), 1021-1022: 1022.

⁴ See, for instance, Kirk Jeffrey, "Reviewed work: American Technological Sublime by David E. Nye," *Environmental History Review*, 19, no. 2 (1995), 85-87; David Simpson, "Review of American Technological Sublime, David E., Nye," *IEEE Transactions on Professional Communication*, 39, no. 4 (1996), 242-243; Joe Podolsky, "Book Review, American Technological Sublime, David E. Nye " *Computers and Society*, 26, no. 1 (1996), 25, 26.

⁵ David E. Nye, *Electrifying America: Social Meanings of a New Technology, 1880-1940*, (Cambridge, London: The MIT Press, 1997 [1990]).

⁶ Nye, *American Technological Sublime*, xv. For the classic work on this approach see Wiebe E. Bijker, Thomas P. Hughes, and Trevor J. Pinch, eds., *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, (Cambridge, Mass./London: The MIT Press, 1994 [1987]).

⁷ See John M. Staudenmaier, "Rationality, Agency, Contingency: Recent Trends in the History of Technology," *Reviews in American History*, 30, no. 1 (2002), 168-181; *Technology's storytellers: Reweaving the human fabric*, (London, Cambridge: The MIT Press, 1989).

⁸ Nye, *American Technological Sublime*, 56.

⁹ *Ibid.*, xvii.

¹⁰ The expression “lens of technology” is borrowed to the agenda of a network that studies History of Technology in Europe, called Tensions of Europe. See, for instance, Thomas J. Misa and Johan Schot, "Introduction. Inventing Europe: Technology and the Hidden Integration of Europe," *History & Technology*, 21, no. 1 (2005), 1-19.

¹¹ Nye, *American Technological Sublime*, 27.

¹² David Nye explains the selection criteria for the cases presented: “First, I have searched for the things that awed the public. Second, I have focused on phenomena that attracted maximum national attention (...). ... I have examined experiences which ordinary people have intensely valued.” *Ibid.*, xvi.

¹³ Hobsbawm makes the caveat that most of the studies on nations’ formation and nationalist movements omit a level of analysis from the bottom, i.e., from ordinary people, often not literate. Therefore I underline the fact that David Nye, in an ingenious way, was able to approach this vision. Eric J. Hobsbawm, *A questão do nacionalismo. Nações e nacionalismo desde 1780*, (Lisboa: Terramar, 1998).

¹⁴ Nye, *American Technological Sublime*, xvi.

¹⁵ *Ibid.*, xv.

¹⁶ *Ibid.* For full references to the books of these authors see, *American Technological Sublime*, 297, 298. (note 8).

¹⁷ Nye, *American Technological Sublime*, 1-5.

¹⁸ *Ibid.*, 30 and ss.

¹⁹ *Ibid.*, 21.

²⁰ *Ibid.*, 1.

²¹ *Ibid.*, xix.

²² *Ibid.*, xx.

²³ *Ibid.*, 9, 10.

²⁴ *Ibid.*, 7.

²⁵ *Ibid.*, 130.

²⁶ “Kant’s sublime made the individual humble in the face of nature, the technological sublime exalted the conquest of nature. The electrical sublime represented a third kind of experience, as it dissolved the distinction between natural and artificial sites”. *Ibid.*, 152.

²⁷ *Ibid.*, 196.

²⁸ *Ibid.*, 177.

²⁹ The author acknowledges that some kinds of technological sublime also have an “element of escapism,” but they are essentially visions focused on progress. *Ibid.*, 295, 296.

³⁰ *Ibid.*, 27, 28.

³¹ Nye draws on ideas about social cohesion of the sociologist Emile Durkheim.

³² Nye, *American Technological Sublime*, 12, 13

³³ See, for instance, Catherine Bertho-Lavenir, *La Roue et le Stylo, Comme Nous Sommes Devenus Touristes*, (Paris: Editions Odile Jacob, 1999); Brian Dolan, *Ladies of the Grand Tour: British Women in Pursuit of Enlightenment and Adventure in the Eighteenth-Century Europe*, (London: HarperCollins Publishers, 2001).

³⁴ Nye, *American Technological Sublime*, 15, 290.

³⁵ *Ibid.*, 283.

³⁶ For example, a discussion of what is beautiful in the city, particularly on the placing of electric signs along public roads, put in dispute the defenders of a high culture, who were against it, and the advocates of a popular culture, who were in favor. *Ibid.*, 190.

³⁷ The principle of the panopticon (proposed by Bentham) is an architectural model that has on its periphery an annular building and a tower in the center. It is the figure in architecture that best symbolizes the pervasive power of those who, from the tower, are not seen but control those on the periphery, who are always visible and don’t see who controls them. See Michel Foucault, *Vigiar e Punir*, (Petrópolis: Editora Vozes, 1993 [1975]), 173-199.

³⁸ Nye, *American Technological Sublime*, 285.

³⁹ *Ibid.*, 100.

⁴⁰ General Motors’ “Futurama”, *Ibid.*, 218. and Ford’s “Road of Tomorrow”, *American Technological Sublime*, 215.

⁴¹ Nye, *American Technological Sublime*, 219, 220.

⁴² He situates the expansion of railways in America between the construction of the first railway line in 1828 until the completion of the first transcontinental connection by railways in 1869.

⁴³ Nye, *American Technological Sublime*, 45.

⁴⁴ *Ibid.*, 70, 71.

⁴⁵ *Ibid.*, 99.

⁴⁶ See, for example, for the case of resistance to the diffusion of the automobile in America Ronald R. Kline and Trevor J. Pinch, "Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States," *Technology and Culture*, 37, no. 4 (1996), 763-795; Clay McShane, *Down the Asphalt Path: American Cities and the Coming of the Automobile*, (New York: Columbia University Press, 1994); Peter D. Norton, *Fighting Traffic. The Dawn of the Motor Age in the American City*, (Cambridge/London: The MIT Press, 2008).

⁴⁷ See, for instance, David E. Nye, *America as Second Creation. Technology and Narratives of New Beginnings* (Cambridge, Mass: MIT Press, 2004).

⁴⁸ Nye, *American Technological Sublime*, 282.

⁴⁹ *Ibid.*, 110, 111.

⁵⁰ *Ibid.*, 112.

⁵¹ *Ibid.*, 289.

⁵² *Ibid.*, 284.

⁵³ *Ibid.*, 60.

⁵⁴ *Ibid.*, 290.

⁵⁵ *Ibid.*, 291.

⁵⁶ "History ... records not logical developments but a mixture of well-reasoned acts, unintended consequences, accidents, shifting enthusiasms, and delusions." *Ibid.*

⁵⁷ *Ibid.*, 253.

⁵⁸ *Ibid.*, 283.

⁵⁹ *Ibid.*

⁶⁰ *Ibid.*, 60.

⁶¹ *Ibid.*, 216.

⁶² *Ibid.*, 277.

⁶³ *Ibid.*, 279.

⁶⁴ *Ibid.*, 286.

⁶⁵ *Ibid.*, 279.

⁶⁶ Nye, *American Technological Sublime*, 228.

⁶⁷ *Ibid.*, 231.

⁶⁸ Nye describes the promotion of viewing of nuclear tests in Nevada, which people watched as tourist attractions, and as another form of technological sublime. *Ibid.*, 232, 233.

⁶⁹ A short biography of David Nye is available at http://www1.sdu.dk/Hum/amstud/staff/david_nye.htm (website accessed on November 29, 2010).

⁷⁰ See, for instance, the project "European Ways of Life in 'the American Century': Mediating Consumption and Technology in the Twentieth Century (EUWOL)," which is a Collaborative Research Project (CRP) in the framework of the European Science Foundation's EUROCORES program Inventing Europe. See <http://www.tensionsofeurope.eu/Research.asp?wh=EUWOL> (website accessed on November 29, 2010).

⁷¹ Nye, *American Technological Sublime*, xiv.

⁷² *Ibid.*, 282.

⁷³ *Ibid.*, 24, 25.

⁷⁴ *Ibid.*, 32.

⁷⁵ *Ibid.*, 24.

⁷⁶ Catherine Bertho-Lavenir, "How the Motor Car Conquered the Road," in *Cultures of control*, ed., Miriam R. Levin (Amsterdam: Harwood Academic Publishers, 2000), 129. The European liberal nation states were affirming the legitimacy of their origins and also resorted to the landscape. Catherine Bertho-Lavenir takes her argument a step further, giving us an account that the preservation of the landscape was also a concern of automobile clubs and tourist industry because of car journeys.

⁷⁷ See Carol E. Harrison and Ann Johnson, "Introduction: Science and National Identity," *Osiris*, 24, no. 1 (2009), 1-14. For the Portuguese case see Tiago Saraiva, "Inventing the Technological Nation: The Example of Portugal (1851-1898)," *History & Technology*, 23, no. 3 (2007), 263-273.

⁷⁸ Nye, *American Technological Sublime*, 64.

⁷⁹ Hobsbawm, *A questão do nacionalismo. Nações e nacionalismo desde 1780*, 78.

⁸⁰ Nye, *American Technological Sublime*, 54.

⁸¹ *Ibid.*, 58.

⁸² See, for example, Marta Macedo, "Projectar e construir a Nação: engenheiros e território em Portugal (1837-1893)" (PhD Thesis, Faculdade de Ciências e Tecnologia da Universidade de Coimbra, 2009).

⁸³ Nye, *American Technological Sublime*, 36.

⁸⁴ *Ibid.*, 35.

⁸⁵ *Ibid.*, 41.

⁸⁶ *Ibid.*, 68.

⁸⁷ *Ibid.*, 5, 6.

⁸⁸ *Ibid.*, 58.

⁸⁹ *Ibid.*, xiii.