

## The Romantic Machine: Utopian Science and Technology after Napoleon

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**Author:**

John Tresch

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Robert D. Priest

Electromagnetism, photographic reproduction, grand operas, phantasmagorias, automatons and socialist utopias: what do these have in common? According to John Tresch, they were all manifestations of a common ‘mechanical romanticism’ that permeated Paris between the fall of the first Napoleon in 1815 and the triumph of his nephew Napoleon III in 1851. By means of a vivid series of excursions through the streets, theatres, laboratories and temples of the French capital under the Bourbon Restoration and July Monarchy, *The Romantic Machine* asks us to put aside the received idea that sets the romantic in opposition to the mechanical. The scientists and engineers of post-Napoleonic Paris were not cold, distant figures who fetishised detachment and instrumental objectivity; rather, they were ‘mechanical romantics’, ‘seized by the passions, mystic flights, uncertainties, and obsessions of romanticism even as they sought new machines and rational sciences to let them show and act upon their environment’ (pp. xvi–xvii). Their artist colleagues, meanwhile, were no nostalgic technophobes; rather, they shared scientists and engineers’ preoccupation with ‘animated matter, vibratory communication, lifelike machines, and eerie metamorphoses’ (p. 126). If these men resembled characters from one of Balzac’s novels, it is because they were often his models.

Tresch ultimately seeks to recover a seam of French thought where instrument and sentiment seemed not only compatible but complementary. He also imbues the reader with the lingering sensation that the ‘mechanical romantics’ understood something we and their successors have subsequently forgotten. The book’s dedication to Bruno Latour, Simon Schaffer and George Stocking clearly signals the contours of its

methodology. Tresch echoes Schaffer and Shapin's attention to the mutual implication of scientific and social thought, and Latour's focus on the relationship between humans and non-humans. In keeping with the careful empiricism of these precursors, Tresch claims to focus 'not on a vague *Zeitgeist* or episteme, but on the concrete and specific means through which actors presented the order of the cosmos to themselves and their fellows' (p. 6). His book is certainly effective at situating its subjects within the 'concrete' social world of Restoration Paris and its institutions. The reader never has the sense of reading a disembodied account; in addition to the book's scholarly focus on locales such as the Conservatoire National des Arts et Métiers or the Paris Opera, Tresch offers colourful anecdotes about Pierre Leroux's hair or Pierre-Simon Laplace hiding the sugar from his wife.

The nine case studies that make up *The Romantic Machine* are organised into three parts that deal respectively with the sciences, the arts and politics, although the intention throughout is to show the interconnections between these fields.

In the first part, 'Devices of cosmic unity', Tresch devotes a chapter each to three scientific innovators of the 1820s: André-Marie Ampère, who helped discover electromagnetism; Alexander von Humboldt, the peripatetic German polymath; and François Arago, the scientist-engineer who patronised the daguerreotype photographic process. While the physicist Laplace is often seen as the dominant figure of Restoration science, these chapters seek to demonstrate that a new generation of scientists battled to unseat Laplace's deterministic physical model. They instead offered a dynamic vision of nature as 'a field of active forces in constant interaction and transformation, undergoing irreversible processes of growth and development' (p. 121). This conception of nature was connected to epistemologies that emphasised the interaction between the observer and his instrument. Whereas, in the classic view of 19th-century objectivity, the unreliable man was an obstacle to the scientific instrument's objectivity, Humboldt, for example, saw man and tool fusing as one. Tresch argues that this mechanical romantic vision incorporated the aesthetic preoccupations of German idealist philosophers such as Kant and Schiller into the realm of scientific discovery. In particular, the mechanical romantics shared Schiller's emphasis on the centrality of aesthetics to freedom, and his dream of an aesthetic state where 'even the tool which serves ... is a free citizen' (p. 75). In Tresch's account, Arago explicitly politicised these ideas. As well as an engineer, he was a serving deputy who sprinkled his speeches with Byron and Goethe. He presented the daguerreotype to the Chamber of Deputies as 'a patriotic act of republican piety' that would help the nation reach unexpected new heights of science and aesthetics (p. 117). This was bound up with Arago's celebration of work – what Tresch calls his 'labour theory of knowledge' (p. 102) – which assigned workers an analogous place in relation to their machines to that given by Humboldt to scientific observers vis-à-vis their instruments.

The second part of *The Romantic Machine*, 'Spectacles of creation and metamorphosis', mimics Arago's apparent turn to the people by shifting its focus to the role of technology in popular spectacles. These include panoramas, dioramas, grand operas and magic shows. Tresch shows that romantic artists employed various forms of what he labels 'technaesthetics'. This neologism, itself drawn from Ampère's work, describes the technological production of aesthetic effects. Tresch's investigations in 'technaesthetics' absorbs Étienne-Gaspard Robison's *Fantasmagoria* in an abandoned Parisian convent, Daguerre's diorama of the *Midnight Mass*, Berlioz's *Symphonie fantastique* and other productions of the 1820s and 1830s. He then offers the 1831 production of Giacomo Meyerbeer's opera *Robert le Diable* as 'the iconic intersection of the period's eclectic currents of spiritualism and mechanics' (p. 151). Meyerbeer used new instruments, harmonic combinations, an enormous chorus 'singing eerily through resonating tubes' (p. 149), lavish costumes and bewitching set changes that drew on the techniques of contemporary illusionists. These artistic experiments mirrored and elaborated contemporary scientific work on human perception. Similarly, Robert-Houdin's magic shows and Grandville's satirical illustrated voyages into imagined alternative worlds intersected with the contemporary debates over nature associated with Georges Cuvier and Étienne Geoffroy Saint-Hilaire. The spectacles and artistic products of the Restoration were, furthermore, developed in the shadow of new institutions such as the Museum of Natural History and National Expositions of French Industrial Products. Throughout, Tresch's argument is that the culture of machines was characterised by enormous variation and ambiguity. Much as there were myriad metaphysical positions in contemporary

philosophy and natural history – there is even a helpful table of these on p. 159 – so Grandville’s illustrations ‘affirmed the polymorphous, world-making potentials of new machines – their ability to serve as sources of oppression, liberation, creativity, inhibition, prophecy, and absurdity’ (p. 184).

In the final section, ‘Engineers of artificial paradises’, Tresch shows how these technological and aesthetic preoccupations took root in the era’s predominantly socialist utopias. The Saint-Simonians, Pierre Leroux and Auguste Comte are all shown to be mechanical romantics. They ‘drew upon the same currents of inspiration and practice that lay behind the era’s developments in electromagnetism, thermodynamics, geophysics, and natural history’, shared the contemporary fascination with popular spectacles, and engaged with romanticism’s ‘reflection on the protean powers of nature and mind’ (p. 186). Tresch takes the Saint-Simonians seriously both as a religious movement and as a pervasive influence on mid-century industrial and technological developments, while also arguing that these two strands were inseparable. His approach to Leroux, himself a fleeting Saint-Simonian, emphasises the importance of Geoffroy Saint-Hilaire’s philosophical anatomy on his social thought, while also drawing attention to the ‘ecological resonances’ (p. 247) of his politics. This chapter features the particularly memorable line from Leroux’s 1846 argument against Malthusianism: ‘All that is needed to answer Malthus is human excrement’ (p. 248); in other words, human dung could be used as fertiliser to ensure a sustainable food supply. Finally, Tresch comes to Comte and his Religion of Humanity, and again argues that utopian dreams were grounded in biological thought. In particular, he suggests that Comte’s organisation of the living world in order of organic complexity and social interdependence offered a ‘theory of the human as a technological animal’ (p. 273).

All good things must come to an end and, for Tresch, this means that the revolutionary upheavals of 1848 extinguished the mechanical romantics’ own utopian visions of the future. *The Romantic Machine*’s cast of characters had oriented around a common tension: on the one hand, the industrial order had produced new injustices that they were among the first to recognise; on the other, they placed industry and technology at the centre of their theories of liberation. In Tresch’s account, the Second Republic of 1848–51 witnessed the explosion of this contradiction. Bertall’s [well-known 1848 cartoon of ‘The Ideas Fair’](#) [2], where an array of radical thinkers tried to flog their competing utopian visions, serves for Tresch as a symbolic representation of the Left’s failure to reach consensus on the relationship between the state, the workers and technology. Nonetheless, he argues, we should not dismiss the mechanical romantics’ vision. They recognised humanity’s interdependent relationship to nature and offered solutions that operated ‘at the middle scale, between the local and the cosmic’ (p. 309). In response to their age’s problems they offered medium-sized solutions rather than total global revolution: Fourier’s phalansteries, Leroux’s communes and Comte’s intendancies. We might say that, in Tresch’s view, the early socialists offered a kind of precursor to the ‘think globally, act locally’ ethos of later environmentalists.

If my description gives the impression that *The Romantic Machine*’s explorations take place on a busy stage that is constantly repopulated by a conveyor-belt of fresh eclectic Frenchmen, then that would be correct.<sup>(1)</sup> Perhaps absorbing the cosmological orientation of his subjects, Tresch effectively attempts to provide a unified theory of Restoration culture. It can be difficult to keep track; but then, the book’s originality lays less in its core argument about the interplay between romantic and scientific thought, than in its sustained consideration of this relationship across an unprecedentedly wide range of cultural forms.<sup>(2)</sup> Tresch is also generous enough to regularly recapitulate his case throughout the book, ensuring that the argumentative thread is never quite broken.

Tresch’s broad view recalls other historians of science whose books have made wide-ranging contributions to cultural history, such as Alison Winter’s *Mesmerized*.<sup>(3)</sup> His ecumenism allows him to address historiographical concerns that extend beyond the (itself substantial) literature on 19th-century science and French romanticism, including debates about the place of religion in early socialism, or the causes and consequences of 1848. These arguments often build on recent work, most notably Antoine Picon’s reconsideration of Saint-Simonianism, Mary Pickering’s study of Comte and Michael Behrent’s examination of religion and ‘association’ in French social thought.<sup>(4)</sup> By bringing these insights together, while also incorporating them within a more ambitious framework, Tresch offers something new and exciting to historians of 19th-century France. His effort will hopefully encourage other innovative perspectives on the

relationship between the arts and sciences.

I will limit criticism to two comments, of which the first is structural. Each chapter is dedicated to a particular machine or piece of technology. This is largely a successful organisational tool: in the case of Humboldt's instruments, Clapeyron's engines or Leroux's pianotype, the relationships between the broader discussion and the specific piece of technology were especially provocative and persuasive. Nonetheless, at other points the connection seemed more opaque. While I would not contest that Comte's calendar is an important 'paper technology' of the age, it seemed to me that it was not strictly the kind of technology with which Comte was concerned in the philosophical discussions considered by Tresch's chapter. Similarly, while the book makes clear how Arago's promulgation of the daguerreotype was a political gesture, it was not clear to me how this explicitly related to the question of work and the 'labour theory of knowledge' outlined in the earlier part of Tresch's discussion.

My second comment also concerns politics. Tresch is keen to emphasise the left-leaning and broadly republican dimensions of mechanical romanticism; but there was a more liberal and elitist side to these views. To pick one example, Ernest Renan's youthful 'thoughts of 1848', *L'Avenir de la Science*, seem to offer a similar combination of technological optimism and nebulous spirituality. Yet Renan's vision offered little to the poor and workers, and he soon grew sympathetic to Bonapartism. Indeed, as Tresch writes very resonantly of the Saint-Simonians, 'the few sad holes dug in the garden at Ménilmontant in preparation for the pillars of a first temple never supported a bridge across the great division opening at this time: that between the offspring of the bourgeoisie and those whose birth destined them to labour' (p. 221). It would be interesting to hear more on this point, and to consider whether mechanical romantics' core ideas produced more conservative 'alternative modernities' that went alongside the radical ones described in this book. After all, if we do wish to revive some of the age's core ideas, then we need to guard ourselves against its pitfalls.

*The Romantic Machine* raises other questions that it cannot reasonably be expected to answer, but which may stimulate future researchers. Two immediately come to mind. The first relates to my above point about politics, namely: if the mechanical romantics were shaped by a common generational dynamic, what were the shared experiences and influences that drove the men who then rejected their vision? This deserves more consideration than Tresch's conclusion can offer, especially since the generation of 1848 grew up steeped in a culture that was apparently permeated by mechanical romanticism. Secondly, if, as Chris Clark has recently argued, the post-1848 era witnessed an authentically European turn to technocratic government (5), then was the mechanical romanticism that preceded it also a common European phenomenon, or, as Tresch sometimes implies, a uniquely French (or even Parisian) take on English industrialism and German romanticism? More questions will surely be asked of such an innovative, refreshing and ambitious work.

One final note: some contemporary technological utopians have foreseen the end of the printed book. The University of Chicago Press clearly has other ideas. *The Romantic Machine* is an elegant example of academic publishing, with sumptuously illustrated chapter headings and stylised typefaces that complement the text. The aesthetic and the intellectual remain interdependent.

## Notes

1. The romantic period seems to bring this out in books; I was reminded of Paul Bénichou's equally busy *Le Temps des prophètes: Doctrines de l'âge romantique* (Paris, 1977).[Back to \(1\)](#)
2. Some of the broader themes were present in, for example, Michael Dettelbach's work on Humboldt (inter alia, 'Alexander von Humboldt between Enlightenment and Romanticism', *Northeastern Naturalist*, 8 (2001), pp. 9–20) and in the important collection, *Romanticism and the Sciences*, ed. Andrew Cunningham and Nicholas Jardine (Cambridge, 1990).[Back to \(2\)](#)
3. Alison Winter, *Mesmerized: Powers of Mind in Victorian Britain* (London, 2000).[Back to \(3\)](#)
4. Antoine Picon, *Les Saint-Simoniens: Raison, imaginaire et utopie* (Paris, 2002); Mary Pickering, *Comte: An Intellectual Biography* (3 vols., London, 1993–2009); Michael Behrent, 'The mystical

body of society: religion and association in nineteenth-century French political thought', *Journal of the History of Ideas*, 69 (2008), pp. 219–43.[Back to \(4\)](#)

5. Christopher Clark, 'After 1848: the European revolution in government', *Transactions of the Royal Historical Society*, 22 (2012), pp. 171–97.[Back to \(5\)](#)

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