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## Dompter Prométhée: Technologies et socialismes à l'âge romantique (1820–1870)

Guido Frison

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South,' would remain an important consideration for de Viti de Marco throughout his life (p. 2).

Mosca's book is complemented by a documentary film (<http://vimeo.com/29599475>, 52 minutes). The combination provides an intriguing view of what practicing the history of ideas might look like in the future. The documentary video is a pleasure to watch, though it is designed to be accessible to a wide audience of Italians and non-Italians. The book provides details, references, footnotes, and greater depth of information useful to historians of economic thought, particularly those interested in the evolution of public finance and public choice. Such individuals will find the interviews with Medema, Buchanan, and Wagner particularly novel and useful.

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Marianne Johnson

*Department of Economics, University of Wisconsin Oshkosh, Oshkosh, WI, USA*

*E-mail: johnsonm@uwosh.edu*

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*Dompter Prométhée: Technologies et socialismes à l'âge romantique (1820–1870)*, Besançon, Presses universitaires de Franche-Comté, 2016, 286 pp., €15.00, ISBN 978-2-84867-560-2

This book includes half of the papers read at the international symposium organised by the Georges Chevrier Centre on *Technologies and socialism: theories, imaginations and experiences in the 19th century* (3–4 June 2013, Bourgogne University, Dijon). Two contributions by Keith Tribe and Liliane Hilaire-Pérez were later added. *Dompter Prométhée* (*Subduing Prometheus*)

addresses the opinions and theories on technology and machines of Marx, Owen and some of the first French socialist thinkers (Saint-Simon, Fourier, Cabet, Proudhon, Pecquer) between 1820 and 1870. A lengthy introduction (47 pages) is followed by nine historical papers and a philosophical conclusion. All the contributors are historians, mainly of contemporary history.

This collective volume fosters better understanding of how some socialist thinkers and movements coped with *technological* unemployment and changes to the means and methods of labour. The book is important because it is one of the first attempts to address some of the fundamental questions raised about technology and machinery by early socialist thinkers. It is ambitious in its aims, because the notion of socialism and cross-disciplinary concepts of technology and technique are still a matter of debate today. Finally, it could be noted that the widely accepted kinematic notion of the machine first emerged in 1875.

The insights provided would probably have been greater had their authors systematically distinguished between the concepts used by the socialists they write about, and those of socialism, technology and the machine, which are supposedly the necessary tools for scholars working in this context. Unfortunately, the use of these latter concepts is not uniform, and often the words *technique* and *technologie* are used in much the same way that they are used in everyday French.

Jarrige, in his introductory essay, provides an overview of the views taken by various socialist movements on machinery in the first half of the nineteenth century. The main lines here draw upon a preceding book (Jarrige 2014). The first two sections of the introduction are more theoretical and somewhat controversial, while the remaining four sections present a great deal of historical data.

In the first section, Jarrige asserts that a connection exists between the terms *technology* and *socialism*, based on two assumptions: (i) that a Promethean concept of progress shared by early socialists led to an ideal emancipation based on knowledge and the technical domination of nature modelling modernity; and that these socialists (ii) sought to master Prometheus (p. 9). The title of the book and its main content are derived from these assumptions.

While there is not space here to discuss the question of the *domination of nature*, it is important to note that some of the relevant evidence does not support the above assumptions. Proudhon and Marx did not share any common Promethean myth, as the author asserts (p. 9). Proudhon's Prometheus is a symbol of society, and for this reason, Marx strongly criticised Proudhon in his *Poverty of Philosophy* (1847). Marx's foreword to his doctoral thesis (1841) mentions Prometheus, but without drawing any

connection between Prometheus and machinery or technology. Trousson's work on the Promethean myth in the European literature, one of the sources quoted by the author, observes that Prometheus did not inspire French social thought (2001, p. 439).

According to a saying erroneously attributed to Agatha Christie, "One coincidence is a coincidence, two coincidences are a clue, three coincidences are a proof". Similarly, the author refers to three sources to corroborate the existence of a strong connection between the emergence of the notions of society and that of the machine (technique) (Karl Polanyi, Walter Benjamin and Karl Marx at pages 11, 12 and 13). There is insufficient space here to discuss Polanyi's five pages of notes for a lecture. Instead, *The Great Transformation* appears to be a better source on which to base a more detailed analysis of the onset of the Industrial Revolution and its machinery (Polanyi 1957, pp. 40, 75, 82, 89). The brief notes made by Benjamin suggest that the French term *technique* was a translation of the German *Technik*. Finally, the author ascribes a short work by Engels in 1847, "Draft of a Communist Confession of Faith", to Marx.

Regarding the concept of *Technologie*, the new meaning of which Johann Beckmann (1739–1811) outlined in 1777 in his *Anleitung zur Technologie*, the "Introduction" contains both some significant and some minor errors. It is hard to accept the idea that "*Technologie* refers to the science of human activities; it may be descriptive, analytical and more and more theoretical..." (p. 18). This applies to Alfred Espinas (1897) but not to Beckmann, who began lecturing at the University of Göttingen in 1766, not in 1772 (p. 18). *The Oekonomisch-technologische Enzyklopädie* of Krünitz took this name in 1785 only, and not in 1773 (p. 18).

The term *technique* appears in the various contributions to the book, including those that were translated from English into French, a lemma conflated with *technologie* (see also Le Robert's *Dictionnaire historique*). The relationship between these two terms and their use by French ethnography of the couple *technique/technologie* is not clear, and most of the papers do not allude to the complex connections between the terms *technique*, *Technik* and technology.

Keith Tribe's paper, "De l'atelier au procès de travail: Marx, les machines et la technologie", draws on chapter 6 of his 2015 book, *The Economy of the Word*. With a mastery of the philological Marxian literature, Tribe discusses sources on the machine and *Technologie* read by Marx and used in the bitter critique of Proudhon in his *Poverty of Philosophy*, and later in *Capital Vol. I*. We do not subscribe to Tribe's philological reservations concerning the modern *Marx Engels Gesamtausgabe* since, despite its limitations, the fourth edition of *Capital* covers more ground than simply the labour process. As a matter of fact, the term *Technologie* and the notion of labour

process are absent from the lexicon of political economy of the classical school, and both of these still need to be better understood.

Many papers address the question of innovation: Geoges Ribeill discusses the attitude of socialists to railways, François Jarrige examines the pianotype, an early compositor used in the printing industry, Thomas Bouchet covers systems of communications “from the carrier pigeon to the electric telegraph”, and Bernard Desmars discusses Fourierist inventors. The key notion of machine during this period owes nothing to the first systematisation by the pseudo-Aristotelian *Mechanical Problems* (c. 335 BC), and it was not until very late, in 1875, that Franz Reuleaux arrived at a stable and secure concept.

Proudhon and Marx proposed two different definitions of the notion of machine, both of which today we consider fanciful. Of course, social debate did not wait for the correct definition of the machine, and some reflections on machinery *as a social object* were at least made in 1830 by Cayley (1830, p. 1), as Tribe observes. This work predates by five years Andrew Ure’s *Philosophy of Machinery*, which is the preferred Marxian source, as Tribe makes clear. This nineteenth-century literature suggests that the main aim of machinery *is to save and displace human labour*, but neither Cayley nor Ure were socialist.

Tresch competently illustrates the nature of Saint-Simonian religion and its connection and parallelisms with the fundamental work of Sadi Carnot’s *Reflections on the Motive Power of Fire*, published in 1824. In this case, the machine is represented as a *thermodynamic object*. However, unlike Emile Clapeyron, who published a mathematical representation of Carnot’s ideas, there is no evidence that Sadi Carnot adhered to Saint-Simonism. The calculation of motor efficiency given here contains a small methodological error, because it is calculated in degrees Celsius rather than degrees Kelvin, so the final result is faulty (note 39, p. 93).

The majority of socialist thinkers saw a kind of *aporia* in the use of productive machinery because it resulted in unemployment and changed the working functions of the labourer, while increasing resultant wealth. Many socialist solutions were proposed: Owenite communities and New Lanark can be considered to be attempts to reconcile technical change with social cohesion – this is the theme of Ophélie Siméon’s contribution. Étienne Cabet proposed a continuous and extensive process of innovation, systematically exposed in the contribution by the late Joost Mertens. Cabet and Marx proposed socialisation of the means of production as the solution to the problem, while other solutions are canvassed both in the introduction and throughout the book.

The pseudo-Aristotelian *Quaestiones mechanicae* (a set of problems relating to statics) were also affected by an *aporia*. A simple machine, for

example, the lever, astonished the Aristotelian physicist because it could move a large weight using a much smaller weight. The Archimedean approach to statics, and, then much later, Galileian mechanics were not affected by that aporia. When will social scientists and historians be able to solve the aporia of the machine?

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Guido Frison

*Department of Anthropology, UCL*

[frison.guido@gmail.com](mailto:frison.guido@gmail.com)

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