Time and Machines, 1700-1850: Economy, Productivity, Discipline

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Institut d'histoire
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Call for papers:

As of the eighteenth century, machines became central to the process of technological innovation. The 'mechanical arts' then encompassed a large spectrum of disciplines and practices, whose commonality – as Jean d'Alembert stressed in the article '*Machine*' of the *Encyclopédie* (vol. 9, 1765, p. 794b) – lied in the endeavor to regulate a given force, and maximize its action. Artisans were most often in charge of the creation of machines and of the elaboration of knowledge linked to their functioning, although natural philosophers also got engaged with technological innovation. In this respect, one might consider the importance of providing expertise on machines for the learned societies of the time, in France (the Paris Academy of Sciences) as well as in Britain (the Royal Society of London and the Society of Arts).

In the creation of machines and their assessment, a key role was played by the concept of 'economy'. This notion had multiple meanings: the economy afforded by machines could be of materials, of human force, but also of *time*. As d'Alembert underscored in the article mentioned above, a machine could also be defined as a device 'aimed to produce movement in a way that saves time in the execution of the effect' (p. 794b). It is therefore not surprising to find a recurrent insistence on time economy in the assessments of machines submitted for scientific evaluation, as testified – to mention just one example – by archival documents held at the Paris Academy of Sciences. Most often, the economy of time was associated with that of fuel (wood, charcoal, etc.), of crucial importance in an age constantly threatened with the dearth of energetic supplies.

The efficiency of machines, particularly regarding the time in which they executed their operations, was crucial also to determine their potential productivity. When the use of a machine was embedded in a chain of production, as was the case in manufactures, the rigid temporal organization of the technical procedure was crucial to control the procedure, the outcome, and the management of workforce, thus ensuring a steady increase of profit. This aspect does not only emerge from expert reports on manufactures or the text of patents, but also from late eighteenth and early nineteenth-century literature on technology and industry. One might consider the discussions of time economy provided in Alexander Hamilton's *Report on the Subject of Manufactures* (1791), Joseph-Gérard Christian's *Vues sur le système général des opérations industrielles, ou plan de technonomie* (1819), Charles Babbage's *On the*

Economy of Machinery and Manufactures (1832), and Léon Lalanne's *Essai philosophique sur la technologie* (1840).

In the early industrialization period, the practice of time economy became a source of discipline. In a seminal article of 1967 – '*Time, Work-Discipline, and Industrial Capitalism*' – E.P. Thompson illustrated the time discipline to which individuals were submitted in the industrial age. An idea of regularity and of 'time thrift' became widespread in society after the introduction of rationalized working rhythms in factories. This new perception of time overthrew the traditional time consciousness of people, shaped by natural cycles and 'task-oriented' work. Thompson gave a strong moral connotation to time discipline, as a condemnation of idleness and time waste. He also established – partly inspired by Max Weber – a connection between time economy, the rise of capitalism, and Puritanism, giving a religious connotation to time discipline. Whilst several historians have casted several doubts on the validity of Thompson's account (e.g., Glennie and Thrift 1996), no critical discussion has been provided so far of the relationship between the emergence of time discipline and the mechanization of labor, which seems however to be one of the key innovations in the industrial development between the eighteenth and the nineteenth century. Likewise, little attention has been devoted to the broader social implications of the idea of time discipline, such as in the emergence of forms of temporal organization, with special reference to mobility (of people, goods, or information).

We welcome submissions on the relationship between time and machines in the period 1700-1850. The issues dealt with in the papers might include (but are not restricted to) the following:

- The economy of time in inventions
- The economy of time in the scientific discourse on machines
- The connections between time and fuel economy
- The economy of time and the birth of a culture of productivity
- The connections between machines, time thrift and capitalism
- The role of machines in optimizing the temporal structure of productive processes in manufactures and factories
- Time as a discipline in the early industrialization, and the broader social implications of this notion

Abstracts (in either English or French) of no more than **500 words** should be sent to marco.storni@unine.ch by **30 September 2022**. Submissions from early career researchers are very welcome.

Funding will be available to cover accommodation expenses and meals (travel expenses will not be covered). The papers presented in the workshop will be considered for publication in an edited volume.