
This is surely one of the most important books published on the history of technology in the United States in the antebellum period over the last ten years. Thomson’s book provides a much needed comprehensive account of the development and diffusion of mechanical technologies in the United States over the period 1790-1865. Furthermore, the book also sketches a conceptual framework for assessing the role played by different sources of technological learning in this historical phase, identifying and discussing the emergence and consolidation of a number of institutional structures that shaped that patterns of technical progress. While Thomson’s interpretive framework is developed with a view to its application for the case of the United States and, accordingly, it pays due attention to the specificities of American historical context, my impression is that it can be probably usefully adapted to be applied also to the study of mechanization during the first half of the nineteenth century in other countries.

The book is divided in three parts. In the first part Thomson provides a detailed description of the development of mechanical technologies in six key areas: textile machinery, steam engines, printing machinery, firearms, clocks and watches and woodworking machinery. In this survey, Thomson combines the evidence gathered from a wide array of historical sources such as contemporary scientific and engineering journals, patent records, business directories, catalogues of industrial exhibitions, etc. Thomson is also able to distil from these sources a series of original and important quantitative snapshots that provide a very effective characterization of the trajectories of evolution of mechanical technologies in different contexts. The main lesson emerging from the first part of the book is precisely the importance of taking into account the specific and distinctive historical features that have shaped innovation and technological learning in each of the key areas examined and that the temptation of interpreting the history of mechanical technologies by means of a simple general model of development should be resisted.

In the second part of the book, Thomson considers the close interaction between the development of mechanical technologies and the foundation and consolidation of three “technological centres” that constituted the backbone of the innovation system of the US economy in the first half of the nineteenth century. Thomson defines “technological centres” as the “structures of change” that shaped the development of new technological knowledge and its application for industrial purposes in different contexts. The historical role of these “technological centres” should not be underestimated because, according to Thomson, “by the Civil War they made technological innovation ongoing” (p. 4) on an economy-wide scale. The three technological centres identified by Thomson are: i) the community of “machinists”, ii) the applied science-technology nexus and iii) the patent system. The community of “machinists” represented an articulated network of inventors that fostered innovation by ensuring the progressive accumulation of mechanical
skills throughout the economy so that the constraints that limited the production
of complex machinery could be progressively relaxed. The “applied” science-
technology nexus was critical in allowing the implementation of more systematic
approach to the search of innovations. Even if the direct contribution of science to
mechanical technologies, in this historical period, was inherently limited, Thomson
shows that “applied” science and ‘propositional knowledge’ combined with the
increasing diffusion of mechanical drawings ensured that the search for innova-
tions could proceed following some broad effective guidelines rather than by ran-
dom trial and error. Finally, the patent system exerted a twofold function: it offered
to inventors a mode of appropriating economic returns from investment in innova-
tion and, at the same time, it made sure that the vast of amount of technological
knowledge embodied in patent specifications was stored and disseminated
throughout the economy. Thomson’s assessment of the role of the patent system is
a particularly judicious and balanced one. He is careful in noticing that several
important innovations in the field of mechanical technologies were developed
without resorting to patent protection. Also the contribution of the patent system
to the diffusion of technological knowledge should not be exaggerated as the
know-how embodied in patent specification remained difficult to be searched and
absorbed.

In the third part of the book, Thomson examines the economy-wide effects of
the innovation system constituted by the three technological centres described in
the second part. First, Thomson traces the contribution given by the technological
centres to the development to four “macroinventions” of the US antebellum econ-
omy: the railroad, the telegraph, the reaper and the sewing machine. Then, he
moves to consider the role of the technological centres in the diffusion of innova-
tions across different industrial branches. Finally, he studies the capacity of the
 technological centres to sustain innovation during the 1850s and 1860s. In this con-
cluding section, there is perhaps a missed opportunity: Thomson refrains from dis-
cussing the implications of his research findings for the so-called “Habakkuk
thesis” (from H.J. Habakkuk, American and British Technology in the Nineteenth
Century. The Search for Labour Saving Innovation, Cambridge, 1962), a theme that is
still much debated by economic historians. As is well known, Habakkuk argued
that rapid adoption of mechanization in the United States during the nineteenth
century was, by and large, due to the relative high level of wages in this country that
afforded a stronger incentive for the substitution of machines for labour. My
impression is that Thomson, on the basis of the materials collected, could have
provided an important contribution to this debate, by identifying the technologi-
cal fields in which Habakkuk’s argument could be regarded as broadly accurate
and those in which, instead, it was unwarranted. Oddly enough, Habakkuk is
nowhere cited in the book.

This relatively minor critical reservation apart, the book is one of the best
accounts of technical change in the first half of the nineteenth century. Historians
of technology and economic historians will find Thomson’s survey of innovation
in the field of mechanical engineering in the antebellum US economy as a