

# Cheap, fast, good: the Roman glassblowing revolution reconsidered

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Among the most dramatic changes in ancient material culture was the widespread adoption of glass vessels for tableware and storage during the 1st c. B.C. and 1st c. A.D. As shown by the quantity of glass finds from occupation sites of the Imperial era, glassware was much more prominent in daily life than it had been previously. This shift occurred concurrently with the widespread adoption of glassblowing. This change in consumer behavior points to a complex process of experimentation, development, and gradual adaptation on the part of both producers and consumers. The transition from centuries-old technologies of core-forming, casting and sagging to blowing required a complete reconfiguration of every stage of glass production, from the increased supply of raw material to the development of new tools and workshop space, and in the training of craftsmen.

This article reviews the evidence for early glassblowing in light of theoretical work on technological change, particularly D. A. Spratt's model for the study of innovation in the archaeological record.<sup>1</sup> At heart is the issue of whether glassblowing was exceptional among ancient technologies, succeeding because it was superior to other glass technologies, as suggested by M. I. Finley and others;<sup>2</sup> or whether glass blowing corresponds to established anthropological models of technological development, its success being due to the particular social, economic and political circumstances of the early Roman Empire. Post-processual approaches to technological change emphasize that such changes rely on local conditions, the rôle of individual agents, and social appropriateness, rather than intrinsic economic or technical advantage.<sup>3</sup> Superior innovations do not necessarily replace

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- 1 D. A. Spratt, "The analysis of innovation processes," *JArchSci* 9 (1982) 79-84; id., "Innovation theory made plain," in S. E. van der Leeuw and R. Torrence (edd.), *What's new? A closer look at the process of innovation* (London 1989) 245-57; S. I. Rotroff, "The introduction of the moldmade bowl revisited: tracking a Hellenistic innovation," *Hesperia* 75 (2006) 357-78.
  - 2 M. I. Finley, "Technical innovation and economic progress in the ancient world," *Econ. Hist. Rev.* 18 (1965) 29; M. B. Schiffer, "Expanding ethnoarchaeology: historical evidence and model-building in the study of technological change," in J. P. Oleson (ed.), *Oxford handbook of engineering and technology in the classical world* (Oxford 2008) 824; Z. H. Archibald, "Innovation and the transmission of knowledge in antiquity: a look at current networking models," in F. de Angelis (ed.), *Regionalism and globalism in antiquity* (Leuven 2013) 28-30.
  - 3 See C. Renfrew, "Varna and the emergence of wealth in Prehistoric Europe," in A. Appadurai (ed.), *The social life of things: commodities in cultural perspective* (Cambridge 1986) 141-68; R. M. Adams, *Paths of fire: an anthropologist's inquiry into western technology* (Princeton, NJ 1996); M.-A. Dobres and C. R. Hoffman, *The social dynamics of technology: practice, politics, and world views* (Washington, D.C. 1999); C. Knappett, "Tradition and innovation in pottery forming technology: wheel-throwing at Middle Minoan Knossos," *BSA* 94 (1999) 101-29; V. Roux, "Spreading of innovative technical traits and cumulative technical evolution: continuity or discontinuity?," *J. Arch. Method & Theory* 20 (2013) 312-30; B. W. Roberts and M. Radivojević, "Invention as process: pyrotechnologies in early societies," *CambArchJ* 25 (2015) 299-306; C. Knappett, "Resisting innovation? Learning, cultural evolution and the potter's wheel in the Mediterranean Bronze Age," in L. Mendoza Straffon (ed.), *Cultural phylogenetics: concepts and applications in archaeology* (Cham 2016) 97-111, with bibliographies. For the application of these theories to the development of glass technology in the Late Bronze Age, see A. Shortland, "Hopeful monsters? Invention and innovation in the archaeological record," in J. Bourriau and J. Phillips (edd.), *Invention and innovation: the social context of technological change*, vol. 2: *Egypt*,