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Paola Bertucci, *Artisanal Enlightenment: Science and the Mechanical Arts in the Old Regime*. New Haven: Yale University Press, 2017. x+ 300 pp. Appendix, notes, bibliography, and index. \$40.00 U.S. (hb). ISBN 9780300227413.

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In the past two decades, a significant corpus of scholarship in the history of science has been dedicated to writing craftspeople, materials, and practical forms of knowledge back into some of the big narratives, such as the so-called Scientific and Industrial Revolutions. Paola Bertucci's timely study of the mechanical arts in eighteenth-century France powerfully reclaims the place of artisans in key arenas of the Enlightenment: the production of goods and knowledge, economic improvement, and social mobility.

Artisanal Enlightenment is the story of the *artiste*, a new figure emerging from the ranks of French artisans around the turn of the eighteenth century. *Artistes* challenged the prevailing view among learned *philosophes* that all artisans were replaceable automata without intellectual merit or agency. Emphasising their practical knowledge of materials as well as the *esprit* of ingenuity required to invent, produce, and improve, they sought to create a political and epistemic identity separate from that of abstract *philosophes*, on the one hand, and mindless, workaday artisans, on the other. Their struggle for recognition and political influence was intimately bound up with the Société des Arts, founded in 1718, and its relationship with the learned establishment of the Académie des Sciences. Bringing to light the story of the *artistes* from archival records as well as published sources, Bertucci explores the historical meanings of the term "useful knowledge" and its implications for individual advancement, economic productivity, and state governance (p. 22).

The first part of the book traces ideas about craftsmanship and artisans in seventeenth-century projects of learned writing about the arts--in the early modern period, this included all crafts and producing trades as well as what we would now call the fine arts. In France, the idea of writing a detailed description of the arts in the manner of a natural history took shape in the 1660s, in the wake of Colbert's call for the reform and improvement of French manufacture, and it was influenced by the Royal Society of London's *History of Trades*, written along the lines of a Baconian natural history. Originally conceived as a project for the Académie des Sciences, the *History of the Arts* fell under the purview of an external committee, the Commission des Arts. Emphasising the usefulness of new inventions, it weighed in powerfully on contemporary literary debates sparked by the Quarrel of the Ancients and the Moderns, promising to promote and preserve technical knowledge. At the same time, the Commission gave their project the cachet of learned natural history by highlighting the interconnectedness of trades and proposing an overall ordering principle (*enchaînement*) in analogy to the great chain of being. By the early eighteenth century, however, the project was languishing due to a lack of support from the Académie des Sciences and the dire state of France's economy after years of war.

The regency period saw a revival of the project at the hands of the nobleman and member of the

Académie des Sciences René Antoine Ferchault de Réaumur. In charge of both the *History of the Arts* and the Regent's survey to improve French manufacture, Réaumur took stock of the country's productive technologies and established the Royal Manufacture, dedicated to experiments for the advancement of metalworking processes. Influenced in part by the sixteenth-century artisan-philosopher Bernard Palissy, Réaumur advocated detailed investigation of artisans' materials and processes, but side-lined the artisans themselves and their skills. As Bertucci argues, his was a learned science of the arts which viewed craftspeople as problems to be managed rather than resources to be acknowledged. Réaumur's ultimate failure to implement this vision within the Académie des Sciences paved the way for the constitution of a separate academy dedicated to the arts.

The second part of the book deals with the rise and decline of that institution: the Société des Arts. Chapter three shows how two British émigrés, the clock-maker Henry Sully and the economist John Law, brought to bear their expertise on French projects of improvement. While Law became minister of finance and founded the Royal Bank of France, Sully obtained permission in 1718 to establish the Société des Arts, with the explicit aim of improving French manufacture. He imported expert clock-makers from England and fostered the training of French artisans in a culture of openness and collaboration between theory and practice. Using Sully as a case study, Bertucci illustrates very colourfully how his *artiste* approach differed from more learned ones. Where Christiaan Huygens tried to get his pendulum clock to run regularly by working out the pendulum's ideal geometric curve, Sully tinkered with the pendulum's metal plates until it did. Where Réaumur had envisioned an improvement of the arts directed by *savants*, Sully insisted that improvement and innovation could only come through attention to materials and from within traditions of making. Following Sully's impetus, the Société des Arts became invested in the relationship between theory, practice, and improvement.

The decline and disappearance of the Société des Arts in the 1740s is charted in the fourth chapter. The institution had been established in answer to artisans' growing frustration at not being involved in state decisions concerning their trades and modes of production. As *artistes*, they established themselves as rule-makers for their respective trade, and they were ambitious to extend that role to the economy and society as a whole, as expert regulators of the state's inner clockwork. The Société was intermittently successful as its *artistes* mediated between learned statesmen and practitioners, for example in the matter of acquiring improved machines and technology for rolling large metal sheets. Its ultimate failure, Bertucci argues, was largely due to a paradox inherent in its social structure. Established under the ideal of Lockean collaboration—between theory and practice, and among different experts—the Société was in reality riddled with hierarchical structures reminiscent of the Old Regime, giving rise to a Hobbesian climate of competition for advancement. Social mobility and political influence came within the reach of only a few *artistes*, at the price of a divisive rhetoric that elevated ingenious *artistes* above their rote-bound artisan colleagues.

The rhetoric and self-identities of the *artistes* in various texts and images are explored in the third part of the book. The political thrust of their writing, addressed in chapter five, carved out a place for *artistes* in judging expertise and articulating rules. Like many artisans before them, they articulated an epistemic role which foregrounded embodied experience and sensory knowledge—what Pamela Smith has termed an “artisanal epistemology” shared by many practitioners at least as far back as the sixteenth century.[1] The *artistes*, however, did not see their way of thinking and making as common to all artisans; on the contrary, what distinguished the *artiste* was the possession of *esprit* and of sensory expertise. It was this spark of ingenuity which elevated them from mere rote practice and allowed them to be in the moment, ready to respond to changing circumstances, and to spot opportunities for innovation. Body and *esprit* converged in what Bertucci terms the “sensorial intelligence” of the *artiste* (p. 185). This intelligence had to be stimulated by reading, making, repairing, collecting, or interacting with didactic cabinets of mechanicals devices or natural materials. The public, too, had to be educated if it was to recognise and appreciate *artistes'* expertise without harbouring unrealistic expectations.

The discourse about expertise and learning in the mechanical arts coalesced around machines, which

were seen by philosophers and *artistes* alike as sites of ordered rationality and as pedagogic devices. As the final chapter shows, however, ideas about the relationship between machines and *artistes* varied widely among members of the Société des Arts. Jean-Antoine Nollet, an expert enameller and instrument maker, was a firm believer in educating the public—especially the elite—by means of physics cabinets and mechanical demonstrations, to underscore the message that the principles and natural laws underlying human mastery of nature emerged from workshop practice, and that physicists therefore needed mechanical knowledge to work with experimental machines and deal with unexpected phenomena. In contrast, Jacques de Vaucanson, a skilled mechanic and maker of intricate automata, saw the purpose of machines not in teaching others about their inner workings, but in replacing human ingenuity altogether. Since most artisans are unteachable, he claimed, it was the role of a few select *artistes* to improve the economy by devising machines with built-in *esprit* to replace embodied knowledge and de-skill production processes. To improve France’s silk manufacture, for instance, he worked to perfect spinning devices and looms, not workers. Whereas Nollet aimed to educate the *esprit* through the machine, Vaucanson located *esprit* in the machine itself, independent of the human mind. Both *artistes*, however, equated their status with useful and productive knowledge that would improve the French economy.

The book closes with an epilogue tracing the fate of the *artiste* in the late eighteenth century. As a literate expert, he was a valuable source for *encyclopédistes* bent on capturing the world of the arts in words and images. But this did little to cement the status of the *artiste* as such: Diderot and d’Alembert elevated their contributors to the status of *savants* rather than recognising their expertise as *artistes*. Later in the century, as *esprit* turned into genius in Romantic thought, the *artiste* became an “artist” in something more akin to the modern sense of the word, while the political role to which he aspired was taken up by a different figure, the state-engineer trained in national institutions and removed from workshops and materials.

Bertucci’s account of the *artistes* brings to light an important group of actors and their influence on French Enlightenment projects. It reconstructs how artisans, *philosophes*, and administrators sought to codify, verbalise, and manage embodied skills and technical expertise, for self-advancement and for the material improvement of the state. It also shows how a group of artisanal experts sought involvement in state decisions by creating the persona of the *artiste*. Drawing on visual and textual sources ranging from the *Encyclopédie* to the archives of the Paris academies, Bertucci provides a compelling analysis of eighteenth-century conceptions of expertise, highlighting the intermittent successes, the ultimate failure, and the lasting influences of the Société des Arts and the *artistes*. Focusing on the historicisation of “useful knowledge” as a common thread throughout her narrative, she highlights the contribution of artisanal enlightened projects to the emergence of technology as a separate field of inquiry.

Bertucci pays serious attention to the question of what constituted expertise and where different actors thought it was located—in the artisan’s body, in the ability of the enlightened *savant* to manage artisans, in the *esprit* of the *artiste*, or in his creation, that is to say the machine itself. Focusing on mechanics and machinery, she fruitfully explores the resulting metaphor of the state as clockwork and the *artiste* as its expert regulator. This focus works well within the overall narrative, but one cannot help feeling that the fascinating source material could tell other, equally compelling stories. For instance, Bertucci’s very useful appendix of known members of the Société lists several surgeons. Her brief discussions of this group suggest that their ideas were significant to *artiste* thinking, and the book might benefit from a more sustained analysis of their role in the Société. In particular, a more central place could have been granted to the figure of François Quesnay, who makes several appearances as an expert surgeon, a member of the Société des Arts and of the Académie des Sciences, and an important economic thinker of the so-called physiocrat school. As a surgeon, he represented a discipline that had grappled with the problem of theorising a craft since the middle ages and that could potentially have provided a model for *artistes’* claims to intellectual as well as bodily acumen. In addition to a historical view of embodied knowledge about the human body, Quesnay proposed a view of state economy couched in terms of

bodily fluids rather than man-made machinery. This could provide a useful counter-narrative to the clockwork view of the state held by Sully and other *artistes*, and it would make for a somewhat richer contribution to ongoing scholarly conversations about the body and embodied knowledge. Another group that appears in the appendix but is only marginally present in the book are the chemists; here, a productive conversation might be had with Emma Spary's work on liqueur-making at the intersection of craft knowledge, polite enlightened science, and commerce.[2]

As the author makes clear, the *artistes* and their specific claims to *esprit* are a uniquely French story, but she tells it without losing sight of its counterparts, especially across the Channel. The early chapters address the cross-fertilisation of English and French projects of writing a natural history of the arts, and the second part maps the Parisian careers of Sully and Law to highlight the movements of mechanical and economic expertise within Europe. The epilogue draws a brief but insightful parallel to the altogether happier marriage of philosophy and crafts at the London Society of Arts. In addition, readers could perhaps have hoped for a comparative view of French claims to expertise and the emphasis on individual skill which Liliane Hilaire-Pérez stresses in her work on the incipient industrialisation in England.[3]

Written with flair and intelligently structured in short sections, Bertucci's monograph makes its fine-grained historical arguments accessible to a range of interested readers, and it will be a welcome resource for teaching the history of science and the Enlightenment.

NOTE

[1] Pamela H. Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: University of Chicago Press, 2004), pp. 59-94.

[2] Emma Spary, "Liqueurs and the Luxury Marketplace in Eighteenth-Century Paris," in *Materials and Expertise in Early Modern Europe: Between Market and Laboratory*, ed. Ursula Klein and Emma Spary (Chicago: University of Chicago Press, 2010), pp. 225-55.

[3] Liliane Hilaire-Pérez, *La pièce et le geste: artisans, marchands et savoir technique à Londres au XVIIIe siècle* (Paris: Albin-Michel, 2013).

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