

The book argues that toleration existed in a few quarters long before Locke or Bayle put pen to paper. Kaplan thinks science had little to do with the emergence of enlightened ideas (Newtonian physics could be understood by few [p. 344]), and thus he misses the first and important appearance of physico-theology in Britain and the Dutch Republic. Faith seems always doctrinal and confessional, seldom hybrid, and Kaplan loses interest when piety accompanies a worldly civility. But latitudinarian Protestants, with their heavy interest in the new science, were as much involved in the emergence of relative toleration as the *philosophes*. Kaplan fails to mention that the tolerant but pious Dutch Collegiants regularly broke bread with Spinoza. Around 1710, Huguenot and Quaker refugees in the Dutch Republic brought into the world a text that labeled Jesus, Moses, and Mohammed as the three great imposters ([Anon.], *La vie et l'esprit de Mr. Benoit de Spinosa* [Amsterdam: Charles le Vier, 1719]; the only American copy of this edition can be found at Young Research Library, UCLA). Religiosity was far more porous and adventuresome than *Divided by Faith* sometimes suggests. But the book needs to be read. Kaplan has documented and brilliantly analyzed a European social and intellectual landscape where religious toleration could sometimes be nonexistent. He has little interest in secular and enlightened thinking—a way of living, he claims, largely for elites; rather, the book offers a sobering account of intolerance woven into the very fabric of early modern religiosity.

MARGARET C. JACOB

Jan Lazardzig. *Theatermaschine und Festungsbau: Paradoxien der Wissensproduktion im 17. Jahrhundert.* 322 pp., illus., figs., bibl., index. Berlin: Akademie Verlag, 2007. €49.80 (cloth).

Theatermaschine und Festungsbau reconsiders the formative stage of Western science in the seventeenth century, when its place in society was still uncertain: neither its institutional settings, its overall disciplinary structures, nor its methodological ideals had been established and solidified. Jan Lazardzig is a young scholar in the academic field of theater history who approaches his topic from the perspective of cultural history rather than history of science. In a way similar to that in which, in the 1950s, Gustav René Hocke discovered artistic practices characteristic of modern avant-gardism in sixteenth-century mannerism, Lazardzig is looking for sources and forces of

productivity and creativity related to those of modern avant-gardism. He finds such forces at work in learned enterprises pursued in the time before science became institutionalized and, in his view, domesticated under the command of utility, progress, soberness, and the like. The term "*Paradoxien*" in the subtitle stands for tensions, cracks, and latent or open contradictions in the scientific enterprises of the seventeenth century that allow such sources of creativity, overwhelmed in the subsequent course of modern science, to be recognized. "*Theatermaschine*" (stage machinery) and "*Festungsbau*" (military architecture) stand for two practices that had their heydays in the seventeenth century; they are used by Lazardzig to develop heuristic concepts that allow tensions to be traced and forgotten sources of creativity to be unearthed.

Chapter 1 deals with baroque stage machinery and its symbolic meaning. For Lazardzig, this machinery epitomizes the paradoxes of early modern machine technology—that is, the paradoxes given by this technology's irreducibility to mere functionality. In the early modern period feelings like wonder, amazement, and admiration were excited not only by stage machinery, which ingeniously tried to evoke them, but by machines in general. Machines produced not only useful effects but also cognitive emotions of high significance for creativity and scientific productivity. Thus the notion of "machine," taken as a metaphor or heuristic concept, signified both functionality, regularity, and intelligibility, on the one side, and marvel, fantasy, and creative imagination, on the other. Through this analysis, Lazardzig confirms and adds to the findings of Lorraine Daston and Katharine Park, who highlighted the significance of "wonder and curiosity" in the incipient stage of modern science.

Chapter 2 tries to show similar paradoxes in connection with military architecture. According to Lazardzig, the notion of "fortress," again taken as a metaphor or heuristic concept, signified the paradox that modern science entrenched itself against the real world it tried to investigate. Although much of the evidence produced for this view seems far-fetched and demands considerable good will on the part of the reader (travel diaries, collections, and publishing are presented as instances of such fortification), the tension Lazardzig tries to demonstrate in this chapter can be elucidated by the familiar opposition of geometry and the real world: geometry stands for military architecture and science's calculable space of experience, as opposed to the real world with all its coincidences, irregularities, monsters, and so forth.

Chapter 3 comprises five short case studies. They are intended to prove the heuristic fruitfulness of the notions of both machine and fortress for tracing the ambivalences and the creative resources of early modern scientific enterprises. The first is concerned with Johann Valentin Andreae's utopian project *Christianopolis* (1619), which is taken as an instance of a geometric fortification plan that switches completely into a labyrinthine architectonic design. The subject of the second case study is Francis Bacon, who called the reformed structures of learning and science proposed in his *Instauratio magna* a "machine." Lazardzig stresses a latent contradiction between Bacon's universal methodical claims, given in his use of this metaphor, and the uncertainties of empirical investigations like those in his *Sylva sylvarum*. The third case study discusses Descartes's concerns about the fallacy of the senses against the background of the baroque stage and its refined illusionist techniques. The fourth case study deals with the little-known academy project that Bengt Skytte proposed to the elector Friedrich Wilhelm of Brandenburg in the 1660s (documents concerning this proposal are presented in an appendix). The fifth and last case study treats Leibniz's *drôle de pensée*, a sheet from 1675 on which he jotted down a host of notes on spectacles, performances, demonstrations, and so on that were apt for evoking amazement, wonder, and admiration in the beholders.

The short Chapter 4, finally, indicates how in the course of the eighteenth century science "purified itself" of all of these ambiguities, thereby gradually sacrificing exactly the creative resources that—in Lazardzig's view—distinguished the scientific enterprises of the seventeenth century.

Theatermaschine und Festungsbau is certainly thought provoking. My skepticism concerns the general assumption on which all of Lazardzig's arguments rest—that is, the assumption that all modern sciences are intrinsically beset with a dichotomy between mind and hand, concept and sensation, rationality and creativity. The great strength of the book lies in the wealth of materials it discusses, many of which are little known and indeed deserve the historian's attention.

WOLFGANG LEFÈVRE

Luigi Maierù. *John Wallis: Una vita per un progetto.* 601 pp., illus., figs., bibl., index. Soveria Manelli: Rubbettino, 2007. €40 (cloth).

One of the most original and productive seventeenth-century English mathematicians, John Wallis (1616–1703) is now remembered

mostly for his *Treatise of Algebra* (1685) and, above all, his *Arithmetica infinitorum* (1656), a major source of inspiration for the young Newton's self-taught introduction to higher mathematics. These two works roughly mark the boundaries of his mathematically creative career. In between, Wallis published two more major works, *Mathesis universalis* (1657) and *Mechanica* (1669–1671), translated Ptolemy's *Harmonics* and Aristarchus's treatise on the sizes and distances of the sun and moon, and wrote shorter treatises about conic sections, the volumes of solids of revolution, proportionality, and the angle of contact. He also published sundry papers in the *Philosophical Transactions* and maintained an important mathematical correspondence with Pierre de Fermat, which he published in book form. He sustained for almost twenty years a bitter, pugnacious quarrel with Thomas Hobbes about the quadrature of the circle, mathematical method, the epistemological status of algebraic symbolization, and the proper relationship between metaphysics and the basic notions of mathematics. Wallis must not have been proud of his exchanges with Hobbes, since they were entirely left out of his carefully planned three-volume *Opera mathematica* (1693–1699). He also wrote about logic, grammar, and theology. Wallis's early mathematical research, and particularly his *Arithmetica infinitorum*, shows a highly original turn of mind. He took for granted results about the summation of finite and infinite numerical series that he discovered—as the late D. T. Whiteside put it—by a combination of "brute-force tabulations" and "a strong feeling for pattern." Wallis applied some of his new methods to mechanics. When his methods were criticized for not being properly mathematical, he responded by enhancing the position of arithmetic and algebra within mathematics. Surprisingly, such a powerful and original character has not received the sustained historiographical attention he deserves. Two notable exceptions are Douglas Jesseph's important book (1999) on the dispute between Hobbes and Wallis over the quadrature of the circle and Luigi Maierù's own articles and the book he devoted to particular facets of Wallis's mathematics and philosophy of mathematics.

Drawing on his previous contributions, Maierù provides in the book under review the big picture, a *quadro generale*, of Wallis's mathematics and his historical import. It contains short, informative, but somewhat superficial accounts of Wallis's life and works on theology, grammar, and logic. Then follow individual chapters devoted to the treatise on