

the erudite Latinate polemical culture of late sixteenth- and early-seventeenth-century Europe: the author deserves considerable gratitude simply for ploughing through these turgid volumes—some of them nearly a thousand pages long—and giving lengthy summaries of them. Moran also quotes from them sufficiently profusely to convey a sense of their vituperative, sometimes downright defamatory, tone; often, he helpfully intersperses his translation with key words from the original. “Oh Hartmann”, Libavius wrote in a characteristic assault on one of his enemies, Johann Hartmann, Professor of *Chymiatría* at the University of Marburg: “yours is a mental darkness [*caligo*] stitched together from falsehoods, deceptions, parables and obscure enigmas ... The schools of the entire world and the new and old wisdom alike are a disgrace to you because they will not be gulped down with your Paracelsian muck [*stercora tua Paracelsica*]” (p. 233).

In the course of the book, Moran gives a helpful account of Libavius’ career and he well brings out his intellectual agenda, particularly his insistence on the need for logical precepts and principles and sound method in chemistry as in other disciplines, and his lifelong ambition to bring together the best of old and new knowledge. Libavius believed strongly in humanist linguistic proficiency and analysis, while equally significant is the strong moral dimension that he perceived in the pursuit of true knowledge: such traits are evidence in all the topics on which he wrote so profusely. The coverage of the book extends even to include the religious polemics in which Libavius engaged, though the bulk of it deals with controversies concerning chemistry, medicine and related fields. In these, Libavius’ appetite for syncretism combined with his polemical zeal sometimes led him to some slightly precarious compromises on which his opponents were able to capitalize. Thus in his wish to ensure that the best of all traditions was incorporated into the chemical discipline to which he aspired, he was happy to accept a good deal of the substance of Paracelsian doctrine, though

not its interpretative superstructure, and he had to indulge in similar convolutions when he intervened in the Parisian medical debates of the early years of the seventeenth century. Moran divides his subject up into a series of chapters of manageable length, and in each he does justice to the complexities of Libavius’ position on the various issues that he confronted, from the role of transmutation to the validity of the weapon salve. He also comments perceptively on the mutual incomprehension of the two sides in some of the disputes in which Libavius was involved. Occasionally his language and vocabulary betray the influence of his subject—as with the strange usage of “paedagogiarch” on p. 35—and the relentless appetite for polemic on the part of his subject at times becomes almost overbearing. But this is nevertheless a valuable book which throws much light on a significant episode in the evolution of ideas on chemistry and related subjects.

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Lawrence M Principe (ed.), *Chymists and chymistry: studies in the history of alchemy and early modern chemistry*, Philadelphia, Chemical Heritage Foundation and Sagamore Beach, MA, Science History Publications/ USA, 2007, pp. xiii, 274, \$45.00 (hardback 978-0-88135-396-9).

This collection of twenty-two essays is based upon a conference held at the Chemical Heritage Foundation in Philadelphia in July 2006, an event featured in the *New York Times*. It covers medieval alchemy to mid-eighteenth century metallurgy, a discipline classified as “chymistry”. “Chymistry” is consciously used by Lawrence Principe to assert that it is an anachronism to make clear distinctions between alchemy and chemistry in this period. For instance, early modern “chymists” attempted to transmute metals into gold, considered an “alchemical” practice, yet additionally performed experiments involving

mass balance or crystallographic analysis that today would be considered “chemical”.

As Stephen Clucas notes in his essay, it is also not so simple to cite early modern discontent (such as that of Robert Boyle in his *Sceptical chymist*) with alchemy’s obscure language and secretive practice as an explanation for alchemy’s decline and the rise of exact experimentalism. As an example, because the French chymist Samuel Duclos was informed by a vitalist and alchemical tradition, he was characterized historiographically as a scientist of “misleading obscurity” (p. 181). But as Victor Boantza’s essay demonstrates, the truth was more complex. Duclos was a talented and exact experimentalist who mounted an effective critique of the corpuscularianism of Robert Boyle. Indeed, this volume demonstrates that changes in chymical practice were accompanied by larger epistemological issues of the “Scientific Revolution”—namely “the rising fortunes of experimental philosophy, and the declining fortunes of hermeneutics” (p. 51).

Chymistry was also set in a larger socio-economic and cultural context. Tara Nummedal’s paper ‘On the utility of alchemical fraud’ gives valuable insights into the nature of scientific authority, as well as revealing chymistry’s ties to the material resources of the early modern state. Matter theory, creation, and religion are constant themes. Dane Daniel analyses the early reception of Paracelsian theology in the Germanies. Margaret Garber examines Jesuit debates in the 1630s about a theory of seminal principles supported by chymical transmutation versus Scholastic hylomorphism. Garber reveals the extent to which these debates affected theories of transubstantiation, a volatile issue in the aftermath of the Counter-Reformation. Hiro Hirai explores the Jesuit polymath Athanasius Kircher’s theories of spontaneous generation, which he perceptively attributes to a combination of corpuscularism, Paracelsian chemical ideas, and early modern concepts of a “plastic power” (p. 87). I would like to have

seen in Hirai’s piece a larger discussion of Joseph Du Chesne, who anticipated a good deal of Kircher’s thinking on this subject, particularly about salts and generation.

There are several interdisciplinary essays. Marcos Martínón-Torres and R Werner Soukup utilize archaeology to unearth early instrumentation. Bruce Moran and Barbara Obrist perform cogent visual analyses of alchemical emblems and illuminated manuscripts, and Wouter J Hanegraaff deciphers the verbal symbolism of Giovanni da Corregio’s Renaissance manuscript on the philosopher’s stone. Allison Kavey has written a thought-provoking piece about alchemical sexual metaphors and gender malleability.

The final theme concerns studies of prominent chymists, patronage, and the transmission of ideas. Gabriele Ferrario analyses the origins and transmissions of the *Liber de aluminibus et salibus*, one of the most famous books of medieval Arabic alchemy. Peter Forshaw examines the medieval and early modern responses to Hermes Trismegistus’ *Emerald tablet*. As part of his effort to digitize Newton’s chymistry, William Newman discusses an undiscovered manuscript concerning metallic generation and the role of gur, or vitriolic liquid (sulphuric acid) believed by early modern miners to indicate ores. Mining and chemistry are revisited in Hjalmar Fors’ analysis of the Swedish Board of Mines (1680–1760). Royal patronage is the theme of Didier Kahn’s essay on King Henry IV of France and Paracelsianism. French connections are also explored by Luc Peterschmitt’s work on French Cartesians and chemistry, and Bernard Joly examines the intellectual quarrels between chymists at the Académie Royale de Sciences in the early eighteenth century. John C Powers and Ku-Ming (Kevin) Chang further elucidate transitions in eighteenth-century chymistry, with analyses of Herman Boerhaave and George Ernst Stahl.

Finally, Claus Priesner analyses alchemy and the Enlightenment among the Rosicrucians, who saw its eighteenth-century practice as part of a discussion of the price of

the triumph of rationality. The possibilities of chemical transmutation still had a hold on Enlightenment thinkers, just as Principe's volume shows that they do for scholars today. *Chymists and chymistry* is a nicely produced conference proceedings and a significant addition to the history of chemistry.

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Eve Keller, *Generating bodies and gendered selves: the rhetoric of reproduction in early modern England*, In Vivo: The Cultural Mediations of Biomedical Science, Seattle and London, University of Washington Press, 2007, pp. xi, 248, £17.99, \$30.00 (paperback 978-0-295-98641-8).

The western, liberal, individualized, interiorized, and normatively masculine self was assembled during the mid-sixteenth to early-eighteenth centuries. Here, Eve Keller offers a genealogy of that subject's supra-material autonomy. She draws our attention to profound similarities between Galenic and post-modern imaginings of the self. The early modern period is shown to stand in between: as a refutation of the "premodern" and "posthuman" (p. 20) notion of the self as extending beyond the envelope of the skin, to include not just language and comportment but also artefacts, spaces, places and objects. The fantastic and "alarming" (p. 31) imaginings of those neuroscientists, cyberneticists and philosophers of mind who suggest "embodiment, embeddedness and distributed capacity" (p. 23) are shown to be unsettling only from the liberal humanist perspective that we have inherited from the early modern period. Keller convincingly demonstrates this to be so through a lucid survey of some recent critical work carried out within cultural and science studies, which she compares to Galen's writings upon a materially-dependent soul of multiple components. The contrary humanist self is a "disembodied, vacuum-sealed centre of cognition and volition" (p. 44)

and an enduring legacy of early modern thought. Keller's finely detailed investigation of vernacular medical texts in a variety of genres explicates the invention of this all-too-familiar self through the thought and practices of early modern physiology, anatomy and what we now call gynaecology and obstetrics. These practices produce an asymmetrical gendered human being. The materiality of the male serves his unified and disembodied supervenient self. The materiality of the female is a definitional body part (the womb) that her self is more or less conterminous with. Keller's concrete examples of seventeenth-century anatomical theories and practical physic for women evidence the success of such thinking, which survived the decline in Galenic models in favour of chemical medicine and mechanical philosophy. Although an enduring "thought style" (p. 13), to use the phrase Keller adopts from Ludwig Fleck, this gendered subjectivity was also problematic and troubling. For Keller, both the heroic and idealized images of masculinity and the investigative methods of the physician, the anatomist and the microscopist were fabricated in response to the perceived inadequacies of paternity and patriarchy. In the field of embryology, for example, animalculist theory is championed over ovist theory because it posits an independent, unified and self-affirming miniature person empowered—from the moment of his conception—to direct his own course. The autonomy and self-determination of the seventeenth-century self was threatened, she tells us, by mechanical conceptions of human physiology. The human machine is "a living object acted on by forces beyond its control" (p. 154). Thus, in response to this, the human is claimed as more than a machine.

The final chapter of the book is located in the birthing room and provides a refreshing alternative to the often-rehearsed account of the rise of the man-midwife as either a triumph of scientific reason over ignorance or as the forcible ejection of capable female practitioners by "self-serving and avaricious" men (p. 160). Keller does not view such