

identified as potassium nitrate) played a prominent part in the history of chemistry, as it stimulated experimental investigation of the vital component of air. This research programme was carried out in England in the second half of the seventeenth century, mostly by Robert Boyle and John Mayow. The latter's theory of nitro-aerial particles as the component of air necessary to combustion and respiration is the object of two chapters of the present book, where the author explains Mayow's experiments and theories in the light of modern chemistry. He comes to the conclusion that Mayow's theory of nitre, which derived from Sendivogius, paved the way for the discovery of oxygen at the end of the eighteenth century.

Sendivogius is placed at the very beginning of a long period of research which started with the recognition of the role of nitre as a substance containing a "secret food of life" (p. 204) and brought about the discovery of oxygen. For Szydlo, Sendivogius was "fully familiar with practical chemistry, and was capable of describing his ideas in a manner that can be interpreted using the language and concepts of modern chemistry" (p. 97). He states that Sendivogius's chemistry was experimental and that it was free from the mystical connotations which can be found in Renaissance and early modern authors. Sendivogius's chemical ideas are summarized in three points: (1) the study of air and its role in life; (2) the identification of the "central salt" (nitre) as the vital ingredient of air; (3) the preparation, from that salt, of the universal solvent, necessary to the transmutation. Sendivogius's sources, like the *Tabula Smaragdina*, Theophrastus Paracelsus and Joseph Duchesne, are not neglected by the author. None the less, they are taken into account as a pre-history of the nitre theory, rather than as part of a larger scientific and philosophical background. The obvious links between the notion of nitre and the controversial doctrines of *anima mundi* and *spiritus mundi* are not investigated in the book, which focuses on "successful" scientific theories. Included, is a complete bibliography

of Sendivogius's works (including translations) as well as summaries and English translations of several of his tracts.

Antonio Clericuzio, University of Cassino

Piyo Rattansi and Antonio Clericuzio (eds), *Alchemy and chemistry in the 16th and 17th centuries*, International Archives of the History of Ideas No. 140, Dordrecht, Kluwer Academic Publishers, 1994, pp. xiv, 208, £72.50, \$105.00, Dfl. 185.00 (0-7923-2573-7).

This collection of nine articles resulted from a conference held at the Warburg Institute in 1989 and represents the continuing exploration and revision of our understanding of the development of alchemy and its influence on philosophy and education in early modern Europe. The focus of study ranges from the Middle Ages to the early-eighteenth century, beginning with Michela Pereira's discussion of alchemical treatises attributed to Raimond Lull, which affirms the current scholarly understanding that in the thirteenth century alchemy already possessed a medical as well as a metallurgical side. She establishes the importance of a Lullian tradition in the work of Paracelsus and his followers, who in turn may have written Pseudo-Lullian tracts. Massimo Bianchi next shows how Paracelsus transformed the alchemy he imbibed from medieval sources, giving it an essentially medical identity and making it the basis for an alchemical epistemology: interpreting the relation between natural objects and their outward characteristics (signatures) was analogous to resolving a substance in the laboratory by applying fire. Both practising alchemy and writing about it are thus manifestations of *conversio*, the process by which the invisible text or essence is rendered meaningful and visible: "In principle, the achievement of the *lapis* is no different from ... the deciphering of a sign" (p. 27). But this abstraction reduces all alchemy to semiotics and requires a certain distance between signifier and signified that recent

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authors deny the Paracelsians maintained. Bianchi's position is likely to stimulate further discussion.

Antonio Clericuzio claims that a transformation of the notion of spirit by seventeenth-century English chemical physiologists permitted them to view vitality as resulting from the chemical activity of substances rather than arising from a homogeneous spirit or soul. Scholars must now examine the validity of Clericuzio's results in a larger historical and geographical framework.

Norma Emerton compares the cosmologies of Robert Fludd and J B van Helmont to show that chemical writers held various opinions on the interpretation of scripture, specifically Genesis I, which she argues was a crucial proving ground for chemical philosophies. Certain irregularities and inaccuracies in the quotations from primary sources that are used to support her arguments are cause for concern. For example, her statement that van Helmont quoted the Danish Paracelsian Petrus Severinus (p. 96) is not borne out by examination of the pages of van Helmont's *Oriatrike* and Severinus' 1571 *Idea medicinae* that are specified in the subsequent footnote. My inspection of the corresponding pages of van Helmont's *Ortus medicinae*, the Latin original, also turned up no mention of Severinus or his book or any unacknowledged quotation. At best the footnote is insufficiently explicit. Elsewhere, sample comparisons also indicate a too liberal policy of extracting quotations from context. One lacuna swallows over fifty lines of text—almost the whole of page 75 of the folio *Oriatrike*. More serious is the interpolation of “[Mineral] seeds” as the subject of a quotation on page 96, when in fact van Helmont was not discussing mineral seeds or the generation of minerals on page 113 of the *Oriatrike*, but rather the spontaneous generation of animals such as lice and “flies breeding in wood”. However, Emerton's somewhat cavalier treatment of the sources does not abrogate her main thesis that van Helmont's interpretation of Scripture depended on traditional hermeneutics handed down from St Augustine and other patristic sources,

whereas Fludd demanded that the Bible accord with the ancient theology of the Orphic hymns and Hermetic writings.

Bruce Moran's study of Raphael Eglinus significantly expands on his treatment of this early-sixteenth-century alchemist and theologian in *The alchemical world of the German court: occult philosophy and chemical medicine in the circle of Moritz of Hessen (1572–1632)* (Stuttgart, Franz Steiner, 1991). Eglinus was one of those elusive theoreticians who dwelled in the grey area between Paracelsian chemistry, mystical religion, and Rosicrucianism, the elucidation of which will reveal much about an ideological crisis that time, orthodoxy, and the obscurity of the primary sources have hidden.

Karin Figala and Ulrich Neumann convincingly argue that the standard biography of Count Michael Maier, the famous Rosicrucian author of *Atalanta fugiens*, merits significant revision in light of information gleaned from Maier's recently discovered c.v. and diverse smaller publications.

William Ryan finds no evidence for alchemy in medieval Russia until the late fifteenth and sixteenth centuries, when the *Secretum secretorum* was translated from a somewhat disordered Hebrew manuscript and the Tsar's court became interested in the magical properties of certain stones. Court iatrochemists were employed in the 1600s, but the author has turned up little evidence of other chemical interest until Freemasons and Rosicrucians acquired and translated Paracelsian literature in the eighteenth century.

Although large portions of William Newman's description of Eirenæus Philalethes' alchemy are taken, largely unaltered, from his book *Gehennical fire: the lives of George Starkey, an American alchemist in the scientific revolution* (Cambridge, MA, Harvard University Press, 1994), the results of his careful scholarship are here focused on the important task of illuminating how early modern corpuscular theory—long considered to be a break with Aristotelian and Paracelsian theory—developed from medieval Islamic and Aristotelian conceptions of matter, both

directly and filtered through the dark glass of Paracelsian and Helmontian doctrines.

Finally, Anita Guerrini explores the teaching of chemistry at the English universities 1680–1730 to ascertain why it found no place in the statutory curricula. She concludes that students required an introduction to standard laboratory techniques and iatrochemical procedures rather than chemical theory, and that this discouraged the penetration of chemistry into natural philosophy.

Except for the irregularities noted above, the articles in this volume are well researched and documented and constitute a welcome challenge to Nathan Sivin's evaluation of the history of alchemy as a moribund field of enquiry (*Alchemy revisited: proceedings of the International Conference on the History of Alchemy at the University of Groningen*, ed. Z R W M von Martels, Leiden, Brill, 1990, p. 4). Their breadth and depth reveal that much remains to be understood about the assimilation and assessment of chemical ideas in medieval and early modern Europe.

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**Linda Bryder, Derek A Dow** (eds), *New countries and old medicine: proceedings of an international conference on the history of medicine and health, Auckland, New Zealand 1995*, Auckland, Pyramid Press, 1995, pp. xvi, 428, illus., NZ \$30 (+p&p), Australia \$10, rest of world \$15 (0-9597871-3-5).

As the title suggests, this is not an edited collection of essays of the kind to which we have become accustomed, but the proceedings of an entire conference, which appear, it would seem, with few additions or revisions. This comprehensiveness is at once the volume's strength and its weakness. Although it illuminates many previously neglected aspects of the transfer of Western medicine (and diseases) to "new countries" (in this case, New Zealand, Australia and the Pacific), many of the individual contributions are weak and some verge on the antiquarian.

The essays are grouped into seven sections: 'Public health policies and practice'; 'Colonial medicine'; 'Hospitals and hospital nursing'; 'Nursing and indigenous peoples'; 'Indigenous health'; 'Fraudulent and fringe medicine'; and—ominously—'Miscellaneous'. Of these, the strongest sections are probably those on public health and indigenous health, although one or two essays in the "nursing" section also have much to recommend them. The section on public health begins strongly with Günter Risse's interesting and well-researched piece on the plague in San Francisco, which is followed by several robust essays on various aspects of epidemic disease in the southern hemisphere, interspersed with reflections on mortality in the north, such as Jan Sundin's tentative conclusions regarding gender and mortality in Sweden. Two essays in this section are particularly worthy of note. The first is Bronwyn Dalley's study of "one-woman brothels" in New Zealand, which makes the interesting point that the portrayal of women in discourses surrounding venereal disease changed during the First World War so that they were depicted as sexually aggressive and rapacious, rather than as the "Fallen Women" of the Victorian era. Lynda Bryder's essay on 'Perceptions of Plunkett' also points the way to a new interpretation of the maternal and infant welfare movement in New Zealand. Bryder makes the valid point that welfare organizations, such as the Plunkett Society, need to be understood from the perspective of wives and mothers rather than simply that of their founders. She argues that women were not reluctant victims of a conservative, male-dominated system, but often availed themselves willingly of infant and maternal welfare.

The second section—on colonial medicine—is unfortunately less strong. The introductory paper shows only scant awareness of recent literature in the area and many of the other contributions are antiquarian in the worst sense of the term. The only real exceptions are the neat overview of medical practice in colonial Philadelphia by Nissa Stottman, and an innovative study of grief in early twentieth-