Atoms and Alchemy: Chymistry and the Experimental Origins of the Scientific Revolution by William R. Newman

Chicago/London: University of Chicago Press, 2006. Pp. xiv + 250. ISBN 0–226–57697–3. Paper $30

Reviewed by
Antonio Clericuzio
Universitàdi Cassino
antonio.clericuzio@libero.it

Over the past 20 years, William Newman has produced a substantial number of articles and books aimed at repositioning alchemy in medieval and early modern science. He has insisted on the experimental program which, he claims, was an integral part of alchemy. The interpretation of alchemy as a spiritual discipline was, in his view, popularized by the occultists of the 19th century and then adopted by Carl Gustav Jung and Mircea Eliade. Newman has even proposed to replace the term alchemy with 'chymistry', thereby stressing the continuity of alchemy with modern chemistry. In the present book (bearing the term 'alchemy' in its very title), Newman has a very ambitious aim that goes beyond reassessing the role of alchemy. As he puts it,

> my hope is that the present book, by revealing the violent rupture that alchemy helped to precipitate in traditional scholastic matter theory and by outlining the role of this discipline in the formation of the experimental version of the mechanical philosophy, will give cause for reconsideration of the 'grand narrative' of the Scientific Revolution. [19]

For Newman, the Western alchemical tradition was both experimental and corpuscular:

> The alchemists of the High Middle Ages established an experimentally based corpuscular theory that would develop over the course of several centuries and eventually supply important components to the mechanical philosophy of the Scientific Revolution. [26]

ISSN 1549–4497 (online) ISSN 1549–4470 (print) ISSN 1549–4489 (CD-ROM)
Aestimatio 4 (2007) 162–165

As he sees it, the source of modern corpuscular theory of matter was not ancient atomism, but Aristotle's *Meteorologica*.

The dismissal of ancient atomism as not influential is surprising, given the well-known interest of Renaissance and early modern natural philosophers in Epicurus and Lucretius. But, according to Newman, ancient atomism was metaphysics and had little or nothing to do with modern science. He spells out his position as follows:

> The metaphysical origins of Democritean atomism are clear enough, even if the details of his system are lost in the haze of historical amnesia. His revivers Epicurus and Lucretius, who came at opposite ends of Hellenistic period, made important additions to the Democritean system, but they too were strangers to the laboratory. [25]

Having dismissed the ancient atomists as 'strangers to the laboratory', Newman then maintains that the source of early modern corpuscular philosophy was Aristotle. In his view,

> it is well known that *Meteorology* IV lays out a detailed corpuscular description of matter expressed in terms of *poroi* (pores) and the *onkoi* (corpuscles) that can fill them. [66]

Newman takes for granted that Aristotle's ὄγκοι were corpuscles and that his πόροι were void spaces filled by corpuscles—as in modern mechanical philosophy. But it is not so easy to make sense of the apparent contradiction between Aristotle's unambiguous rejection of atomism in his works (including the criticism of the doctrine of πόροι as empty spaces to be found in *De gen. et corr.* 326b) and the interpretation of *Meteor.* 4 as containing a corpuscular theory of matter. In 1915 [35–36, 189–199], Hammer-Jensen claimed that in *Meteor.* 4 there is an atomistic theory; and for this reason, she concluded that this book is spurious and should be attributed instead to Strato of Lampsacus. More recently, Carmela Baffioni [1981, 35–36] has maintained that the πόροι and ὄγκοι in *Meteor.* 4 are not to be seen as evidence of Aristotle's adherence to atomism. She claims that the atomists employed the term κενόν for void, and that the term ὄγκοι can hardly be translated by 'atoms'. While in *Meteor.* 4 πόρος is only once identified with κενόν, Strato did not differentiate πόρος and κενόν. But this was Strato, not Aristotle. In short, the existence of an Aristotelian corpuscular theory of matter remains at least debatable.

As Newman has pointed out on many occasions, a key text in the history of alchemy was pseudo-Geber's *Summa Perfectionis*, which 'contains a comprehensive theory of mineral formation, chrysopoeia, and artisanal laboratory operations expressed in terms of particles and pores' [13]. The *Summa Perfectionis*, according to Newman, 'developed a corpuscular side of Aristotelian matter theory that is present in book 4 of the Stagirite's *Meteorology*...' [13]. After the pseudo-Geber, Newman takes into account Erastus and Libavius, both outspoken opponents of Paracelsus. Whereas Erastus rejected alchemy, Libavius aimed at reforming chrysopoeia and defended medieval alchemists against Paracelsus. Newman traces the lineage of corpuscular matter theory as it starts with Aristotle *Meteorology*, proceeds *via* pseudo-Geber and Libavius, and finally reaches Sennert and Boyle in the 17th century. He describes this descent of modern atomism as follows:

> The corpuscular theory of the *Meteorology* merged with the tradition of Geberian alchemy—now seen in the light of Paracelsian *spagyria*—to yield a widely held physical theory based on the experimental analysis and synthesis of substances believed to consist of minute particles, a position that would reach its consummate expression in the work of Daniel Sennert. [67]

Sennert wanted to combine Aristotelianism and atomism, and resorted to chemical experiments to prove the existence of atoms, notably by means of the so-called reduction to the pristine state.[1] For Newman,

> Sennert followed the lead of Libavius in making Democritus into a sort of Aristotelian and Aristotle into a sort of quasi-Democritus.... [94]

Newman's discussion of Sennert, which focuses on his *De Chymicorum* (1619), is insightful and takes into account the relationships of Sennert to late Aristotelians such as Scaliger and Zabarella.

The third part of *Atoms and Alchemy* deals with Boyle's matter theory. Newman restates the views held by Kuhn and Marie Boas, among others, that Boyle's matter theory was strictly mechanical.

[1] Meinel 1988 documents this well.

He distances himself from both Kuhn and Boas by assuming that no opposition existed between corpuscularianism and chemistry, and that alchemy played a central role in the establishment of mechanical philosophy. The evident tension between Boyle's mechanism and the notion of active principles (i.e., seminal principles) which some scholars have stressed in the past two decades, receives only passing reference in a footnote.

Overall the volume, which is beautifully illustrated, is an important contribution to intellectual history, notably to the ongoing debate about early modern theories of matter.

BIBLIOGRAPHY

Baffioni, C. 1981. *Il iv libro dei meteorologica di Aristotele.* Naples.

Hammer-Jensen, I. 1915. 'Das sogenannte IV Buch der *Meteorologie* des Aristoteles'. *Hermes* 50:113–136.

Meinel, C. 1988. 'Early Seventeenth-Century Atomism: Theory, Epistemology and the Insufficiency of Experiments'. *Isis* 79:68–103.