

## Atoms

### 1049 words

Descartes ardently opposed atomism in his published works, both in his books and in his letters. Indeed, part of the appeal of his natural **philosophy** was its being able to offer a well worked out plenist (see **plenum**) alternative to the atomist philosophies that were in vogue in his day—one that could take advantage of the atomists’ style of **explanation** of phenomena in terms of the size, **shape** and **motions** of micro-corpuscles, but without the need for the atomists’ dangerous metaphysics, which rendered an immaterial God and soul superfluous. Nevertheless, there are certain aspects of Descartes’ views that have led readers to suspect that his opposition to atomism was not as absolute as his words suggested.

In his *Principles of Philosophy* (1644) Descartes explicitly rejects the two founding assumptions of atomism. First he argues that it would be contradictory for there to be an absolute **vacuum** (AT VIII A 50; CSM I 230-1); then he offers a demonstration of the impossibility of atoms, arguing that their **existence** would be contrary to the fact that matter is essentially divisible (see **divisibility**): “It is impossible that there should exist atoms, that is, pieces of matter that are by their very nature indivisible, as some philosophers have imagined. For ... no matter how small we imagined them to be, they would necessarily have to be extended, and hence we could ... recognize their divisibility” (AT VIII A 51; CSM I 231). The fact that matter is necessarily extended (see **extension**) precludes the kind of point-atoms entertained by the Zenonists, whereas the divisibility of extension precludes something being both indivisible and extended, as were the atoms proposed by Descartes’ contemporaries **Sebastian Basso**, Daniel Sennert, Jean-Chrysostôme Magnen and **Pierre Gassendi**. Descartes adds that even if **God** had made some particles “indivisible by any of his creatures,” he himself would still be able to divide them—a weak argument, to which **Leibniz** responded, “this Gassendi would not have denied” (Leibniz 2001, 25).

Much more influential are Descartes’ arguments for the possibility of motion in a plenum. Against the atomists’ argument that a motion could not begin unless there were a void space for a body to move into, Descartes argues in the *Principles* that this objection

is evaded if a ring of matter all begins moving simultaneously; and against the objection that voids or condensations would be created by circulation of matter through unequal spaces, he argues that continuity can be preserved if the flow of matter through a space is swifter in inverse proportion to the width (i.e. cross-sectional area) of the space (AT VIIIA 58-59; CSM I 237-39). In order for this to happen, however, some parts of this circulating matter will have to adjust their **shape**, which they can only do by having their innumerable constituent particles slightly shifted relative to one another, resulting in an actually infinite or indefinite division of that part of the fluid matter (AT VIIIA 59-60; CSM I 239).

This assertion by Descartes of the actual infinite division of parts of matter left him open to the charge that he was composing the continuum out of material points. To such criticisms Descartes responded (AT I 422; CSMK III 65) that the particles of the subtle matter are continuous bodies, divisible to infinity and that one “must not imagine that they are atoms, or at all hard” (AT I 140; CSMK III 21). Nevertheless, **Cordemoy**, and also Leibniz, would later argue that in the absence of some principles of unity in matter, or substantial atoms, there is no justification on Cartesian principles for bodies not to simply dissolve into points (see **individuation**). Again, some of Descartes’ contemporaries identified him as an atomist because he used the same style of explanation as Democritus; to this he replied that the consideration of shapes, sizes and motions was “adopted even by Aristotle and all the other philosophers” (AT VIIIA 325; CSM I 287).

Descartes did in fact appeal to atoms in his earliest investigations in natural philosophy, conducted under the influence of the atomist **Isaac Beeckman**, who initiated him into the micro-corpuscular explanations characteristic of his philosophy, and provided him with the foundation for his understanding of the laws of motion (see **inertia**). These atomist origins of Descartes’ natural philosophy perhaps explain some of the tensions in his views. For example, it would seem impossible for bodies ever actually to exhibit the continued motion in a straight line that his first and second laws require. In order to allow for it, Cartesian **subtle matter** has to become so like the void as to be virtually indistinguishable from it.

Another context in which Descartes has been seen as advocating atomism is in his proof of the existence of **God** (see **cosmological argument**) from the nature of duration in the Third Meditation (AT VII 49; CSM II 33) and *Principles* I, 23 (AT VIII A 13; CSM I 200). This depends on identifying the mutually independent parts of the duration of a created thing with the individual moments at each of which God conserves the thing, thus seemingly entailing the composition of duration from indivisible moments (see **time**). This tension between individual moments and continuous creation may, however, be another symptom of the atomist origins of Descartes' thought, where, in his solution to the problem of the falling body, he follows Beeckman in dividing its duration into atomic moments, only to take the limit to arrive at durationless instants and a continuous motion.

See Basso, Sebastian; Beeckman, Isaac; Cordemoy, Géraud de; Divisibility; Individuation; Leibniz, Gottfried; Motion; Plenum; Time

### **For Further Reading**

#### **Primary Source**

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