INRODUCTION

This study is best characterised as a contribution to the history of Natural Philosophy during its first two millennia. Throughout this period – from Democritus to Newton – no sharp distinction existed between philosophy and natural science: figures like Aristotle, Descartes, and Leibniz may be found in histories of science as well as of philosophy. The Atomic Theory is essentially a philosophy of Nature: it is idle to ask, at least during the period in question, whether it belongs properly to metaphysics or to physics.

Qua philosophy of Nature, classical Atomism seems to involve four central claims, two of which might be described as existential (giving the foundations of its ontology), the other two as explanatory, i.e. laying down strict guidelines concerning legitimate patterns of physical explanation. These four claims can be summarised as follows:
1. A commitment to indivisibles, particles of matter either conceptually indivisible (i.e. such that one cannot conceive of their division) or physically unsplittable.
2. Belief in the existence of vacuum or ‘Non-Being’, purely empty space in which the atoms are free to move.
3. Reductionism: explanation of the coming-to-be, ceasing-to-be and qualitative alteration of sensible bodies in terms of the local motion of atoms which lack many (most) of the sensible properties of those bodies.
4. Mechanism. This is a thesis about the nature of physical agency: it claims in effect that no body is ever moved except by an external impulse from another, moving body.

These four assertions form the heart of classical or Democritean Atomism. (It is important to distinguish 3 and 4, since many Renaissance thinkers accepted the former but not the latter, insisting that the movements of minute bodies that constitute the generation and alteration of sensible bodies are guided by purposive, spiritual agencies of some kind. 3 is essentially a thesis about qualities; 4, about agents.) Even if no actual thinker subscribed wholeheartedly and unreservedly to all of 1–4, they still constitute, between them, an ideal Atomist position capable of serving as a sort of ideological landmark for future reference.
Our study concerns the reasons which led men to assert – or to deny – one or other of these four pillars of Classical Atomism, i.e. with the arguments employed on both sides. Although we shall range widely and with some freedom, these are the four key issues of which we must not lose sight: Indivisibles, Vacuum, Reduction and Mechanism. Under each of these headings, however, may be found questions belonging to several different fields of study: a chapter on indivisibles, for example, may contain issues chemical as well as mathematical or physical, while questions about the vacuum slide from physics into philosophy and even theology. An argument is pursued wherever it leads, with no respect of interdisciplinary borders.

The work divides naturally into three temporal periods, giving it an overall 3 x 4 structure, in which Chapters 1, 5 and 9 deal with indivisibles, 2, 6 and 10 with vacuum, and so on. The three time-periods are, roughly, Classical Antiquity (c. 500 B.C.–500 A.D.), the Middle Ages and Renaissance (c. 500–1600 A.D.), and the Seventeenth Century. These divisions, I feel, mark real changes in the direction of Western intellectual history, i.e. the break-up of the classical Greco-Roman learning, and the transition from Renaissance to modern, respectively. (The gulf that separates seventeenth from sixteenth century thought is at times quite striking.) Transitional figures such as Philoponus and Francis Bacon find themselves called upon as and where their ideas seem best to fit.

Why, one might ask, pursue the story to the year 1700, rather than, say, 1600 or 1800? This too, I would claim, is non-arbitrary: by the end of the seventeenth century there existed a conception of the physical world (e.g. in the writings of Boyle and Locke) not very far removed from that of Democritus: the debt of these ‘corpuscularians’ to classical Atomism is both transparent and profound. Around 1700, however, this world-view is already under threat: the ideas of, e.g. Newton and Leibniz are beginning, in their very different ways, to undermine the foundations of the whole edifice. To pursue the story to the year 1800 would involve, therefore, a host of new departures and themes. To call a halt around 1600, however, would be to leave too many loose ends waiting to be tied up, and would thus be profoundly unsatisfactory. I choose, then, to pursue the story as far as the year 1700 (give or take a few years), when the Atomistic world-view has been triumphantly re-established (and is just beginning to show signs of strain), rather than either to call a
halt in the confusion of Renaissance thought or to pursue the tale on into pastures new. By around 1700, a world-view has been established which is clearly a revived version of classical Atomism: one of the themes of this study is, therefore, that of departure and return. Book One deals with the ancient Atomists and their critics; Book Two traces surviving Atomist ideas in the predominantly Platonic and Aristotelian (i.e. anti-Atomist) thought of the Middle Ages and Renaissance, and investigates developments during that period which facilitated, in one respect or other, the eventual re-emergence of one or other of the Atomists' claims; Book Three deals with the revival in seventeenth century thought of classical Atomism, often incorporating ideas from medieval and Renaissance thought. (It would be quite wrong to think of Book Two as merely a confused digression separating the weightier material of Books One and Three.)

The study argues for no single grand or universal thesis, and the reader is left, by and large, to draw his own or her own conclusions. This, I feel, is as it should be: any attempt to draw all the threads together into some great synthesis would produce either oversimplification and trivialisation, or else requires another work of comparable length: better, then, to tell the story and let the consequences take care of themselves.

In a work of this scope, there are bound to be faults: omissions, misinterpretations, fallacies, and plain errors of fact. I have eliminated many, and can only beg the reader's indulgence for those which, doubtless, remain.