itself in the imperial realm of Heaven and in the casting of Satan as a romance wanderer. Whereas Tasso transforms the romance pattern of the wandering boat into epic by representing Fortune as a minister of Providence (therefore valorizing exploration voyages and colonial expansion), Milton figures Satan's voyage to earth within a romance narrative, thus suggesting that discovery voyages are the work of the devil. The human plot, on the other hand, "reclaims and revalorizes the open-endedness and contingency of romance." Once again Quint takes into account the "ideology of form," noting that deferral and deviation permits a "suspended period of free choice to surface again after the Fall, to resist the notion that the Fall and its consequences are final and irreversible." Thus, on the level of topical allusion, Adam and Eve's embracing of historical contingency signifies a resistance to and undermining of the permanence of the Restoration.

While there is little in Quint's book to criticize, it does seem odd that he says nothing about Spenser's *Faerie Queene*, a poem which oscillates between epic and romance. Nonetheless, *Epic and Empire* is a major contribution to the study of epic. In its impressive scope, rich commentary and notes, and its theoretical sophistication this book offers new and exciting possibilities to students and scholars of the epic. Whether in the application or critique of Quint's epic/romance taxonomy, future readers of the epic will be indebted to this book.

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Harinder S. Marjara. *Contemplation of Created Things: Science in Paradise Lost*. Toronto: University of Toronto Press, 1992. Pp. ii, 376.

After reading Harinder S. Marjara's *Contemplation of Created Things: Science in "Paradise Lost,"* one is certain that Milton must have been extremely thoughtful concerning natural philosophy, not simply accepting the orthodoxies of a bygone day, not simply adopting or adapting the latest trendy beliefs whether well- or ill-founded, not going out of his way to shock or to avoid shocking, but striving to create a cosmos whose operations would seem credible, even plausible, to his contemporaries. Essentially what Marjara shows, and it is well worth the showing, is that contemporary theological, moral, and scientific thought simply did not deliver a vision of the universe acceptable to all and which Milton could just assume and let his readers assume. Consequently, he had to construct a vision of nature (including the extra-mundane phenomena of angels, devils, Heaven, Hell, Chaos) that made sense within the context of contemporary empirical data, harmonized with his own theological and moral beliefs, and was, into the bargain, poetically effective — a huge and complex undertaking of the intellect and the imagination in which Marjara convincingly shows Milton to have been largely successful.

Marjara sets himself two primary tasks: to help Milton studies catch up to recent developments in the history of science by placing Milton's beliefs within the context

of seventeenth-century scientific beliefs, trends, controversies; and to outline Milton's specific scientific beliefs, and demonstrate how they form a crucial component of the poetry of *Paradise Lost*. Dealing with the first of these complementary endeavors, Marjara argues that before we accept the claims of earlier scholars, such as Tillyard and Bush, that Milton's science was little more than a medieval hand-me-down, out-of-date and hopelessly enmeshed with theology, we should consider Milton's scientific ideas and imagery in relation to the scientific speculation and modes of thought of his own time. Marjara's definition of science as "the totality of postulates, theories and beliefs that constitute our perception of nature at any given time" (p. 20) centralizes the fact that science, including the interpretation of empirical results, is dependent on the cultural context of those practising it. Hence, this definition does not imply a quintessentially "scientific" method or attitude towards nature: scientific investigation occurs within a framework of beliefs, methods, and assumptions, including those in the fields of theology and metaphysics, accepted by the majority of practising scientists.

Many students of *Paradise Lost* still assume, largely because of Raphael's apparent denigration of scientific knowledge, that Milton is opposed to science, and reinforce that assumption with the further one that religion and science are necessarily at odds, so Milton had to choose between them. Marjara shows that, far from this being the case, the seventeenth century is a time when religion and science cannot be assumed to be in fundamental conflict, or even to be completely distinct fields. Indeed, one of the most important things Adam eventually learns is that contemplation of created things can lead one towards God and Heaven. Marjara goes on to show that scientific thought in the seventeenth century is characterized by curiosity, skepticism, and considerable controversy on matters such as the continued viability of Aristotelian physics, the Copernican hypothesis, the origins of the universe, the nature of matter and its relation to spirit, and the extent to which human choice and action is determined by physiology. On these matters and others there seems to be such a variety of views that Milton could be up-to-date whatever his views were, and that it is only by hindsight that we accuse him of being behind the times; in other words, he frequently aligned himself with the sides (such as geocentrism) that eventually lost out. This conclusion is a healthy reminder that we should not chastise Milton for being a man of his century, caught up in its contradictions, controversies and confusions, and that contemporary science left him considerable room in which to construct a morally significant universe that is at the same time physically plausible. We tend to think of science as mainly an empirical activity, but Marjara usefully points out that in Milton's time observation, although recognized as of great importance in natural philosophy, was still an unreliable means of advancing knowledge because of the primitiveness of its tools and methods; as a result, observations, in practice, were likely to be accepted only if they could be confirmed by deductive reasoning from a series of postulates and axioms widely held to be true (e.g. that God created the universe in time; that He imparted a rational and mathematical order to nature; that nature takes the easiest path; that nature does nothing without purpose). Postulates of this sort both guarantee a scientific discourse

heavily laden with metaphysical assumptions and accommodate a variety of specific theories — an ideal situation for a poet with Milton's interests and predilections.

Generally speaking, Marjara's accounts of the opinions of the various scientists he cites are clear and persuasive. But one area in which he could be stronger is that of the fortunes of astrology in the period. He quotes the common maxim "*natura nihil facit frustra*" (e.g. p. 49) which implies that there is nothing redundant or superfluous in creation; this maxim obviously supports a belief in stellar influences on terrestrial affairs. Marjara does note that in Milton's century as opposed to our own, "astrology as a 'science' of the stars was much more fundamental to an understanding of the role of the stellar influences in relation to the system of science as a whole" (p. 111). He credits many scientists such as Boyle with semi-astrological ideas, particularly in claims that the sun activates the sundry properties of other planets and that the stars have governorship over sublunary change, especially over various processes of generation, by means of their heat and light. This sort of general governorship is quite a different thing from judicial astrology (which was controversial largely because it threatened to compromise human free will) and clearly forms part of a desire to ensure that the natural world is ruled by laws and that there are no parts of creation left with nothing to do. As far as we know, this principle of nature's frugality did not lose any force in the period, yet by the end of the century astrology, even in the most general and innocuous sense, had been decisively abandoned by serious scientists. The book would profit from some consideration of the work of Patrick Curry and others on the gradual decline in favour of astrology throughout the period despite (or perhaps because of) efforts of people like John Gadbury to give it a scientific foundation, efforts which Marjara does not mention. Marjara's general discomfort with, and general dismissal of, astrological thought is also manifest when in note 27 in Chapter 4 he cites Hughes citing D.C. Allen for an astrological claim rather than resorting to an astrological source; it again appears when his claim on p. 112 that Tycho "believed in astrology very strongly" is juxtaposed to the assertion on p. 115 that Tycho "considered astrological prognostications to be mere conjecture." These two statements may very well be perfectly compatible, but further explanation is in order. The section dealing with attacks and defenses of astrology (pp. 111ff) would be much stronger if it were to cover more fully the extensive English contribution to the debate. Finally, although the context is not astrological, Marjara confuses Aries with Libra on P. 204.

For me, the real strength of this book is found in Marjara's accomplishment of his second task, showing that many incidents and images in *Paradise Lost* have hitherto unsuspected ramifications and reverberations if read with a sensitive understanding of Milton's natural philosophy as well as of his theology. He shows that Milton creates a universe which does not exactly mimic that of any specific scientific source, ancient or contemporary, but which is consistent, and integrates new scientific speculations with a basically, though frequently strained, Aristotelian framework (p. 83). For Marjara, the key concepts in Miltonic science are the following: the replacement of the Aristotelian dualism that sees the sublunary and superlunary worlds as fundamentally

different with a monism that entails all levels of the universe's obeying the same natural laws; a reinforcement of this monism by a radical materialism that envisions Creation as resulting from "one first matter" emanating from God and becoming diversified in the variety of the cosmos, with matter becoming progressively more corporeal as it is further removed from the divine source; a series of transmutations of matter, in both its animate and inanimate forms, in which matter becomes gradually more rarefied and "spiritous" as it proceeds up the scale of being in its return to God; and the consequent view of spirit (including both angels and human souls) as the most refined form of matter.

The great strength of Milton's vision of nature is that it provides a cosmos unified by the commonness of matter to all things and by the universality of the processes of its operations and transformations. Milton stresses this unity, Marjara points out, by positing earth-like phenomena on the moon and the sun, by suggesting that angelic emotions and physiology have parallels with their human counterparts, and by extensive use of vitalistic imagery and analogies, based on the processes of generation and nourishment, to describe and link phenomena at all levels of the universe. The unity of the cosmos goes beyond mere similarities between various levels; there is continual interaction among the various levels; for example, the sun and stars are fed by exhalations from the earth, which feeding supports and sustains the higher processes at the celestial levels; the heavens repay the favour by raining down astral influences that help regulate the processes of terrestrial change; this whole process of terrestrial-celestial interchange is also seen as analogous to the way that human blood generates spirits that sustain the higher functions such as reason, which in their turn exercise governance over the human being as a whole. The only real problem in this respect is that it is sometimes difficult, in both Milton and Marjara, to determine when such a parallel process is to be seen as purely metaphorical and when it is to be taken as a factual claim about the natural world.

Presenting nature as an entity that follows rules that can be learned, one in which actions have predictable consequences, also permits it to serve as an objective correlative to Milton's moral and theological concerns, an aspect of the poem Marjara covers well. One might have entertained the possibility that Milton approached the subject of nature with the mindset of a writer of fantasy or some types of science fiction, positing an essentially magical universe in which different rules apply to different creatures or different levels of creation — for instance, that different physical laws apply to angels than to man, or to fallen than to unfallen angels. This sort of thing is not totally alien to the poem, nor indeed to the Christian tradition from within which Milton writes, but is seen primarily in the specific consequences of the Fall — the hostility of animals, the pain of childbirth, the variations of the seasons, for example. But despite these "extra-natural" consequences of the Fall, the mass of evidence that Marjara presents suggests that Milton was very much concerned with describing a self-contained, law-governed universe in which chance as an operating principle is relegated to Chaos and in whose daily operations God intervenes (via miracles, special punishments, etc.) as little as possible. The only creatures in the poem that seem alien to the cosmos in which they find themselves are Sin and Death. This

pair, whose natural environs more closely resemble Spenser's Faeryland, is, unfortunately, not accounted for in Marjara's book.

There are a number of places in the book in which Marjara convincingly argues that an informed awareness of Milton's science is crucial to the reading of an incident or image. One of these is in the debunking of Moloch's argument that the "proper" motion of angels is ascent (*Paradise Lost*, II.73-7), by showing that Milton's angels, being material, would naturally descend when in a medium too tenuous to support their weight, the very thing that happens to Satan and his followers when they leap out of Heaven into Chaos and to Satan himself during his solo flight to Earth (148-50, 159-62). Another is an image in Adam's self-recrimination in *Paradise Lost* X.735-41 in which, when he pictures the curses of future generations gravitating to him as their natural centre and settling there heavily upon him, he cleverly reverses the Aristotelian principle that "heavy objects lose their heaviness . . . and become light when they reach 'thir natural center,' which is the centre of the earth" (p. 147). These two passages, in which Milton uses the physical as a correlative for the moral but which presuppose rather different theories of motion (Moloch and Adam use Aristotelian theory while Milton's description of the angels' fall suggests more current views) exemplify Marjara's central assertion that Milton attempts both to accommodate and to update Aristotle. The reading of the passage in which Eve's seduction by Satan is compared to *ignis fatuus* (*Paradise Lost* IX.634-42) is stimulating in its reminder that Milton provides both a natural and a supernatural explanation of this phenomenon and by extension of the seduction itself. The question of whether the "scientific" explanation undercuts the "superstitious" one, or vice versa, or whether they are mutually supportive, implying that Eve is a victim of both "natural misjudgment and supernatural deception," (p. 180) is left open. Marjara provides other useful contributions to questions of this nature when he discusses the relationships among reason, will, and imagination.

This book is not only a logical extension and deepening of Marjara's studies published in *Milton Studies* and *Milton Quarterly*; it is also a good companion piece to Stephen M. Fallon's *Milton among the Philosophers: Poetry and Materialism in Seventeenth-Century England* (1991), which, of course, appeared too late for Marjara to take note of. Both Fallon and Marjara put Milton into an intellectual milieu quite different from that in which he is usually considered, frequently dealing with the same philosophical problems and writers, and by so doing, bring new light to our reading of *Paradise Lost*. Fallon, putting Milton in the context of Hobbes, Descartes, and the Cambridge Platonists, similarly stresses his monistic materialism and his determination to present a coherent, consistent, and moral universe, and argues further that Satan embraces the errors of the philosophies Milton rejects.

Although the presentation of cogent material is too often marred by repetitiveness in the writing, *Contemplation of Created Things* is a timely, useful, and often stimulating book.

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