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Robert Boyle and the Epistemology of the Novel

Abstract
Somewhere in the dawning light of modem science, the consciousness that led to the novel-as plot, literary form, epistemological system, and physical book--came to be. Here almost all accounts of the beginnings and origins of the novel agree, for it is hard to imagine, in pre-empirical ages, a literary species with the distinctive modem features of the novel.' But there are radical differences of opinion about sequence, influence, and cause: protestantism, empiricism, individualism, imperialism, and modernism are key terms for nearly everyone in describing the ideological and cultural contexts of the early novel, but the sequence and weight among these forces is open to doubt. The emergence of the novel is concurrent and consonant with the rise of these other values, biases, and methods, but in the sorting a new cultural and literary history may well emerge. I will not propose here a causal sequence, but I do want to indicate how one quasi-scientific goal became a feature of the culture, bridged several of the categories, and led, at least in an indirect way, to the novel. The novel's curiosity about process, its interest in how people make sense of a dense, complex, and resistant world, and its concentration on the materials and rhythms of everyday life all seem to have their roots in ways of thinking about the world that emphasize immediacy, personal observation, subjectivity of response, circumstantiality, empirical modes of thinking, and the desire to systematize. One curious popular strand of science provides part of the cultural explanation of what happened. Newton was not the only scientist to demand the muse; the demands I am interested in here are Robert Boyle's.

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Somewhere in the dawning light of modern science, the consciousness that led to the novel—as plot, literary form, epistemological system, and physical book—came to be. Here almost all accounts of the beginnings and origins of the novel agree, for it is hard to imagine, in pre-empirical ages, a literary species with the distinctive modern features of the novel.[1] But there are radical differences of opinion about sequence, influence, and cause: protestantism, empiricism, individualism, imperialism, and modernism are key terms for nearly everyone in describing the ideological and cultural contexts of the early novel, but the sequence and weight among these forces is open to doubt. The emergence of the novel is concurrent and consonant with the rise of these other values, biases, and methods, but in the sorting a new cultural and literary history may well emerge. I will not propose here a causal sequence, but I do want to indicate how one quasi-scientific goal became a feature of the culture, bridged several of the categories, and led, at least in an indirect way, to the novel. The novel's curiosity about process, its interest in how people make sense of a dense, complex, and resistant world, and its concentration on the materials and rhythms of everyday life all seem to have their roots in ways of thinking about the world that emphasize

1 It is, of course, possible to define the novel more broadly so that the fictions of virtually all ages and nations may be called novels, in which case historical considerations about cultural enablement do not apply. See, for example, Arthur Heiserman, *The Novel before the Novel* (Chicago: University of Chicago Press, 1977) and David Margolies, *Novel and Society in Elizabethan England* (Totowa, NJ: Barnes and Noble, 1985).

Eighteenth-Century Fiction, Vol. 2, Iss. 4 [1990], Art. 4

immediacy, personal observation, subjectivity of response, circumstantiality, empirical modes of thinking, and the desire to systematize. One curious popular strand of science provides part of the cultural explanation of what happened. Newton was not the only scientist to demand the muse; the demands I am interested in here are Robert Boyle's.

As a chemist, Boyle has always had his due, but his reputation in intellectual history is slender. Jonathan Swift helped establish opinion early with two typically Swiftian footnotes: his subtitle to "A Meditation upon a Broom-Stick" makes Boyle responsible for literary and philosophical absurdity, and a marginal scrawl in his copy of Burnet's *History of his Own Time* calls Boyle a "silly writer."[2] Boyle largely deserves the place Swift and history have given him, the specialist who strayed too far from his expertise: he is like a good, well-meaning actor who strays into politics (as distinguished from bad actors who stray into politics), and it is hard to feel sorry for him in spite of good intentions. But he deserves a larger niche in literary, cultural, and intellectual history, though not because he was a great or even a clear thinker. Rather, his pedestrian commitments make him important in the history of taste, desire, and ideas, for his fuzzy categories and refusals to make distinctions are in fact responsible for popularizing ways of thinking crucial to the reception of novels.

To think about the historical reception of novels—what goes on with actual "common" readers who voraciously devour narrative accounts of daily life and experience in the contemporary world—at the same time that one thinks about the complex cultural history of epistemology may seem contradictory, and it is a challenge to standard ways of doing intellectual history under the auspices of traditional historicisms. Even to search for the conceptual roots of the novel in a post-Baconian epistemology may appear to be inconsistent with the novel's commitment to ordinary, everyday life and its accessibility to a wide variety of readers without deep learning or philosophical sophistication.[3] Reconciling the

2 In the 1711 *Miscellanies in Prose and Verse*, Swift said his meditation was "According to the Style and Manner of the Honourable Robert Boyl's Meditations," p. 231. The standard account of how Swift came to parody Boyle is rehearsed fully by Herbert Davis in his introduction to volume I of Swift's *Prose Works* (Oxford: Basil Blackwell, 1939–66), pp. xxxiii–xxxiv. For the Burnet annotation see *Prose Works*, V, 271.

3 On the novel's philosophical contexts, see Michael McKeon, *The Origins of the English Novel*

novel's deep foundations in modern intellectual movements with its appeal to "common" readers in ordinary circumstances is, in fact, one of the most difficult issues that must be faced in any account of the novel's "origins" or any study of its cultural contexts, for the "new species" that English writers and readers began to recognize in the wake of Samuel Richardson and Henry Fielding bridged polite and popular culture in several ways at once. Not only did the novel mix traditional and new value structures into a relatively stable compound and represent daily modern life alongside grand allusive patterns of history and myth, but it also made extraordinary hermeneutic demands on its readers, asking them in effect to take on sophisticated tasks of interpretation and evaluation that would seem to be beyond the abilities of the "new," inexperienced, or simple readers said to be the novel's audience. How readers were able to cope with such demands and how the deep structural changes in thinking came to affect ordinary people so quickly are not, however, clear in traditional accounts of intellectual history, one of the reasons the emerging forms of cultural history are so appealing. The contribution of Robert Boyle is, in fact, best seen in these new cultural terms, for in his quest to make science palatable to wide varieties of people and to make it a powerful cultural force in the thinking of ordinary individuals, he created—perhaps inadvertently—a context of receptivity that novelists were able to exploit for very different ends.

Crucial to the novel's relationship with readers was the empowerment of ordinary people—not just priests and poets but journalists, novelistic protagonists, observers of everyday life, and readers of novels—to interpret textual signs that led to larger understanding. Once unleashed, the power of the individual to interpret was impossible to control, and (as rampant interpretations of events like the storm of 1703 or the Great Fire of 1666 exemplified) the impulse to "read" all events intensely became very strong. As readings were increasingly paraded for public view, self-appointed "priests" turned up everywhere. Preachers, scientists, and journalists combined to make priests of us all: readers of texts of any verbal or non-verbal kind. In times of great anxiety or when a special event dramatically captured the public attention (whether a natural event like a flood or a human one like the accession of a new monarch) different interpretations competed for acceptance. But the public print record

1600–1740 (Baltimore and London: Johns Hopkins University Press, 1987); for its heritage in popular literature and culture, see my *Before Novels: The Cultural Contexts of Eighteenth-Century English Fiction* (forthcoming, New York: W.W. Norton, 1990). The present essay is a section of chapter 8.

Eighteenth-Century Fiction, Vol. 2, Iss. 4 [1990], Art. 4

is only the edge of the issue, for once the idea of universal interpretation was established in the culture, examples readily multiplied in daily life. The need to read even the most minute events in the lives of the most ordinary people became central to the culture. The old sacramental world available to priests and specially designated decoders (but only to others through them) was translated to a dynamic world with emblems spatial and temporal that anyone with determination and patience could read. The democraticization of empiricism meant that texts were constantly evolving and crying out to be read; "readers" did not even have to be literate. Reading in its literal sense became necessary because "reading"—in the sense of construing everything one observed—had already become basic to the culture. Milton and Bunyan, Watts and Blake in different ways all saw to the heart of English Protestantism in insisting that the only enemy to light was the suppression of the free trade of ideas. The vigorous, often contradictory, and sometimes bewildering array of printed "readings" sprang from the energy of the culture's desire to know. It was Boyle who played the leading role in creating this epistemology of ordinary life. The key texts are, it seems to me, *The Christian Virtuoso* (1690–91) and the odd collection of meditations prefaced with a kind of theoretical justification—the collection that Swift scoffed at but paid parodic homage, the *Occasional Reflections on Several Subjects* of 1665.

In the world that spawned the novel, knowing was important, but *knowing* was everything. Mere facts, though being known to know them was crucial to anyone's social reputation in early eighteenth-century England, were only the most direct route to secrets of Nature, for in the wake of scientific advancement and the growing emphasis on observation and experience, the world seemed there to be read, and the discovery, accumulation, and recording of miscellaneous facts could point to larger patterns of understanding. In its pure form empiricism insisted on observation of data under rigidly controlled conditions, but heightened interest in all kinds of observation was a cultural result of its practice as ordinary observers—mere amateur spectators on the world—became aware of its assumptions. And although the doctrine that everyone could be his or her own priest originated as a credo about received texts, it was quickly applied to the Book of Creation as well. Observation of the

Hunter: Robert Boyle and the Epistemology of the Novel

natural world became a duty for all, not just for scientists or priests.[4] Interpreting the natural world came to mean interpreting not just the phenomena of nature—plants and animals, earthquakes and tempests, the sun and the stars—but human events as well.

The recording of everyday observations and events came to seem essential as a means to understanding the nature of things; the record became, in fact, a kind of rival to life itself. Human aspiration thus involved the desire to possess—dangerously—the fruits of the Tree of Knowledge and something very like the Book of Life itself. But recording events was, theoretically, only of instrumental importance: preserving the moments, deeds, and observations of humankind—what Swift called parodically the outer "husk" and "shell" of things that an empiricist used to discover the "essence" of the kernel—ultimately meant that the record was there to be read, reread, and studied. The importance of having the full record was that it could then be interpreted—studied and reviewed until pattern, principle, or order became clear—but the means became for some an end in itself. The ultimate Protestants (although they were systematically distrusted and excluded from carrying matters to the extremes that Protestantism by its nature implied) actually thought that subjective views—what individuals could themselves observe, experience, and interpret—could lead to ultimate truth, that the light of the individual consciousness brought results superior to those of any controlled, communal, or handed-down method, and that the individual judgment was finally the only route to knowledge. If some of Protestantism's nominal adherents were frightened of its radical manifestations and pulled timidly back to authoritarian orthodoxies, its radical prophets chased the inherent subjectivism almost to the solipsistic extremes that their critics said they did. Dissent, with nearly as many forms and sects as its internal logic demanded, carried out the implications most fully and deeply. It is no accident that journalism and the novel—as well as the adventurous spirit and preoccupation with the epiphantic moment of discovery that sponsored both—got their impetus primarily from Protestantism in general and Dissent in particular.

Even when individual writers (or observers) eschewed putting an interpretation on the events they recounted, reporting on the known, the seen,

4 I am not sure intellectual historians put enough emphasis on the inclusive tendencies of scientists in the seventeenth century, tendencies that admitted virtuosi and encouraged a general amateurism in scientific theses. The subsequent exclusivity of scientific discrimination is often read back into earlier science, a problem for interpreting the toleration of such figures as Boyle and Newton.

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Eighteenth-Century Fiction, Vol. 2, Iss. 4 [1990], Art. 4

or the experienced came to seem important in itself. In the plethora of circumstantial detail in the early novel, the textual outcome of such habits is manifest. The early novel's circumstantiality, "realistic" though it may be, is not so much a device to establish factuality and credibility as it is an outcome of the habit of observing and reporting. The transference of detail to manifest fictions may create verisimilitude, for it appropriates to fiction a strategy of recording reality, the world of brute and unignorable fact. But the impetus for it involves ways of thinking and experiencing rather than a rhetoric calculated to convince doubters. Novelists repeatedly assured readers that the substance of their story was real and historical and that their account was faithful—a reporting of actuality—but "recording" circumstances is less an attempt to back up claims of authenticity than an extension of habits formed when they recounted matters they themselves had experienced. Those habits were created by diaries that proliferated in Protestant England, Scotland, and America in the seventeenth century and that thus became useful in producing expectations novelists could take advantage of. The traditions of autobiography, biography, and memoirs developed from habits of observation and recording that diaries made familiar, but the practice of observation in daily life is the basis of knowing on which desire is built. The promulgation of that practice is the aim of a specific, little-known tradition that derives directly from the premises of empiricism and individuation cum subjectivity.

The tradition of Occasional Meditation enjoyed enormous popularity in the second half of the seventeenth century among varied practitioners, not all of them Puritans. It had a clear effect on diarists who often appended meditations or interrupted their narratives to insert them. Diarists learned to "meditate" on earthly objects by imitating the printed meditations of figures like Boyle, Edward Bury, and John Flavell, who encouraged readers to observe all the details of everyday life and preserve their thoughts on everything.[5] Bury, for example, himself meditated on such objects as snails, toads, apples, falling leaves, and "a Tuft of green

5 See Robert Boyle, *Occasional Reflections upon several Svbiects. Whereto is premis'd [sic] A Discourse About such kind of Thoughts* (1665); Edward Bury, *The Husbandmans Companion: Containing One Hundred Occasional Meditations Reflections and Ejaculations, Especially Suited to Men of that Employment. Directing them how they may be Heavenly-minded while about their ordinary Calling* (1677); John Flavell, *A New Compass for Seamen* (1664; often reprinted as *Navigation Spiritualized*) and *Husbandry Spiritualized: or, the Heavenly Use of Earthly Things* (1669); William Gearing, *The Mount of Holy Meditation: or a Treatise Shewing the nature and kinds of Meditation* (1662), and William Spurstow, *The Spiritual Chymist: or, Six Decads of Divine Meditations on Several Subjects* (1666).

Grass." But more important, and more complex, is the way these observational habits came to apply to event as well as object and became an influence on narrative as well as discursive writing. That influence did not develop in a strictly literary way; rather it involved practices of everyday life common to farmers, artisans, tradesmen, and servants as well as to scientists and theologians.

The beauty of Occasional Meditations was that everyone could do them, with little guidance and no talent beyond the ability to observe and to associate ideas. A little familiarity with the most frequent biblical metaphors and the herding and hunting metaphors that gave them human resonance could be a help in leading to the most obvious spiritual meanings in everyday objects and events, but only a desire to know was really necessary. Even illiterates could create oral meditations on chance objects they might encounter, although the ability to write down one's lucubrations had obvious advantages for preservation, re-use, and sharing. The advice to record one's meditations on the spot and at the moment—or to compose them while recollecting in tranquillity—was, like the encouragement to record the full range of daily experiences in a diary, part of a larger program of articulating the universe and summing it up, making the world into a series of interlocking subjective texts. The literate felt enjoined to become scribes, to do their part in making the universe known both to themselves and others who might benefit from their lead. Readers of the world are elevated to unprecedented power; every reader becomes, in effect, his or her own writer.[6]

The practice of Occasional Meditation helped to create a class of writers which had never yet been seen in the world, and it is no wonder that traditional humanists, with their sense of writers as privileged figures who performed priestly functions, felt threatened by the democratization of the writing process and by the interpretive implications of Protestantism more generally. Traditional writers understandably felt threatened by such Here Comes Everybody textuality. For all his joking about being "born for nothing but to write" and being doomed to letters by some ancestral sin, Pope took his singled-out talent seriously. His career is a record of his resentment of interlopers, and Swift's anger similarly bursts through his wit about hacks being the amanuenses of the universe, his parodic representation certifying his belief in the specialness

6 "My desire," wrote Bury of his purpose in *The Husbandmans Companion*, "is that thou maist take out this lesson, prove an artist, and set up for thy self ... . No ship that sails either to the East or West *Indies* brings home richer lading than meditation doth, if rightly steered; This is the chewing of the cud, that turns all to nourishment, the true Philosophers stone that turns all to gold" (fols. 43v–44).

Eighteenth-Century Fiction, Vol. 2, Iss. 4 [1990], Art. 4

of the writing function gone awry. The "deluge" of print seemed a legitimate concern to serious writers. Londoners who daily saw the bookstalls in St Paul's Churchyard or on London Bridge might be forgiven for thinking that the channels of information had been clogged to overflowing. But beyond the world of public print itself, meditators (and diarists) represented hordes of still others who took up the pen but who had not gone public with their results. Having so many writers—people who knew what the writing process was like and who, more important, shared the sense that the nature of the world and its events could be understood by observation and interpretation—meant a new kind of reading public, one with verbal habits and expectations that novelists soon would learn to exploit.

As a good scientist should, Robert Boyle set out in 1665 to describe this new category of writing. He decided to call it Meletetics.[7] Unlike earlier practitioners who had neglected to formulate rules for Occasional Meditation, he stresses method as a means of providing discipline and regulation, but he does not seek "*Uniformity in the style*."[8] The "method"

7 The name derives from μελετᾶν, to meditate. Boyle thinks of Bishop Hall as his model and appears to credit Hall with inventing this kind of meditation. Prolix as it is, Boyle's prefatory "Discourse" to his *Occasional Reflections*, in which he defines his subject and promulgates a method, may have originally been intended to be longer. The meditations proper begin on p. "161" of the volume, while the "Discourse" goes through p. 80 and there are no pp. 81–160. I would guess that space was left by the printer for prefatory materials and that Boyle found himself writing a less long theoretical justification than he had at first intended, perhaps a hint that he had more reservations about his large epistemological claims than he may have admitted to himself. Boyle might simply have been pressed for time, but (as readers of Boyle know only too well) he never seemed at a loss for words and usually elaborated everything more lengthily than was required. On the other hand, the printer, knowing Boyle, could have left room for 160 pages instead of the planned 80.

8 *Occasional Reflections*, "An Introductory Preface," fol. [a8v]). The preoccupation with Method as a means of mental discipline and as a structural device for writing is well known and extends to all levels of discourse. In *A New Family-Book; or The True Interest of Families* (1693) James Kirkwood gives this "advice to parents" about how to help children with their prayers, meditations, and self-examination: "It will be convenient, in order to their doing this to good purpose, to be directed to a method, that so their thoughts may not wander and be unfixed" (p. 81). See also Thomas White, *A Method and Instructions for the Art of Divine Meditation. with Instances of the severall Kindes of Solemne Meditation* (1655). On the implications of the preoccupation with Method, see Walter J. Ong, *Ramus: Method, and the Decay of Dialogue* (Cambridge: Harvard University Press, 1958); Nelly Bruyère, *Méthode et Dialectique dans l'Oeuvre de la Ramée* (Paris: J. Vrin, 1984); and Philippe Desan, *Naissance de la méthode: Machiavel, La Ramée, Bodin, Montaigne, Descartes* (Paris: A.-G. Nizet, 1987). For accounts of traditional patterns of meditation, see Louis Martz's classic study, *The Poetry of Meditation* (New Haven: Yale University Press, 1954); H.R. McAdoo, *The Structure of Caroline Moral*

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he advocates is in fact quite casual, involving none of the controlled procedures of Scientific Method, and what Boyle seems to mean by method simply involves an insistence on close observation—a close reading—of even the smallest and most trivial things encountered in daily life. It is method in the same sense that New Criticism is method and for many of the same reasons. Boyle thinks that the discipline of making meditations leads to rigorous habits of analysis and strengthens the mind itself. "[T]he custom," Boyle argues, "of making Occasional Meditations ... accustomes a man to an attentive observation of the Objects wherewith he is conversant" (p. 28), allowing him "to make Reflections upon the things he takes notice of, and so, by exercising, improves his reasoning Faculty" (p. 31). He advocates aggressive observation and interpretation, insisting that events but especially *things* encountered in even the most ordinary life were clues to basic truths in the universe. In ploughing a field, rowing a boat, picking a flower, or walking along a street, even ordinary men and women could gain not only pleasure and inspiration but knowledge just as scientific observers could, except that the process was easier. What observers would learn was not, however, subject to the same limitations as the "truth" of science any more than it was subject to the tests of scientific method. "We need not in this case, as in most others," Boyle writes, "make an uneasie Preparation to entertain our Instructors; for our Instructions are suddenly, and as it were out of an Ambuscade, shot into our Mind, from things whence we never expected them, so that we receive the advantage of learning good Lessons, without the trouble of going to School for them" (pp. 15–16).

The "discovery" in meditation was circumscribed only by the observer's own limits of seeing or interpreting. Imagination—finding analogies with other objects in the universe or thinking of how what one experienced was a metaphor for something else—was the determining factor in what one could derive from meditation, but the "scientific" claims of the procedure, its pompous name, and the fact that it was championed by a great scientist gave it not only currency but a certain epistemological status. Boyle called it a "way of Thinking" (p. 1); whatever he actually believed about its epistemological potential, he saw it as a popular extension of scientific outlook, a procedure that allowed ordinary individuals in everyday life to do what scientists did more grandly.

Theology (London: Longmans, Green, 1949); Frank Livingstone Huntley, *Bishop Joseph Hall and Protestant Meditation in Seventeenth-Century England* (Binghamton, NY: Center for Medieval and Early Renaissance Studies, 1981); and Isabel G. MacCaffrey's important essay, "The Meditation Paradigm," *ELH* 32 (1965), 388–407.

Eighteenth-Century Fiction, Vol. 2, Iss. 4 [1990], Art. 4

The idea of Occasional Meditation is based on assumptions—scientific and religious—that "the World is the great Book, not so much of Nature, as of the God of Nature ... crowded with instructive Lessons, if we had but the Skill, and would take the Pains, to extract and pick them out: The Creatures are the true Aegyptian Hieroglyphicks, that under the rude forms of Birds, and Beasts, &c. conceal the mysterious secrets of Knowledge, and of Piety" (p. 47). "The whole world," wrote George Swinnock in advising how to "get honey and sweetness by occasional meditation, out of the carcass of every creature," "is a great *vast library*, and every creature in it a several *Book*, wherein he that *runs may read* ... ; Every object is as a *Bell*, which if but turned, makes a report of the great Gods honour and renown."[9] "The book of the creature stands open to us," Edward Bury went on to insist in 1677 in his collection of meditations, "and God may be read in every line of it" (fol. [a4]). Boyle elsewhere described (sounding a lot like the speaker of *A Tale of a Tub*) the world as displaying the "stenography of God's omniscient hand."[10]

The emphasis of the tradition was repeatedly on what could be learned from even the smallest object of contemplation or from the most minute detail. "[T]hough the Thing itself, which sets a mans thoughts a-work," Boyle argues, "may be but Mean in Other regards, yet that which the Reflector pitches upon to consider, may be of another Nature; ... though the Glo-worm ... be but a small and contemptible Insect, yet the Light which shines in his Tail, and which makes the chief Theme of the Meditation, is a noble and heavenly Quality" (*Occasional Reflections*, fol. [a6]). "A devout Occasional Meditation," he concludes, "from how low a Theme soever it takes its Rise, being like *Jacob's* Ladder, whereof though *the foot lean'd on the Earth, the top reach'd up to Heaven*" (p. 80).[11] Thus, the meditator authored a book of his own, a kind of rival to the Book of Nature on which his representations were based. Those who make Occasional Meditations, Boyle said, "may have the Satisfaction of making almost the whole World a great *Conclave Mnemonicum*, and a well furnished *Promptuary*" (fol. b2). And the knowledge thus secured might

9 *The Christian Mans Calling, Third Part, Directing a Christian to perform his duty* (London, 1665), p. 451.

10 "Of the Usefulness of Natural Philosophy," part 1, essay 5, in *Works* (5 vols, London, 1744), I, 462.

11 Bury uses the same metaphor: "we may of these earthly materials frame to our selves a *Jacobs ladder* to ascend to heaven; for all those visibles will mount us up to beholde invisibles, and give us a *Pisgah* sight of the heavenly *Canaan*" (*Husbandmans Companion*, fol. [a3v]).

be extensive: "I would not confine Occasional Meditations to Divinity it self ... but am ready to allow mens thoughts to expatiate much further, and to make of the Objects they contemplate not onely a Theological and a Moral, but also a Political, an Oeconomical, or even a Physical use" (p. 24).

While not claiming that the pursuit of Occasional Meditations would produce significant discoveries of the magnitude of those by scientists in formal experiments, Boyle suggests that a better understanding of the world results almost automatically from the practice of meditation. He emphasizes that making meditations leads to habits, discipline, and a frame of mind crucial to knowledge, regardless of the quality of individual reflections. Throughout his writing, he is critical of Aristotle not so much for what he had said or done as because of the authoritarian symbol he had become, and although Boyle avoids attacking traditional religious authorities—the commentators, the Church fathers, or the Bible itself—it is plain that he thinks that virtually all knowledge of the world can and should be derived from personal experience. In taking the position he does, Boyle speaks for countless contemporaries of a similar "modern" stamp. Anxious to discredit traditional authority, distrustful of received opinion, open to new "truth" of almost any kind but still "devout" in a traditional sense, reverent (and sometimes even awestruck) about the universe, and concerned not to find modernity and especially science in conflict with personal religious belief and commitment, he sets out to be a model for contemporary thinkers, a "Christian virtuoso." For Boyle, the "way of thinking" in Meletetics leads to habits and methods conducive to discovery, and if new information does not result from the close, devotional observation of a flower, a butterfly, or an act of farming or fishing, better character, attitudes, perspective, and even wisdom do.

From a very different set of philosophical assumptions—rational rather than associative, authoritarian rather than empirical, communal rather than individual—Swift might well find it ludicrous that a broomstick could reveal the nature of man or that an individual reader of such physical "texts" was any kind of interpreter at all, but Boyle celebrates such individual capacity even in the meanest of observers. For all his celebrity as a scientist and scientific interpreter, he emphasizes his likeness to the generality of individual readers and chooses not to segregate his talents from theirs or make discriminations about principles or modes of interpretation. He writes as spokesman for the new science rather than as a practitioner, someone who champions its possibilities rather than

Eighteenth-Century Fiction, Vol. 2, Iss. 4 [1990], Art. 4

one who carries along its growing body of knowledge. When he celebrates himself in *The Christian Virtuoso* (1690–91), it is as a member of that great ill-defined body of amateurs who want to help the world reveal itself to the observing senses. He chooses to define himself simply as *one* of the virtuosi rather than as an intellectual leader or expert in the growingly professional scientific world. There is, in Boyle's stance, vanity and even arrogance, as his contemporary critics saw plainly; no matter how Boyle pretended to be just another butterfly-watcher or meditator on country walks he betrayed pride in his accomplishments and the fact that he dared assume such a role. His was the pride of a humble face; he thanked God that he could be like other men.

But he is deeply committed to the universal priesthood of observers and interpreters. Boyle saw in his Meletetics a means of supporting a culture for science, if not a furthering of scientific observation itself. If he did not expect common readers to find new physical laws or innovative means of classifying plants or animals, he did expect them to develop a sense of humility—of awe and wonder—in the face of a rich and bountiful universe, and he saw Meletetics as a way of furthering that attitude and extending the culture of science. Empowering the senses, the individual observer, and the subjective interpreter involved a deliberate decision to make the forwarding of science and pious everyday religious practice seem one and the same thing, and Boyle spent a lot of his intellectual capital to establish a Christian scientific community, not only insisting that scientific evidence and religious belief were not in conflict but "proving" that their aims were harmonious and their principles mutually supportive.

Boyle is emphatic about how easy it is to make meditations for oneself and is anxious to provide a do-it-yourself guide.[12] His own meditations—

12 Boyle designed his treatise largely as a guide for others, and he goes out of his way to encourage all readers to make their own meditations, and other meditationists are similarly anxious to encourage the craft. "[L]abour to *spiritualize earthly things*," advises Swinnock; "this is one of the most excellent and enriching arts in Christianity; Though these *occasional* thoughts resemble *lightning* ... yet such *light gains, with quick returnes, make an heavy purse*. He that hath learned this mystery, is the true *Chymist*, he leaves the *dregs* and *lees* of things, and extracts the *substance* and *quintessence*" (*Christian Mans Calling, Third Part*, p. 372). John Dunton uses the language of the meditationists when he describes what modern Athenian virtuosi do: "When a *Virtuoso* thus seriously reflects on the *Visible World*, (and upon what's Curious in it) he does as 'twere *spiritualize Earthly Things*: He can here make *New Discoveries*, as will as raise his mind from Earth to Heaven ... . In a Word ... [this process] is a Divine Improvement of *all the Wonders under the Sun*" (*The Christian's Gazette* [1709], p. viii). How many believers followed such advice is anyone's guess, but spiritual biographies of the period often contain samples and testify to longer private documents. In William Hamilton's *The Life and Character of James Bonnell* (1703), for example, the hero is said to have "left behind him many Volumes of Meditations & Prayers" (p. 17).

more than three hundred pages of them—are mostly based on common occurrences, illustrating his point that even the simplest of things or events can become the stimulus or occasion for reflection and devotion.[13] He meditates on "His Horse stumbling in a very fair way," "Upon the Sight of a Wind-mill standing still," "Upon the want of Sleep," "Upon my Spaniel's fetching me my Glove," and "Upon Fishing with a counterfeit Fly," showing how easy it is to extend the range of meditation beyond natural objects. Sometimes his subjects are dictated by moments in his own life and career as an experimental scientist: "Upon his distilling Spirit of Roses in a Limbick," "Upon comparing the Clock and his watch," "Looking through a Prismatical or Triangular Glass," or "Upon the Magnetical Needle of a Sun-Dyal." But even the more "scientific" of the meditations use simple language and draw upon simple observation rather than a knowledge of sophisticated principles or laws. No one (except perhaps Boyle himself)[14] ever imagined his style to be distinguished or even very organized—he often rambles along about whatever interests him, and sometimes the sentences seem to unfold or re-entangle in a way that surprises the author himself—but as an encouragement to would-be meditators his practice is exemplary. He stresses simplicity: "Nor would I have any man be discourag'd from this way of thinking, that cannot express so much wit or eloquence in Occasional Meditations, as perhaps he may aspire to. ... [M]uch subtilty of wit is not be expected, or at least exacted, in this kind of composures, where we commonly make use of things rather out of haste than choice, as frequently being but the first thoughts we meet with, not the best we have" (p. 26).

13 "[T]here is scarce any thing that may not prove the subject of an Occasional Meditation" (p. 28). Swinnock agrees: "No sight, no sound but may afford matter for meditation" (*Christian Mans Calling, Third Part*, p. 383). And so does Bury: "there is nothing *in rerum natura*, but may be a fit object for occasional meditations" fol. [a5]. Boyle was so anxious that individuals cultivate meditation as a habit that he often falls into the language of addiction, as when he says that "they that would compleat the good Fortune of these Papers, may do it more effectually, by Addicting themselves, (as considerable Persons have been of late induc'd to do) to Write Occasional Reflections" (fol. b3).

14 In his "Introductory Preface" to *Occasional Reflections* (as elsewhere), Boyle praises the "moderns" for their writing as well as for strides in observation and knowledge; see, for example, fols [a5v]–[a6]. Boyle sometimes seems to take personal credit for advances in writing, and he seems to crave a reputation as a writer and stylist even more than as a scientist or thinker. "I see no great Reason to *confine* my self to the Magisterial Dictates of either Antient or Scholastick Writers," he writes somewhat arrogantly in his "Introductory Preface." "For, living in this Age, and in This part of the World, where we are not like to have those for Readers that dy'd before we were born, I see not why one may not judge of *Decorum* by the Examples and Practices of those Authors of our own Times and Countries" (fol. [a5]). Boyle's praise of modern style and his desire to help create an accessible discourse for a large audience is a crucial part of his project in "Theory" to popularize science and generalize the culture of scientific thought.

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Eighteenth-Century Fiction, Vol. 2, Iss. 4 [1990], Art. 4

"[T]he difficulty," Boyle emphasizes, "of framing Occasional Meditations, need not be estimated by that which we find when we first addict our selves to the making of them; for practice will by degrees so much lessen that difficulty, that after a while we shall find, that Occasional thoughts will need but small invitation to frequent those minds where they meet with a kind entertainment" (p. 27). Boyle regards himself as teacher and guide as much in his role as meditator and religious writer as in his laboratory and scientific writings. His emphasis is on how "the custom of making Occasional Meditations ... conduces to the exercise and improvement of divers of the faculties of the mind" (p. 28). And his followers repeatedly insist that people in all occupations—but especially those who encounter nature daily by tilling the soil or navigating the high seas—learn to create meditations as a way of at once furthering their piety and extending their intellectual reach.

Whichever is the primary desired result of meditation—whether pious feelings or a more searching grasp of the universe—the assumption behind the form is that the physical world of thing and event will bare its secrets to the sincere and thoughtful observer, whether expert or amateur, priest or layman, scientist or ploughman. But if the tradition presumes that data are decipherable and the world knowable, the grounds of knowing are seldom addressed, nor are ways of deciding between legitimate and illegitimate interpretations sorted out. The ebullient optimism of Boyle about the human mind stands for the tradition: Protestant confidence in the individual to discover and decide for himself or herself sponsors the whole notion that when the universe surrenders the meaning of its texts, the reader shall decide exactly what those meanings are.

Boyle's blissful vagueness about how to discriminate among possible interpretations does not look, to a modern observer, very scientific.[15] Boyle is no help at all in sorting out false leads or providing tests for judgment, and others who give advice on "spiritualizing" events, experiences, and locations are even less concerned to show that meditations are subject to some higher test of truth. John Flavell, for example, offers examples that stretch the art to Swiftian absurdity; he encourages

15 Although Boyle had little to say about tests of evidence, he did place a lot of emphasis on the power of experience to help one decide. In *The Christian Virtuoso*, he says that "the knowledge ... [that the virtuoso] has of the Various, and sometimes very Wonderful, Operations of some Natural things, especially when they are skilfully improv'd, and dexterously apply'd by Art ... will qualify him to distinguish, between things that are only *strange* and *surprizing*, and those that are truly *uncommon*" (p. 83).

the preservation of individual efforts that, in effect, recreate the universe textually in daily life. Although seventeenth-century science aspired to precision of method and yearned for grounds to judge between interpretations, its most immediate and arguably its most lasting contribution to the culture involved its openness, enthusiasm, and sense of possibility—the refusal to accept received opinion or honour old authority—not its ability to discriminate and establish why one reading was right and another wrong. That was a major part of what Swift had against it. His attack on the projectors in book III of *Gulliver's Travels* is a logical extension of his attack on Boyle in *Meditation on a Broomstick*: not only did modern science have no clear program of usefulness and no plan for sorting between practical and impractical methods, but it offered no authoritative conclusions and depended simply on the subjective application of individual observation and experience.

The broomstick meditation goes to the heart of the matter, attacking both the absurdities of the emerging literary "kind" and the philosophical assumptions upon which it was based. Principal among these is the prescription, which Swift usually associates with Dissenters but which he here sees embodied in Boyle, that a simple observer can move to cosmic conclusions on the basis of a chance sighting and undisciplined figurations. Swift correctly saw that this assumption licensed all kinds of interpretations and that, once allowed, there was no stopping the sharing of such a priestly function. If grand conclusions could be supported by individual experience and the subjective observation of any event or thing, who knew what might result—heretical ideas in religion and politics, irresponsible readings of natural and human events, grand journalistic claims about the everyday and ordinary, even novels, with their extraordinary claims for subjectivity.[16]

16 I have discussed more fully Swift's attitude to the novel, as implied in his attack on Boyle, in "*Gulliver's Travels* and the Novelistic Tradition," *The Genres of Gulliver's Travels*, ed. Frederik N. Smith (Newark: University of Delaware Press, 1990), pp. 56–74. Quite beyond Boyle's status as a scientist, Swift might have had good reasons to dislike Boyle and suspect his literary and ideological commitments. Boyle regularly championed the moderns as writers (as well as as scientists), his distrust of traditional authority extending well beyond his scientific scepticism, and his position as a loyal Anglican was nevertheless marked by some strong religious opinions that allied him closely with the emphases of Dissent. Boyle had refused to take orders because he did not feel he had been "called," and he repeatedly lamented his lack of a personal "conversion" experience, a matter that for him devalued his religious authority. For Boyle's own extended account of his scepticism about scientific evidence, see *The Sceptical Chymist* (1661), in which it becomes clear that Boyle has, intellectually, no faith in any kind of authority, ancient or modern, though he repeatedly claims elsewhere his total trust in divine revelation and the Scriptures. "I can yet so little discover what to acquiesce in," he concludes, "that perchance the Enquiries of others have scarce been more unsatisfactory to me, than my own have been to my self" (p. 436).

Eighteenth-Century Fiction, Vol. 2, Iss. 4 [1990], Art. 4

The ability to regard a rock, a tree, a cloud, a comet, or a whale in the Humber as a meaningful event may be puzzling to a twentieth-century reader steeped in a body of scientific thought that has gradually hardened interpretation and emphasized the rejection of theses. But the same sense of open possibility that led to the founding of the Royal Society and that generated experiment after experiment—many of them unproductive and some as silly and ill-conceived as Swift suggested—offers status to Occasional Meditations and to religious and political readings of tempests and omens.[17] Boyle's contemporaries—and Clarendon's and Defoe's—accepted the sense of intellectual and political conflict that went with the belief that all things and events carried inside them signs and secrets of nature and divine will. Not that they liked the ensuing uncertainties or the sometimes violent conflicts their assumptions engendered. But they lived with—thrived on—the fact that an event might inspire wildly different interpretations of its meaning and totally antithethical analyses of political, economic, social, or religious causes. A storm could mean that the Whigs were wrong or the Tories, that sabbath-breaking had to stop or reformers of manners had gone too far, that the stage was corrupt or the theatre of politics debased. But few doubted that interpreting matters this way was appropriate, however much they might disagree about a particular construal. And the fact that there were no reliable rules for deciding (beyond the judgment of the individual interpreters) derives from the sense, represented by Boyle, that opening up meaning was more productive than shutting it down. Such thinking leads to—and justifies—the subjective interpretation of events that the novel exploits, and the popular proliferation of the idea of reading the universe as text instils in the culture a need for texts that offer similar ambiguous possibilities while themselves remaining stable. Without an openness to subjective authority and a willingness to tolerate (even encourage) radically divergent "readings" as equally true, the culture could hardly have been ready for any kind of narrative or discourse that encouraged readers to find themselves and their own resonant potential in texts. It is no wonder that Boyle and the novelists scared the Augustans and made them worry about the implications of modernism even while they made fun of its silliness.

17 Boyle's kind of meditation flourished at least through the 1680s, perhaps well into the eighteenth century. As late as 1734, Isaac Watts published meditations on such subjects as "A Hornet's Nest destroy'd," but he suggests they were written when he was young. See *Reliquiae Juveniles: Miscelaneous Thoughts in Prose and Verse, on Natural, Moral, and Divine Subjects, Written chiefly in Younger Years* (1734).

What was intellectually a liability in Boyle's populist programme, since no certainties could be decided, became in fiction a major asset because the reader, like the individual meditator, was empowered to decide. Bad methodology for science was effective rhetoric in novels. Writers very nearly wrote themselves into insignificance, whatever their role in producing texts. Their role in testifying to the order of things was purely instrumental, and intention counted for nothing at all. Like a universe that produced a random broomstick—or a dog, a sheep, or a fly—a text could not only give observers a chance to see some larger intelligence, but it could produce a coherent reading by itself. The subjective intelligence had supplanted the ordering power of words or things; texts, like the physical world, had been subordinated to readers, and "scientific" "method" had been reduced to a question of perception and metaphor. Novels might well offer, if they stuck to representations of a recognizable everyday world, matters that defied rational explanation and gave readers a chance to exercise their imaginations. And they did.

There is, of course, far more to the novel than its meditative derivation—its insistence on the adequacy of subjective reading—and I am not proposing Robert Boyle as the father of the novel. I am, in fact, sceptical of any system of origins that puts anyone in a singular creative role or that "explains" novels by giving one key event or some inevitable chain of events credit for what is a complicated form with a rich and varied heritage in literary and paraliterary tradition and in the dynamics of cultural desire. The novel was made possible by the lucky concatenation of a variety of cultural directions and events, and no single intellectual direction, any more than any single social or economic direction, causes or even explains it. Boyle is a footnote in the story of origins, an equal perhaps of John Dunton or Bishop Burnet or Colley Cibber. Still, Boyle played a significant midwifery role in codifying and popularizing daily habits and habits of mind that the novel cleverly exploited. Readers of broomsticks or clouds were ideal novel readers in part because they trusted too much and overread the universe's texts, just as narrators often did. Very like a whale, we might say, but the novel became leviathan.

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