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“The Mind Is Its Own Place”: Science and Solitude in Seventeenth-Century England

Call this, truth –
Why not pursue it in a fast retreat,
Some one of Learning's many palaces,
After approved example?

Robert Browning, *Paracelsus*

There is a solitude of space
A solitude of sea
A solitude of death, but these
Society shall be
Compared with that profounder site
That polar privacy
A soul admitted to itself –
Finite Infinity.

Emily Dickinson, *For Alice Dickinson, Mathematician*

The Argument

It is not easy to point to the place of knowledge in our culture. More precisely, it is difficult to locate the production of our most valued forms of knowledge, including those of religion, literature and science. A pervasive topos in Western culture, from the Greeks onward, stipulates that the most authentic intellectual agents are the most solitary. The place of knowledge is nowhere in particular and anywhere at all. I sketch some uses of the theme of the solitary philosopher across a broad sweep of history, giving particular attention to its deployment in and around the scientific culture of seventeenth-century England. I argue that the rhetoric of solitude is strongly implicated in individualistic views of society and empiricist portrayals of scientific knowledge. Solitude is a state that symbolically expresses direct engagement with the sources of knowledge – divine and transcendent or natural and empirical. At the same time, solitude publicly expresses disengagement from society, identified as a set of conventions and concerns which act to corrupt knowledge. Hence, the study of the social uses of solitude adds further support to the notion that problems of knowledge and problems of social order are solved together.

Introduction

If we find it difficult to point to the social place of knowledge, it is partly because we inherit the historical legacy of so much testimony that the producers of our most valued knowledge are not in society. At the point of securing their knowledge, they are said to be outside the society to which they mundanely belong. And when they are being most authentically intellectual agents, they are said to be most purely alone. The social place of knowledge is nowhere.

Solitude as the setting for the transfer of divine knowledge to human agents is a familiar topos. God prefers to hold His conversation with isolates. The Commandments were imparted to Moses alone on Mount Sinai; the Lord spoke to Paul alone on the road from Jerusalem to Damascus; Mohammed shut himself up in the cave of Hera to receive the word of Allah; George Fox, the founder of Quakerism, went alone up Pendle Hill in Yorkshire to hear the Lord tell him in what places He had a great people to be gathered; Joseph Smith uncovered the message of Mormonism alone on a hill in upstate New York. More commonly, the voice of God is not physically accessible to others at all. Mohammed was one of many prophets who heard God's speech within his own head, or within the privacy of dreams, though physical separation from society enhances the probability of divine conversation. Having received divine afflatus and publicly communicated the holy word, the prophet demonstrates and confirms his authenticity by removing himself from society: John the Baptist was among very many inspired voices crying in the wilderness. Genuine religious knowledge and genuine piety are not, in this code, to be attained so long as one lives in human society. Holy and civil society stand in contrast to each other.

The truths of artistic creation, no less than those of religion, are similarly said to be most accessible to those who place themselves outside the polity. From the metaphysicals to the romantics, poets have limned their aloneness. Walter Raleigh compared himself to "a Hermite poore in place obscure"; Keats sojourned "alone and palely loitering," found inspiration "by my solitary hearth" and succor for his fears standing "on the shore/ Of the wide world . . . alone"; Shelley celebrated the uncorrupted young poet Alastor: "He lived, he died, he sung, in solitude"; and Wordsworth "wandered lonely as a cloud" to experience his transcendental daffodils:

For oft, when on my couch I lie
 In vacant or in pensive mood,
 They flash upon the inward eye
 Which is the bliss of solitude.

Eighteenth-century British poets developed a conventional poetics of melancholic solitude. From Thomas Gray's *Elegy Written in a Country Churchyard* to James Thomson's *Seasons*, authentic poetic sensibility and creative genius were attached to lonely places. William Cowper placed the virtuous as well as the creative man in nature's solitude, where "traces of Eden" were still to be seen. Thomson found his inspiration in the "deepening dale, or inmost sylvan glade":

These are the haunts of meditation, these
 The scenes where ancient bards the inspiring breath
 Ecstatic felt, and, from this world retired,
 Conversed with angels and immortal forms.

Literary historians are wholly familiar with the theme, variously referred to as "literary loneliness" and "gloomy egoism" (Sickels 1932; Mack 1969; Sitter 1982, esp. 92–94; Pasinetti 1985).

We are accustomed, indeed in most modern sensibilities we prefer, to hear of our writers, painters, and composers struggling in garrets and studios, unrecognized and alone. Modern tastes tend to distrust the authenticity and sincerity of art produced in and for a social setting. The difference between solitary ("Rembrandt") and social ("Studio of Rembrandt") painting is counted in hard cash (Becker 1982, 22–24, 114–15; Alpers 1988, esp. 2–5, chap. 3; Wolff 1981, chap. 2; cf. Jones 1991). And no aesthetic, or indeed intellectual, epithet is currently deemed more damning than "fashionable." Samuel Johnson described the garret as "the usual receptacle of the philosopher and poet": it was a place from which he could look at the world from a distance (1969, 5:261–63).¹ Moreover, solitude is often said to provide the setting for profound understanding of both self and society. Edward Gibbon reflected on the relationship between his own solitude and his understanding of the historical past. Isolation was the price of insight – as much for historical actors as for the historian. Membership in human society imparted mundane knowledge, but only separation from that society yielded heroic knowledge. His example was the prophet Mohammed: "Conversation enriches the understanding, but solitude is the school of genius" (Gibbon 1901, 5:337; see also Carnochan 1987, 7–8). The Quaker William Penn observed that solitude was "a school few care to learn in, though none instructs us better" (Penn [1693] 1915, 25). And a modern psychoanalyst practically equates genius with the capacity to be creatively alone (Storr 1988).

Rousseau dwelt extensively on solitude as the proper condition for securing self-knowledge. His most painful dissections of self and his most anguished commentaries on the relations between self and society were achieved in isolation: at the Hermitage in the forest of Montmorency and St. Peter's Island in Lake Bienné (Rousseau [1782] 1979, esp. 5–6, 30–31, 62–70). Solitude taught Robinson Crusoe the holy basis of human happiness, which living in society had masked (Defoe [1719] 1972, 128, 135–36). The young Ralph Waldo Emerson reflected on solitude as the fittest condition for self-knowledge and self-cultivation; for him, as for Gibbon, "greatness is the fruit of solitary effort" (Gonnaud [1964] 1987, 30, 34). Thoreau left Concord for the solitude of Walden Pond in order to understand the nature of the

¹ Johnson also held medical and physical theories of why intellectuals and artists flourished in garrets. On the one hand, purer air assisted the operation of genius; on the other, the swifter motion of the elevated philosopher relative to ground level acted as a stimulant (1969, 5:262–63). Seventeenth-century advocates of private worship recommended that the room set apart for this purpose be as high in the house as possible: "some secret Property there is in such high and eminent places, whence we may behold the heavens and over-look the earth, which . . . much raiseth the soul and elevates the affections, as if we derived or partaked more from Heaven, by how much nearer we come to it" (Wetenhall [1660] 1684, 5–6).

individual and his proper place in society. The more one lives an individually authentic life, the more one is really free and really wise: "the laws of the universe will appear less complex, and solitude will not be solitude, nor poverty poverty, nor weakness weakness" (Thoreau [1854] 1983, 372). Tocqueville analyzed American democracy as institutionalized aloneness. It was a polity that made each man forget his ancestors, and that separated him from his contemporaries: "It throws him back for ever upon himself alone, and threatens in the end to confine him entirely within the solitude of his own heart" (Tocqueville 1835-40, 3:206).

Solitude is identified as a proper setting for obtaining philosophical knowledge and for analyzing the methods by which it is to be won. The most fundamental item of seventeenth-century scientific knowledge – the principle of universal gravitation – was said to have been conceived by a philosopher "as he sat alone in a garden" (Pemberton 1728, preface; Manuel 1968, 82-83). Over a century later, Newton's solitude was assimilated to the heroic epistemology of the romantic poets. From his rooms in St. John's, Wordsworth looked out upon

The antechapel where the statue stood
Of Newton with his prism and silent face,
The marble index of a mind for ever
Voyaging through strange seas of thought, alone.

To his modern biographer, Newton was the definitive "solitary scholar" (Westfall 1980, chap. 3, 191-92). And the most far-reaching methodological insights of the Scientific Revolution were also said to have been secured in solitude. Descartes prefaced his *Discourse on Method* with a picture of chilling aloneness. The methodological principles for attaining indubitable knowledge were vouchsafed to him during the course of a single day when he "remained the whole day shut up alone in a stove-heated room." His conclusion was that those who wished correct knowledge could not seek it in society, or in the stock of knowledge available in society, but only in themselves: "I could not . . . put my finger on a single person whose opinions seemed preferable to those of others, and I found that I was, so to speak, constrained myself to undertake the direction of my procedure." Descartes decided that his renewal of philosophic method depended on separating himself from society, resolving "to remove myself from all places where any acquaintance were possible, and to retire to a country such as this [Holland] . . . where . . . I can live as solitary and retired as in deserts the most remote" ([1637] 1955, 88, 91, 100; cf. Schuster 1986). Into the nineteenth century scientists have portrayed themselves as alone during crucial phases of their work and used that display to assist the appropriate evaluation of ideas, methods, and roles. Dorinda Outram's (1984) study of Georges Cuvier shows how, in the midst of an intensive and compromising political career, he painted a picture of himself, and the evolution of his thought, in solitude.²

² For the significance of Charles Darwin's solitude – on the *Beagle* and at Down House – see Rudwick 1982, esp. 188-89 and Moore 1985.

I want to explore some aspects of discourse concerning the setting of intellectual life and work and, especially, repertoires that have historically placed the philosopher in solitude. These repertoires and their attendant structures of evaluation are very widely distributed in Western culture, and I want briefly to trace some patterns of their use from antiquity to the early modern period. I then want to pause at a particular historical conjuncture, and indicate how these repertoires were drawn upon and put to work in making stipulations and rendering evaluations concerning the meaning and worth of specific cultural activity. The setting is seventeenth-century England, and the culture is that of the new experimental and, later, mathematical natural philosophy. This is a particularly pertinent exercise, since discursive features of that context are still evident in modern portrayals of properly scientific knowledge and its proper setting. Finally, I shall speculatively summarize some persistent uses of these repertoires in present-day science and the evaluations they import into epistemology.

Two features of this discourse need to be stressed at the outset. First, one is dealing here largely with symbolic locations. When solitude was spoken of as the setting of intellectual life, it rarely meant absolute aloneness. (The sociologist from Mars, unfamiliar with our culture and conventional ways of talking about it, would probably not be convinced that the philosopher engaged in less social interaction than others in his society. Nor should an earthly sociologist accept that a culture-producing individual, however sociometrically isolated, is rightly to be regarded as an isolate.) The historical rhetoric of solitude typically signified a series of normatively patterned disengagements from specific institutions or sectors of society. Such disengagements might, and typically did, place the "solitary" not in a vacuum but in a different social institution from the one from which he professed his separation. Solitude might be achieved, for example, in a sizable community of like-minded fellows – as in a monastery – or within the considerable household of a gentleman's country seat (Vickers 1985b, 2). Moreover, the solitude referred to might be regarded as specifically nonsociometric: there was an aloneness that might be achieved even in company. Second, solitude was often an intensely public pose, intended to express an evaluation of the society from which the isolate represented himself to be disengaged and of the activities that went on in his chosen solitude. It made no sense without that public audience, and its meaning depended utterly on a publicly understood language and stock of evaluations.

What was meant when it was said that knowledge was produced either alone or in company? How did the symbolic placement of knowledge bear upon the perceived worth of that knowledge and those who made it? I want to display both the weight of history and the inventiveness of historical actors in a specific setting – creatively adapting, rearranging, and redefining the cultural resources they inherit. History prestructures and preselects the resources we have available to comment on and evaluate practices. But when historical actors put those resources to work they do ingenious *bricolage*.

Classical and Christian Repertoires

Aristotle understood man to be a naturally political animal, "one whose nature is to live with others." Life in society was the condition for the exercise of that activity – even contemplative activity – which made man happy and virtuous (Aristotle 1925, 1169–70; Aristotle 1921, 1325a; Kraye 1988, 335–39; MacIntyre 1966, 83; MacIntyre 1984, chap. 11). For Aristotle and his followers, the ascription to man in general of a naturally sociable character was basic to a particular understanding of how *philosophers* were situated. While no man could fulfill the ends of his nature as a solitary, the philosopher was, of all men, the best equipped to do his work outside the polity. Compared to other men, those who dedicated themselves wholly to the search for truth were relatively unencumbered: "The man who is contemplating the truth needs no such thing [as money or power], at least with a view to the exercising of his activity; indeed they are, one may say, even hindrances, at all events to his contemplation" (Aristotle 1925, 1178b); the contemplative life "is wholly independent of external goods" (Aristotle 1921, 1324a). The philosopher's condition is thus independent in comparison to that of other men. For his activity to be acquitted the philosopher needs less of the world and its goods than other men. Like men leading other types of life, he requires the necessities to support his material existence. But Aristotle conceded that those contemplating truth were set apart from other men by the fact that they may, in practice, achieve their goals alone: "the philosopher, even when by himself, can contemplate truth, and the better the wiser he is; he can perhaps do so better if he has fellow-workers, but still he is the most self-sufficient" (Aristotle, 1925, 1177a–b). As the philosopher imitates the gods in his dedication to pure contemplation, so he mirrors their freedom and integrity (*ibid.*, 1179a). Greek thought therefore displayed divergences between, on the one hand, the view that man was naturally sociable and ought to live actively in society and, on the other, the portrayal of the search for truth as a praiseworthy pursuit that might, in practice, be carried out in relative solitude.

Cicero and the Stoics deepened the evaluative distinction between those living public lives, acquitting their obligations to the state, and the "barren and fruitless" private lives of men who wholly gave themselves over to the contemplative search for truth. The unsociability of those entirely dedicated to philosophy was its own condemnation: by "being engaged in their learning and studies, they abandon their friends to be injured by others, whom in justice they ought to have protected and defended." The entirely sequestered contemplative life was culpably egoistical; society must stand before self and the pleasures of privately seeking truth (Cicero 1909, 13, 68–70).

Hannah Arendt has argued that early Christian and medieval uses of the term *vita activa* were fundamentally different from their Greek counterparts. Where the Greeks meant specifically to designate the action required to sustain the political life of the city-state, writers from Augustine onward treated the "active life" as the total pattern of engagements with the things of this world, including "work" and "labor,"

leaving contemplation "as the only truly free way of life" (Arendt 1958, 12-17). For Arendt this counted as a massive "misunderstanding," but the translation enabled Greek and Ciceronian-Stoical conceptions to remain visibly current while being artfully adapted to new social and cultural circumstances. Yet Christian conditions also altered the classical framework in which the place of those committed to the search for truth was evaluated. First, the Christian contrast between the city of man and the city of God introduced a basic dichotomy into commentary about how one ought to conduct oneself in this life: the codes that operated in civil society might have a legitimate call upon us, but they might be fundamentally different from the codes of holy conduct. Second, the evolution of dual religious and civil cultural and social structures in European society meant that individuals might choose which structures, and hence which codes, to live under; and, so long as these parallel structures continued in authoritative form, equally legitimate different forms of life might coexist in one society. Those who wished entirely to devote themselves to preparation for heaven might legitimately separate themselves from the city of man and live in a society peripheral or parallel to it. Finally, Christian, unlike classical, society licensed and sustained a set of institutions wholly committed to separation from civil society, and these institutions constituted the major intellectual sites of the early Christian and medieval periods. The effect of these developments was that there now existed a significant practical challenge to the Greek and Roman stress on the natural sociability of man, and thought about the location of intellectual activity was now implicated in much more polarized conceptions of the nature and value of active and contemplative lives.

The most visible contrast to early and medieval Christian thought stressing man's natural sociability was monasticism and associated forms of divinely sanctioned withdrawal from civil society (Duby 1988). From the early Christian period, the desert or wilderness formed a potent symbol of religious authenticity as well as an important site of religious testing. Early saints such as Anthony went to the desert to subject themselves to the same temptations that Christ experienced and, in withdrawing themselves from human society, to forge closer links with God. Through the Middle Ages, the iconography of St. Jerome in his desert cell was a pervasive visual display of the solitude of the holy intellectual (Brown 1989, chaps. 11, 18).

The significance of these patterns of withdrawal is twofold. First, it was widely considered among both laity and clerics that such separation from society was the most authentic life for a Christian, that it was the ideal to which all should aspire. And those whose separation was most total – the anchorites – were viewed as carriers and exemplars of the religious values of the Middle Ages. Second, it was understood that such separation and relative solitude were implicated in the attainment of genuine religious knowledge. The monastery, the hermitage, and the reclusorium were the major medieval sites for the production of the highest forms of religious knowledge – which is to say, the highest forms of knowledge recognized by that society. (Friar Roger Bacon was said to have marked his turn away from natural magic and his

embrace of wholly divine forms of knowledge by walling himself up in an anchorhold.) These were places of contemplation, and the contemplation of God was the fundamental purpose of the solitary life. One walled oneself off from civil society, or one wandered alone in the wilderness, to engage the devil, to suffer temptation, and also, crucially, to put oneself in a position for the most direct communion with God. Only by being dead to the society of men could the living enter into society with God. "Stripped . . . of human contact, dead to the world, the soul would be freest to find its home." For St. Jerome, the monastery was a "provisional paradise" (Warren 1985, esp. 2–17, 94, 100–101).

Even so, late medieval and Renaissance understandings and evaluations of the act of withdrawing oneself from civil society diverged radically (Nederman 1988; Panizza 1985; Skinner 1988, esp. 428–29, 449; Kristeller 1985, 137–39). The dominant opinion among secular writers, and many clerics, followed the drift of classical, and especially Stoical, thought: man was naturally sociable; privacy, retirement, and the wholly sequestered contemplative life were culpable. However, Christian culture and Christian institutions expressed and sustained patterns of separation. In the endless discussions of the active and contemplative lives through the early modern period, one particular Aristotelian epigram was endlessly quoted and paraphrased: the man who lives alone, it was said, is either a saint or a savage, a God or a beast (Aristotle 1921, 1253a; Stanley 1655–60, 1: Part 1, 169; Guazzo [1581] 1925, 1:30; Smith 1600, 13; Burton [1628] 1927, 216; Bacon [1597] 1852, 73). Indeed, no other sentiment so accurately and economically expressed the contrasting evaluations of solitude that coexisted in early modern European society. The late Renaissance and early modern period thus inherited *two* repertoires for identifying and evaluating the place in society of those committed to the production of intellectual goods. One repertoire held that no man, however fitted and disposed for a contemplative life, should separate himself from civil society. To do so was egoistical, corrupting, unnatural. The other repertoire maintained that those seeking the highest forms of knowledge should (indeed, must) live in relative solitude. Isolation from this world, from the society of man, enabled the closest and most direct engagement with the divine and transcendent source of truth. A major task undertaken by many sixteenth- and seventeenth-century commentators was to rearrange these repertoires and, especially, by redefining each of the components, to arrive at a conception of the happy and virtuous life that might be seen as suitably situated in relation to the extremes of solitude and active engagement in society (Caspari 1954, 80; Kristeller 1985).

The Scholar versus the Gentleman

Through the Renaissance, and especially in secular circles, a solid consensus developed against the legitimacy of a wholly retired and contemplative life for those of gentle standing. At the same time, the role of the scholar as a relative isolate was increasingly acknowledged as a fact of social life. The monastery, the college, the

closet or study, and even the laboratory, observatory, and garden, were places where the scholar could be found at work. By contrast, the active citizen was associated with the court, the exchange, the theater, the gaming house, and the tavern (Hannaway 1986; Biagioli 1989, 51–52). The result was the elaboration of an important topos which contrasted the “scholar” and the “gentleman” and their respective situations in civil society and which evaluated their patterns of life accordingly (Caspari 1954, 79–80).

Recommendations varied about how the scholar *ought* to live and *ought* to be placed with respect to society. Nevertheless, through the early seventeenth century there was general understanding of the practical fact of scholarly solitude, as well as widespread appreciation of the meaning and consequences of this isolation. The Jacobean physician Robert Burton, for example, noted that “enforced solitariness” was an endemic feature of the lives of students as well as monks and anchorites; and an Italian courtesy writer³ whose work was enormously influential in late Tudor and Stuart England agreed that for the ascent to heavenly intellectual benefits “the desartes, al by places and solitarie, are the right ladders. And contrariwise, companies are nought els but hookes and tonges, which withdrawing us by force out of the course of our good thoughts, set us in the way of distruction” (Burton [1628] 1927, 215; Guazzo [1581] 1925, 1: 24; cf. Brathwait 1630, 234). Nevertheless, scholars – divine and secular – were considered to have paid a price for solitude. Melancholy was the scholar’s “inseparable companion.” Lack of exercise “dries the brain and extinguisheth natural heat”; lack of company and distraction encourages mania and wild swings between delight and brooding (Burton [1628] 1927, 260; cf. Guazzo [1581] 1925, 1:18–19). The poet Samuel Butler described a melancholy man as “one, that keeps the worst Company in the World, that is, his own” (Butler 1759, 2:134).

If solitude was widely regarded as a practical necessity for the scholar, it was considered neither necessary nor legitimate for the gentleman, whose retirement from active public concerns and rejection of his “calling” were typically read as licenses to idleness, trivial pursuits, and debauch. A sixteenth-century humanist asked of the scholarly recluse: “Doe you not thinke that these men may bee called wise by learning, and fooles in respect of the common people?” (Guazzo [1581] 1925, 1: 33). Montaigne observed that “The most great Clerkes are not the most wisest men.” The multitude disdained scholars “as ignorant of the first and common things, . . . as incapable of publike charges, as leading an unsociable life, and professing base and abject customes, after the vulgar kind” (Montaigne [1580] 1965, 1: “Of Pedantisme,” 135–36). Sir Henry Wotton, diplomat and provost of Eton during Robert Boyle’s pupilage, recognized that “slovenliness is the worst sign of a hard Student” and, endorsing Plato’s advice to Xenocrates, recommended that the philosopher occasionally “offer Sacrifice at the Altars of the Graces” (Wotton [1651] 1938,

³ The term “courtesy text,” and the appreciation of a loosely linked “courtesy” genre, dates from the work of Victorian scholars in the Early English Text Society. Courtesy texts are generally understood as works dealing with manners, civility, and practical daily conduct. For discussions of this literature, see Kelso (1929), Childs (1984, 15–26), Mason ([1935] 1971, chaps. 1–2), Brauer (1959), and Ustick (1932).

25; cf. Chesterfield [1774] 1984, 48). Indeed, in early modern Europe the public display of carelessness, unkemptness, distractedness, and social solecism came to count as emblematic of authentically scholarly status.

These patterns and their associated evaluations were both pervasive and persistent. While the thrust of English and Continental humanist thought from the sixteenth century was to urge the gentleman to become more intellectually accomplished, more practical courtesy texts uniformly traded upon legitimate distinctions between the scholar and the gentleman. The scholar's solitary life, it was said, unfitted him for the public life of a gentleman. "The study" was contrasted to "the world" (Brauer 1959, 60–62; Childs 1984, 215–21). Thus, from the sixteenth through the eighteenth centuries, social commentators manipulated repertoires that drew contrasts between the lives of gentlemen and scholars and that situated those contrasts in the relative engagements with the world which did, and should, characterize each. So far as gentlemanly society was concerned, there was general agreement that the life of unremitting retirement and solitude was grossly inappropriate for the citizen. So far as scholarly society was concerned, there was considerable disagreement about where the life of the mind ought to be located. Should the life of the intellectual be acted out in the same venues inhabited by the active citizen? Or should the contrast between the public citizen and private scholar be accepted? What considerations bore upon such deliberations? How did they affect public appreciations of the value of knowledge and those who produced it?

The Scholar and Public Affairs: Bacon's Reformation

Guazzo, Brathwait, and a host of courtesy writers of the sixteenth and seventeenth centuries, were primarily concerned with the making (or "institution") of a gentleman. They argued, against more traditional patterns, that the gentleman could and should bear the tincture of the scholar, that he was more authentically a gentleman if he acquired the lineaments of learning. Accordingly, such writers recommended that a gentleman's life might legitimately transit the scholar's study, while arguing for a new openness of that study. But what did these efforts at redefinition look like from the point of view of the world of learning and philosophy? Francis Bacon's *Advancement of Learning* (1605) systematically addressed the charges laid by civil authorities at the scholar's door. Learning and the learned were to be acquitted from the denigrations and reservations of princes and politicians. In so doing, Bacon attempted to resituate the world of learning in public space.

Bacon's defense of learning, and the particular argument that princes should actively encourage its bearers and institutions, rebutted five major "disgraces which learning receiveth from politiques" (Bacon [1605] 1857–58, 268). Given the reforms in learning that Bacon proposed, (1) it was not true that learning worked against the military and civic virtues; (2) it was not true that the life of learning was, or conduced to, sloth, sensuality, irreligion, or subversion; (3) it was not true that immersion in

scholarly pursuits corrupted manners; (4) most significantly for the seventeenth-century career of natural history and natural philosophy, it was not true that a *correctly conceived* philosophy was a solitary activity – the making of knowledge was profoundly social; and (5) precisely *because* proper philosophy took place in public space, it was not a luxury charged to the public purse; instead it was, and must be regarded as, a public good, contributing importantly to the public welfare.

The “idols” that afflicted human cognitions and judgments could not be dissolved, but their effects could be mitigated by ensuring that individuals criticized and corrected one another’s deliberations. This could be achieved only if individual philosophers were led out of their solitude into social interaction with one another and with civil society (ibid., 327). Bacon specifically criticized so-called “voluntaries” – that is, anyone who asserted himself to be his own master, whether in knowledge or in political action. Because of the workings of the idols, individual voluntaries could not produce reliable natural knowledge. The individual human understanding needed to be disciplined by method, namely an instrument of true induction. And that instrument was implemented not by an individual but by a complexly organized, densely interacting collectivity (Martin 1988, 86–91, 107–8, 228–29).

Solitude and the New Science

The advertised public character of the experimental science propagated by the early Royal Society is such a common theme among historians that it scarcely bears reiteration. The debt to Bacon so fulsomely acknowledged by the leaders of the Society freely specified his resituation of natural philosophy in civic space. And, like Bacon, the Royal Society regarded the social setting of scientific activity as a strong guarantee of the reliability of its intellectual products (Dear 1985; Shapin 1984; Shapin and Schaffer 1985, chap. 2; Golinski 1987, 1989). Thomas Sprat’s official *History of the Royal Society* (1667) commenced with an historical critique of philosophical privacy:

[T]hey who retire from humane things, and shut themselves up in a narrow compass, keeping company with a very few, and that too in a solemn way, addict themselves, for the most part, to some melancholy contemplations, or to *devotion*, and the thoughts of another world. That therefore which was fittest for the *School-mens* way of life, we will allow them. But what sorry kinds of Philosophy must they needs produce, when it was part of their *Religion*, to separate themselves, as much as they could, from the converse of mankind? (Sprat 1667, 13–14, 19)

And even some of the “moderns” failed to appreciate the philosophical costs of a secluded contemplative life. Sprat fastened on the philosophical aloneness recommended by “the excellent *Monsieur des Cartes*” in the *Discourse on Method*. Descartes’ retirement to his stove-heated room and his immersion in self-reflection were systematically rejected. This method is perhaps “allowable in matters of *Contemplation*, and in a *Gentleman*, whose chief aim was his own delight,” but it will not serve as

the basis for "practical and universal *Inquiry*." The unsociability of Cartesian method was the basis of its philosophical illegitimacy (*ibid.*, 96–97).

Yet at the same time a quite different repertoire concerning the place of philosophical life was also in circulation. This repertoire was inherited from antiquity and the Middle Ages; it stipulated that solitude was the proper setting for the scholar and philosopher, and it displayed that solitude as a warrant for the value and authenticity of the knowledge issuing forth. Indeed, solitude figured importantly in rhetoric surrounding the new experimental science, and even in practical measures for its institutionalization. In 1648, William Petty laid plans for a "College of Tradesmen," which, despite its strongly practical purposes, was described as a residential institution with celibate "ministers" (Petty [1648] 1745, 5–7). In the year prior to the formation of the Royal Society, John Evelyn solicited Robert Boyle's support for the partial realization of Solomon's House, pointing to Carthusian cenobitic models for rural retreat and disengagement: "Is this not the same that many noble personages did at the confusion of the empire by the barbarous Goths, when Saint Hierome [Jerome], Eustochius, and others retired from the impertinences of the world . . .?" (Evelyn to Boyle, 3 September 1659, in Evelyn 1852, 3:116–20). A year after the Society was established, the poet Abraham Cowley, while condemning "the solitary and unactive Contemplation of Nature," still proposed a cloistered "Philosophicall Colledge" set outside the city and housing thirty-five unmarried philosophers (Cowley 1661, esp. sig. A5, 14–15, 22, 35, 40). And Sprat's version of the Society's prehistory reeked with the rhetoric of retirement (Sprat 1667, esp. 53, 56).⁴

Until Isaac Newton entered the natural philosophical arena, no English life was more influential in forging the identity of the new scientific practitioner than that of Robert Boyle. Again, historians are familiar with Boyle's character as a paragon of the civic philosopher. Contemporaries and eulogists celebrated the dedication of his scientific work to the public welfare and his easiness of access to the philosophical public (Birch [1744] 1772, cxlv; Burnet 1833, 361; Maddison 1951, 1954; Jacob 1977, chap. 4; Shapin 1988a, 383–88; Boyle [1674b] 1772, 4: "Two Sorts of Helmontian Laudanum," 149). Yet throughout his life Boyle also portrayed himself as a solitary and his philosophical work as taking place in seclusion from the civic world. And this portrayal, while less familiar to historians, was equally influential among Boyle's contemporaries.

Bishop Burnet's funeral sermon applauding Boyle's public life also celebrated his separation from the world and stipulated its holiness: Boyle "withdrew himself early from affairs and courts"; "his mind was . . . entirely disengaged from all the prospects and concerns of this world" (Burnet 1833, 358, 368). Eulogists' displays of

⁴ The political significance of the rhetoric of rural retirement in the civil wars and early Restoration merits extended treatment in this connection. It would, for example, be apposite to compare the debates over solitude in the poetry of Andrew Marvell ("Appleton House," "The Garden") and Cowley ("The Wish," "Of Solitude") with Sprat's portrayal of interregnum Oxford as a place where philosophers might breathe "a freer air" and converse "in quiet." Hunter (1983–84) describes the Royal Society's plans in the late 1660s for purpose-designed quarters and their relationship with earlier thinking about the proper venue for experimental natural philosophy.

Boyle's life as retired and withdrawn were grounded in the philosopher's own self-presentation. As a young man Boyle recorded a conversion experience while walking alone towards a Carthusian monastery in Savoy (Boyle [1648-49] 1969, 32-35; Jacob 1977, 38-40). During the mid to late 1640s Boyle repeatedly made personal notes recording his exasperation at the triviality of normal social intercourse, confessing to a "Hermit's Averseness to Society" and pleading to be rescued by "deare Philosophy" from "some strange, hasty, Anchoritish Vow" (Boyle Papers 37, f. 166). Through the 1660s Boyle publicly yearned for solitude and debated his identity as hermit or anchorite (e.g., Oldenburg 1965-86, 2:509, 613, 639). By the 1670s, Boyle was publicly warning the prospective experimentalist about the inconveniences of acquiring a philosophical reputation: "if he should affect a solitude . . . yet he will not escape" the solicitations and visits of the curious (Boyle [1674a] 1772, 4: "Excellency of Theology," 53-54; cf. Boyle [1691] 1772, 5: "Experimenta & Observationes," 566; Shapin 1988a, 386-87).

In *Seraphick Love* (written in 1648 and published in 1659) Boyle counseled a holy renunciation of "unmanly sensualities" and recommended retreat as the proper setting for a pious life - in his case to "my own western hermitage" at Stalbridge (Boyle [1659] 1772, "Some Motives to the Love of God," 1: 246-49, 259, 281, 290, 293). In fact, Boyle remained celibate, and almost certainly a virgin, advertising practitioners' chastity and disengagement as guarantees of a genuinely Christian philosophy. Harold Fisch and J. R. Jacob have discussed Boyle's identification of the Christian natural philosopher as a "priest of nature" (Fisch 1953; Jacob 1977, 96-118). And, indeed, Boyle was widely recognized as such by contemporaries (e.g., John Beale to Boyle, 17 October 1663, in Boyle 1772, 6:341-42; Lower [1665] 1983, 198; Glanvill 1668, 93). The stipulated solitude of his laboratory was publicly understood as holy.⁵ It was the setting from which divinely endowed practitioners might, while alone, enjoy divine conversation (Boyle [1665] 1772, 2: "Occasional Reflections," 334-40; Boyle [1663] 1772, "Usefulness," 8, 32, 57, 61-62). This newly described solitude was identified as an appropriate place in which to make right philosophy and right religion.

Solitude and the Making of Natural Philosophical Knowledge

The retirement of the new natural philosopher was a retreat to a redefined and relegitimized solitude. Moreover, it was an intermittent retreat, temporally linked to active work in a public forum. Thus the cultural place of the new practitioner was artfully reassembled from existing repertoires associating places and the respective virtues that flourished therein. Much the same sort of *bricolage* was involved in situating the knowledge that this new practitioner produced. The career of an item of experimental knowledge similarly traced a trajectory between private and public spaces.

⁵ For an account of Boyle's laboratory as densely inhabited - by support personnel - see Shapin 1989a.

Yet, as Thomas Kuhn and others have pointed out, there were at least two traditions of scientific work current in the seventeenth century, differing in their respective placements in civic space and in the roles they identified for a philosophical public (Kuhn 1977; Shapin 1990). If the role of a public in the making of empirical knowledge was considered vital, such a role in the constitution of mathematical or logical knowledge was highly problematic (Shapin 1988b). In the more pure forms of such mathematical practice, and in the most extreme versions of what mathematical discourse consisted in, it was unclear what role could or should be played by philosophers assembled at a particular place and time. In the seventeenth century it was customarily understood that mathematical operations could be followed by anyone possessing natural reason who had been adequately informed of a finite number of axioms and procedures (for Hobbesian views, see Shapin and Schaffer 1985, 100–102, 143–54, 328–29). The rightness of mathematical inferences might, therefore, be checked by any competent member in the privacy of his study; indeed, the presumption would be that this had already been done by a competent mathematical author. If the public had a role, it was only in confirming what could equally have been concluded by each individual working alone. And the judgment collectively rendered could only be one of the rightness or wrongness of rule-following. Establishing mathematical knowledge did not involve the pooling of individual stocks of empirical experience. In this ideal-type practice, the outcome of the conversation of a mathematical public could not modify, but only check, the claim under consideration.

To be sure, in seventeenth-century England the real culture of mathematics rarely corresponded in practice to the ideal type. The early Royal Society always maintained a strong research program in mathematical physics, even during the highly empirical years of strongest Boylean influence, and in the early 1670s Isaac Newton presented it with a radical challenge to the Boylean enterprise in the form of his first optical papers. In this work Newton elaborated a demonstrative practice on an experimental foundation. Once the veracity of the experimental claim was granted, the inferences made from it were meant to follow with the certainty of mathematics. Where Boyle stressed the importance of reiterating large numbers of experiments, Newton argued that his demonstrative enterprise could as well proceed on the basis of one well-judged experiment. In 1676 Newton told Oldenburg, "It is not number of Expts, but weight to be regarded; & where one will do, what need of many?" If any experiments are "demonstrative, they will need no assistants nor leave room for further disputing about what they demonstrate" (18 August 1676, in Newton 1959–77, 2:79). It is significant that this highly mathematical natural philosophy emerged together with Newton's presentation of self as solitary scholar and with his denial of the importance and legitimacy of the role of a philosophical public as it had been understood in the previous decades. Robert Iliffe's excellent thesis traces the links between the privacy of Newton's person and the disciplined nature of the mathematical public he prescribed (Iliffe 1989, esp. chaps. 5–6).

Newton's contemporaries were as aware as his biographers of his devotion to solitude. At Cambridge he became legendary for his studious retirement, his neglect of appearance and bodily needs, and his disengagement from the ordinary social and intellectual life of college and university (Westfall 1980, 74–75, 78–79, 191–96).⁶ Through the nineteenth century Newton's solitude was pointed to as the school of his genius; his devotion to scientific truth was manifested in his neglect of the mundane social world. It was a philosophical as well as a social aloneness. He advertised himself as having been no man's pupil – as Westfall says, “an autodidact in mathematics, as he was in natural philosophy” (1980, 98–99). Indeed, Newton generalized the importance of autodidacticism in making an authentic mathematician. Writing a letter of reference for a mathematician applying for a London teaching position, Newton pointed to “ye surest character of a true Mathematicall Genius” – namely, that the candidate had learnt mathematics “by his owne inclination, & by his owne industry without a Teacher” (Newton to Governors of Christ's Hospital, 3 April 1682, in Newton 1959–77, 2:375). Contemporaries and later commentators both recognized close links between Newton's solitary meditations and his method of discovering scientific truths. William Whewell wrote that “often, lost in meditation, he knew not what he did, and his mind appeared to have quite forgotten its connexion with the body . . . Even with his transcendent powers, to do what he did, was almost irreconcilable with the common conditions of human life.” And David Brewster argued against any view that Newton made his discoveries merely by applying known rules of method, such as Bacon's: this would “tend to depose Newton from the high priesthood of nature” (both quoted in Yeo 1988, 266, 276).

Newton's discoveries having been made in solitude, it became a highly vexed matter what the public forum of the Royal Society should, or was intended to, do with them. When the first optical papers of 1672 – “my poore & solitary endeavours” – emerged from Newton's “darkened chamber” at Trinity, they met with initial resistance at the Arundel House meetings of the Society (Newton to Henry Oldenburg, 6 January and 6 February 1671/72, in Newton 1959–77, 1:80, 92, 100; Schaffer 1989; Adrian 1963). Zev Bechler (1974) has shown that the controversy between Newton and Robert Hooke initially stemmed from divergent conceptions of the certainty appropriate to mathematically – vs. empirically – conceived enterprises. To Hooke, publicly disciplined to Boylean probabilism, the mathematical certainty that Newton announced he had secured was illegitimate. To Newton, refusal by critics to grant that certainty could only mean that his “veracity” or mathematical competence was being impugned (e.g., Newton to Oldenburg, 20 February 1671/72, 11 June 1672, 13

⁶ Golinski (1988, esp. 151–55) discusses the distinction between private and public knowledge in Newton's chemistry. Newton distinguished “vulgar chymistry” – laboratory imitation of mechanical processes – from “a more subtile secret & noble way of working” – laboratory reenactment of the processes of growth and life. It was knowledge of the latter that Newton wanted kept private. Golinski contrasts the relatively open laboratory maintained by Boyle with Newton's private, and largely self-manned, laboratory attached to his Trinity College rooms. He also usefully points out the extent to which Boyle and Newton were agreed that certain items of chemical knowledge not be made public, though it still seems likely that Boyle – far more than Newton – wanted chemistry moved into the public domain. See also Westfall 1980, 361, 371–77.

November 1675, 29 February 1675/76, 18 August and 28 November 1676, in Newton 1959–77, 1:116–17, 186–87, 356, 422; 2:81, 184–85; Iliffe 1989, 202–207). While Boyle's and Hooke's public was accustomed to weigh, consider, and modify empirical claims, the public Newton wrote for was instructed to assent to proper mathematical demonstration. Correspondingly, Newton's early attitude toward the existing philosophical public was either ambivalent or hostile. Within a month of communicating his optical papers to the Royal Society, Newton was approving what he then took to be the *private* status of that organization. He welcomed publication in Oldenburg's *Philosophical Transactions* "instead of exposing discourses to a prejudic't & censorious multitude (by wch means many truths have been baffed & lost)" (Newton to Oldenburg, 10 February 1671/72, in Newton 1959–77, 1:108–19). Four years later, he knew better. Encouraging Hooke to limit their future exchanges to "private correspondence," Newton turned upside down the Royal Society's previous justification of the public constitution of scientific knowledge: "What's done before many witnesses is seldome without some further concern then that for truth: but what passes between friends in private usually deserves ye name of consultation rather then contest" (Newton to Hooke, 5 February 1675/76, in *ibid.*, 416–17). The public that guaranteed scientific objectivity for Boylean experimentalists became, in Newtonian practice, a continuing potential source of corruption and distortion.

Thus different forms of seventeenth-century natural philosophical practice were considered to intersect different points of the axis connecting solitude and public life. However, even if attention is confined to empirical-experimental practice, different stages in the career of knowledge-making occur at different sites. I have noted the thrust of seventeenth-century experimentalist rhetoric, which insisted on its location in public space. Yet that rhetoric tended to equate the constitution of knowledge with just one phase of its career and with one particular image of how scientific knowledge was secured. In particular, the rhetoric of "public" science highlighted the stage of showing experiments to witnesses and expatiating upon their interpretation, while drawing a veil over processes that occurred distal to that stage. In more modern terminology, one might say that this rhetoric dwelt on a certain view of the "context of justification" as opposed to the "context of discovery."

In the English seventeenth-century context, one appreciation of legitimate scientific solitude was freely available: scientific discovery – empirical or mathematical – might proceed along the same channels as religious enlightenment. The solitary philosopher, like the religious isolate, might be seen as separated from the corruptions and contaminations of social life. Just as the astronomer must for practical reasons move away from the glare of the city to observe the heavens, so the natural philosopher discovers truth by removing himself from the conventions, interests, authoritative beliefs, and distortions of society. And if the object of scholarly gaze was a divine Book of Nature, then the same sorts of understandings that were traditionally available to appreciate the religious recluse could also be drawn upon to establish the natural philosopher's identity as "nature's priest" (Schaffer 1987). Indeed, both Boyle and Newton were so identified, and their solitude was so

appreciated. Yet neither religious nor natural philosophical exercises were traditionally thought to be sufficiently constituted through individual acts of belief or witness. Individual belief had to be turned into knowledge; witness had to be shared. Thus, in both cases, private contexts of discovery had to be linked with public contexts of justification.

A public had to be shown what had been won in private. But this public display of private events was rarely what it seemed. The experimental displays and "shows" that characterized the public meetings of the seventeenth-century Royal Society were not simple reiterations of events that took place in the experimentalist's laboratory. Rather, they were *demonstrations* of ideal experiments, made ready to be displayed in public through endless private work devoted to making their phenomena docile, amplifying their read-outs, and routinizing their performances (Shapin 1988a, 399–402; Shapin 1989b, 281–86). The seventeenth-century public for experiment neither requested, nor was it offered, displays of nature's recalcitrance, the ambiguity of experimental judgment, and the uncertainty of experimental integrity. What it witnessed, validated, and discoursed upon were demonstrations and displays – experiments specially prepared and adapted for public consumption. These characteristics of private and public science are, of course, fully general. David Gooding's work on Michael Faraday splendidly documents the trajectory traced from the "experiments" in the Royal Institution's basement laboratory to the "demonstrations" in the lecture theater (1985, esp. 108), and H. M. Collins has recently analyzed the "public experiments" laid on to convince a general audience of the safety of flasks for nuclear fuel and the effectiveness of antifire additives to aviation kerosene. Collins notes that demonstrations work "because of the smoothness of performance, distancing the audience from the untidy craft of the scientist – caging Nature's caprices in thick walls of faultless display. Whereas most experiments are directly witnessed only by their perpetrators . . . a demonstration is made for direct witnessing by strangers" (1988, 726–28). The context of discovery is thus pushed into solitude, because processes of persuasion cannot tolerate a full release of what happens there into public space.

Such tendencies are to be found in a wide range of cultural performances. Indeed, the segregation of culture-making away from public space is an important means of securing the integrity and stability of cultural goods. If we have no appreciation of how things are made, we are very unlikely to be able to take them apart. In fact, we may even come to believe that the things are not made at all, but that they are divinely gifted or are part of the natural order. Erving Goffman documented these processes in his study of the "regions" in which "self" is socially constituted (1969, chap. 3). "Front regions" are those in which social actors expressively accentuate to others certain features of their activities; "back regions," by contrast, are those containing suppressed facts, those that might discredit the impression encouraged in the front region. All performances have their back regions, and these may correspond to divisions in physical space. For example, it is "backstage" that the means to create theatrical illusion are located. But the illusion itself is generated "frontstage,"

and any accidental intrusion of backstage reality into the audience's view has a powerful capacity to destroy the illusory effect. Impression management is not, however, the exclusive concern of professional actors, though it could be said that "professionals" are people who have achieved peculiarly effective means of controlling access to their back regions. People who labor to produce goods and services for others have a practical requirement to divide front from back regions and to regulate entry to the latter. Back region work needs to be conducted in relative solitude because public knowledge, of it erodes characteristics of the product or service that carries its value. The *Rheingold* is tin foil; the gas station staff are not as caring about your car as is portrayed; the restaurant kitchen is not clean; scientific knowledge is not generated by following clear and universal methodological principles. If no man is a hero to his tailor, it is because the tailor has access to the inside leg. The protection of back regions is, therefore, a practical necessity in the making of all sorts of cultural goods. Whatever cultural resources are contingently available to warrant solitude while those goods are in the making is available to protect those regions. In making seventeenth-century science, religious understandings of solitude were available for that task.

The Place of Knowledge

The uses of solitude in seventeenth-century English scientific discourse were strongly directed toward goals specific to a range of social and cultural contexts. Contemporary actors creatively adapted, redefined, and reassembled the repertoires for talking about the place of knowledge and action that they had inherited from antiquity. For all that ingenious *bricolage*, certain understandings and stipulations about the place of knowledge were scarcely changed from their Greek and Roman origins and, indeed, remain fundamentally unchanged today. Within the Western heritage of thinking about man, society, and knowledge, there are certain patterns that persist and that have altered little over the broad sweep of history.

In our culture we do not have to listen hard to hear the hermit's voice. Everywhere, there are voices claiming to speak from solitude, reporting on the solitary state, commenting on social life, as it were, from the other side. The hermit's voice is consequential. It enjoys an audience widely distributed among groups on the margins of many social institutions. Yet, as Mary Douglas has noted, the hermit's voice is fatally compromised: "The more that the hermit thinks it worthwhile speaking out and seeking for his voice to be heard abroad, the more he is edging onto the social map and becoming part of the throng to which he preaches" (Douglas 1978, 44).⁷

⁷ Pasinetti (1985, 29) comments on this feature of the voice of the supposedly isolated poet: "The role of solitariness implies the presence of an audience; the performance implies acknowledgment of a social context which has, if nothing else, the function of being the target, for instance, of the hero's anger or rebellion. . . . The solitary voice does not exist except communally." And Arendt (1958, 22) notes that "No human life, not even the life of the hermit in nature's wilderness, is possible without a world which directly or indirectly testifies to the presence of other human beings."

Thus the voices that emerge from "solitude," that define its characteristics and virtues, make sense only within some public setting, commenting on and evaluating features of a communal life. The hermit's voice speaks to an audience. To be audible it must use a public language and address itself to public concerns.

So far as the constitution of knowledge is concerned, the hermit's voice has spoken with remarkable consistency in our culture. The most valuable forms of knowledge, it has said, are not attached to place at all. If knowledge is to be regarded as universal and transcendent, then by definition it is not knowledge belonging to any particular social place. Society is conceived of as a set of forces and structures that work *against* the constitution of proper knowledge. Its conventions, customs, structures of authority, interests, and exigencies all act to compromise the integrity of knowledge. In our culture, the rhetoric of solitude is powerfully supported by individualistic views of society and empiricist theories of knowledge. If the model of genuine knowledge-making places an isolated individual in direct contact with reality, then all that society can do for proper knowledge is to get out of the way. The greatest knowledge makers are most wholly alone, and in relation to the individual genius, society is, as Swift suggested, but a confederacy of dunces (1939-68, 242). (The structures collectively used by knowledge-makers to secure and assess their products are not typically regarded as "society" at all: they are simply arrangements found maximally to assist, and minimally to interfere with, the workings of individual minds. "Society" is what happens outside the life of the mind.)⁸ To be anywhere in particular in society is to be poorly positioned to make global knowledge. What is believed in society may be contrasted to the transcendentally true. Local knowledge need not even be dignified by the term: it can be called "lore," "custom" or "skill" instead. But, since the Greeks, we have become used to equating the idea of knowledge with the idea of transcendence. The very idea of mathematics and science encompasses a global domain. It is knowledge that is taken to apply everywhere and at every time.⁹ Any attempt, therefore, to show the situatedness of knowledge is likely to be regarded as denigration: what we thought was genuine knowledge was, in fact, just local lore.¹⁰

Where, then, are the producers of this global and transcendent knowledge to be found? Again, from the Greeks to modern times, the answer has been notably uniform. Unlike the maker of handicrafts, the maker of universal knowledge is not tied to his workshop; unlike the hunter or fisherman, he is not dependent on the

⁸ Bruno Latour's work is a powerful attack on the notion that "society" happens outside of "science" (e.g., 1987, esp. chap. 1; 1988, esp. 3-7, 13-16). The present essay may be understood as an attempt historically to identify the forces that protect such a distinction.

⁹ Of course, knowledge that applies everywhere is likely not to apply very accurately anywhere in particular. Most writers who insist both on the global character of mathematical and scientific knowledge and its universal application tend to overlook the immense amount of work that is done to create and sustain the artificial and formal environments in which "application" happens. See, for example, Livingston 1986 on mathematical transcendence as a "locally produced" phenomenon and Bloor's critique (1987, esp. 341-43, 351-52).

¹⁰ Jean Lave's work (1986, 1988) marvellously displays both the situatedness of lay arithmetical skills and the resources available, even in lay society, to distinguish context-dependent knowledge from what is taken to be the genuine commodity.

movement of his prey; unlike the professional, he need not await the solicitation of clients or patients; and unlike the athlete, his work is not conditional on the state of his body. The philosopher expresses ultimate freedom from the world's particular ties and demands. He is at home everywhere and nowhere. His disengagement from the social world is a symbolic voucher of his integrity. Diogenes the Cynic, like many other ancient philosophers, was a man exiled from his own country. On being reproached for that banishment, Diogenes replied: "You wretched man, that is what made me a philosopher." When asked what country he belonged to, he gave the classic philosopher's response that he was "A Citizen of the World." When Anaxagoras was criticized for having no affection for his country, he said "Be silent, . . . for I have the greatest affection for my country," pointing up to heaven. Crates of Thebes announced that "Tis not one town, nor one poor single house,/ That is my country; but in every land/ Each city and each dwelling seems to me,/ A place for my reception ready made" (Diogenes Laërtius 1853, 59, 234, 240, 255; Stanley 1655-60, 3: Part IV, 20). The Stoic Epictetus distinguished the philosopher from other men on the grounds of his superior integrity: "The ignorant man's position and character is this: he never looks to himself for benefit or harm, but to the world outside him. The philosopher's position and character is that he always looks to himself for benefit and harm" (1916: 2:235). Democritus' solitude in his sepulcher and Pythagoras' in his cave publicly testified to their independent disengagements from particular worldly concerns and constraints.

The wise man and the philosopher are said to live and work anywhere at all and nowhere in particular. This is the ultimate basis of their wisdom and their integrity. Not only is the philosopher free of place; through the exercise of pure intellect he constitutes his own place. His mind elaborates a world wholly independent of his corporeal situation. The philosopher, like any man of absolute integrity, needs no company to distract, amuse or instruct him. Hannah Arendt identified with the Greek tradition when she wrote that the "philosopher can always rely upon his own thoughts to keep him company":

The philosopher, even if he decides with Plato to leave the "cave" of human affairs, does not have to hide from himself; on the contrary, under the sky of ideas he not only finds the true essences of everything that is, but also himself, in the dialogue between "me and myself" in which Plato saw the essence of thought. To be in solitude means to be with one's self, and thinking, therefore, though it may be the most solitary of all activities, is never altogether without a partner and without company. (Arendt 1958, 75-76; also 16, 20)

Scipio Africanus' claim that he was never "less alone than when he was alone" was echoed through the early modern period (Cicero 1909, 114; Guazzo [1581] 1925, 1:49-52). Montaigne underlined the importance of mental solitude compared to mere separation from society: "It is not enough, for a man to have sequestered himself from the concourse of people: it is not sufficient to shift place, a man must also sever himself from the popular conditions, that are in us." Removing one's self

from social intercourse was but an aid toward achieving the true solitude that was the cleansing of self from dependence on the social and physical worlds. And that solitude, once achieved, might as well be enjoyed in company. "We have a mind moving and turning in it selfe; it may keep it selfe companie; it hath wherewith to offend and defend, wherewith to receive, and wherewith to giveVertue is contented with it selfe, without discipline, without words, and without effects" (Montaigne [1580] 1965, 1:253-55; also Ophir 1991). In the seventeenth century Milton expressed the Puritan impulse to move eschatological geography into mental space: "The mind is its own place, and in itself/ Can make a Heav'n of Hell, a Hell of Heav'n" (Milton [1667] 1950, 98-99; see also Hill 1975, 175; 1979, 308-11).

Within the space defined as being everywhere and nowhere we find the philosopher, the transcendent knowledge he makes, and the ultimate source of transcendent knowledge. For God is also defined as being everywhere and nowhere. And only God, it is said, enjoys the unity and integrity of absolute solitude. In the seventeenth century Sir Thomas Browne identified the limits of human aloneness. "There is no such thing as solitude, nor any thing that can be said to be alone and by itself, but God, Who is His own circle, and can subsist by Himself; all others . . . cannot subsist without the concurrence of God, and the society of that hand which doth uphold their natures. In brief, there can be nothing truly alone and by it self, which is not truly one; and such is only God" (Browne [1643] 1940, 82). The solitary philosopher is therefore only a man imitating God.

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