# *Francis Bacon and Ingenuity**

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*This essay discusses the Latin term* ingenium *within the writings of Francis Bacon (1561–1626). It proposes that although* ingenium *does not easily translate into English, Bacon uses the term in a clearly defined range of senses. For the most part, he echoes the discourse of ingenuity and inventiveness common to many sixteenth-century humanists, but differs from them in sharply delimiting the scope and status of ingenious thinking. In particular, he excludes ingenuity from the logical portion of his reformed art of discovery: as the goal of this was demonstrative knowledge, Bacon (like the Aristotelian logicians he aimed to supplant) believed that it had to be the province of the intellect, not of* ingenium. *A fuller understanding of the ways in which Bacon uses* ingenium *casts his methodological thought into illuminating new relief, and draws attention to the manner in which Bacon's ideas were appropriated, criticized, and misunderstood in the half century after his death — not least by the self-styled Baconians in and around the early Royal Society.*

## 1. INTRODUCTION

The origins of this essay lie in a form of perplexity: in the two best and most authoritative English editions of Francis Bacon's *Novum organum* (1620), the Latin term *ingenium* is translated in a bewilderingly large number of ways. For the nineteenth-century doyen of Bacon studies, James Spedding (and the anonymous translator with whom he worked), it could be rendered as "disposition," "wit," "mind," "spirit," "reason," and the capacity for producing "contrivances."[1] Meanwhile, for the recent

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[1]Bacon, 1857–61, 4:15, 21, 50, 75, 179, 201. On the anonymous translator (apparently a student at Trinity College, Cambridge), see ibid., 1:xiv, 4:v–vi; Bacon, 1889, 147.

scholar who has done most to enhance the knowledge and appreciation of Bacon's philosophy, Graham Rees, the term comprehends "wit," "mind," "judgment," "intellect," "mettle," "talent," "brains," "ingenuity," "reason," and "skill."[2] Further, a similar variety obtains in the Spedding and Rees translations of Bacon's other Latin writings, which, as Marta Fattori's compendious labors have confirmed, are shot through with the discourse of *ingenium* in its various forms.[3] While translating early modern Latin into present-day English is an undertaking that can never answer to the principles of Occamite simplicity, one could be forgiven for concluding that Bacon's use of *ingenium* has been interpreted with a little too much license.

And yet to those who have had occasion to use their editions, it would be supererogatory to insist that Spedding and Rees worked with due care and attention: both were flexible and exact Latinists who attempted to illuminate the sense of Bacon's prose as they understood it. Furthermore, their conviction that *ingenium* occupies an unusually elastic semantic field is lexicographically sound. It originally signified any "innate or natural quality, nature" — that is, the quality in virtue of which a given object or entity is what it is. But in time, its principal sense became more specialized, denoting the qualities that distinguished particular human beings, or groups of human beings: "natural disposition, temper, mode of thinking, character, bent, inclination," along with "natural capacity, talents, parts, abilities, genius." The adjectival form *ingeniosus* tends to reinforce the second of these usages, and is defined as "intellectual, superior in intellect, endowed with a good capacity, gifted with genius, of good natural talents or abilities, clever, ingenious."[4] As the Oxford schoolmaster and eventual bishop of Winchester Thomas Cooper (ca. 1517–94) summarized in his *Thesaurus linguae Romanae et Britannicae* (1565), although *ingenium* is "the nature, inclination, disposition, or propertie of a thyng: also witte," *ingeniosus* suggests the

[2]Bacon, 1996–, 11:19, 43, 73, 91, 157, 185, 197, 305, 319, 359. Other modern translations of the *Novum organum* are comparable: see, for example, Bacon, 1994, 9 ("mind"), 11 ("spirit"), 13 ("intelligence"), 24 ("ingenuity"), 53 ("talent"), 108 ("personality"), 125 ("ability"), 131 ("cleverness"), 209 ("reason"), 235 ("skill"); Bacon, 2000, 7 ("character"), 9 ("genius"), 10 ("intelligence"), 23 ("intellectual capacity"), 39 ("mind"), 61 ("understanding" and "turn of mind"), 179 ("skill"). On the challenges of translating Bacon's Latin, see Rees's remarks in Bacon, 1996–, 6:cxv–cxvi, 11:cxxvi–cxxviii.

[3]Fattori, 2002, 180–93 (also Fattori, 2012, 105–15). See, for example, Bacon, 1857–61, 6:689 ("wit"), 696 ("fancy"), 698 ("understanding"), 701 ("disposition"), 734 ("genius"), 758 ("mind"); Bacon, 1996–, 6:7 ("intellect"), 9 ("capacity"), 113 ("ingenuity"), 137 ("wit"), 165 ("cleverness"), 247 ("mind").

[4]Lewis and Short, s.vv. "ingenium," "ingeniosus." See also Vallini.

condition of being "wittie" alone.[5] It would be easy to adduce other examples of this sort from sixteenth- and seventeenth-century England: the equation of *ingenium* with wit was widespread and entirely standard in early modern English. Indeed, toward the end of the 1590s, Ben Jonson (1572–1637) was able to poke fun at the inkhorn term *ingenuity*, having it do duty for *wit* in the mouth of a courtier who is as pretentious as he is undiscerning.[6]

Such considerations make it imperative to address at the outset a problem of terminology, translation, and style that no attempt to assess Bacon's engagement with the Latin *ingenium* can reasonably evade: like almost all his contemporaries, Bacon habitually made do with *wit* for *ingenium* when working in English.[7] Writing in the twenty-first century, the temptation to follow suit is considerable, on grounds both of convenience and historical responsibility. Unfortunately, linguistic evolution means that this option is only available at prohibitive cost: *wit* has long been resonant with eighteenth-century understandings of the term relating to unexpectedness, humor, and verbal brilliance, and there is no ready way to prevent these from suffocating earlier definitions of what C. S. Lewis accurately but inelegantly labeled "wit-*ingenium*."[8] Instead, and self-consciously faute de mieux, this essay begins by using *ingenium* and *ingenuity* interchangeably.

Putting to one side the group of meanings clustered around character, disposition, temper, and so forth, the immediate question must be whether *ingenium*, *ingenuity*, or the early modern English *wit* can legitimately be said to have signified talent, ability, intellect, intelligence, cleverness, judgment, imagination, reason, mind, understanding, and spirit. Whatever other claims are made in the following pages, their paramount concern is to

[5]Cooper, s.vv. "ingenium," "ingeniosus."

[6]Jonson, 263 (*Every Man Out of His Humour* 3.3.80–86).

[7]For Baconian *wit*, see, for example, Bacon, 1996–, 4:24, 41, 52, 75, 78, 88, 110, 124, 132, 172 (*Advancement*); ibid., 15:20, 103–04, 134, 154 (*Essayes*); Bacon 1857–61, 2:338, 459, 665 (*Sylva Sylvarum*). Bacon only seems to have used the English *ingenuity* once: Bacon, 1861–74, 7:226. As is discussed below, the sense in which he used the term — denoting something like freeborn, and therefore incorruptible, nobility — became increasingly prominent later in seventeenth-century England.

[8]On the changing signification of *wit* from the sixteenth to the eighteenth centuries, see Crane, 9–32; C. S. Lewis, 86–110; Salingar, 140–52; Lund. See also *OED*, s.v. "wit," *n.* 1, II.7, 8a–c. Sidney, 111, translates *ingenium* as "genius," using it as a synonym for *wit*. Toward the end of his life, Bacon occasionally used *genius* comparably: see, for example, Bacon, 1857–61, 1:441, 461; Bacon, 1861–74, 7:285; Bacon, 1996–, 13:172. Still, as *genius* is now unavoidably infused with romantic and postromantic notions of creativity, I have also chosen to avoid it here. On the evolving relationship between *ingenium* and *genius*, Zilsel, 211–99, remains indispensable; cf. Klein.

demonstrate that although *ingenium* certainly connoted some of these things, it did not connote others. In particular, it will become clear that in Bacon's hands, *ingenuity* represented a range of psychological attributes that demanded sustained attention and cultivation, but that were crucially distinct from those that empowered logical, philosophical, or otherwise discursive analysis.

That said, any attempt to pin down Bacon's vocabulary might justly seem fraught with danger. In the first place, Bacon was notable for the way in which he appropriated and then redefined conventional philosophical vocabulary. A good case in point is *philosophia prima* (first philosophy), a Scholastic locution for metaphysics that Bacon radically redefined as a summary branch of philosophy, something that aided the discovery of connections between areas of study that had become separated by the overrigid boundaries of the academic disciplines.[9] A second difficulty is that Bacon was seldom wholly consistent in his usage, and over time could change the sense of his vocabulary and the field of reference in which he employed it. Take the *Advancement of Learning* (1605), in which Bacon describes imagination, memory, and reason as the three "partes" of the human "vnderstanding." By the time this passage came to be reworked for the Latin *De dignitate et augmentis scientiarum* (1623), Bacon's emphasis had changed: imagination, memory, and reason are now treated as the three "faculties" of the "rational soul."[10] In a word, Bacon's philosophical writings are conceptually and terminologically dynamic; although the lines of Bacon's intellectual evolution from the early 1600s to the 1620s are relatively easy to discern, they should not obscure an awareness of just how much his writings can differ from themselves.

In exploring Bacon's use of *ingenium* it is vital to keep these two caveats in mind, but they need not impede an appreciation of the topic that is at once simpler and more revealing than has hitherto been the case; Bacon's approach to the set of overlapping semantic spheres that comprised early modern *ingenium* remained consistent, even as the contexts of his usage changed.

This essay falls into four discrete but interconnected sections. The first reconstructs the broader field of *ingenium* as treated in sixteenth-century humanist philosophy, rhetoric, poetics, and mechanical-architectural theory; the second examines Bacon's uses of the term; the third assesses

[9]On *philosophia prima*, see Chronis; and Hartmann. On Bacon's philosophical lexis and its appropriations more generally, see Fattori, 1985; Fattori, 2012, 143–68; Gontier, 2003a.

[10]Bacon, 1996–, 4:62; Bacon, 1857–61, 1:494 (2.1; cf. 1:607 [4.3]). See further K. R. Wallace, 118–21, 132–34.

how Bacon's uses of the term can enhance an understanding of the new philosophical methodology by which he set such store; the fourth builds on the versions of *ingenium* discussed in the previous three sections, and uses them to reconsider the appropriation of Bacon's methodological ideas in the fifty or so years after his death. Discussing Bacon's use of *ingenium* in this manner has claims to historical and conceptual sensitivity. It also provides for better-informed, and occasionally corrective, readings of some key passages in the Baconian corpus. More fundamentally, it enables us to discern that while Bacon's reformed system for acquiring knowledge of the world has an important role within it for ingenious thinking, it cleaves to the approach of Aristotle's *Posterior Analytics* in ranking the products of intellect and philosophy far above those of *ingenium* and inventiveness, and in so doing rejects the writings of many sixteenth-century humanist dialecticians. Furthermore, an awareness of how little Bacon's methodology had to do with ingenuity suggests that many self-identifying Baconians of the mid-seventeenth century — including those in and around the early Royal Society — seldom paid attention to the details of what Bacon's writing entailed. Disregarding Bacon's carefully parsed distinction between the role of *ingenium* and that of the intellect, they flattened out Bacon's philosophical program into something concerned with usefulness and the undertheorized accumulation of particulars. Attending to the nuances of *ingenium* as employed by Bacon not only lays the foundations for more discriminating interpretations of the Baconian method, but realigns the prism through which the historical phenomenon of Baconianism should be viewed, in both the seventeenth century and beyond.

## 2. Varieties of *Ingenium* in the Long Sixteenth Century

A good place to begin any exploration of early modern philosophical vocabulary is the lucidly eclectic *Lexicon philosophicum* (1613) compiled by the Marburg professor Rudolph Goclenius (1547–1628).[11] Under the heading of "ingenium," Goclenius began with the general definition that it is the "innate force and nature of each and every thing," and the specific definition that it is the "power of effectively and easily discovering and making in humankind, and the power of memory." As a supplement to the

[11]Although not touching on Goclenius, Robinet provides an overview of approaches to the status of *ingenium* in early modern philosophy. On Goclenius, see Copenhaver, 107–10; Vidal, 47–53. For a later and more digressive introduction to early modern *ingenium*, cf. Charleton, esp. 8–32.

specific definition, Goclenius gave two examples of its improper usage (both of which, one may surmise, must have been fairly commonplace for him to have felt the need): analogically, in being attributed to animals like parrots or elephants, and metonymically, in describing those arts that have been learned or discovered through ingenious activity. Each of Goclenius's specific uses is important to understanding Bacon's use of *ingenium*, and so is what he wrote next: "*Ingenium*, spoken of most properly, is a disposition of the rational faculty of the rational soul, [and is] for perceiving something, or discovering it, or teaching it. Or *ingenium* is the natural ability or faculty, by which we teach, and through [which] we ourselves think, or discover something."[12]

His account proceeds to align *ingenium* with the Aristotelian *euphuïa* (good natural parts) and *eumátheia* (teachability), terms that are not elucidated in the logical works of the *Organon*.[13] With this in mind, Goclenius suggested that *ingenium* was comparable with *agchinoia*, or native quick-wittedness in arriving at the middle term of a syllogism, introduced at the end of book 1 of the *Posterior Analytics* in contradistinction to the *noûs*-based understanding on which demonstrative knowledge must depend. (In Latin, this shrewd mental dexterity would usually be rendered as *sollertia*.)[14] The final point to emphasize from Goclenius's account is the variability of each individual's *ingenium*: "The diversity of *ingenium* hangs sometimes on the disposition of the body, sometimes on the different dispositions of the mind, and the constitution of the organs, and the complementary faculties, as of the fantasy (or imagination). The distinctions of *ingenium* are various. For instance, the *ingenium* can be subtle, or somewhat coarse, acute or blunt. Perspicacious or less perspicacious, fast or slow, sharp or less sharp."[15] As his authority on diversity of *ingenium*, Goclenius cited the *Universa philosophia de moribus* (1583) of the Paduan

[12]Goclenius, s.v. "Ingenium": "Ingenium maxime proprie dictum, est facultatis rationalis animi constitutio, ad intelligendum aliquid, siue inueniendo, siue discendo. Seu ingenium est naturalis aptitudo seu facultas, qua nos discimus, & per nos ipsos cogitamus, seu inuenimus aliquid."

[13]See Aristotle, 1894, 51–52 (*Nicomachean Ethics* 1114b3–12); Aristotle, 1959, 26, 177 (*Rhetoric* 1362b23–25, 1415a38); Aristotle, 1965, 37 (*Poetics* 1459a5–8).

[14]Goclenius, s.v. "Ingenium": "Est & pars ingenij solertia, Graece ἀγχίνοια, hoc est, celeris inuentio medij termini." Cf. Aristotle, 1964, 158 (*Posterior Analytics* 89b10–21); Aristotle, 1894, 123 (*Nicomachean Ethics* 1142b2–6). See further Detienne and Vernant, 308–11.

[15]Goclenius, s.v. "Ingenium": "Varietas ingenii pendet tum ex temperamento corporis, tum ex varia dispositione mentis, & constitutione organorum, & facultatum administrarum, vt φανταστικῆς (imaginatricis.) Distinctiones ingenii variae sunt. Ingenium enim subtile est, vel crassiusculum, acutum vel hebes. Perspicax vel minus perspicax, velox vel tardum, acre vel minus acre."

professor Francesco Piccolomini (1520–1604), but he might also have turned to the medical tradition.[16] For instance, in 1575 the Spanish physician Juan Huarte (1529–88) had published his *Examen de ingenios*, in which he undertook to codify differing human *ingenia* with a view to determining each individual's vocational aptitude, and to educating him accordingly.[17] The novelty and power of Huarte's work on *ingenium* made an immediate impact throughout early modern Europe, but, as Huarte himself avowed, it grew out of foundations laid in Galenic medicine: specifically, in Galen's *Quod animi mores corporis temperatura sequantur*, which uses the theory of the temperaments to explore the ways in which human mental and physical behaviors are interrelated.[18]

Much more could be said about Goclenius's overview of *ingenium*, but for this essay's purposes three of its dimensions stand out. *Ingenium* was a cognitive power of human beings (occasionally attributed to animals), something that enabled an individual to make connections between different areas of his knowledge, but that operated at a lower level than the faculties that enabled logical thinking, i.e., the *noûs*-based understanding; it was a cognitive power that depended, somehow, on the "complementary faculties" (or internal senses) like imagination and memory; and it was something that was often associated with innate quick-wittedness, but that more properly encompassed many different types of cognitive disposition, including those of the fox, hedgehog, parachutist, truffle hunter, and dolt.

Moving beyond the scope of Goclenius's account, there are several other Renaissance and early modern traditions in which *ingenium* was an important term of art. The most pertinent of these can be examined under the headings of rhetoric, poetry and visual aesthetics, and mechanics and architecture.[19] All have attracted large scholarly literatures in the course of the past half century or so, and all have some bearing on Baconian ingenuity.

[16]Piccolomini, 92–94 (2.4–5).

[17]See Gensini, 2002, 34–40. Bacon studied Huarte's work with care: see Iriarte, 358–60; Olivieri. In 1576, a differently inflected study of human *ingenium* was published by the Telesian and Neoplatonic philosopher Antonio Persio (1542–1612): see Persio, 1–17; Gensini, 2002, 40–46.

[18]See Huarte, 21–23; Iriarte, 146–51. On Galenic *ingenium* (in this case translating *agchinoia*), see also Galen, 1565, 1:fol. 63$^{v}$ (*Ars medica* chapter 6); cf. Galen, 1821–33, 1:322–23.

[19]These headings are intended as a sort of heuristic, and there was extensive cross-fertilization between the traditions summarized beneath them. Though of tangential relevance to Bacon studies, textual criticism comprises another tradition in which *ingenium* played an important role: emendation could be undertaken either *ope codicum* (with the aid of manuscripts) or *ope ingenii* (with the aid of the scholar-critic's *ingenium*). See further Timpanaro, 45–46.

The most important of these three traditions is Roman rhetoric, the lynchpin of humanist education throughout the long sixteenth century. Here, particularly for Quintilian, a student's *ingenium* is presented as the basis of all rhetorical proficiency, principally as the natural predisposition for hunting out arguments, without which effective rhetorical *inventio* could not hope to proceed. Although *inventio* is the etymon of the modern English *invention*, it is more accurately thought of as the "discovery" — or, rather, the creative rediscovery — of prearranged arguments within the imaginary space of the orator's *loci*, or places. *Ingenium* was also envisaged as a gift for making connections between apparently different things or ideas, thereby providing an orator with the wherewithal to generate metaphors, something as important to *inventio* as it was to *elocutio*.[20] Erasmus (ca. 1467–1536) thus framed the two books of his enduringly popular *De copia* (1512–34) explicitly to develop the *ingenium* of the embryonic rhetorician.[21] Elsewhere, and to the dismay of partisan Ciceronians, Erasmus followed Quintilian in insisting that each individual should adopt a rhetorical style consonant with his own *ingenium*, rather than unthinkingly imitating the manner of Cicero or any other authority.[22]

Furthermore, in the hands of many sixteenth-century humanists, *inventio* was redefined as a province of both rhetoric and dialectic, thereby extending the range of *ingenium* beyond the ken of even the most dexterous orator. For Erasmus's sometime protégé Juan Luis Vives (1492–1540), ingenuity comprised the "universal power of our mind," and warranted a form of philosophizing that was far more acute than those dependent on syllogistic rationality — one that would do away with the specious certainty of the Schoolmen, and offer in its place a dialectical art framed with

[20]Quintilian, 1:7, 349, 594, 595, 597, 2:606 (*Institutio oratoria* 1.Pr.26, 6.4.8, 10.2.4, 10.2.12, 10.2.19–20, 10.4.4); Cicero, 1902–03, 1:28–29, 37, 57, 133 (*De oratore* 1.25.113–15, 1.33.151, 1.51.221–23, 2.35.147–51). Cf. Aristotle, 1959, 146, 166 (*Rhetoric* 1405a8–10, 1411b9); Aristotle, 1965, 37 (*Poetics* 1459a5–8). For a digest of the relevant rhetorical sources, see Caussin, 104–10 (3.6). See further Crane, 57–112; Close, 475–77; Baxandall, 1971, 15–17; Gensini, 1997; Grassi, 2001, 8–17.

[21]See, for example, Erasmus, 1969–, 1/6:28, 221, 228 (trans. Erasmus, 1974–, 24:297, 595, 604–05). See further Cave, 1979, esp. 18–34; Mack, 2011, 76–103. Nashe, 2:245 (*The Unfortunate Traveller* [1594]), describes Erasmus as "that abundant and superingenious Clarke."

[22]Erasmus, 1969–, 1/2:652 (*Ciceronianus* [1527]; trans. Erasmus, 1974–, 28:402). Quintilian, 2:651, 726 (*Institutio oratoria* 11.2.44–46, 12.10.10). On sixteenth-century squabbles over the priority of the Ciceronian style (themselves echoing those of the Quattrocento), see Scott; T. Greene, esp. 181–89; Fumaroli, esp. 77–162; Monfasani. See also DellaNeva.

clear moral purpose.[23] Given that *ingenium* was the universal power of the mind, syllogistic was itself a product of ingenious thinking. The problem was that Scholastic logic was ugly, useless, and unintelligible: its proponents abused their often-abundant reserves of ingenuity in remaining attached to it.[24] A treatise on dialectical invention first published in 1534 by Joannes Visorius (d. 1568) was titled simply *Ingeniosa*, and an emphasis on harnessing ingenuity was commonplace within the topical logics developed by Lorenzo Valla (ca. 1407–57), Rudolph Agricola (1444–85), Philipp Melanchthon (1497–1560), and many others working in their wake.[25] In his *Dialecticae institutiones* (1543), Petrus Ramus (1515–72) would amplify this intellectual reconfiguration in studiously provocative terms. One seeking to understand the native human facility for *disserendi* (discoursing) should not consider the self-professed rationality of a Scholastic logician, but should instead consult laborers at work in the vineyards: "from their *ingenium*, as in a mirror, the image of nature will be reflected."[26] Even for those otherwise unsympathetic to Ramism, such as the Oxford scholar John Rainolds (1549–1607), *ingenium* was a power that transcended, even dissolved, the boundary between logical and rhetorical thinking, confirming the true nature of dialectic as a tool for teaching.[27]

Moving on to poetics and the visual arts, *ingenium* was the imaginative talent through which the poet, painter, or sculptor was able to imitate, and even to surpass, the created world in his works. Again, in most accounts this talent was taken as something that needed to be perfected by the disciplines of the relevant *artes*, a view canonically affirmed in Horace's *Ars poetica*. Furthermore, as the Renaissance progressed, creative *ingenium* came more and more to be infused with a semidivine version of the *furor* derived from Plato's *Ion*.[28] To take an unexceptional example from the later sixteenth century in England, the *De re poetica* (1573) of Richard Wills

[23]Vives, 1782–90, 3:364 (*De anima et vita* 2.6): "Universam mentis nostrae vim . . . *Ingenium* nominari placuit." Cf. ibid., 6:285–97 (*De tradendis disciplinis* 2.3–4); see further Noreña, 1970, 268–69; Noreña, 1989, 108–12; Hidalgo-Serna, 1983; Grassi, 1988, 22–25, 65–71; Mack, 2008.

[24]See, for example, Vives, 1979, 46–48 (*In pseudodialecticos*).

[25]Visorius. On the emergence of topical (or "place") logic, see Vasoli; Jardine, 1977; Schmidt-Biggemann; Hidalgo-Serna, 1985; Mack, 1993; Nauta; Spranzi, 65–98. See also Crane, 49–56.

[26]Ramus, fol. 6$^{v}$: "tum ex eorum ingeniis veluti speculis imago naturae resultabit." See further Ong, 173–95.

[27]Green, 152.

[28]Horace, 266 (*Ars poetica* 408–18). The most-useful discussions of this topic include Hathaway, 303–98; Baxandall, 1963; Weinberg, 1:71–200; Baxandall, 1971; Kemp, 1977, esp. 385–95; Summers, 1981 and 1987; Kemp, 1989; Emison, esp. 321–48. See also Brann.

(1546–79?) maintains that poetry is none other than the suitable "ordering of the *ingenium*" ("conformatio ingenii"): poetic *ingenium* is thus a quality of mind that finds expression and validation in the very act of making a poem, rather than an instrument with which to fashion a poem with claims to mimetic value.[29] The point is reaffirmed by Henry Dethick (1547–ca. 1613), whose *Oratio in laudem poëseos* (1572–76?) holds that *ingenium* is a form of inspiration that transports the poet's creative qualities far above the realm of mundane historicity.[30]

A particularly arresting example of what is at stake here is found in the edition of Marlowe's *Hero and Leander* published in 1598, in "completed" form, by George Chapman (1559–1634). The epigram on its title page reads "*Vt Nectar, Ingenium*," or "as nectar, so *ingenium*."[31] At one level, this is just a flattering conceit, in which those who buy and read the book are compared to gods enjoying the nectar of Marlowe's ingenuity. But the witticism goes further than this, and distorts the famous lines that begin Seneca's eighty-fourth *Epistle*. Here, just as the bees' natural qualities enable them to transform their industriously gathered nectar into honey, so the thoughtful reader and writer should use his *ingenium* to refine the fruits of his reading. In the poet, artist, or rhetorician, it was the power of such ingenuity that enabled the transformation of observed reality (qua nectar) into illuminating and intellectually nutritious new mimetic forms (qua honey).[32] In contrast, Marlowe's *ingenium* is not presented as something that converts his reading and observations into poetry; instead, it serves as poetic agent and its own subject matter. It transforms itself into poetic honey in the very act of composition, and has such potency that it needs no externally gathered materials in order to create poetry of the highest order.[33] Bacon owes something to this strand of poetic-artistic *ingenium*, particularly when discussing the potential uses of allegory, but despite the

[29]Wills, 56. Later, ibid., 74–76, proposes that only a Christian poet can be infused with true poetic talent. For further discussion of poetic *ingenium*, see D. L. Clark.

[30]Binns, 1999, 36. As discussed in ibid., 5–12, Dethick's *Oratio* was long thought to have been the work of John Rainolds. See also Binns, 1990, 141–59. Cf. the unflinchingly Ramistic *Analysis* (1584–86?) of Sidney's *Defence* compiled by William Temple (1554–1627): here, *ingenium* (translating Sidney's "wit") is stripped of its Neoplatonic charge, as poetry is asserted as a dialectical art: J. Webster, 78–82.

[31]Marlowe.

[32]Seneca, 1:285–86 (*Epistles* 84.1–7). The apian topos was a humanist staple, but on its particular importance to Bacon, see Rossi. See further Gmelin, 123–28; Pigman, 4–9; T. Greene, 72–80.

[33]Note that bees, themselves unable to differentiate between nature and art, play a prominent role in the description of Hero's appearance with which Marlowe's poem begins.

learned and supple arguments advanced by Fattori, it has very little to do with his philosophical and methodological uses of the term.[34]

Turning finally to architecture and mechanics, *ingenium* stands both for inventive ability, that is, the ability to conceive of new architectural layouts, or mechanical designs, and for the skill in practical mathematics required to realize such aptitude. The common etymology of *engine* and *ingenuity* gives some idea of the vitality of this tradition, but also gestures toward some of the difficulties that *ingenium* of this sort could engender, particularly when engineers sought to replicate the motions (rather than just the likenesses) of the natural world. For the early moderns, the most ingenious of mechanical inventions could be considered adulterate, which, after the Latin *adulterinus*, connoted deceit and deliberately hybrid misrepresentation. Moreover, it was only a short step from here to the accusation that technical innovators were deliberately courting monstrosity, and thereby contriving to undermine the natural order of things. The mechanically minded therefore had to impart their ideas and their inventions with a suitable measure of piety.[35]

Different though these three humanist traditions may be in various particulars, they have one important thing in common, at least as they were articulated in the long sixteenth century: all privilege the display of *ingenium* above the claims of reason, philosophy, judgment, moderation, or externally determined ends of almost any kind. Instead, the manifestation of inventive ingenuity becomes an end in itself, advertising the orator, poet, artist, architect, or engineer's power of mind, and flattering his audience that they too have some share in it. Erasmus's *De copia* is good on the dynamics at work here, and describes how to set about the kind of rhetorical performance that is "handled precisely for the purpose of exercising and demonstrating one's ingenuity."[36] Bacon himself could describe poetry as the "play" of imaginative *ingenium*, and as many studies have by now established, the mode of exhibiting one's ingenuity for its own sake was a common one in later humanist writing and practice, illuminated quite distinctly by the emergence of mannerism.[37] Furthermore, the prominence

[34]See Fattori, 2002; Fattori, 2012, 87–115. See also Fattori, 1984; Fattori, 2012, 61–85.

[35]Vitruvius, 3, 243 (*De architectura* 1.1.3, 10.Pr.3). See Summers, 1987, 235–65; Bredekamp; Vérin; Sawday; Wolfe; Roberts, Schaffer, and Dear. On monstrosity, see Hanafi, 53–98; Daston and Park, 173–214; Newman, 164–237. See further Smith.

[36]Erasmus, 1974–, 24:580; Erasmus, 1969–, 1/6:204: "quae exercendi ostentandiue ingenii causa tractantur." On this passage, see Cave, 1976.

[37]Bacon, 1857–61, 1:161 (*De augmentis* 5.1). See Curtius, 293–301; Summers, 1981, 101–43, 177–85; DaCosta Kaufmann, 126–35; Semler. See further Hallyn.

of this cultural mode was reinforced by the courtly mores associated with the notion of *sprezzatura*, most notably codified by Baldassare Castiglione (1478–1529): the graceful simulation and dissimulation that this comprised depended on the acuity of one's *ingegno*, and on the ability to make one's *ingegno* seem effortlessly acute.[38]

Placed within this milieu, the most salient feature of Bacon's attitude to *ingenium* is his disregard for the culture of elaborate or ostentatious display. As he put it in the preliminary material to the *Instauratio magna*, knowledge was not to be sought "arrogantly within the cells of human *ingenium*," but with humility and in the world itself.[39] Bacon is thus much closer than many of his humanist contemporaries and immediate forbears to Quintilian, who championed ingenuity, but who regulated its role with reference to the demands of judgment, decorum, and perspicuity: the possession of an *ingenium* appropriate to one's ends is essential to their accomplishment, but in itself offers no guarantee that one's accomplishments will be either useful or praiseworthy.[40] Be this as it may, to offer such observations is to risk jumping the gun. Before attempting to determine the import of Baconian *ingenium*, Bacon's engagement with the term must be reconstructed in more detail. Having sketched in the outlines of the discursive and literary background, it is to Bacon's own writings that this essay now turns.

## 3. *Ingenium* and Its Abuses

There are two predominant senses in which Bacon employed *ingenium*, the second of which is of much-greater magnitude than the first. A good example of the first sense is found midway through the second book of the *Novum organum*, where Bacon explores instances of alliance or union. In so doing, he turns to the "discourse of ingenuity" ("discursus ingenii"). After drawing attention to the distinction between "human reason" ("ratio humana") and "animal dexterity" ("solertia brutorum"), he calls it into question with the activities of animals like ravens: their behavior is so advanced that it might cause one erroneously to infer their ability to "syllogize." Whatever *ingenium* might signify here, it is present in both

[38]See, for example, Richards; Briggs, 118–28; Emison, 42–58; Wolfe, 56–87. Testifying to the close equivalence of *ingegno* and *ingenium*, Florio, s.v. "ingégno," translates the Italian term as "the nature or inclination of a man. Also wit, arte, skill, cunning, knowledge or discretion. Also any engine, machine, toole, implement or deuise."

[39]Bacon, 1996–, 11:24: "denique Scientias, non per arrogantiam in humani Ingenij cellulis, sed submissè in mundo maiore quaerat." See also ibid., 11:36.

[40]Quintilian, 2:423, 429, 442, 459 (*Institutio oratoria* 8.Pr.25, 8.2.19–21, 8.3.56, 8.5.22). Cf. Erasmus, 1969–, 1/6:42 (trans. Erasmus, 1974–, 24:310).

animals and human beings, and can be seen to resemble the powers of discursive rationality.[41] Likewise, when discussing the "idols of the cave" ("idola specûs") in aphorism 55 of the *Novum organum*'s first book, Bacon presents *ingenium* as something that underpins different cognitive dispositions and abilities. In perhaps the earliest explicit foreshadowing of Darwin's celebrated division between lumpers and splitters, Bacon maintains that in philosophy and the pursuit of knowledge the most fundamental distinction between different forms of human ingenuity was that they enable some people to be "better at spotting the differences between things, others at spotting their resemblances." The first kind of *ingenium* is "tenacious and sharp," while the second is "sublime and discursive." Whichever way one's *ingenium* tended, Bacon insists on keeping such natural inclinations in check.[42]

On this evidence, Baconian *ingenium* can look very much like what many Renaissance and early modern thinkers envisaged as the organic soul, or the interlocking arrangement of internal and external senses through which most cognitive activity took place: of the internal senses, the imagination, judgment, memory, and common sense were the most frequently invoked. The organic soul was further defined in contradistinction to the intellective soul, the immaterial and immortal entity that was central to the higher operations of discursive logic in Scholastic Aristotelianism, and that for the purposes of this essay can be seen as closely related to Aristotle's *noûs*-based understanding.[43] This comparison reveals a lot about Baconian *ingenium*, but encounters a sizeable difficulty in that Bacon repudiated the model of the organic and intellective souls. Book 4 of the *De augmentis* provides the fullest extant account of Bacon's psychology, and in it Bacon instead proposed a twofold division between the sensible and rational souls: the imagination, memory, and reason — traditionally faculties of the organic soul — are here reconfigured within the rational soul.

[41]Bacon, 1996–, 11:318 (2.35). Like Spedding, Rees translates "Discursus Ingenij" as "Discourse of Reason." On logical "discourse," see Goclenius, s.v. "Discvrsvs." On quasi-rational animals, cf. Bacon, 1857–61, 1:618–20 (*De augmentis* 5.2); and see further Serjeantson, 2001b; R. Lewis, 2012, 43–54.

[42]Bacon, 1996–, 11:90: "Maximum & velut radicale discrimen ingeniorum, quoad Philosophiam & Scientias, illud est; quòd alia ingenia sint fortiora, & aptiora ad notandas rerum differentias; alia, ad notandas rerum similitudines. Ingenia enim constantia & acuta . . . Ingenia autem sublimia, & discursiua." Cf. Bacon, 1857–61, 3:518–19, for a vaulting estimation of his own mental qualities in the *De interpretatione naturae prooemium* (1600–05?).

[43]On early modern notions of the organic and intellective souls, see Harvey; Park, 1988; Keßler; Serjeantson, 2011.

The foundations of this doctrine are complex — Bacon was keen to stress that the difference between human and animal cogitation is one of kind rather than degree, and was perhaps following the example of Bernadino Telesio (1509–88) — but its import is clear: although there is a definite correlation between *ingenium* and the natural condition of the human mind or soul within Bacon's writings, they do not support an unproblematic equivalence between *ingenium* and the organic soul.[44]

The second chief sense of *ingenium* within Bacon's writings is not only more significant than the first, but also helps to resolve some of the ambiguities around the status of *ingenium* in connection with the rational soul. In the *Advancement*, Bacon outlines an attitude to the study of the human mind that he would maintain throughout his later works, and that he seems to have borrowed from Vives: "For HVMANE KNOWLEDGE, WHICH CONCERNES THE MIND, it hath two parts, the one that enquireth of THE SVBSTANCE, OR NATURE OF THE SOVLE OR MIND; The other, that enquireth of the FACVLTIES OR FVNCTIONS THEREOF."[45] As the first of these was "bounded by Religion," Bacon does not propose to treat it in any detail. Instead, he was concerned to explore the operations that the nature of the soul empowered: what the soul does, rather than what it is. By the same token, in using the term *ingenium* Bacon for the most part does not refer to anatomical or physiological aspects of the human mind, but to the cognitive powers that human beings possess by virtue of their rational souls. Bacon follows standard early modern usage in describing this sort of ingenuity as the driving force behind poetic and rhetorical invention, historical writing, political maneuvering, and artisanal activities of various kinds. Furthermore, and as the enumeration of differing mental characteristics in the *Historia vitae et mortis* (1623) makes apparent, he believed that such ingenuity varied from individual to individual. Consequently, the *De augmentis* proposes that educational practice should reflect this by teaching pupils according to "the nature of their *ingenium*" ("pro natura ingeniorum quae erudiuntur").[46]

[44]Bacon, 1857–61, 1:604–13 (4.3). See K. R. Wallace, 96–134; R. Lewis, 2009b, 156–57, 169–71. On Telesio, see further Bacon, 1996–, 6:xxxvi–lxix; Spruit; De Mas; Margolin.

[45]Bacon, 1996–, 4:103. Cf. Vives, 1782–90, 3:332 (*De anima et vita* 1.12); Huarte, 52–55.

[46]Bacon, 1996–, 12:200, 202, 208, 212 (*Historia vitae et mortis*); Bacon, 1857–61, 1:710 (*De augmentis* 6.4). Cf. the discussion of the *ingenium* necessary to embrace learning in book 1 of the *De augmentis*: ibid., 1:441. The beginning of the *Historia naturalis et experimentalis* (1622) provides a distinct example of Bacon using *ingenium* in both its first and second senses: Bacon, 1996–, 12:8.

This sense of *ingenium* has two subdefinitions, both of which are metaphorical. First, it came to do duty for the entire character or disposition of an individual or, in some cases, group: the way people behave is the result of, and can be identified with, their abilities and proclivities. As Bacon explains at several points in books 7 and 8 of the *De augmentis*, this matters because the politician, counselor, or orator could not hope to persuade either a prince or the populace at large without understanding the variety and characteristics of their *ingenium*.[47] In the second subdefinition, which Bacon only occasionally deploys, the cognates of *ingenium* are used to describe any work that could be seen to be the product of its author's innately dexterous wit, be it literary, mechanical, artistic, or otherwise creative.[48]

Broadly interpreted, Bacon's use of *ingenium* to denote a power or function of the mind serves as the focus for the remainder of this essay, especially in connection with his repeated calls that ingenuity of any sort had to be actively harnessed or cultivated in order to realize its purpose. With such considerations in mind, the list of those whom Bacon took to have abused their *ingenium* becomes as revealing as it is lengthy.[49] For instance, although the extempore rhetorical performances of Protagoras, Gorgias, Callisthenes, Posidonius, and Carneades speak highly of "the powers of human ingenuity," since the codification of the rhetorical arts by Cicero and his Roman peers — a process that had unintentionally exacerbated the isolation of rhetoric from logical, moral, and philosophical rigor — eloquence had come to be seen as an end in itself.[50] A good example of the threat posed by this state of affairs is offered by the *ars memoriae*. It was a potentially useful component in the mental toolkit of the rhetorician and philosopher, but had fallen into disrepute over the course of the sixteenth century; rather than being used to aid rhetorical invention, its exercise had become an ostentatious sort of party trick, on account of

[47]Bacon, 1857–61, 1:733 (7.3): "de diversis characteribus ingeniorum." See also ibid., 1:772–78, esp. 775–76 (8.2). Cf. ibid., 1:675 (6.3).

[48]See, for example, Bacon, 1857–61, 6:638 (*De sapientia veterum*, "Pan"), 642 ("Perseus"), 653 ("Tythonus"), 659–60 ("Daedalus"); Bacon, 1996–, 11:418 (*Novum organum* 2.50), where mechanical devices are rendered as *ingeniationibus*.

[49]Quintilian's censure of Ovid's poetic self-indulgence sets the tone for many of Bacon's criticisms: see Quintilian, 2:585, 587 (*Institutio oratoria* 10.1.88, 98). See also Quintilian's remarks on Seneca in ibid., 2:593 (*Institutio oratoria* 10.1.130).

[50]Bacon, 1857–61, 1:581 (*De augmentis* 4.1): "Ingenii Humani Vires haud parum nobilitant." Bacon (ibid., 1:580) holds Socrates responsible for first separating philosophy and rhetoric. See similar formulations in ibid., 3:228 (*Valerius Terminus* chapter 8); Bacon, 1996–, 4:93 (*Advancement*). Cf. Bacon, 1996–, 15:103 (the beginning of Bacon's essay "Of Discourse"). On earlier humanist attempts to reunite philosophy and rhetoric, see Seigel.

which its exponents sought praise and personal advancement. "*Ingenium* and habit" were thereby being abused to induce "wonder" alone, and Bacon accordingly gives such performances no more weight than those of "clowns and jugglers": one wasted the "powers of the body," the other the "powers of the mind."[51]

If rhetoric was to be saved from such essential frivolity, discursive integrity had to take precedence over the urge to make a show of one's ingenuity.[52] Similarly, Bacon believed that historians were too willing to indulge their ingenuity. Civil historians were particularly culpable in this respect, and frequently, "by too much indulging their *ingenium*, produce many shameless fabrications." Even worse than this, they sometimes neglected their *ingenium* altogether, and impressed instead the inventions of their "emotional attachments" (whether personal or factional) on the historical record.[53] A little later in the *De augmentis*, Bacon reworks the fable of Dionysus from his *De sapientia veterum*, and elaborates on just how "ingenious" the emotions could be in seeking to attain their goals: to permit the "indulgence and impudence" of our *ingenium* was to make the Muses follow the cupidity of our desires, thereby preventing them from guiding us to the profounder pleasures of learning.[54]

In the second book of the *De augmentis*, Bacon identifies three kinds of poetry: narrative, dramatic, and parabolic, or allegorical. He takes the last of these to be of most importance: it was the literary form in which parts

[51]Bacon, 1857–61, 1:648 (*De augmentis* 5.5): "quaeque ingenio et exercitatione ad miraculum usque extolli possunt . . . haec certe omnia et his similia nos non majoris facimus quam funambulorum et mimorum agilitates et ludicra . . . cum haec corporis, illa animi viribus abutantur." On Bacon and the *ars memoriae*, see R. Lewis, 2009b; on Bacon's use of the juggler trope (and on its Calvinist origins), see S. Clark, 78–80. But cf. the more favorable accounts of *praestigiae* in Bacon, 1857–61, 1:603 (*De augmentis* 4.2); Bacon, 1996–, 11:304 (*Novum organum* 2.31).

[52]On the proper place of rhetoric, and on the office of the rhetorical imagination in serving higher discursive goals, see Bacon, 1857–61, 1:670–74 (*De augmentis* 6.3). See further Vickers.

[53]Bacon, 1857–61, 1:505 (*De augmentis* 2.5): "nonnulli, nimia erga ingenia propria indulgentia, plurima audacter confingant; ast alii non tam ingeniorum suorum quam affectuum imaginem rebus imprimant et addant." Accounts of nature were similarly vitiated: in his *Thema coeli* (ca. 1612), Bacon, 1996–, 6:184, explains that as human *ingenium* could not be on a level with things, it preferred unwarrantedly to elevate itself above them, thereby distorting its observational perspective. Cf. ibid., 12:9 (*Historia naturalis et experimentalis*).

[54]Bacon, 1857–61, 1:536–37 (2.13): "Omnis enim affectus ingeniosus est admodum et sagax, ad investigandam ea quae ipsum alant et foveant . . . Hac enim in re ingeniorum indulgentia et procacitas Musarum majestatem in immensum minuit." For the original fable, see ibid., 6:666.

of sacred scripture were written, and was also the medium in which the mythological works of Hesiod and Homer had survived. And yet the subject had fallen into disrepair after being corrupted by "levity and indulgence of *ingenium*" in connection with allegory and its interpretation.[55]

Other than what appear to be some ill-defined blows at mythographic handbooks like the *Mythologiae* (1567) of Natale Conti (1520–82), the *De augmentis* does not provide many more clues as to who the corrupters of allegory might have been. In the preface to his *De sapientia veterum*, Bacon had been more forthcoming: after condemning the general "levity and indulgence of *ingenium*" with which allegory had been treated, he specified that the transgressors included ancients like Chrysippus (whose Stoic interpretations of Homeric myth had been mocked by Cicero and Seneca), and moderns like the alchemists (who attempted to find precedents for transmutation in the writings of Homer, Virgil, and Ovid).[56] Their ingenuity was not in question, but had been given free rein to impose readings that the texts themselves could not support, thereby traducing responsible mythographic practice. In the *Advancement* (though not in the corresponding portion of the *De augmentis*), Bacon identifies Niccolò Machiavelli (1469–1527) as another such culprit. Much though Bacon admired Machiavelli's keen political intelligence and determined self-inoculation against muddleheadedness and fanaticism, in this case he finds him guilty of debasing mythography with calculated rationality. The eighteenth chapter of *Il principe* (1532) dwells on the example of Achilles when exploding the civic pieties of Cicero's *De officiis*: in Bacon's estimation, Achilles was "Expounded Ingeniously, but corruptly by Machiauell. . . . I doe rather think that the fable was first, and the exposition deuised, then that the Morall was first, & thereupon the fable framed."[57] Machiavelli had consciously bent mythology to his own ends, and although this indicated the fertility and muscularity of his *ingenium*, it also meant that Machiavelli had compromised his critical integrity.

In their turn, however, these condemnations lead Bacon to presentational difficulties of his own, ones that he faces down with characteristic boldness

[55]Bacon, 1857–61, 1:520 (2.13): "Attamen et haec quoque ingeniorum circa allegorias levitate et indulgentia contaminata invenitur." On Bacon's mythography, see R. Lewis, 2010.

[56]Bacon, 1857–61, 6:625: "omnemque ingeniorum circa allegorias levitatem et indulgentiam." On Bacon's criticisms, see R. Lewis, 2010, 370–73. See further Pépin, 125–45 (on Stoic allegoresis); Telle (on alchemy and mythography).

[57]Bacon, 1996–, 4:75. Cf. Machiavelli, 61; Cicero, 1994, 4–6, 10, 14, 18 (*De officiis* 1.7, 11, 13, 23, 34, 41). On Bacon's engagement with Machiavelli, see Kahn, 113–19.

and art. As Bacon believed that allegorical interpretation was a heuristic exercise that demanded "sharpness and subtlety of *ingenium*,"[58] and as the *De sapientia* makes much of Bacon's conviction that he was himself a worthy interpreter of allegory, he needed to find a way in which to reassure his readers that his own *ingenium* was appropriately tempered. His solution was to enmesh it within the modesty topos that shapes his dedicatory epistle. This epistle was addressed to Robert Cecil (1563–1612), Earl of Salisbury and chancellor of the University of Cambridge, and in it Bacon affects to be anxious that the expositions of his *De sapientia* are unworthy of Cecil's attention. However, given that Cecil had otherwise been favorably disposed toward Bacon's cast of mind, Bacon makes bold to hope that Cecil might go as far as to excuse the least valuable aspect of his work, "the *ingenium* of the author."[59] Of course, although this passage goes through the motions of displaying conspicuous humility, Bacon's wink is almost audible. And yet the implications of his playfulness were as serious as they were rhetorically necessary. Just as his ingenuity could acquiesce in the performance of courtly convention, so he implies that he had made it subservient to the scrupulosity of true mythographic inquiry.

Despite the excesses of rhetoricians, historians, alchemists, and poets, it was the mythological figure Daedalus who best illustrated the dangers of failing to cultivate one's *ingenium* for the good. In the *De sapientia veterum*, Bacon describes him as the embodiment of "mechanical wisdom and industry." Yet although he was "the most ingenious of men," the complete license he gave his *ingenium* meant that he was also an abomination.[60] His inventive skill was measured by its willing complicity in the satisfaction of Pasiphaë's taurean lusts; his "perverted industry and pernicious *ingenium*" were responsible for the Minotaur and its infamous crimes in devouring

[58]"Ingenii acumine et subtilitate": Bacon, 1857–61, 1:665 (*De augmentis* 6.2). Cf. Bacon, 1996–, 4:124 (*Advancement*).

[59]Bacon, 1857–61, 6:619. Cf. Bacon's letters accompanying the copies of his *Instauratio magna* and *De augmentis* that he presented to the University of Cambridge: Bacon, 1861–74, 7:136, 439. In the *Instauratio magna* itself, he took such modesty a stage further, and described his work as a product of "time rather than [my] *ingenium*" ("temporis, quam ingenii"): see Bacon, 1996–, 11:6, 184.

[60]Bacon, 1857–61, 6:659: "Sapientiam atque industriam Mechanicam . . . antiqui adumbraverunt sub persona Daedali, viri ingeniossimi, sed execrabilis." In the *Descriptio globi intellectualis* (ca. 1612), Bacon, 1996, 6:126, also associated the mechanical and the ingenious under the person of Hero. On Bacon's Daedalus, see further Wolfe, 12–14; Briggs, 167–68. Note that Bacon took no interest in the historical content of this fable: cf. Conti, 2:689–90 (7.16), itself drawing on Eusebius's Euhemeristic reading of the Daedalus myth. Tritonio, 52, helpfully provides a list of the mythological "Ingeniosi."

"noble youths" ("pubes ingenua") within the labyrinth. For Bacon, Daedalus's *ingenium* is thus twofold, connoting his inventions and the mental talents that gave rise to them. It is also linked inextricably to the discourse of inventive monstrosity. Yet for the purposes of this essay, Bacon's half-punning juxtaposition of Daedalus's *ingenium* with the nobly ingenuous dispositions of the Minotaur's victims is of equal moment. By the end of the seventeenth century, the senses of these lexical neighbors would often be conflated within the imprecise but pervasive usage of the English term *ingenuity*, but for Bacon the distinction between *ingeniosus* and *ingenuus* was at once plain and a further confirmation of Daedalus's reprehensibility: his willingness to pander to his ingenuity meant that he had no claims to ingenuousness, to the nobility, morality, or freedom of spirit displayed by those who sacrificed themselves to assuage the Minotaur's destructively anthropophagic hunger.[61] At the same time, Bacon seems to have felt no hesitation in associating himself with Daedalus's positive accomplishments, going as far as to name three manuscript works some variation of *Filum labyrinthi*, or the "clue to the labyrinth." Bacon's ingenious reform of learning would enable philosophical discovery to penetrate the most inscrutable byways of nature, but unlike the father of Icarus, he would not allow his ambitions to corrupt either his *ingenium* or his philosophical goals.[62] This slightly uneasy duality is reflected in the *De sapientia* itself: the mechanical arts, Bacon intones, were instrumental and therefore of "ambiguous use, serving as well for injury as for cure."[63] For one's *ingenium* to attain either usefulness or virtue, it was imperative that one should direct it to some higher end.

Although Daedalus most vividly indexes Bacon's fears about the dangers of granting one's *ingenium* too much liberty, Bacon was most frequently exercised by another target when discussing this subject. In the preliminary materials to the *Instauratio magna*, Bacon outlines how, after knowledge had been subject to incremental advancement in the distant past, one of "bold *ingenium*" had sought to subsume things within a superficial order of his own devising, an order that betrayed both the natural world and the learning

[61]Lewis and Short, s.v. "ingenuus." On later seventeenth-century "ingenuity," see R. A. Greene; Bennett; R. Lewis, 2013.

[62]*Filum labyrinthi sive formula inquisitionis* (before 1607?), *Scala intellectus sive filum labyrinthi* (1620s?), and *Filum labyrinthi sive inquisitio legitima de motu* (?). See Bacon, 1857–61, 2:687–89, 3:493–505, 3:625–31. And see Bacon, 1996–, 11:18 (the preliminaries to the *Instauratio magna*). See further Pesic; Weeks, 138–40.

[63]Bacon, 1857–61, 6:660: "Sunt enim artes mechanicae veluti usus ambigui, atque faciunt et ad nocumentum et ad remedium."

of his predecessors. This was Aristotle.[64] Likewise, in the *De augmentis*, Bacon describes him as the possessor of a "wonderfully acute *ingenium*,"[65] and commends the ingeniousness with which he investigated immobile bodies.[66] The rub was that Aristotle was so gratified by the quality of his own *ingenium* that he had arrested his natural-philosophical inquiries far short of their proper ends; instead, he had abused his ingenuity to establish and maintain a posture of dominant philosophical authority. Bacon's fullest exploration of Aristotle's ingenious errors is found in a less-guarded work than the *De augmentis*, the *Redargutio philosophiarum* (1607–08). Here he begins by positing that anyone who does not credit the ingenuity of Plato and Aristotle is either stupid or unbalanced: their differing *ingenia* were "capacious, acute, [and] elevated."[67] Aristotle's "rapid and impatient *ingenium*" was particularly worthy of note: he would not have been able to realize his universal philosophy without it, but its ungoverned precipitancy prevented him from doing justice either to his own ideas, or to those of others. It followed that his discursive manner was "magistral," and comparable to that of a teacher instructing schoolchildren; this was as inappropriate for a seeker after truth as it was for one attempting to encourage such a pursuit in others.[68] As valuable as Aristotle's works were, they were therefore to be distrusted. In writing them, Aristotle had allowed his *ingenium* to serve his worldly ambitions, not his love of learning.

Even those admired by Bacon, such as the staunchly anti-Scholastic Telesio, could be indicted on related grounds: in seeking to impose their *ingenium* on the nature of things, they traduced the natural world and their cognitive abilities alike.[69] In the complementary formulation of the

[64]Bacon, 1996–, 11:12. Vives had commented on Aristotle in similar terms: see, for example, Vives, 1782–90, 3:25–26, 374 (the *Censura de Aristotelis* and the *De anima et vita* 2.8); cf. Vives, 1979, 66 (*In pseudodialecticos*). Rees suggests in Bacon, 1996–, 11:492, that Bacon may also have had one eye on Ramus. Cf. Bacon, 1996–, 11:16; Bacon, 1857–61, 1:460–61 (*De augmentis* bk. 1). On Bacon and Aristotle, see further Alan Stewart's detective work in Bacon, 1996–, 1:517–22.

[65]Bacon, 1857–61, 1:549 (3.4): "acumen ingenii mirabile."

[66]Ibid., 1:583 (4.1): "Siquidem Aristoteles ingeniose et solerter corporis fabricam, dum quiescit, tractavit." Cf. Bacon, 1996–, 4:94 (*Advancement*); ibid., 6:140, 164 (*Descriptio globi intellectualis*). Later in the *De augmentis* (7.1), Bacon, 1857–61, 1:714, notes that one of Aristotle's precepts for the direction of the mind was "ingenious" but of little practical value. Cf. Aristotle, 1894, 39 (*Nicomachean Ethics* 1109b5–6).

[67]Bacon, 1857–61, 3:565: "Ingenia certe illorum capacia, acuta, sublimia."

[68]Ibid., 3:566: "ingenium incitatum et se proripiens." On the iniquities of the "magistral" method of teaching and communicating philosophy, see Bacon, 1996–, 4:123 (*Advancement*).

[69]Bacon, 1996–, 6:246 (*De principiis atque originibus*).

*Advancement*, Telesio and his follower, Agostino Doni (fl. 1577–83), were patronized for espousing "a Pastorall Philosophy, full of sense, but of no great depth."[70] Elaborating on the poetic theme in the *Cogitata et visa* (ca. 1607), Bacon compares Telesio to an ambitious but inept playwright, offering his audience fare that is superficially attractive but that ultimately fails to satisfy.[71] By contrast, in the *Advancement* Bacon presents his own plans to reform learning as a "Georgickes of the mind concerning the husbandry & tillage thereof." Just as georgic agriculture had proved itself more profitable than pastoral roaming, so he would push philosophical endeavor toward an enlightened future, in which the natural abilities of humankind would be cultivated for the common good.[72] This statement of georgic self-identification is the culmination of a passage in which Bacon laments that the most-gifted people had often "dispised to be conuersant in ordinary and common matters."[73]

In the *De augmentis*, he expands on this sentiment to revealing effect. On account of the "innate pride and vaingloriousness" that they had inherited from Aristotle, philosophers, scholars, and teachers had chosen topics — and means of treating them — that "show off their *ingenium* to best advantage, rather than serve to profit the reader."[74] (Pride, for Bacon, was a foremost philosophical vice: just as moral pride had occasioned the original sin, so philosophical pride, particularly that evinced by the post-Socratic professoriate, had helped to bring about the decay of Adam's perfect knowledge in the ages after the expulsion from Eden.)[75] Addressing himself directly to King James, Bacon avowed that his reformation of learning would correct this unsatisfactory state of affairs, and that it would actively embrace the humble and the quotidian, however lacking in glamor these might be: in the *De augmentis* and the remainder of the *Instauratio magna*, he would not stand on the misplaced dignity of his "*ingenium* or

[70]Ibid., 4:93. Cf. ibid., 6:250 (*De principiis*). There is no equivalent passage in the *De augmentis*.

[71]Bacon, 1857–61, 3:603. Cf. ibid., 3:536 (*Temporis partus masculus*); ibid., 3:571 (*Redargutio philosophiarum*).

[72]Bacon, 1996–, 4:135 (*Advancement*). On Bacon, pastoral, and georgic, see Patterson, 241–46; A. Wallace, 132–39.

[73]Bacon, 1996–, 4:134.

[74]Bacon, 1857–61, 1:714 (7.1): "quod homines ingenita superbia et gloria vana eas materias tractationum eosque modos tractandi sibi delegerint, quae ingenia ipsorum potius commendent quam lectorum utilitatibus inserviant."

[75]See, for example, Bacon, 1996–, 4:6–7, 34–35 (*Advancement*); and related discussion in Harrison; R. Lewis, 2007, 18–20; R. Lewis, 2010, 382–85.

name (if such a thing exists)."[76] Given that moral philosophers had generally been content to glorify themselves on account of their "acuity of *ingenium*, and vigor of eloquence," Bacon had sought a model for his undertaking elsewhere.[77] He found one in the Virgil of the *Georgics*, who "arrived at as much glory of eloquence, *ingenium*, and learning in discussing agricultural observations as in narrating the heroic acts of Aeneas."[78]

While considerably more might be said about Bacon's self-identification with Virgil through his "Georgics of the soul" ("Georgica animi"), three points bear particular emphasis here. First, Bacon's insistence that nothing should be beneath the dignity of human *ingenium* (itself putting further distance between himself and the traditions of the Neoplatonic *furor*). Second, his belief that one should train one's *ingenium* to be as versatile as possible: that it should be able to treat both husbandry and the epic heroism of Aeneas, to pitch a rhetorical performance according to the tenor of different audiences, to make war or peace, or to produce responsibly works as dissimilar as a history of the reign of King Henry VII or a history of life and death.[79] Third, his supervening conviction that while the quality of its untutored form could differ radically from individual to individual, *ingenium* was something that could be cultivated in pursuit of the good — and that the advancement of learning as he conceived it depended on just such a deliberate cultivation.[80] Bacon's disapproval of the ends to which human *ingenium* had too often been abused, and his confidence that he was in a position to remedy such abuses, is thus plain to behold.

Nonetheless, and despite the well-defined role that Bacon accorded *ingenium* within rhetoric, poetry, history, and mechanics, whether and to what extent it had a role within his reformed philosophical methodology is unclear. As Guido Giglioni has recently reminded us, viewed within the methodological context, Bacon's chief understanding of history and poetry was as a propaedeutic to the rigors of philosophical analysis.[81] Memory and imagination are squarely within the orbit of the ingenious, but it remains

[76]Bacon, 1857–61, 1:714: "dignitatem ingenii et nominis mei (si qua sit)."

[77]Ibid., 1:715: "philosophi in Ethica . . . in qua potissimum vel ingenii acumen vel eloquentiae vigorem venditare possint."

[78]Ibid.: "qui non minorem eloquentiae, ingenii, et eruditionis gloriam adeptus est in explicando observationes agriculturae, quam Aeneae res gestas heroicas enarrando."

[79]On *ingenium versatile*, see Bacon, 1996–, 4:172 (*Advancement*); Bacon, 1857–61, 1:784 (*De augmentis* 8.2). See also Bacon, 1996–, 15:123 (*Essayes*, "Of Fortune").

[80]On the *cultura animi*, see Bacon, 1996–, 4:145–55 (*Advancement*); Bacon, 1857–61, 1:731–44 (*De augmentis* 7.3). See further Corneanu, 14–45.

[81]Giglioni, 2012a.

to be determined how *ingenium* interacts with Bacon's more-advanced stages of inquiry.

## 4. *Ingenium*, Intellect, and the Art of Discovery

In book 5 of the *De augmentis*, Bacon specifies three modes through which knowledge might be discovered. In the first place, revealing "accidents" or "chances" ("casus potius"); in the second, "literate experience" ("experientia literata"); and in the third, the "new organon" or "interpretation of nature" ("novum organum" or "interpretatio naturae").[82]

Bacon took a dim view of the first mode, asserting that even at their most effective, chance discoveries offered little to differentiate human investigative competence from that of the animals.[83] More frequently, "ingenious chances" ("casuum ingenia," or those occurrences that by virtue of their very irregularity engage our ingenuity) did not provoke further investigation.[84] Instead, they were employed to amuse the "curious and vain" *ingenium* of those who read humanist natural histories, just as early modern cabinets of curiosity provoked little sustained inquiry into nature, despite being stuffed full of wonders and prodigies.[85] In place of such inanity, Bacon reaffirms a version of the Aristotelian topos that wonder should be the beginning of philosophical inquiry: *casuum ingenia* should give the student of nature occasion to acknowledge the inadequacy of received philosophical opinions, and to embrace the power and potential of natural philosophy. If the natural philosopher could but "follow nature's trail with [his] keen sense of smell," he would be able to "lead or force her to the same place again" at his pleasure.[86] Bacon's "with keen sense of smell"

[82]Bacon, 1857–61, 1:618–33. Bacon had been mulling a version of this trichotomy at least as early as the *Advancement*: see Bacon, 1996–, 4:88–89, 111; and cf. Bacon, 1857–61, 3:573 (*Redargutio philosophiarum*), 3:617–19 (*Cogitata et visa*). For an introduction to Baconian discovery more broadly, see Pousseur; Malherbe, 1996.

[83]Bacon, 1857–61, 1:618–19.

[84]Ibid., 1:497 (2.2). The corresponding portion of the *Advancement* gives "the strange euents of time and chance": Bacon, 1996–, 4:63. In writing of *casuum ingenia*, Bacon probably had in mind Pliny's *Historia naturalis*, for example, Pliny, 2:8–9 (*Historia naturalis* 7.2.32). See further Céard, 12–22.

[85]Bacon, 1857–61, 1:498: "curiosis et inanibus ingeniis gratificetur." Cf. Bacon, 1996–, 11:456 (the related discussion in the *Parasceve* aph. 3). Of the now-extensive literature on curiosity, wonder, prodigies, and *Wunderkammern*, see Bredekamp; Daston and Park; Kenny; Evans and Marr.

[86]Bacon, 1857–61, 1:498: "Neque enim huic rei plus inest negotii, praeterquam ut naturae vestigia persequaris sagaciter, cum ipsa sponte aberret; ut hoc pacto postea, cum tibi libuerit, eam eodem loci deducere et compellere possis."

("sagaciter") is not just colorful phraseology: for instance, the *Advancement* speaks of "following, and as it were, hounding Nature in her wandrings."[87] Since antiquity, dogs had been credited with sagacity (qua both practical wisdom and an acute sense of smell), and a standard Latin appellation for hunting dogs, most often for the bloodhound, was *canis sagax*.[88] The language of the hunt was commonplace within descriptions of rhetorical invention, and in emphasizing the utility of one's sagacity and ingenuity in discovering knowledge of nature, Bacon effectively translated the vocabulary and assumptions of rhetoric to the sphere of natural philosophy.[89] It thus comes as little surprise that when Bacon came to describe the second means through which natural knowledge might be discovered, *experientia literata*, he did so in explicitly venatorial terms.

Literate experience, Bacon maintains, should not be seen as "a part of philosophy," but rather as "a kind of sagacity," something comparable with the "hunt of Pan" ("venatio Panis").[90] In writing thus, Bacon harks back to his exposition of Pan in the *De sapientia veterum* (and in book 2 of the *De augmentis*), where the faun-like god's ability to locate the missing Ceres gave Bacon occasion to commend the "sagacious experience, and universal knowledge of things in the world, through which even by chance (and as it were going hunting) such discoveries are made."[91] Just as hunting dogs must be trained fully to exploit their talent for following the trail — lest they should start following a different scent because it is stronger or more appealing — so *experientia literata* provides a set of practices with which to make the most of human sagacity in exploring natural phenomena: "as a man may proceed in one of three ways — either when he feels his own

[87]Bacon, 1996–, 4:63.

[88]See, for example, Gesner, 184–86, 250–55. Cf. Lewis and Short, s.vv. "sagacitas," "sagax." See further Höltgen; Reuterswärd.

[89]On rhetorical hunting, see Wilson, sigs. J5$^{v}$–6$^{r}$. On Bacon's use of rhetorical models within his natural philosophy, see further Gaukroger, 37–57.

[90]Bacon, 1857–61, 1:623 (*De augmentis* 5.2): "Prior quidem . . . vix pro Arte habenda est aut parte Philosophiae, sed pro Sagacitate quadam." The best account of *experientia literata* is Weeks, 162–73. See also Jardine, 1974, 143–49; Jardine, 1985 and 1990; R. Lewis, 2009b, 170–73; and, for its relationship to ingenuity, Daniel; Pérez-Ramos, 1988, 282–83; Gontier, 2003b, 58–59. In characterizing *experientia literata* as an "inductive methodology" concerned with the exploitation of "cunning" to ensure a progression from "particulars to axioms," Eamon, 287–90, fundamentally misunderstands it. Reiss, 202–12, conflates *experientia literata* with Bacon's comments on the significance of literacy in the history of thought.

[91]Bacon, 1857–61, 6:640: "experientia sagaci et rerum mundi notitia universali, quae etiam casu quodam ac veluti inter venandum in hujusmodi inventa incidere solet." Cf. ibid., 1:529 (*De augmentis* 2.13).

way in the dark for himself, or is led by the hand of another without seeing anything himself, or else when he guides his footsteps with a light. So it is a mere feeling by hand when a man attempts all kind of experiments without sequence or method. But when he proceeds by direction and order in experiments, it is as if he were led by the hand; and it is this which we understand by literate experience. For the light itself, which is the third way, is to be obtained from the interpretation of nature, or the new organon."[92] Dismissing accidental or otherwise undertheorized discoveries as methodologically worthless, Bacon presents an art of discovery consisting of two complementary, but hierarchically arranged, parts: e*xperientia literata* and *novum organum*. Though *novum organum* is able to generate the light with which the natural philosopher can possess the agency to explore where he wishes, *experientia literata* can only lead him by the hand along paths whose course and location must remain hidden in darkness; *novum organum* proceeds from "experiments to axioms," whereas *experientia literata* can only proceed from "experiments to experiments."[93]

A digression in book 3 of the *De augmentis* further indicates what Bacon had in mind. Observing that all philosophical discoveries have come about through chance or deliberate inquiry, Bacon focuses his attention on the latter category. One of its two forms works through the light of "axioms and causes," i.e., the *novum organum*, while the other is more properly conceived as an "extending, translating, or bringing together [of] previous discoveries — which is a matter more ingenious and sagacious than philosophical." Perhaps because they were the province of ingenuity rather than intellect, this second set of practices had been neglected and insufficiently esteemed: accordingly, Bacon undertakes to consider it more fully under the heading of *experientia literata*.[94]

[92]Bacon, 1857–61, 1:623 (*De augmentis* 5.2): "Attamen quemadmodum possit quis in via sua triplici modo progredi; aut cum palpat ipse in tenebris; aut cum alterius manu ducatur, ipse parum videns; aut denique cum vestigia lumine adhibito regat: similiter cum quis experimenta omnigena absque ulla serie aut methodo tentet, ea demum mera est palpatio; cum vero nonnulla utatur in experimentando directione et ordine, perinde est ac si manu ducatur: atque hoc illud est quod per Experientiam Literatam intelligimus. Nam Lumen ipsum, quod tertium fuit, ab Interpretatione Naturae, sive Novo Organo, petendum est."

[93]Ibid., 1:622: "Aut enim defertur Indicium *ab experimentis ad experimenta*; aut *ab experimentis ad axiomata*."

[94]Ibid., 1:572 (*De augmentis* 3.5): "Quae autem intentionaliter inventa sunt, illa aut per causarum et axiomatum lucem eruta sunt, aut per extensionem quandam vel translationem vel compositionem inventorum priorum deprehensa; quae magis ingeniosa quaedam res est et sagax, quam philosophica."

When making good this promise in book 5, Bacon maintains that *experientia literata* has three uses, two of which have significantly more importance than the third. First, it generates what the *Novum organum* deems the "experiments of light" ("experimenta lucifera"), which though of no immediate utility in themselves, illuminate causes and thus are of vital preparative value to the interpretation of nature.[95] They achieve this by systematically juxtaposing diffusely gathered data, and interrogating it through a process of analogy and comparison, thereby extending the body of natural-historical learning on which the natural-philosopher could set to work.[96] The second chief purpose of *experientia literata* is "ministration to the memory": just as "unguided experience" is "groping in the dark," so the intellect is "quite incapable" of analyzing natural-historical data "unprompted and by memory."[97] Such assertions are reinforced later in the *Novum organum*, where Bacon observes that "Natural and Experimental History is so various and scattered that it will bewilder and distract the intellect" unless reduced to suitably ordered heads. It was therefore necessary to "fashion Tables, and Structured Sets of Instances, marshaled in such a way that the intellect can get to work on them." Literate experience provides for exactly this, offers assistance to the natural operations of the *ingenium* in collecting, retaining, and collating data about the natural world, and lays the groundwork without which the interpretation of nature could not reliably proceed.[98] Finally, literate experience also generates what Bacon calls "fruitful experiments" ("experimenta fructifera"): while these are useful and of immediate potential profit, they are incidental to the epistemic goals of philosophical inquiry, and should not be allowed to distract from or otherwise impede its progress.[99]

[95]On *experimenta lucifera*, see Bacon, 1996–, 11:158 (1.99). See also ibid., 6:4 (*Phaenomena universi* preface); Bacon, 1857–61, 2:501 (*Sylva Sylvarum*).

[96]Bacon, 1857–61, 1:624–33 (*De augmentis* 5.2), sketches seven of these systematic processes, and describes them in terms of ingenious activity: for example, ibid., 1:626, 631.

[97]Bacon, 1996–, 11.158 (1.100–01): "Vaga enim Experientia, & se tantùm sequens, (vt superiùs dictum est) mera palpatio est, & homines potiùs stupefacit, quàm informat"; "tamen nullo modo sufficit Intellectus, vt in illam Materiam agat spontè & memoritèr." See also *Partis instaurationis delineatio* (ca. 1607) in Bacon, 1857–61, 3:552.

[98]Bacon, 1996–, 11:214: "*Historia* verò *Naturalis* & *Experimentalis* tam varia est & sparsa, vt Intellectum confundant & disgreget, nisi sistatur & compareat ordine idoneo. Itaque formandae sunt *Tabulae*, & *Coordinationes Instantiarum*, tali modo & instructione, vt in eas agere possit Intellectus." Note that reading Bacon's own natural histories as the practical counterpart to the activities theorized in *experientia literata* is flawed. As Rees observes in connection with the *Historia ventorum* (1622), due to the "poverty of fresh data available to him," Bacon's natural histories are themselves theoretical works, serving as a "simulation" of the new natural history he proposed: ibid., 12:xliv, xlvi.

[99]Weeks, 169–71.

The status of *experientia literata* becomes more distinct when it is contrasted with Bacon's second means of regulating philosophical discovery, the *novum organum*. This is not discussed in the *De augmentis*, but in the *Novum organum* itself, the subtitle of which advertises "true directions for the interpretation of nature" ("indicia vera de interpretatione naturae").[100] Rather than "experiments of light," the goal of this process was to pass through physics to nothing less than a demonstrative knowledge of the metaphysical laws through which nature operates. For Bacon, these laws were the determinate physical properties, or forms, considered to be so basic that all things could be articulated in terms of them: they comprised the apex of the pyramid of natural knowledge, while the primary natural history comprised its broad base. In the *Novum organum* and elsewhere, Bacon often describes these forms as "simple natures," or as the "cardinal virtues." (Suggesting Bacon's ease with the heritage of Lucretian thought, these "simple natures" are characterized as a kind of natural "alphabet": all natural bodies are compound substances made up of them, in the same way that words were compounds made up of elementary letters.)[101] It was, however, difficult to abstract these simple natures from material reality, and in the first part of the second book of the *Novum organum*, Bacon describes the painstaking series of experiments required to investigate just one: heat.

For the purposes of this essay, the most significant feature of the *interpretatio naturae* is its association with the intellect. When outlining the component practices of *experientia literata* in the *De augmentis*, Bacon draws a line between "sagacity through literate experience" and "the rational way of the organon," and this distinction is emphatically borne out in the *Novum organum*.[102] In the intellective work of interrogating the natural world, trusting to the "naked force of the mind" is like attempting to erect an obelisk with one's bare hands, without the aid of ropes and pulleys.[103] Traditional logic attempted to supply the requisite mental technology, but as it was born of (and could not proceed beyond) the *ingenium*, it was unequal to the task. Conversely, Bacon's *Novum organum* would equip the intellect to journey beyond the long-established discursive arts. In the words of the *Distributio operis*, it would represent "the doctrine concerning

[100]The best and most lucid introduction to the procedures of the *interpretatio naturae* is by Rees in Bacon, 1996–, 11:lxvii–xcii.

[101]The elementary *loci classici* are Lucretius, 18, 68, 76, 148, 174 (*De rerum natura* 1.196–98, 1.823–29, 1.912–14, 2.688–90, 2.1013–14). See Jardine, 1974, 109–14; Passannante, 135–36.

[102]Bacon, 1857–61, 1:628–29: "Via Rationalis per Organum . . . Sagacitas per Experientiam Literatam."

[103]Bacon, 1996–, 11:54 (*Praefatio*): "opera Intellectualia nudis ferè Mentis viribus tractare non dubitârunt."

the better and more perfect use of reason in the investigation of things, and the true helps of the intellect, so that (as far as the condition of mortality and humanity permits) the intellect may be elevated in its ability to surmount the difficulty and obscurity of nature."[104] Although it must be granted that Bacon's two investigative modes can occasionally stand in overlapping, if not interpenetrative, relation to one another, Bacon took care to exclude ingenuity from the higher portion of his art of discovery.[105] In explaining this omission, the doctrine of the idols provides the best place to look.[106]

The status of *ingenium* within the "idols of the cave" has been noted above. This set of philosophical shortcomings arose from each individual's "peculiar nature," the disposition of his "body and soul," and from "education, habit, and accident."[107] When an individual allows his peculiar nature to occlude and impede his intellect, his intellect is prevented from discerning the true nature of things: one might, for instance, favor certain specialist topics or modes of study, and come to view all of one's considerations through their lens. Once again, Bacon's preferred example is Aristotle: though the energy and range of the Stagyrite's natural histories are praiseworthy, they end up martyred to the false god of his logical-categorical *idées maîtresses*. But Aristotle was exceptional, and a more general threat to the progress of philosophy is posed by the variety of *ingenia*: natural philosophers had too often been the slaves of their predispositions. Lumpers lumped and splitters split, all the while paying no heed to the truth that an understanding of nature demands every kind of mental dexterity. Likewise, some kinds of *ingenium* had been drawn toward antiquity and others toward novelty and the modern, with very few

[104]Ibid., 11:28: "Doctrina de meliore & perfectiore vsu rationis in Rerum inquisitione, & de auxilijs veris Intellectus: vt per hoc (quantùm conditio humanitatis ac mortalitatis patitur) exaltetur Intellectus, & facultate amplificetur ad Naturae ardua & obscura superanda."

[105]Consider the "Prerogative Instances" or "Instances with Special Powers" ("praerogativae instantiarum") outlined in the *Novum organum*; these belong to the initial phase of the *interpretatio naturae* — concerned with physics rather than metaphysics — yet have a role for sagacious and ingenious thinking within them. See, for example, *Novum organum* 2.26 (discussing the *ars memoriae*), 2.27 (commending "Sagacitas quaedam in conquirendis & indagandis Conformationibus & Similitudinibus Physicis"), and 2.31 (commending the skills of jugglers and illusionists): Bacon, 1996–, 11:284–86, 296, 300, 304. See further Jardine, 1974, 124–27, 147; Bacon, 1996–, 11:lxxvii–xcii. The later phases of the *interpretatio naturae* are concerned with metaphysics, and are the exclusive province of the intellect.

[106]On the idols, see Jardine, 1974, 76–85; Malherbe, 1990; Zagorin, 82–86. See further Gaukroger, 118–31; Corneanu and Vermeir.

[107]Bacon, 1996–, 11:88 (1.52): "*Idola Specûs* ortum habent ex propriâ cuisque Naturâ & animi & corporis; atque etiam ex educatione, & consuetudine, & fortuitis."

able to steer a judicious middle course between the two.[108] And yet Bacon, the theorist of natural-philosophical inquiry, was at pains to stress that none of this should matter: the intellect must never be bound by ingenuity, predispositions, bad habits, or passions of any kind. Rather, it was incumbent on the natural philosopher to keep his intellect "balanced and clear" ("aequus & purus").[109]

In much the same vein, Bacon's "idols of the tribe" ("idola tribûs," the impediments to learning that are the fault of human nature) enumerate the imperfections of the intellect itself. It frequently reduces things to an ordered system where in reality no recognizable order exists, but is also susceptible to the sudden or vivid impressions "with which the imagination is accustomed to being filled and puffed up."[110] This is because the intellect is not "a dry light," and is instead "infused by the will and the emotions." When the intellect allows itself to be governed by such non-intellective impulses, it produces explanations that are philosophically worthless, however ingenious these impulses might be, and however agreeable such explanations might seem to their authors.[111] The "dry light" was a favorite trope of Bacon's, taken from the Heraclitean maxim that "a dry light is the best soul" ("lumen siccum optima anima"). Bacon turns to it again in book 5 of the *De augmentis*, when exploring the assertion that the "logic is less pleasing to the taste and palate of most ingenuity" than poetry, history, and moral philosophy. Although the "rational knowledges" gained through logic are the "key to all other arts," they had been neglected because their "dry light" offended most people's "soft and watery *ingenium*."[112]

Misplaced ingenuity is one of the charges with which the *Novum organum* frequently taxes the established philosophical schools, particularly that of Scholastic Aristotelianism. Even to comprehend its doctrines depended on the fruitless exertion of one's *ingenium*, and, rather than drawing their conclusions from the rigorous study of nature, its proponents

[108]Bacon, 1996–, 11:90 (1.54).

[109]Ibid., 11:92 (1.58).

[110]Ibid., 11:84 (1.47): "Intellectus humanus illis, quae simul & subitò mentem ferire & subire possunt, maximè mouetur; à quibus phantasia impleri & inflari consueuit." See related discussion in Park, 1984, 295–97.

[111]Bacon, 1996–, 11:86 (1.49).

[112]Bacon, 1857–61, 1:616 (5.1): "Pars ista Humanae Philosophiae quae ad Logicam spectat, ingeniorum plurimorum gustui ac palato minus grata est. . . . At istud *lumen siccum* plurimorum mollia et madida ingenia offendit et torret. . . . Rationales Scientiae reliquarum omnino claves sunt." Cf. Bacon, 1996–, 4:8, 107 (*Advancement*); ibid., 15:84–85 (*Essayes*, "Of Friendship"); Bacon, 1861–74, 6:677 (*De sapientia veterum*, "Scylla et Charybdis"); ibid., 7:163 (*Apophthegms* no. 268). On Bacon and Heraclitus, see further Wolff, 1:240–45.

rested their theories on "meditation and ingenious agitation" alone.[113] Worse even than such Scholastic sophistry were the "superstitious" doctrines of alchemical and otherwise occult philosophers. While Scholasticism only "ensnares" the intellect ("illaqueat Intellectum"), these superstitious doctrines — despite being "fanciful, swollen, and almost poetic" — flatter and fawn upon it, exploiting that in those of "high and elevated *ingenium*" the intellect could be as "ambitious" as the will.[114] Bacon's "almost poetic" is a clue that these comments appear within his discussion of the "idols of the theater" ("idola theatri"). The various forms of philosophy had become so willfully theoretical that they were comparable to the "drama of the poets." Like drama, such quasi-philosophical productions confirmed that "stories made up for the stage are more pleasing and elegant, and more as one would wish, than true stories from history."[115] Furthermore, and again like drama, such productions were the product of *ingenium*, not intellect: Bacon speculates that there would be many more philosophical sects had not so much ingenuity been expended on the controversies of religion and theology in the centuries immediately preceding his own.[116] While this might just seem like the statement of a potentially controversial historiographical opinion, Bacon's point is that although ingenuity can be used to measure the success of the labors undertaken by poets, historians, artists, and artisans, it is inappropriate to the office of one seeking to interpret nature.

One of the least adulterated expressions of Bacon's animus against the incursions of ingenuity into philosophical thinking is found in the *Redargutio philosophiarum*. Here Bacon asserts that the more ingenious one is, the less likely one is to arrive at true knowledge of things: a strong *ingenium* will more often than not cause one to desert the light of nature

[113]Bacon, 1996–, 11:98 (1.62): "reliqua in meditatione, atque ingenii agitatione ponunt." See, for example, ibid., 11:32 (*Distributio operis*); Bacon, 1857–61, 3:533 (*Temporis partus masculus*), 572 (*Redargutio philosophiarum*).

[114]Bacon, 1996–, 11:100–02 (1.65): "at illud alterum phantasticum, & tumidum, & quasi Poeticum, magis blanditur Intellectui. Inest enim homini quaedam Intellectûs ambitio, non minor quàm Voluntatis; praesertìm in ingenijs altis & eleuatis." For instance, Bacon dismissed Cornelius Agrippa's thoughts on jewelry becoming impressed with celestial signs by reflecting that such doctrines rested on fanaticism, unlettered credulousness, and the "astonishing fabrication[s] of the human *ingenium*" ("ea nacta est mirum commentum ingenii humani"): Bacon, 1857–61, 1:559 (*De augmentis* 3.4); cf. Agrippa, 174–75 (1.47).

[115]Bacon, 1857–61, 11:96 (1.62): "Atque huiusmodi *Theatri* fabulae habent etiàm illud, quod in Theatro Poetarum vsu venit: vt narrationes fictae ad Scenam, narrationibus ex historiâ veris concinniores sint, & elegantiores, & quales quis magìs vellet."

[116]Ibid. Cf. Bacon's remarks on doctrinal controversy in *An Advertisement Touching the Controuersyes of the Church of England*: Bacon, 1996–, 1:161.

for the dark caverns of the imagination.[117] Book 3 of the *De augmentis* offers a less bilious variation on the theme. Although exerting oneself ingeniously to maintain doubt is perfectly licit for a lawyer pleading a case or for a student involved in a university disputation, the natural philosopher should apply as much ingenuity to resolving doubt as he does to identifying it.[118]

Ingenuity, then, is given short shrift within Bacon's new logic, which is driven by the capacity for intellective thinking, vulnerable though this is to the pull of the *ingenium* and emotions. Instead, Bacon claims that his twofold systematization of philosophical discovery will move beyond the reliance on the acuity of *ingenium*, and would "almost make equal" all forms of *ingenium* and intellect: ingenuity would be harnessed by the practices of *experientia literata*, and the intellect by those of the *novum organum*.[119] Even so, the aids to the intellect carried far more weight than those to the *ingenium*, and were what distinguished Bacon's reformed philosophy from its ancient antecedents. The ancients were the equals or superiors of the moderns in terms of their *ingenium* — some of the prudential wisdom, *sapientia* or *sagacitas*, this conferred could be recovered from the heuristic study of their mythology — but their systems of logical inquiry left them philosophically all at sea.[120]

Bacon's resolve to make use of both the *ingenium* and the intellect within his art of discovery comprises a powerful intervention in early modern debates on the place and nature of philosophical inquiry. It reflects the ambition and breadth of his methodological vision, and testifies to his determination to synthesize what was best within the Scholastic and humanist traditions of thought. To cast Bacon's promises in the Aristotelian terms that he intended them to supplant, his new mental technology would maximize the potential of one's *agchinoia*, *ingenium*, or innate quick-wittedness in making connections lower down the logical scale, and exploit the powers of the *noûs*-based understanding more effectively than the form of syllogistic canonized in the *Organon* and the centuries of paratextual doctrine that had accrued around it. The regulated version of ingenuity embodied in *experientia literata* would do vital work in preparation for the

[117]Bacon, 1857–61, 3:572.

[118]Ibid., 1:562 (3.4). Cf. Bacon, 1996–, 11:118 (*Novum organum* 1.75).

[119]Bacon, 1996–, 11:96 (1.61): "sed quae ingenia & Intellectus ferè exaequet." Cf. ibid., 11:184 (*Novum organum* 1.133); Bacon, 1857–61, 1:622 (*De augmentis* 5.2); ibid., 3:572–73 (*Redargutio philosophiarum*).

[120]See, for example, Bacon 1996–, 11:18–20, 76 (the preface to the *Instauratio magna*, and *Novum organum* 1.32). Cf. Bacon, 1857–61, 3:564–65 (*Redargutio philosophiarum*); Bacon, 1996–, 12:12 (*Historia naturalis et experimentalis*). On the mythographic recovery of the *sapientia veterum*, see R. Lewis, 2010, 381–86.

*interpretatio naturae*, but the ultimate arrival at *scientia* would depend on the intellect, and the *novum organum*, alone. Although *experientia literata* shows Bacon following his sixteenth-century humanist forbears in giving *ingenium* a role in the art of discovery, he fundamentally rejects the dialectic centrality with which ingenuity had been invested by a Vives or a Ramus, dismissing such an approach as apt only for rhetorical or pedagogical ends, not the pursuit of demonstrative knowledge.[121] Instead, and despite a view of Aristotelian syllogistic that was no less hostile than those articulated by Vives and Ramus, Bacon cleaved to a version of the hierarchy asserted in the *Posterior Analytics* and affirmed by Goclenius: the *interpretatio naturae* was a matter of intellective rather than ingenious thinking.[122]

Before continuing, it might be helpful to address two potential objections to this reading of Baconian discovery. The first of these, in Lisa Jardine's words, is that *experientia literata* and the *novum organum* are "conflicting strategies," one designed to produce knowledge that was observational, tentative, and contingent, the other to produce knowledge that was rational, metaphysical, and universal.[123] In reality, there is no conflict between Bacon's two stages of inquiry in either the *De augmentis* or *Novum organum*: they are radically different modes of investigation, to be sure, but they are described in terms of explicitly mutual complementarity.

The second potential sticking point emerges from Bacon's insistence on the "rational soul," and his repudiation of the model of organic and intellective souls that was commonplace in early modern psychology: the distinction between *ingenium–experientia literata* and intellect–*novum organum* might seem to require exactly this sort of psychological paradigm. Possibly so, but despite Bacon's inability to complete a systematic account of his psychological theories, there is no need to intrude any such model into his thinking. As discussed above, he took only the slightest interest in the anatomy and physiology of the human mind, and was preoccupied instead with discovering how best to exploit its activities: what the mind does, rather than what it is. Viewed from this perspective, intellect emerges as the rational soul — the principal aspects of which are imagination, memory, and reason — engaged in higher philosophical inquiries. By contrast, *ingenium* is the rational soul engaged in activities — investigative, inventive, and otherwise — lower down the cognitive-philosophical food chain.

[121]Cf. Bacon's famous criticisms of the way in which humanist rhetoricians had allowed their distaste for Scholastic Latin to lead them away from the study of "matter" in favor of "words": Bacon, 1996–, 4:21–23 (*Advancement*).

[122]On this point, cf. Malherbe, 1990, 75–78; Malherbe, 1996, 94–97.

[123]Jardine, 1990, 60.

## 5. Ingenuity and the Origins of Baconianism

While Bacon's two-stage art of philosophical discovery has irrefutable claims to coherence, more can be learned about it by examining its reception among Bacon's earliest readers. For all the prominence that Bacon's plans for the reformation of learning would attain in the decades after his death — in the celebratory metaphor of Cowley's "Ode to the Royal Society" (1667), he was a second Moses, leading the *novatores* toward the philosophical promised land — this story is not a straightforward one.[124]

Most crucially, the new philosophical logic in which Bacon invested so much significance attracted little or no favorable attention. A good example is provided by *La vérité des sciences*, published in 1625 by the Minim friar Marin Mersenne (1588–1648). Mersenne praised Bacon's call for better-informed natural histories — and defended him against the accusation that his "idols" were skeptically motivated — but condemned his new logic for unwarrantedly doing away with syllogistic and not offering anything better in its place.[125] Likewise, the *Ephemerides* of that most ardent and influential of early Baconians, the émigré Prussian intelligencer Samuel Hartlib (1600–62), registers a singular lack of regard for Bacon's logical endeavors. For instance, in mid-1639 Bacon's literary executor, Sir William Boswell (d. 1650), informed Hartlib that Bacon should have studied the *De methodo* (1558) of the Italian religious exile Jacobus Acontius (ca. 1520–ca. 1566); had he done so, his "Induction would have beene far more compendious and rational." As Stephen Clucas has shown, when Hartlib's extensive circle of educational, philosophical, and social reformers did turn to consider logic, Bacon's new method for the *interpretatio naturae* was not high on their agenda. In addition to Acontius, they concentrated instead on the works of Herbert of Cherbury (ca. 1582–1648), Joachim Jungius (1587–1657), and Johann Heinrich Bisterfeld (1605–55).[126]

In the course of his logical deliberations, Hartlib frequently sought advice from his younger associate, the Oxford-based scholar Joachim Hübner (1611–66).[127] An entry from Hartlib's *Ephemerides* for 1640

[124]On seventeenth-century Baconianism, see Pérez-Ramos, 1988, 7–18; Pérez-Ramos, 1996; Donnelly, 4–12; Giglioni, 2012b. For Cowley's "Ode," see Sprat, sig. B2$^{v}$. On Bacon and the Royal Society, see Hunter, 1989. Cf. Lynch.

[125]Mersenne, 206–18, esp. 211–13 (bk. 1, chapter 16). Jardine, 1990, notes parallel criticisms by Hermann Conring (1606–81) and Pierre Gassendi (1592–1655). On Gassendi, see also Cassan.

[126]Hartlib, 30/4/20b. Clucas, 1994 and 2010. See further Serjeantson, 2001a. On the Hartlib circle, the preeminent study remains C. Webster.

[127]On Hübner, see Blekastad, 249–51; Tautz, 4–16.

shows Hübner — clear-sighted, direct, and habitually unimpressed — intimating something of why Bacon's new logic had failed to catch on: "Wee shall never come to know proprietates Essentiales or y$^{e}$ formas Rerum w$^{ch}$ Verul[am] aimes so much at, doe wee w$^{t}$ wee can by any humane meanes till G[od] himselfe reveale those principia rerum out of which every thing was made vp, vnto vs. Till then all our subtiltys and deepest speculations and abstractions will bee vaine and to no purpose at all. Ergo there remaines nothing to doe good in the State of Learning but 2. things. 1. to improove all the Historical or Natural Works of G[od] from their bare out sides to make more vses of them for the benefit and comfort of humane life. 2. to discover more et more the Mysterie of Iniquity falshood Vanity. &c. w$^{ch}$ are in all parts of Learning in w$^{ch}$ men vse to pride thems[elves]."[128] Hübner understood well the emphasis that Bacon — Baron Verulam from 1618, Viscount St. Alban from 1621, and almost universally known as "Verulam" to his successor generations — placed on his *novum organum*, and the elevated position that the *novum organum* had within Bacon's philosophical project. Nonetheless, after a number of years on his own quest for the "true logick," he had come to believe that Bacon's logical plans were doomed to fail. The fallen condition of the human mind meant that it simply was not fitted out to know the true natures of things, and Hübner believed that the reformist energies of the Hartlibians should therefore be directed elsewhere. One might surmise from this that Hübner did not share the millenarian urgency of others within Hartlib's orbit, but what makes Hübner's comments most pertinent is that they map so closely onto the reality of the Baconianism espoused by the Hartlib circle and the English seventeenth century more generally. Taking little or no interest in the methodological innovations of the *novum organum*, they occupied themselves with natural histories and *experientia literata* — not to discover the "experiments of light" that Bacon hoped would facilitate further philosophical discovery, but because its "fruitful experiments" provided them with the practical means with which to ameliorate the immediate difficulties of farmers, doctors, printers, soldiers, engineers, and civic planners.[129]

In other words, Bacon's corpus became a medium through which the Hartlibians sought to tap hitherto underexploited reservoirs of individual and collective ingenuity, not through which to maximize the interpretative

[128]Hartlib, 30/4/49a–b. Cf. Hübner's remarks a year earlier: ibid., 30/4/18a.

[129]See C. Webster, esp. 335–43. To the limited extent that the Hartlibians maintained an interest in Baconian logic, it expressed itself through their commitment to a "real character" and "philosophical language": see R. Lewis, 2007, 23–109.

powers of the intellect. As William Petty (1623–87) put it in his *Advice of W. P. to Mr. Samuel Hartlib* (1648), the Hartlibians' aim was to bring together those "Wittes and Ingenuities lying scattered up and downe the world."[130] Accordingly, Hartlib and his associates planned to set up an "Office of Address" that would provide for a "Correspondencie and Agencie . . . for the Advancement of Universal Learning and all manner of Arts and Ingenuities."[131] These plans never came to fruition, but by the end of the 1640s the discourse of ingenuity had come to dominate discussions of educational and philosophical reform. Preaching to the House of Commons in March 1647, the Cambridge philosopher Ralph Cudworth (1617–88) deftly spliced the two senses of English *ingenuity* in championing the claims of "Ingenuous Learning": if the members of Parliament were to support it, they would ensure "*the Noble and Generous Improvement of our* Understanding *Faculty*."[132] Cudworth's younger colleague, the literary prodigy John Hall (1627–56), drew from the same well in agitating for an "Academy of Ingenuitys for Humane Learning," and his proposals caught Hartlib's sustained interest.[133] Moreover, such sentiments were not limited to Cambridge, as is made clear by a newly elected fellow of Corpus Christi College in Oxford, Thomas Gilson (1630–80). In October 1649, he wrote to Hartlib detailing proposals to reform the statutes of the University of Oxford, bringing them into accord with the Hartlibian spirit of the age: in particular, he sought to replace the lecturers' emphasis on the canons of tradition and authority with attention to either Baconian ingenuity or the ingenious doctrines of other moderns.[134] Given the nature of institutional politics, it comes as no surprise that Gilson's proposals did not get very far. But Gilson's equation of ingenuity and Baconianism is telling, and takes us to the very nub of the Hartlib circle's selective appropriation of Bacon. As Hartlib himself put it on first meeting John Aubrey (1626–97) in December 1652, Aubrey "seemed to be a very witty man and a mighty favorer and promoter of all Ingen[ious] and Verulamian Designes."[135] For Hartlib, the adjectives *Ingenious* and *Verulamian* were essentially coterminous.

[130]Petty, 2. See further McCormick, 40–83.

[131]Hartlib, 14/2/3a. See further C. Webster, 66–76, 369–84.

[132]Cudworth, sig. A1$^{r-v}$.

[133]Hartlib, 9/10/5a–6b, 60/14/7a–8b, 13a–b, 30a–31b. On Hall's interactions with Hartlib, see McDowell, 55–69.

[134]Hartlib, 10/1/8a. This document has been printed in C. Webster, 523–24. On Gilson, see ibid., 194–97; Davids, 344–46; Calamy, 224.

[135]Hartlib, 28/2/43a (*Ephemerides*). On Hartlib and Aubrey, see Hunter, 1975, 37, 44, 53–55, 63.

Ingenuity provided a flag of the utmost convenience under which to sail the ship of Baconian reform, and one finds repeated references to it throughout the natural-philosophical writing of the 1640s, '50s, and '60s. It suggested the cultivation of natural talent and the discoveries that would emerge from so doing, but also implied that these discoveries would be practically useful, and that cultivating them would be a gentlemanly, free, and disinterested process.[136] Which is to say that it would disavow the enthusiasm, dogmatism, and careless theorizing on which the internecine trauma of the 1640s was commonly blamed. The claim to transcend faction and to be pulling together for the common good of the British nations was a powerful one in the years around 1650, as it would be again in the decade after the Restoration. Furthermore, and as Joanna Picciotto has observed, for many champions of philosophical and religious renewal in the mid-seventeenth century, ingenuity also connoted the pristine innocence of the knowledge that had been lost at, or at some point after, the Fall — and the virtuousness of those who were now attempting to recover it.[137]

From the perspective of Bacon studies, the problem nonetheless remains. Namely, to advance an explanation as to how the first Baconians felt so radically able to depart from what Bacon himself insisted on as the path to true knowledge and dominion over the created world. And to determine how, moreover, they could have devoted so much energy to the ingenious business of *experientia literata*, while neglecting the intellectual rigors of the *novum organum*. Part of this difficulty can no doubt be written off to difficulties of Bacon's philosophical methodology: in 1634, Hartlib's *Ephemerides* record that the Oxford mathematician William Gilbert (fl. 1623–38) had spent a great deal of time with "Verulamian Philosophi[e] for the Natural part," and that Gilbert was perhaps the only person alive who understood what Bacon had intended.[138] In this reckoning, Bacon could resemble a sort of Vives redux — a sharp-eyed critic of Aristotelity and

[136]At least one of Hartlib's correspondents objected to the polysemic charge with which *ingenuity* was thus invested. In a letter dated 1 September 1651, the physician William Rand (ca. 1617–62) — who later translated Gassendi's life of Peiresc into English — complained that ingenuity was being used to denote "wits, active spirits, activityes or Ingenies." Instead, Rand took "Ingenuity to be an uprightness & gallantry of mind, makeing a man owne truth & iustice," or a "candid disposition of owneing freely the truth upon all occasions." Preferring "ingenuity" to "ingeny" for the Latin *ingenium* was an affectation, favored by the feebleminded because its pronunciation was "more pleasing to the palate": Hartlib, 62/27/1a–b. On Rand, see C. Webster, 304–08; Darley, 146–48. See further R. A. Greene; *OED*, s.v. "ingeny."

[137]Picciotto, 66–75.

[138]Hartlib, 29/2/32a (*Ephemerides*). On Gilbert, see Feingold, 74.

unthinking reverence for the old ways, but not the author of an attempt to supplant syllogistic with a logic of his own. As the diplomat and civil servant Sir William Becher (1580–1651) put it to Hartlib in early 1640, "Verulam is for the most part but a refined Lud[ovicus] Vives."[139] Furthermore, many students of nature shared Hübner's opinion that no system of logic could deliver what Bacon claimed for his *novum organum*.

However, neither of these explanations is able to account for the degree to which Bacon's higher logic was overlooked or discarded by those who were otherwise so keen to wrap themselves in the totality of his reformist mantle. Yet more perplexing is that the *De augmentis* shows Bacon anticipating exactly this course of events. Toward the end of the chapter on *experientia literata*, he observes that: "Although in the long run the rational way of the organon promises greater things, in the short term, this sagacity by means of *experientia literata* nevertheless produces more things closer to human experience, like the gifts that were thrown and scattered among the masses in antiquity."[140] As Bacon takes pains to repeat in the concluding paragraph of the chapter, the natural philosopher therefore has to be patient, to remind himself that a failed experiment was often more illuminating than one that succeeded in producing something of immediate utility, and to pursue true *scientia* through the disciplines of the *novum organum*.[141]

Be this as it may, the limited scope of seventeenth-century Baconianism was largely a problem of Bacon's own making. Bacon well knew that the democratic and collaborative appeal of his philosophical reforms was one of their most winning characteristics: everyone from manual laborers to the aristocratic cognoscenti could and should contribute to the advancement of learning. However, looked at more closely, this collaboration was intended to be decidedly unequal. As early as the *De interpretatione naturae prooemium*, Bacon's aim was to ensure a "mutual exchange of ingenuity" ("ingeniorum correspondentiae"), and at no point did he outline plans to encourage a similar correspondency of the intellect.[142] The reasons for this are laid out plainly at the beginning of the *Parasceve*. As far as "the work of the intellect,"

[139]Hartlib, 30/4/42a (*Ephemerides*).

[140]Bacon, 1857–61, 1:628–29 (5.2): "Quamvis enim Via Rationalis per Organum longe majora spondeat, attamen haec Sagacitas per Experientiam Literatam plurima interim ex iis quae in proximo sunt in genus humanum (tanquam missilia apud antiquos donativa) projiciet et sparget." Cf. Bacon, 1996–, 12:12 (*Historia naturalis et experimentalis*), where Bacon remarks that although his *organum* would be as nothing without reliable natural histories on which to work, reliable natural histories would still be valuable without the *organum*.

[141]Bacon, 1857–61, 1:632–33.

[142]Ibid., 3:620. For a standard account of Baconian collaboration and its appeal, see Sargent, 1996.

that is, the *interpretatio naturae*, was concerned, Bacon thought that he might be able to complete it by himself. By contrast, the "materials for the intellect" were so widely and diffusely dispersed that they demanded the assistance of "agents and merchants" to seek them out and collect them. Besides, Bacon concludes, it was beneath his dignity and a waste of his time to engage in pursuits that were "open to virtually everybody's industry."[143] The natural histories make similar claims, and specifically align the work of preparing materials for the intellect with ingenuity.[144]

The fullest illumination of Bacon's designedly hierarchical philosophical community comes from his unfinished utopian fiction, the *New Atlantis* (1627). Here the core of Salomon's House comprises thirty-six fellows, thirty-three of whom variously collect, arrange, and experiment upon natural data for consideration by the remaining three. These three are the "Interpreters of Nature," who "raise the former discoveries by experiments into greater observations, axioms, and aphorisms." They are at the head of Salomon's House, just as the *interpretatio naturae* comprises the most elevated stage of Bacon's art of philosophical discovery.[145] Although Bacon made much of the profession that his new methodology would eliminate the disparity between different qualities of *ingenium* and intellect — thereby involving as many people as possible in his project for the renewal of learning — the reality of his proposals is that they only offered a common remedy for ingenious activity and thought. Intellective thinking was to remain the responsibility of the few. The *novum organum* would enable one's intellect to comprehend nature much more effectively than Aristotelian syllogistic, but it was no part of Bacon's plan to supply the want of intellectual aptitude in those who did not already possess it.

Ironically, it was the cognitively elect of seventeenth-century England and Continental Europe who were unmoved by the logical dimensions of Bacon's work: the remainder of Bacon's readers, as he perhaps intended, simply ignored them. In Hugh Trevor-Roper's penetrative phrase, a "vulgar Baconianism" prevailed, one concerned with the prominence that Bacon accorded versions of *experientia literata* and fruitful experimentation, but not with the *interpretatio naturae* or the methods through which this

[143]Bacon, 1996–, 11:450: "At Intellectûs Materialia tam latè patent, vt ea (tanquam per Procuratores & Mercatores) vndiquè conquiri & importari debeat. Accedit etiam illud, quòd Coeptis nostris vix dignum esse aestimemus, vt in re tali, quae ferè omnium Industriae pateat, nos ipsi tempus teramus."

[144]See, for example, Bacon, 1996–, 12:10–12 (*Historia naturalis et experimentalis*). Also cf. ibid., 13:262 (*Prodromi philosophiae secundae*).

[145]Bacon, 1857–61, 3:164–65. On the oligarchic structure of Bacon's philosophy, see Serjeantson, 2002, 96–97; Martin, 163–71; Ash, 204–12.

could be brought about.[146] Even Robert Boyle (1627–91), wealthy nobleman and Baconian experimentalist par excellence, felt no need to move beyond *experientia literata*. Anything but a naïve empiricist, Boyle choreographed his experiments expertly, wrote up his results with exemplary care and attention, arranged them innovatively in tables and under heads of inquiry, and attempted to resolve the claims of speculative and experimental philosophy. Yet he had little more than modestly framed hypotheses with which to draw conclusions from his experimental labors.[147] In Barbara Shapiro's estimation, this form of experimentalism marks the point at which "the Baconian research program was severed from Baconian method and philosophy of science and anchored to an empirical, but essentially probabilistic conception of natural science."[148] Her view carries a good deal of explanatory force, but when tracing the history of ingenuity alongside that of seventeenth-century Baconianism, it becomes clear that to speak of a severance is in error: since Mersenne's *La vérité des sciences* at the latest, Bacon's program of collective natural-historical research (qua literate experience) was often if not always detached from his philosophical logic (qua new organon).

Indeed, the only seventeenth-century natural philosopher to advance a form of methodological Baconianism that Bacon himself might have owned did not do so until the mid- to late 1660s. This was Robert Hooke (1635–1703), whose lectures on the "General Scheme of Natural Philosophy" maintain that the "incomparable *Verulam*" had gone further than anyone in devising an "art of inquiry," but that Bacon had died before he could perfect it. Hooke proposed to remedy this with a two-stage "philosophical algebra." Stage one would comprise "the manner of Preparing the Mind, and Furnishing it with Materials to Work on"; stage two "the Rules and Methods of proceeding or operating" on these materials. Unfortunately, the "General Scheme" as it survives only details the first of these: glancing at the second of them, Hooke's posthumous editor explains, "This I think Dr. *Hook* never wrote."[149] His statement is the last word on the subject, and its bathos reveals much about the unhappy fate of Bacon's *novum organum*.

[146]Trevor-Roper, 239: "It was Baconian reform with a difference, of course, Baconianism for new times, and brought down to a lower level. We may call it 'vulgar Baconianism,' for it lacked the range and power of the true Baconian message."

[147]On Boyle's experimental practice, see Sargent, 1995; Anstey; Hunter, 2007; Hunter and Anstey. See also Weeks, 164–65.

[148]Shapiro, 16.

[149]Hooke, 6–7. See further Hesse; Mulligan. Some letters exchanged around 1680 between Hooke and Gottfried Wilhelm Leibniz (1646–1716) suggest that Hooke never gave up on the idea entirely: see R. Lewis, 2009a, 355–58.

## 6. Conclusion: Hobbes contra Boyle

Thomas Hobbes (1588–1679) offers both a coda and a conclusion to this account of Baconian *ingenium*. In 1661, he published the *Dialogus physicus*, an attack on Boyle and the emergent Royal Society's avowedly Baconian philosophy of experiment. Its prefatory epistle debunks the carefully nurtured "ingenuity" with which many of those in and around the early Royal Society tried to legitimate their philosophical undertakings, and does so by realigning the discourse of *ingenium* with Bacon's own thoughts on the topic: "If ingenuity were sufficient for the sciences, for a long time now no science would have been lacking to us. For this new Academy [the Royal Society] abounds with most excellent ingenious men. But ingenuity is one thing and method [*ars*] is another. Here method is needed. . . . For those living for ingenuity vie with each other."[150] In their discussion of this passage, Shapin and Schaffer assert that it shows Hobbes insinuating that the artisanal character of Boyle's experimentalism was "making philosophy ignoble."[151] Certainly Hobbes was trying to get under Boyle's skin, but the thrust of his argument was not troubled by the social status of their discipline: instead, he was concerned to suggest a distinctively methodological battleground. In what must have seemed like an act of perverse effrontery to Boyle and his associates, Hobbes — who had once served Bacon as amanuensis, and who had no time for what he took to be the fad of pseudo-Baconian experimentalism — used the epistle implicitly to identify himself as a better Baconian than they.[152]

In chapter 8 of his *Leviathan* (1651), Hobbes defines "wit" (*ingenium* in the 1668 Latin text) as a mental virtue "which is gotten by Use onely, and Experience; without Method, Culture, or Instruction."[153] Though it was valuable in writing poetry and history, its unsystematic and highly personal nature meant that it was unable to establish truth or to demonstrate knowledge: these belonged to rational discourse alone. This circumscribed

[150]Hobbes, 1661, unsigned and unpaginated: "Si ad scientias sufficeret Ingenium, nulla nobis scientia jamdudum defuisset. Nova enim haec Academia ingeniis abundat excellentissimis. Sed aliud est Ingenium, aliud Ars. Arte hic opus est . . . Certant enim inter se Viventes de Ingenio"; English translation from Shapin and Schaffer, 347, where it is noted that Hobbes's last line is an echo of Lucretius, 94 (*De rerum natura* 2.7–11). On the *Dialogus physicus* and its contexts, see Jesseph, 261–64; Parkin, 217–22; Hunter, 2009, 135–38.

[151]Shapin and Schaffer, 130.

[152]On Hobbes and Bacon, see Bunce, esp. 79–80 on the polemic Baconianism of the *Dialogus physicus*.

[153]Hobbes, 2012, 2:104. The Latin reads "*Ingenium*, quod usu solo & experientia, sine Methodo, Cultu vel Doctrina accedit hominibus aetate": ibid., 2:105.

view of *ingenium* is one that Bacon could have assented to without any difficulty, and in attributing misplaced ingenuity to those with whom he disagreed, Hobbes had something else in common with his former employer.[154]

Returning to the *Dialogus physicus*, it is now possible to arrive at some better-informed conclusions as to what Hobbes was trying to do in his prefatory epistle. By emphasizing Boyle's ingenuity and the inadequacy of ingenious thinking in pursuit of natural-philosophical knowledge, Hobbes deployed the discourse of ingenuity to mockingly ironic effect, and reasserted the Baconian claim that a version of *experientia literata* on its own would never be enough.[155] Even for the most ingenuous and socially elevated philosophers, there had to be some higher art of logic that enabled the discovery of *scientia*, or demonstrable knowledge. In insisting otherwise, Boyle may well have been industrious, assiduous, committed, and reverentially humble; but he also suggested that he was neither properly educated nor very bright, perhaps fit only for the lowly task of compiling natural histories.[156] Hobbes concluded with the reflection that without an *ars* equivalent to Bacon's *novum organum*, it would be impossible to venture beyond the realm of opinion. That being the case, natural philosophers could not aspire to truth, but only to personal victory. Rather than forming a gentlemanly society of sober-minded, unbending, and impartial students of nature, Boyle and his peers were bound to end up scrambling to display the fruits of their *ingenium* as prominently as possible.

Unfortunately for Hobbes, Bacon had been dead for thirty-five years and could not appreciate his brilliantly provocative deflation of what ingenuity had become. But the *Dialogus physicus* is not only of value as an index of how much philosophical discourse had changed in the decades after Bacon's death: despite the manifest differences between the philosophical logics proposed by Bacon and Hobbes, Hobbes's polemic encapsulates most of what Bacon took to be valuable and threatening about human *ingenium*. Properly regulated, it had a vital role to play in activities of rhetoricians, artists, poets, historians, courtier-politicians, practical mathematicians, and artisans of all sorts. It even had a useful preliminary function in Bacon's proposals for a reformed means of discovering the unknown continents of the natural world. However, unlike his variously humanist forbears, Bacon never viewed the exercise of *ingenium* as an end in itself or believed that it

[154]See, for example, his letters to Mersenne, 7 February 1641, and 30 March 1641: Hobbes, 1994, 1:62, 103.

[155]On Hobbes and the rhetorical uses of humor, see Skinner, 198–211, 391–425.

[156]For the claim about natural histories, see Hobbes, 1661, 3.

had a role to play in logical inquiry. As the goal of Bacon's logic was demonstrative knowledge of the forms of nature, its province was ultimately that of the intellect alone. This was lost on Bacon's readers in the Hartlib circle and the early Royal Society, who enforced a partial comprehension of Bacon's methodological works — long on ingenuity, empiricism, and lists; short on ideas and analysis — that would remain current for centuries.

Having said all that, it remains to think again about the problem with which this essay began, and to offer a view on how exactly Bacon's use of *ingenium* should be translated into present-day English. Even so, and although such a conclusion might seem anticlimactic or woolly headed to some readers, it is unclear that any such translation is either possible or desirable. Renaissance and early modern *ingenium* is so much of its own time that translation virtually guarantees misrepresentation, sometimes of the most radical kind: on no account should *ingenium* be taken to mean "intellect," "mind," "understanding," or "reason." On the more positive side of the ledger, returning to the Latin in which Bacon wrote his philosophical works has reconfigured the Baconian method as commonly understood, and brought its historical significance into far sharper focus. It has also underscored the absolute centrality of attending to the original languages in which sixteenth- and seventeenth-century texts were written and read. In their introduction to volume 6 of the *Oxford Francis Bacon*, Graham Rees and Michael Edwards offer a prudent note on which to end. Describing their practice as translators, they remark that "in the case of polysemic specialist terms for which no modern English word seems to be available, we have often chosen to Anglicize the Latin."[157] It would be a stretch to describe *ingenium* as specialist vocabulary, but its polysemic qualities are not open to question. For the most part, *ingenuity* it is.

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[157]Bacon, 1996–, 6:cxv.

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