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READING VIRGIL'S *GEORGICS* AS A SCIENTIFIC
TEXT: THE EIGHTEENTH-CENTURY DEBATE
BETWEEN JETHRO TULL AND STEPHEN SWITZER

BY FRANS DE BRUYN

Of all the literary works of classical antiquity, Virgil's *Georgics*, a didactic poem on the subject of husbandry written in the years 37–30 B.C., was deemed by eighteenth-century British writers an unparalleled model of literary perfection. John Dryden esteemed the *Georgics* “the divinest part of all [Virgil’s] writings,” and Joseph Addison judged it “the most Compleat, Elaborate, and finisht Piece of all Antiquity.”¹ The poem prompted a vogue of formal imitations (John Philips’s *Cyder* [1708], John Dyer’s *The Fleece* [1757], James Grainger’s *Sugar-Cane* [1764], among others), but more importantly, it lent classical sanction to two defining trends in eighteenth-century poetry: its turn to description and to didacticism. The presence of the georgic was also registered in literary forms far beyond poetry, from travelogues, scientific treatises, and manuals of husbandry, to essays, novels, and conduct books. In an age that professed a *via media* in its ethics, enthusiasms, and allegiances, the georgic proved indispensable as a mode of literary and cultural mediation, reconciling pastoral ease and epic seriousness, sensory appeal and plain instruction, retirement and engagement, cyclical return and historical progress.

Recent literary scholarship has demonstrated the range of cultural work this most protean of literary modes was called upon to perform. We can read profitably of the georgic as the “landscape of labour,” of the “imperial georgic” and the “female georgic,” and of “English georgic and British nationhood.”² The dearest and often contradictory desires of the age, for mastery, for improvement (of one’s mind, soul, or land or enterprise), for connection to place and landscape, for political and social justification, all found expression in the language and idiom of the georgic. A poem ostensibly dedicated to the dissemination of the art of farming resonated in the minds of its eighteenth-century readers with complex symbolic and thematic harmonies. In taking as his subject the self-reliant life of the Roman farmer, Virgil was understood to broach large philosophical ques-

tions, such as the enabling conditions of virtue, the attributes of the good life, and the basis of a sound polity.

Yet a striking and often unremarked feature of the georgic revival in the seventeenth and eighteenth centuries is the debate Virgil's poem occasioned about the scientific or technical merit of the agricultural instructions it conveys. Eighteenth-century readers were well aware of Seneca's critical judgment in the first century A.D. that "Virgil sought . . . not what was nearest to the truth, but what was most appropriate, and aimed, not to teach the farmer, but to please the reader."³ Still, it was widely held that the poet intended his farming advice to serve practical as well as poetic ends. According to a venerable critical tradition, Virgil put pen to papyrus at the request of his patron, Maecenas, as part of a campaign to repair the damage Roman agriculture had suffered during the protracted series of civil conflicts (49–29 B.C.) that presaged the end of the Roman republic. John Martyn, professor of botany at the University of Cambridge from 1732 to 1762, notes in his edition of the *Georgics*, "A great part of the lands in Italy had been divided among the soldiers, who had been too long engaged in the wars, to have a just knowledge of Agriculture. Hence it became necessary that the ancient spirit of Husbandry should be revived among the Romans." To this undertaking Virgil dedicated himself with zeal, producing, in Martyn's view, a precise set of instructions for the farmer. So well did he perform his commission that "it has been found by experience, that most of his rules may be put in practice, even here [in Britain], to advantage."⁴

One of the most passionate exponents of Virgil as a writer of serious scientific and technical pretensions, as a writer, indeed, whose opinions on agriculture merited careful scrutiny in the eighteenth century, was Stephen Switzer, a landscape gardener and nurseryman with an established reputation in the theory and practice of horticulture. Switzer's Virgil anticipated in his outlook the forward-thinking eighteenth-century gentleman: he served the cause of "Improvement in Agriculture" and excelled "in a few Words . . . all that ever wrote before or indeed since him" on the subject.⁵ But just how literally Switzer took the *Georgics* to be the work of an agriculturist did not become apparent until nearly twenty years after he first published these laudatory remarks in 1715. He was moved to revisit the subject by the appearance in the early 1730s of a landmark book on the theory of agriculture by Jethro Tull, a gentleman farmer who had been experimenting for a considerable time with new techniques of planting and tillage. In 1731 Tull published a brief account of his

findings as *The New Horse-Houghing Husbandry*, and two years later he followed up this initial “specimen,” as he called it, with a greatly expanded work, *The Horse-Hoing Husbandry: or, an Essay on the Principles of Tillage and Vegetation*.⁶ In what Switzer took as a calculated provocation, Tull included in his enlarged text an incendiary chapter entitled, “Remarks on the Bad Husbandry, that is so finely Express’d in Virgil’s First Georgic.” Reviewing Virgil’s precepts in the first book of the *Georgics* on ploughing, burning, and tilling land, Tull pronounced them erroneous and pernicious, and he deplored their continuing influence in eighteenth-century England. The time-honored farming practices of his age he dismissed as a benighted “Virgilian” husbandry; and his own new system of cultivation, meanwhile, he pointedly distinguished with the epithet “*Anti-Virgilian*,” a term more polemical than descriptive (*H*, 44). Indeed, Tull’s excursus on Virgil’s agricultural precepts was characterized throughout by an impolitic bluntness and irreverence at the Roman poet’s expense.

Whether or not Tull intended to provoke a debate, a response was not long in coming. Just at the time that *The Horse-Hoing Husbandry* appeared, in June 1733, Switzer was engaged in compiling a collection of reference essays on agricultural and horticultural subjects for a “Society of Husbandmen and Planters.” Entitled *The Practical Husbandman and Planter: or, Observations on the Ancient and Modern Husbandry, Planting, Gardening, &c.* (1733–1734), this compendium was initially promised to the public in a series of twelve monthly installments (later reduced to six). Switzer had already prepared several of the projected numbers when Tull’s attack on Virgil appeared. Seizing the opportunity afforded by his editorship of *The Practical Husbandman*, Switzer used the final two installments of the collection (numbers 5 and 6) as a platform to launch a furious counterattack against Tull. Not long after, Tull responded in kind with his publication of *A Supplement to the Essay on Horse-Hoing Husbandry . . . Wherein All the Objections against that Husbandry, which are come to the Author’s Knowledge are Consider’d and Answer’d* (1736). Switzer and Tull assailed each other on a broad front, ranging far beyond the question of Virgil’s qualifications as an agriculturist. They impugned each other’s knowledge of soil chemistry, plant nutrition, and plant physiology, to say nothing of each other’s patriotism and religious orthodoxy. As Switzer’s biographer in the *Dictionary of National Biography* ruefully concludes, “Hard words were used on both sides.”⁷

Although the textual battleground on which Tull and Switzer waged their polemical war is easily recognizable today as the field of agricultural science, the two antagonists in the dispute, especially Switzer, did not identify it as such. On the contrary, Switzer conducted himself as though he were engaged primarily in a literary controversy that, like other critical disputes of the time, coalesced around a celebrated classical writer whose literary and intellectual achievements assumed a kind of iconic status in the debate. For Tull and Switzer, Virgil was that icon: in the cultural context of the early eighteenth century, an argument about the merits of Virgil was almost inevitably a debate about a great many other issues. Examining their quarrel with some care offers us an opening to historical understanding, for episodes of controversy, as Stephen Shapin and Simon Schaffer argue, give the historian a vantage-point to observe what is problematic about cultural beliefs and practices otherwise taken for granted—an opportunity to “play the stranger,” as they put it, and thereby to call into question that which is regarded as self-evident. The historical actors in a controversy, they note, “frequently play a role analogous to our pretend-stranger: in the course of controversy they attempt to deconstruct the taken-for-granted quality of their antagonists’ preferred beliefs and practices, and they do this by trying to display the artifactual and conventional status of those beliefs and practices.”⁸

In the contention between the two men over Virgil’s legacy as a writer and a husbandman can be witnessed the birth pangs of the new intellectual discipline we today call agricultural science, together with the methodologies, modes of writing, and technical languages proper to it. In the process, Virgil’s cultural authority was gradually, but inexorably, eroded. Tull’s questioning of Virgil’s scientific accuracy and his rejection of Virgil as a literary model for agricultural writers undermined, I will argue, the period’s most powerful critical argument on behalf of his cultural preeminence, namely, his value as a didactic writer. Though in the end Virgil was to preserve intact his poetic reputation, his cultural status nonetheless diminished, as poetry was forced more and more to relinquish its cognitive claims and to retreat, albeit with Virgil in the rearguard all the way, into a realm of the imagination and the aesthetic.

The controversy between Tull and Switzer, which continued to reverberate up to the nineteenth century, discloses with unusual clarity the means, motives, and rationale for the period’s elevation of Virgil to the rank of philosopher and scientist. In this essay I should

like to assess the significance of this seemingly improbable characterization and of Tull's singular rejection of a powerful cultural consensus. My discussion centers on two related inquiries. The first is how and why the *Georgics* could be read as a scientific text. The second, which focuses more particularly on Tull and Switzer, explores the modes of reading and interpretation they applied to the poem. In pursuing these inquiries we confront the more fundamental question of why these agricultural texts of Tull and Switzer should claim the attention of the literary historian, a point that I address in the concluding section of this paper.

I. THE *GEORGICS* AS EIGHTEENTH-CENTURY SCIENCE

To set the intellectual stage, we first need to consider the habits of thought that permitted eighteenth-century readers to apprehend the *Georgics* as a work of what we would today classify as applied science. Notwithstanding the fact that Virgil's treatment of the various branches of agriculture was, of necessity, concise and abbreviated, his precepts were understood to be much more than scattered bits of picturesque advice. On the contrary, they were thought to be grounded in a systematic view of the subject. Even Tull read the first book of the *Georgics* as an ostensibly methodical exposition of agricultural practice, a practice he deemed disastrously wrong because it was based on erroneous and contradictory underlying principles. Virgil's time-honored system is summarized in the following passage by Francis Forbes, a late eighteenth-century disciple of Tull:

In the Old Husbandry, the tillage, *viz.* the ploughing and harrowing, is done first: the ploughing, to open the land; and the harrowing, to make it fine, and get out the weeds. Dung, or other manure, is then spread upon the land, which is ploughed-in; and then the seed, as of wheat, or other corn, is sown by hand, broad-cast, which is covered by the plough or harrow. Nothing more is usually done till harvest, except weeding, when the weeds are grown up pretty large. Dung promotes the growth of weeds; and though many of the large weeds are pulled up, the others remain, run to seed, and . . . very much impoverish the land.⁹

Two further practices not mentioned here by Forbes were generally associated with this Virgilian husbandry: the burning of stubble after crops had been taken off the field and the practice of alternating the planting and fallowing of land.

Against all this, Tull advocated a radically different system of cultivation, based on his observation of viticulture in France, the main features of which are drill planting (sowing seeds in widely spaced rows), intensive cultivation of the soil between the rows of plants, continuous farming of the land (no fallow periods), and a minimal use of manure. Farming in this way permitted the use of machines to plant the seeds (Tull's new mechanical seed drill) and to control weeds (the horse hoe or cultivator); it required much less seed for a given patch of ground; and it paved the way for more intensive, more productive, and more efficient agriculture. Tull's methods are a forerunner of modern mechanized farming. To justify this radical approach, he devised an elaborate new hypothesis about the way in which plants absorb nutrients. Posterity has shown Tull's own theories to be wrong in many respects, but what is significant in the present context is his conviction that the various practices he advocates are consistent with one another, a correspondence grounded in a coherent underlying theory. He claims in the preface to his first book that his adapted "Vineyard Culture" is "founded upon Principles, which if they be true . . . they must be, as all Truth is, Eternal." By contrast, the confused medley of practices recommended by the ancients suggests to Tull that "they treated of an Art, wherein they had formed no manner of Principles" (N, iv–v).

The eighteenth-century commitment to a scientific reading of Virgil is revealingly illustrated in William Benson's prefatory comments to his translation of the second book of the *Georgics*, which appeared in 1724:

The Precepts of Husbandry, as deliver'd in the *Georgics*, are so various, that they are adapted to every Country, in one respect or other. . . . I never yet saw any Country of *Europe* which *Virgil's* Husbandry was not fit for. I am certain the Husbandry of *England* in general is *Virgilian*. This is shewn by the Paring and Burning the Surface, by the Manner of Watering Meadows, by the dry Fences, by Rastering or Cross-Ploughing, and innumerable other Instances which could be produced. In those Parts of *England* which the *Romans* principally inhabited, all along the *Southern Coast*, *Latin Words* remain to this Hour among Shepherds, and Ploughmen in their rustic Affairs, and what will seem more strange at first Sight to affirm, tho' in Fact it be really true, there is more of *Virgil's* Husbandry put in Practice in *England* at this Instant than in *Italy* itself.¹⁰

Benson makes a broad claim for the applicability of Virgil's "Precepts of Husbandry," arguing that the poet has achieved a level of general-

ity and comprehensiveness sufficient to make his observations useful throughout Europe, with all its variety of topographical and climatic conditions. His remarks on the technical merits of the *Georgics* are noteworthy, for they were to become a flashpoint in the contention between Switzer and Tull.

Benson's concise enumeration of Virgilian principles ("Paring and Burning," "Watering Meadows," "Rastering") suggests that he approached the *Georgics* as a compendium of axioms or maxims. "By *Axioms*, call'd also *Maxims*," notes Ephraim Chambers's *Cyclopaedia* (1728), "are understood all common Notions of the Mind, whose evidence is so clear and forcible, that a Man cannot deny them without renouncing common Sense and natural Reason."¹¹ According to the *OED*, the term "maxim" refers especially to propositions "in aphoristic or sententious form" that express "ostensibly . . . some general truth of science or of experience." This is how Adam Dickson, later in the century, understood Virgil's poem, especially those verses in which the poet gives memorable, pithy expression to ideas widely diffused in the writings of other ancient agriculturists. These "maxims of the Ancients" are in fact the subject of an extended analysis in Dickson's *Husbandry of the Ancients* (1788), a treatise in which he collected the agricultural knowledge of the Romans and systematized it in conformity with eighteenth-century scientific classifications.¹²

The maxim is understood today primarily as a form of proverbial or distilled wisdom, and in this sense it is no longer seen to play much of a role in the formation of scientific thought. A broader understanding of the term prevailed, however, in the eighteenth century, when the maxim was regarded as an important building block in the edifice of scientific knowledge. In the previous century Francis Bacon had rejected the scholastic conception of maxims or axioms as general propositions presumed to be self-evident or innate and, as such, the foundation for deduction and dialectical argument. In place of this Bacon insisted that reliable axioms must be arrived at through an inductive process of well-founded generalization. From the "particulars" of experience, one forms "lesser axioms" which "differ but slightly from bare experience," and from these one rises by a rigorous process of comparison, rejection, and exclusion to more and more general axioms.¹³ Experiment and observation are two key sources of the particulars that form the basis for more general axioms, but another important source of facts and raw materials, Bacon believes, is preexisting knowledge. This knowledge has not been adequately harnessed to the inductive method because it has remained hitherto inaccessible and unsystematized or

because intellectual and social prejudice, as in the case of mechanical arts, has deemed it “sordid” and beneath notice. Yet for Bacon “[t]he use of history mechanical,” which includes the methods of agriculture, “is of all others the most radical and fundamental towards natural philosophy . . . for it will give a more true and real illumination concerning causes and axioms than is hitherto attained.”¹⁴

Dickson appeals to this Baconian model in his reading of Virgil and the other ancients. Despite the fact that the Roman agricultural texts were often written in generalized terms and lack specifics of data and experimental accounts, Dickson insists we can infer that their generalizations rest on a solid empirical basis because we know how conspicuously successful the Romans were in so many other arts of civilization: “[A]mong the Romans, who held agriculture in high estimation, and whose nobles and senators studied and practised it, the maxims of the ancients were respected with veneration: They were considered as founded upon the experience and observations of men, who had given the strongest evidence of capacity and knowledge in governing a state, forming laws, and commanding armies.”¹⁵ He goes so far as to argue that the experimental work on which the maxims of Virgil and others rest is superior to anything accomplished by the moderns:

If it is considered, that husbandry, like other branches of natural knowledge, is intirely founded on the history of facts, that the rules of it must be drawn from the experience of ages, conveyed down in authentic accounts; and that such a series of observations and experiments, has not occupied the attention of modern Europe for much more than an hundred years; whereas this science was an object of careful inquiry among the ancients, and the subject of innumerable books, from the days of Hesiod . . . down to the end of the fifth century of our aera . . . we must confess, that the remains of their writings on the subject, must be highly interesting and instructive.¹⁶

In *The Practical Husbandman*, Switzer vindicates Virgil in similar terms, praising him as a writer “whose Husbandry has stood the Test of so many Ages.”¹⁷

II. SCIENTIFIC KNOWLEDGE AS “EXPERIENCE”

The arguments Dickson advances here on behalf of the ancients are by no means unproblematic, as eighteenth-century agriculturists themselves appear to have recognized. The question is what exactly

constitutes the valuable experiences or experiments from which the maxims of the Romans were derived. That the ancients valued experimentation is attested, according to Dickson, in the texts of the Roman agricultural writers Varro and Columella. He cites a passage in Varro's *De Re Rustica* (giving his own English rendering): "'Nature,' writes Varro, 'has pointed out to us two paths which lead to the knowledge of agriculture, viz. experience and imitation. The ancient husbandmen, by making experiments, have established many maxims. Their posterity, for the most part, imitate them; we ought to do both, imitate others and make experiments ourselves, not directed by chance, but reason.'"¹⁸

The historian Peter Dear argues that the Royal Society in its early days defined an experience as a report of a discrete event, that is, of one specific instance showing how an aspect of the external world behaves. Dear notes, "the veracity of the report clearly depended on the original experience of a specified person on a particular occasion."¹⁹ Dickson appears to have this sense of the word "experience" in mind when he commends Columella's advice that the farmer should use his most fertile plots of land to make new "trials" or experiments (so as to incur the least possible risk to his livelihood and to maximize his chances of success).²⁰ Such trials are clearly understood to be particular attempts, observed by an individual in a particular time and place, and the observer is deemed to play a crucial role.

But the term "experience" was also used in a looser sense to mean the knowledge or skill acquired over time through the direct observation of or participation in events, as when eighteenth-century writers asserted their "long experience" in matters agricultural.²¹ Switzer uses the term in this latter sense when he defends Virgil's views about the proper mode of tilling "poor" (sandy) soil against Tull's objections (*P*, 5:xi). Whereas Virgil advises a light ploughing late in the year, Tull insists on frequent ploughing in early spring. Switzer declares Tull "egregiously mistaken" on this score, pointing to the current practice of farmers in western England, who know "from no less Mistresses than long Observation and Experience themselves, that if they were to summer fallow, thin, light Lands, the Sun . . . would dry up those few Juices that are in such Lands." Here "Experience" refers to knowledge acquired through practice rather than experiment, but such knowledge, too, was deemed capable of yielding up maxims. The experience of these farmers, Switzer affirms, has "grown to a Maxim amongst them, and a Maxim of a very long standing" (*P*, 5:xii–xiii).

Tull, for his part, uses the word “experience” in both the general and specific senses here described. In vindication of his drill husbandry, for instance, he appeals to his “thirty Years Experience,” which shows “that St. Foin [sainfoin, a forage herb] thus planted, brings better Crops, and lasteth longer than [broadcast] sown St. Foin” (*N*, xiv). He contends that Virgil, by contrast, practiced agriculture first-hand only in his tender years as a “Plow-Boy,” turning his attention as an adult to the “Farrier’s Trade” and then to the calling of poet. Tull concludes that the poet must therefore have formed his knowledge of the art from books, since children are “very incapable of making useful Observations upon arable Husbandry; so that Virgil could have little or no Experience in it of his own.” He must have relied upon “Authors who lived when Agriculture was in its most imperfect State” (*HS*, 220). At the same time Tull insists that his own “long Experience” is not simply a lifelong rehearsal of received practice but the product of experiment, and he again makes his point by contrasting himself with Virgil: “Virgil was *born* a Poet . . . but neither he, nor any other, I believe, was ever *born* a Farmer: Talents in Husbandry must be acquired by long Experience and diligent Observations thereon; and he that will make any Improvements therein, must sometimes deviate from the old beaten Road of *Patrios Cultusque Habitusque Locorum*, by Way of Trial” (*HS*, 220).

The Latin tag Tull cites here is taken from *Georgics* 1.52, a passage in which Virgil notes that each locality has traditional methods of cultivation peculiar to it. For Tull this is not enough: traditions that evolve from cumulative experience must be challenged or confirmed by trials, that is, by experiments understood to be “singular, contrived events.”²² In his view, it is only from such events (which he records in *The Horse-Hoing Husbandry* in some detail) that general statements about agricultural methods can be generated. He declares in the opening of his treatise, “Every Man is best satisfy’d with Experiments made by himself; therefore I advise him who intends to practise, that he would repeat the Trials of all mine before he relies upon them . . . nor doubt I but that, if he follows the same *Process*, his will succeed as mine did, and he may very likely draw many more *Inferences* from them, than I have. . . . The Matters of *Fact* I have related, are not like some Stories told by *Travellers*, hard to be disproved if they are wrong” (*H*, iii). The rhetorical means that Tull employs here to secure belief in the factuality of the claims he makes in his book are in the tradition of those pioneered by Robert Boyle.²³ Tull claims his experimental facts have been sought out to address an overall theory;

they have not simply arisen from the kind of commonplace experience that underlies Virgil's statements. The latter order of experience, as Dear points out, "merely supplies raw information about phenomena that has not been deliberately solicited to interrogate a theory or interpretation."²⁴

It is one thing to assert, as Tull does, that his ideas have been subjected to rigorous experimental testing, but quite another to convince others that this is indeed the case. Careful thinkers in the eighteenth century were aware how little was known with any confidence about subjects such as chemistry, soil composition, and plant physiology. In this atmosphere of theoretical uncertainty, appeals to ancient authorities retained a measure of intellectual weight by default, and writers such as Switzer fell back on older habits of thought. Without actually reverting to scholastic dialectical reasoning, they mined Virgil for authoritative statements about agriculture. We have seen that these Virgilian statements were themselves asserted to be the products of empirical investigation, but such assertions could not be proved, and the citation of Virgil continued to resemble the scholastic procedure of establishing premises by "attaching the name of an authority to a statement of fact," thereby rendering that fact "probable."²⁵ In consequence, although eighteenth-century agricultural writers took pains to show that their appeals to authority had a different basis from the modes of argumentation in earlier centuries, the effective outcome was in some ways very similar. The probability and credibility of statements depended on the authoritativeness of the source, and that, in turn, inevitably became bound up with matters of social and cultural prestige. Dear remarks that for medieval and Renaissance natural philosophers, "[e]xperience and social accreditation were never sharply distinguished"; the same remained broadly true for eighteenth-century British agriculturists.²⁶

In the case of Virgil, that link between experience and social accreditation played itself out in a number of related ways. First, readers transferred the literary prestige he enjoyed as one of the preeminent poets in the Western literary tradition to his factual statements, thereby underwriting their veracity. Second, agricultural writers borrowed this attributed veracity for themselves, establishing a degree of authority for their own often controverted experiences and theories by citing Virgil in support of them. Third, the procedure of social accreditation was applied to the Roman rustic writers themselves. To reiterate Dickson's argument, their testimony regard-

ing their agricultural experience was deemed worthy of trust because they were such able warriors, leaders, and lawmakers. Their ethos as Roman gentlemen, as Romans, indeed, who were perceived to be remarkably like their eighteenth-century counterparts, warranted the veracity of their agricultural observations.

Finally, the need to project a trustworthy ethos proved equally important for the modern experimenter, since the authority of the experimenter's observations depended on the credibility of the observer present at the discrete events that formed the basis for his claims about the natural world. Here the social and cultural identity of the observer returns as a matter of crucial importance for the public reception of the experimenter's conclusions. Paradoxically, references to Virgil served an important function in establishing this ethos, even if, as in the case of Tull, Virgil was invoked only in order to be refuted. The very act of demolishing Virgil's opinions demonstrates Tull's mastery of the classics and indicates to the reader that he is an educated member of the gentry. His scientific observations are to be taken as trustworthy by virtue of his social standing.²⁷ This troubled connection between experience and social accreditation was central to much of the dispute between Tull and Switzer. The need to establish rhetorically one's experiential ethos, to press one's credentials in print, accounts for the bitterness and the *ad hominem* character of the exchanges between the two writers.

III. READING THE *GEORGICS* AS A SCIENTIFIC TREATISE

Turning to the second question in my inquiry, I should like to examine briefly the strategies of exegesis Tull and Switzer employ in reading key passages of the *Georgics*. Tull approaches written intellectual authority very much in the spirit of the seventeenth-century polemicists for the new science, who contrasted their new methods with the unquestioning deference to authority they perceived in scholastic natural philosophy. He voices regret at having to differ in print with other "Learned Writers," but he states forcefully his reasons for so doing:

No *Canon* having limited what we shall *think* in *Agriculture*, nor condemned any of its *Tenets* for *Heresy*, every Man is therein a *Free-Thinker*, and must think according to the Dictates of his own Reason, whether he *will* or *no*. And such Freedom is given now-a-days in Speculations in *Natural Philosophy*, that 'tis common to see People even in print maintain that there are *Antipodes*, that the Earth moves

around the Sun, and that he doth not set in the Sea, without being censur'd for these and many other formerly *Heterodox* Opinions. And any one may now upon *solid* Arguments contradict *Aristotle* himself publickly any where, except in the *Schools*. (*H*, ii)

In this spirit Tull subjects Virgil to the same skeptical scrutiny the previous century had trained upon Aristotle. His attack focuses not only on Virgil's precepts about tillage, but also on those passages of the *Georgics* that affirm such seemingly occult doctrines as spontaneous generation (abiogenesis) or that perpetuate superstitions, such as the belief that certain days and times are more astrologically auspicious than others for undertaking agricultural labors.

Despite their opposing views on Virgil's scientific reliability, Tull and Switzer both employ the time-honored philosophical mode of the commentary when they write about the poet's views on tillage. The formal structure of the scholastic commentary, which follows the organization of the textual authority being commented on and draws its *quaestiones* or problems from that recognized text, was a key mode of expression in medieval philosophy and reflects in its generic structure the intellectual habits of medieval thought.²⁸ It is therefore noteworthy that Tull's detailed refutation of Virgil in his "Remarks on the Bad Husbandry, that is so finely Express'd in Virgil's First Georgic" displays many of the features of the commentary. His argument follows the order of the poet's precepts carefully and subjects key Latin phrases to close analysis. Similarly, in responding to Tull, Switzer comments extensively on the same passages and contests in detail Tull's construal of Virgil's Latin. He declares, "[W]e can't pass over [Tull's] mistaken and detractive Misinterpretations [of] . . . *Virgil's* first Georgick, which 'tis certain, he either does not understand, or has much misrepresented" (*P*, 5:viii). Though the two antagonists could easily have debated their differences of opinion without reference to Virgil at all, the fact that Tull, in particular, felt compelled to refer his ideas back to Virgil, even by way of negation, is symptomatic. Structures of intellectual authority do not wither away overnight, even after they have been declared overthrown, and Tull's reversion to an outmoded philosophical form reflects this reality.²⁹

A prime illustration of the procedure adopted by the two writers is their debate over Virgil's counsel about burning fields, "*saepe etiam steriles incendere profuit agros / atque levem stipulam crepitantibus urere flammis,*" which Tull renders, in Benson's translation, "It profits

oft to Fire the Fruitless Ground, / And thirsty Stubble crackling all around.”³⁰ Virgil writes here of setting fire to “barren fields,” but Tull makes sense of the passage by reading against its manifest meaning, assuring his readers that Virgil actually means “Rich Land” in this context, since “Barren Land had no Stubble on it to be burnt” (*H*, 41). He supports this radical emendation with extratextual, empirical evidence, citing his own observation of farming practices near Rome while on his grand tour as a youth. He maintains that he traveled “the whole length of [Italy] by Land . . . and in above two Years time, I never could find or be informed of Paring or Burning” in areas with comparatively infertile soil (*HS*, 221). Tull engages here in some revealing contortions of argument. Though his primary purpose is to discredit Virgil, he cannot resist enlisting the poet in support of his own opinion by insisting that Virgil means the opposite of what he appears to say. Virgil thus becomes an authority in an argument designed to call that very authority into question. And Tull reads back into Virgil his own views on the subject, remarking approvingly that burning stubble on fertile lands eases the passage of the plough before the next planting.³¹ His reading of Virgil confirms a central tenet of his own theory, that land must be well ploughed to unlock its fertility.

In his response Switzer also seeks to reconcile Virgil’s advice with Switzer’s own agricultural knowledge, finding in the poet’s verses a mirror of his own opinions. He maintains that the kinds of lands Virgil deems fit for burning are waterlogged soils or those “which owe their Sterility to the too close Contexture of their Parts (as all barren Clays do)” (*P*, 5:xvi). These are conditions more characteristic of Britain than Italy—and ones with which Switzer was obviously familiar. But rather than merely reading into Virgil those practices he knows by experience to be productive, he also looks for textual consistency in the passage under examination, adopting techniques of close contextual reading to tease out Virgil’s meaning. Thus, he argues that Virgil cannot have in mind “the Burning of the Turf of that Sort of barren Land, which owes its Sterility to its Shallowness, or Looseness of Parts” because the poet has already discussed those soil conditions in an earlier passage (*G*, 1.67–70) and would not therefore revisit the subject (*P*, 5:xv–xvi).

Switzer then attempts to clinch his argument by reading the controverted lines about burning stubble (*G*, 1.84–85) in the light of the eight verses that follow. These verses (*G*, 1.86–93) propose four widely varying conjectural reasons for the efficacy of the practice of burning. Benson’s translation reads:

Whether from thence by Nature's Secret Laws,
 Fresh Nourishment the Earth, and Vigour draws;
 Or that the latent Vice is purg'd by Heat,
 And the redundant Humours waste in Sweat:
 Or that the Flames unusual Tracks explore,
 Relax the Grit, and open ev'ry Pore;
 Whence genial Moisture hastens through the Earth,
 Slides to the Root, and chears the tender Birth:
 Or that the Heat the hollow Glebe constrains,
 Braces each Nerve, and knits the gaping Veins;
 Lest piercing Wet, or the swift Power of Day
 More fierce; or scorching *Boreas* urge his Way.³²

Tull had borne down heavily on precisely this passage in the text. "The Reasons *Virgil* offers for . . . Burning this barren Land," he writes indignantly, "are such, as abstracted from the Poetry, will appear to be utterly unbecoming the Character of a Philosopher, who pretends *Rerum cognoscere Causas*. His are such, that tho' contrary to one another, and Jarring among themselves, are all of them False" (*H*, 41). Switzer responded by denouncing Tull's "Arrogance" and affirming that there is "not the least Incoherence amongst [Virgil's reasons for burning], if apply'd to that Species or Kind of Soil, which owes its Sterility to the too close Contexture of its Parts" (*P*, 5:xviii–xix). Switzer here applies criteria of textual unity and internal coherence as his tests of Virgil's accuracy. But in order to preserve coherence, Switzer finds himself compelled to qualify his argument with a crucial limiting "if" that has the effect, ultimately, of undermining his vindication of the poet.

Despite his vigorous defense, Switzer must have realized that his opponent's objection to Virgil's muddled reasoning was a palpable hit. In citing the phrase "*Rerum cognoscere Causas*" [to know the causes of things], Tull assailed what eighteenth-century readers regarded as the very foundation of Virgil's philosophical credentials. In the *Georgics*, these words appear in the lengthy paean to the felicity of rural life and retirement at the end of the second book, introduced with an apostrophe to the "happy husbandmen" ("*O fortunatos . . . agricolas*" [*G*, 2.458]). This celebrated passage appealed powerfully to the eighteenth-century imagination, and the very fact of that emotional (and ideological) investment makes Tull's dismissal of Virgil all the more telling.³³ He compels the poet to bear witness against himself by citing the very verse in which Virgil prays for wisdom: "*Felix, qui potuit rerum cognoscere causas*" [Blessed is he who has been able to win knowledge of the causes of things] (*G*,

2.490). With these words Virgil was understood to have claimed for himself the weighty mantle of the philosopher, but Tull's point is that the poet's pretensions to knowledge are a sham. Whatever value eighteenth-century readers may place on the *Georgics*, the author of the poem is not himself to be numbered among the "blessed" for whom he utters his hieratic words.

IV. TO KNOW THE CAUSES OF THINGS:
"RERUM COGNOSCERE CAUSAS"

It is worth pausing for a moment to reflect on the Virgilian quest for knowledge as the basis for the happiness of retired country life. Maren-Sofie Røstvig has shown that the ideal of retirement inherited by Renaissance Europe from classical times underwent a significant metamorphosis in the seventeenth and eighteenth centuries. An initial Stoic emphasis on the self-sufficiency of rural retirement and its spiritual rewards, supplemented by a neo-Epicurean view of the superior pleasures of country life over those of court and city, yielded increasingly in the early eighteenth century to a conviction (influenced by physicotheology) that the pursuit of scientific knowledge is the way to wisdom, a pursuit perfectly adapted to life in the country. Røstvig remarks with some bemusement on "the almost complete transformation of the classical *beatus vir* [happy man] into a scientist fully equipped with telescope and microscope."³⁴

A passage in Philips's formal georgic, *Cyder*, confirms that Røstvig is scarcely exaggerating. Philips recommends to his reader a retirement of strenuous intellectual application:

Then sedulously think
To meliorate thy Stock; no Way, or Rule
Be unassay'd; prevent the Morning Star
Assiduous, nor with the Western Sun
Surcease to work; lo! thoughtful of thy Gain,
Not of my Own, I all the live-long Day
Consume in Meditation deep, recluse
From human Converse, nor, at shut of Eve,
Enjoy Repose; but oft at Midnight Lamp
Ply my brain-racking Studies, if by chance
Thee I may counsel right; and oft this Care
Disturbs me slumbring, Wilt thou then repine
To labour for thy Self?³⁵

Poetic labors scarcely figure in this account of the challenges confronting the modern writer who aspires to compose a genuinely

useful georgic. The bookish work of the georgic poet, often understood in the tradition of georgic writing as a thematic analogue to the labors of the husbandman, is no longer simply the writer's struggle for language and an answerable style but the scientist's search for accurate knowledge, so that the poet may "counsel right" in his verses. Whereas John Milton, whose poetic style Philips emulates, is visited in his sleep by his heavenly muse, who "dictates to me slumb'ring," Philips is disturbed in his slumbers by "Care," by his sense of obligation to his readers, who merit accurate, relevant information.³⁶

The verses immediately preceding the passage just cited indicate that Philips is served not by one but by two distinct muses. His poetic inspiration derives from Virgil and Milton, but his precepts and instructions come from an altogether different quarter. In the context of our present discussion this second muse, "sage Experience," merits closer scrutiny. Philips advises the reader, in a lengthy paragraph, to

Let sage Experience teach thee all the Arts
 Of Grafting, and In-Eyeing; when to lop
 The flowing Branches; what Trees answer best
 From Root or Kernel: She will the best Hours
 Of Harvest and Seed-Time declare

 She found the polish'd Glass, whose small Convex
 Enlarges to ten Millions of Degrees
 The Mite, invisible else, of Nature's Hand
 Least Animal; and shews, what Laws of Life
 The Cheese-Inhabitants observe, and how
 Fabrick their Mansions in the harden'd Milk,
 Wonderful Artists! But the hidden Ways
 Of Nature wouldst thou know? How first she frames
 All things in Miniature? Thy Specular Orb
 Apply to well-dissected Kernels; lo!
 Strange Forms arise, in each a little Plant
 Unfolds its Boughs; observe the slender Threads
 Of first-beginning Trees, their Roots, their Leaves,
 In narrow Seeds describ'd; Thou'lt wond'ring say,
 An inmate Orchat [*sic*] ev'ry Apple boasts.
 Thus All things by Experience are display'd,
 And most improv'd.³⁷

The patroness "Experience," whose guidance Philips here recommends, is unmistakably a personification of the intellectual and

methodological ideals of the Royal Society. She embodies that special conception of “experience,” meaning experimentation and the observation of discrete events, to which eighteenth-century science was committed, and it is to her Philips turns when he seeks to know “the hidden Ways / Of Nature.” The Virgilian quest to know the causes of things is to be pursued down the lens of a microscope.

But Philips is discreet in his didactic turn away from Virgil. Unlike Tull, he avoids voicing any overt skepticism about Virgil’s precepts. Nonetheless, as Juan Christian Pellicer notes, he unobtrusively brings “the science of the *Georgics* up to date.”³⁸ A case in point is his discussion of grafting, a subject on which Virgil’s poetic enthusiasm was widely conceded to have outstripped the possible. Virgil recommends grafts (insertions of shoots from one tree onto the stock of another) that modern science deems impossible, including grafts between such different species of trees as beech and chestnut, ash and pear, and elm and oak (*G*, 2.71–72). Yet, the scope of possible grafts between species is sufficiently uncertain (unlikely pairings may work in some instances) that categorical pronouncements are not always appropriate. Philips exploits this uncertainty in order to echo Virgil’s pronouncements on the subject, thereby paying homage to his poetic source, while simultaneously distancing himself from his predecessor by assuming an attitude, as Pellicer puts it, of amused agnosticism.³⁹

Some think, the *Quince* and *Apple* wou’d combine
In happy Union; Others fitter deem
The *Sloe*-Stem bearing *Sylvan* Plums austere.
Who knows but both may thrive? Howe’er, what loss
To try the Pow’rs of Both, and search how far
Two different Natures may concur to mix
In close Embraces, and strange Offspring bear?⁴⁰

Philips skillfully exploits the ironic distance between his poetic imitation and its source (a distance often expressed by eighteenth-century poetic imitators in terms of burlesque or mock-heroic) in order to signal to the reader that he recognizes the limitations of Virgil’s scientific knowledge, but without grievously undercutting Virgil’s cultural authority or the intellectual rationale of the georgic poetic form.

Whereas Philips saves appearances by diplomatically redefining how one comes to know “the hidden Ways / Of Nature,” Tull is openly scornful of Virgil’s scientific pretensions. He dismisses as preposterous any claim that a writer who offers four mutually contradictory

explanations for a phenomenon should nonetheless be revered as a philosopher who seeks to understand causes. At best he is engaged in frivolous conjecture. Ironically, Tull himself was overfond of theorizing, and although his theory has the virtue of consistency, it also has some crippling deficiencies. In the first instance, it is reductive. His radical views on how crops should be planted and cultivated rest on a precariously narrow theoretical foundation, and his own claim to know the causes of things was consequently open to question. Yet it is symptomatic that Switzer fails to exploit this vulnerability effectively in his responses to Tull, focusing instead on Tull's polemic against Virgil.

To outline briefly Tull's theory, he entertains a radically simple hypothesis about plant nutrition: earth is the exclusive food of plants, not water, air, or any other element. This single hypothesis becomes the basis for all that follows. Plants absorb the essential particles of soil through their roots, which Tull regards, on analogy with the digestive tracts of animals, as intestines turned inside-out. The surfaces of a plant's roots, he explains, are covered with "Lacteal Mouths" (*H*, 35), through which food is conveyed into the plant. The corollary to this fundamental principle is that any procedure undertaken to pulverize the soil and break it down into smaller particles, making them easier for plants to absorb, will improve growth and crop yields. Frequent ploughing and inter-row hoeing are therefore central to Tull's system. He insists that this comminution of the soil eliminates the need for crop rotations (planting different successive crops in a field in a fixed sequence) and for fallowing (leaving land unsown for a season), two techniques known to control weeds and increase fertility. He also reasons that the only purpose served by manure is to further divide the soil by fermentation: "[I]ts use is not to nourish, but to dissolve, *i.e.* Divide the Terrestrial Matter" (*H*, 18). It was known by experience, however, that manuring promotes the growth of weeds, so Tull concludes it is better, on balance, to avoid using manure altogether.

Tull is convinced, moreover, that on the question of burning stubble his theory explains what Virgil so spectacularly failed to understand: "From observing the Effect of these impure Ashes, [Virgil] might have discover'd the Cause he so unfortunately Aims at; for it can be no other than, the Cinereal Salts being spread upon the unburnt Earth that is left, Ferment therewith, and reduc[e] it into an almost infinite Number of Parts." But this is an injurious process: "[I]f we would compute the Loss we sustain in Waste and Diminution of the Staple of our Thin Land in Burning it, we should find these

Ashes, a very Dear sort of Compost" (*H*, 42). Thorough ploughing does far less damage than burning and achieves the same result of dividing the soil and providing nourishment to plants.

Our present-day knowledge of the principles of plant nutrition and metabolism makes it easy for us to assess Tull's theoretical views. Clearly, such confidence was not available to Switzer. Even so, one wonders why he did not make some of Tull's truly radical views more central to his refutation of *The Horse-Hoing Husbandry*. Why were such contentious claims as Tull's insistence that a tract of land can be planted with the same crop year after year or his dismissal of the value of manuring not the central focus of debate for Switzer? Switzer does address these two assertions belatedly, in an "Advertisement" prefaced to the second volume of the collected version of *The Practical Husbandman*, but his arguments there are evidently an afterthought, "a Supply," as he himself states, "of whatever appeared, to us, to be defective in the Course of the Papers which followed."⁴¹ In the initial published version of *The Practical Husbandman* (in particular, the prefaces to numbers 5 and 6, written in the heat of the quarrel), the main thrust of Switzer's contention with Tull is persistently mediated through Virgil and other ancient rustic writers. As a result, what to us would seem the truly crucial issues of debate are curiously deflected from the center of contention to the periphery, and Virgil assumes an unwonted centrality.

V. POETRY VERSUS PHILOSOPHY, VERSE VERSUS PROSE

Still, the aim of this analysis is to ask why the debate between Tull and Switzer took the form it did rather than to prescribe how it ought to have unfolded. If we step back from the minutiae of the quarrel (in which the contention over Virgil's precepts on burning is but one representative instance of many), a larger underlying question comes into view, that of the poet's veracity as a writer. This question is, in turn, linked to issues of genre and style. What kinds of writing are most appropriate for conveying truth? We have seen that Tull broaches the question of veracity when he castigates Virgil for claiming *rerum cognoscere causas*. He returns to the question several pages later in his text when he cites the poet's counsel about the days of the lunar cycle, those that are auspicious for labor (the seventeenth is a good day for planting vines) and those that are foreboding ("the Fifth be sure to shun") (*G*, 1.276–86). Tull dismisses this astrological advice with characteristic forcefulness:

Is this what the late Commentator in his Preface calls, An Appeal to Truth and Nature throughout all Ages of Mankind? Must vain and idle Superstition be thought Truth and Natural, because 'tis *Old*, though we know it to be False, and consequently against Nature? I am sure 'tis far from shewing, that the Foundation of the whole *Georgic* is Truth; unless he left out this, and most of all the rest. (*H*, 43)

The “late Commentator” to whom Tull here refers is Benson, who claimed in 1724 that the *Georgics* is a greater poem than even the *Aeneid*, despite the superior display of imaginative power and narrative skill in the latter poem:

[The *Georgics*] has the Advantage of Nature or Truth, over Invention or Fable, which is no inconsiderable Circumstance; for the Mind of Man is so form'd, that where Truth appears in its native Charms, it never fails of pleasing. If we weigh the Extensiveness of these Subjects, and the Utility resulting from them, what Comparison can be made betwixt the most necessary Science to the whole Species of Mankind, and a Compliment to a Prince, or One People at most? Then as to the Arts of Poetry, how much greater Ability is required to produce simple Nature in all her Beauty, than to range the wide Fields of Imagination to furnish out an entertaining Amusement! 'Tis true, that Fiction well laid, and confin'd to the Service of Virtue, is no easy Task; but an Appeal to Truth and Nature throughout all Ages of Mankind, was the most daring Enterprize that could be undertook: 'Tis upon the latter that *Virgil* laid the Foundations of his Immortality.⁴²

For Tull, these extravagant claims and the attitude of cultural deference they bespeak were simply too much. Against Benson's assertion that every page of the *Georgics* affords the reader numerous “useful Truths,” Tull retorts that he has been hard-pressed to find a single “new useful Truth” in the entire poem (*H*, 43).⁴³ He explains what he means by “truth” in a somewhat cryptic footnote: “The natural Habit of Truth is a plain Dress: yet not suddenly found, being the Daughter of Time, therefore the Moderns have the Advantage of the Ancients” (*H*, 43 n. 3). The “Habit” or “Dress” Tull has in mind is the words that clothe the author's thoughts. The analogy that language is like clothing covering a body was, of course, widely accepted in the eighteenth century. Pope's *Essay on Criticism* is perhaps the best-known statement of this relationship:

Expression is the *Dress* of *Thought*, and still
Appears more *decent*, as more *suitable*;
A vile Conceit in pompous Words exprest,

Is like a Clown in regal Purple drest;
For different *Styles* with different *Subjects* sort
As several Garbs with Country, Town, and Court.⁴⁴

A key critical conception that informs these couplets is decorum or appropriateness of style and subject matter, an idea grounded in social practice, as Pope's last two verses indicate. Tull applies the same critical principle to books of agriculture. Just as a country rustic would be out of place in royal robes, so too, "fine Language will not fill a Farmer's Barn; neither does Truth need any Embellishments of Art" (*H*, i). In recommending that truth be clothed plainly, he propounds, in effect, a theory of decorum specific to scientific writing.

For Tull, however, a violation of decorum is more than simply the verbal equivalent of a social solecism. A peasant in courtly dress may cut a ridiculous appearance, but, more importantly, such garb would be an encumbrance to him, a danger even, in his work. Similarly, bad counsel clothed in poetic eloquence may foster destructive practices and impede the spread of accurate knowledge. Such is the case with Virgil's advice about burning barren fields. The poet describes the custom vividly, but he thereby lends his eloquence to a practice "so pernicious" that it renders a farmer's lands "scarce worthy the Name of an Inheritance" (*H*, 41). Switzer endeavours to exculpate Virgil by arguing, as we have already seen, for an overall consistency in his views, but when this strategy reaches its limits, he falls back on a claim that Virgil is bound by rules of generic decorum and that these take precedence over the requirements of accuracy. Thus he admits Virgil falls into incoherence, but he maintains that the poet's questionable explanatory verses (*G*, 1.91–93) were, "in all Probability, added by a *Licentia Poetica*, a Licence that most of those Poets take, who are to weave their Precepts with their Poetry, and which is to be seen much more, either in *Hesiod*, than in *Virgil*" (*P*, 5:xix). This proves a damaging admission, which Tull is quick to exploit in his response to Switzer: "Here *Equivocus* hath indeed for once hit upon the only Way of reconciling Contradictions: But I may presume to say with good Assurance, that this *Licence* is never allowed to a Philosopher" (*HS*, 219).

In this exchange between the antagonists, we penetrate to the heart of the matter. The didactic poet is a servant of two masters. His mission is to instruct his readers and to do so in as faithful and truthful a manner as possible. Yet he is also sworn to impart his precepts as pleasurably as he can: hence his choice of poetry as his medium of instruction. Tull sees these two aims—the aesthetic and

stylistic requirements of poetic form versus the need to write perspicuously, plainly, and accurately—as fundamentally incompatible. The writer must sacrifice one of the two purposes to the other. “Poetry like Musick,” he declares, “is a very pleasant and innocent Amusement of Life; but we ought not to suffer our Diversion to captivate our Reason” (*HS*, 221). He concedes that Virgil’s enumeration of a choice of reasons for burning land (in the manner of Lucretius) makes a poetically and rhetorically effective passage of verse, but those same reasons, when considered “as abstracted from the poetry,” are philosophically false (*H*, 41; *HS*, 219).

Tull’s critique is far-reaching. Beyond Virgil, it has implications for the wider didactic project of eighteenth-century British poetry. Whether willingly or not, all three participants in the debate (Benson, Switzer, Tull) acknowledge that the didactic mode in poetry is unstable and contradictory in its assumptions. Tull cites a criticism levelled by Benson at Dryden’s translation of the *Georgics*—“if you take from *Virgil* his Figures, you take the Club from *Hercules*”—but he insists that Benson’s censure applies with equal validity to the original poem (*HS*, 219). Stripped of its tropes and figurative language, Virgil’s poem is, he argues, at best thin and unoriginal in its precepts. Benson’s remark appears in a note commenting on Dryden’s translation of a passage in the first book of the *Georgics* on the subject of planting. Virgil writes, “*quid dicam, iacto qui semine comminus arva / insequitur cumulosque ruit male pinguis harenae*” [Need I tell of him who flings the seed, then, hoe in hand, closes with the soil, and lays low the hillocks of barren sand] (*G*, 1.104–5). In his translation, Dryden abandons the rhetorical interrogative (“*quid dicam*”) used by Virgil to effect a transition from the preceding verses and opts instead for a straightforward instruction couched in the imperative mood: “When first the Soil receives the fruitful Seed, / Make no Delay but cover it with speed.”⁴⁵ Benson decries the banality of Dryden’s rendition:

I can’t imagine how a Writer, so much us’d to Poetry, shou’d be altogether insensible of what makes the great Beauty of this surprising Work before us. Take from Virgil his Figures, and you take the Club from *Hercules*. The Figure that Virgil uses here, he uses in every Book of the *Georgics*, and ’tis the most necessary of any in Pieces of this Nature, because it flings the Stile out of the Didactic Trot, (if I may use such an Expression) which Mr. *Dryden* jogs on with to the End of the Stage.⁴⁶

Benson's note pinpoints the dilemma that confronts the writer of didactic poetry. To describe a technical procedure correctly may well require a prosaic "Didactic Trot," but to omit necessary, if obvious, steps ("need I tell of") for the sake of poetic beauty impairs the usefulness of the poet's advice. In fact, Tull argues, the more skillful the poet, the more difficult it is to ascertain a plain, unambiguous meaning in his verse: "What Credit can be given to the fine words of these Ancients, who joyn all together in Verse and in Prose to impose upon Posterity, even in Matters of Fact; and, by the most elegant Expressions, compose a Theory of Agriculture without Reason or Truth? They were most accomplish'd Masters of the Art of Cheating themselves and us with Sound instead of Sence" (*H*, 69).

Tull drives home his point with an example taken from Virgil's catalogue of soil types in *Georgics* 2, in this case the rich, black, crumbly soil that is best for growing wheat: "*nigra fere et presso pinguis sub vomere terra / et cui putre solum (namque hoc imitamur arando), / optima frumentis*" [Land that is black, and rich beneath the share's pressure and with a crumbly soil—for such a soil we try to rival with our ploughing—is, in the main, best for corn] (*G*, 2.203–5]). Switzer is convinced that by "*putre solum*" or friable soil, Virgil actually means "*putridum solum*" or "putrid, cold, watry" soil and that the poet means to give advice about how such unpromising soil can be made soft by ploughing. He enlists Columella, who cites these lines in his own discussion of soils, in support of his revisionist reading of the passage, as well as the Renaissance Virgil commentator Ruaeus (Charles de la Rue) (*P*, 6:b3v n.).⁴⁷ But Tull simply throws up his hands at the expenditure of wit that the elucidation of this passage seems to require:

Or how should I, who am no Critick, be certain of a *Poet's* Meaning, which the Criticks among themselves differ about? Our Critick *Equivocus* [Switzer], against the Opinion of all others, will have it, that where Virgil says, *Hoc imitamur urando* [we imitate this in ploughing], by *putre solum*, Virgil means *putridum solum*: But 'tis certainly absurd to conclude with *Equivocus*, that the Design of *Tillage* is to imitate, *putred, cold, watry* Land. . . . For my Part, I have taken Virgil's Meaning in the true Sense, to the best of my own Judgment. And do not think it worth while to enter into any Dispute about it, unless it were of greater Moment than I apprehend it to be. (*HS*, 220)

Why enter into disputes about what Virgil means when the critics cannot agree amongst themselves and when the question can be

decided in any case by experiment and observation?⁹ Tull argues, in effect, that if Virgil is as obscure as Switzer makes him out to be, it is useless to turn to him for information. Moreover, the point Virgil makes is sufficiently trivial that it hardly merits discussion. Ironically, despite this apparent declaration of independence from supererogatory textual authority, Tull carries on obsessively with such textual disputes as this. He devotes page after closely printed page in his supplemental notes of 1736 to such questions. Indeed, not satisfied with having seen off Switzer over the meaning of “*putre solum*,” he returns to the issue at some length in the supplemental notes, where he further castigates his opponent for his perverse and ignorant readings of Virgil.

The logic of Tull’s position throughout has been that prose—and a prose shorn of rhetorical and figurative adornment—is the appropriate medium for the agricultural writer. Prose demands a standard of factuality that the poet is not customarily required to satisfy, as even Switzer concedes: “Poets, sure, have a little more Liberty to make use of Flights in Verse, than those who write in Prose have” (*P*, 5:xxx). The decorum of prose calls for a greater attention to the literal than does that of poetry. In the preface to his first publication, *The New Horse-Houghing Husbandry*, Tull offers a pragmatic justification for presenting his ideas in the form and style he does: “Writing and Ploughing are two different Talents; and he that writes well, must have spent in his *Study* that time, which is necessary to be spent in the *Fields*, by him who will be Master of the Art of Cultivating them. To write then effectually of *Ploughing*, one must not be qualified to write *Learnedly*” (*N*, iii). The plain, unfinished style of Tull’s treatise is submitted to the reader, in a rhetorical gesture ostensibly antirhetorical, as a guarantee that the author has achieved a practical mastery of his subject.

In his 1733 preface Tull defended his “Want of Method” as a writer (*H*, ii). By want of method he does not mean that his work lacks a scientific methodology or theoretical rigor but rather that his writing eschews the orderly arrangement of ideas requisite in a finished piece of work. In refusing to reduce his text to the kind of narrative order expected in a learned treatise, Tull claims he is faithful to the process of experience that has led him to his new insights into tillage and cultivation: “Connexion cannot be expected in a Book composed of Notes written at different Times, some in one Year, some in others, as something new flow’d from a different Practice from what was common” (*H*, i). Besides, in preserving as full

and accurate a record as possible of his experiments and observations, his text may have an added utility for his readers: "As to the Manner of filling the Pages with Notes, whether it be a Fault or not may be doubtful; those who *read* merely for Curiosity may blame it for being out of the *Mode*; but the Reader who intends to practise may like it the better; because by this means Things are brought into the shortest Compass, and he has in his View in one Page as much Matter, as might be extended to several Sheets by the Introductory Words which would be necessary to carry it on in a *continued Discourse*" (*H*, ii). Another advantage in not writing up his findings in the form of a "*continued Discourse*" is that he can easily add to his text as further ideas, experiments, and observations accumulate. He knows that his additive mode of presentation violates the expectation that a philosophical work of stature should exhibit structural and rhetorical completeness, yet such completeness is precisely what the incremental, collaborative character of scientific investigation was often ill-suited to produce.⁴⁵

Tull's quarrel is not, finally, with Virgil or with forms of poetry but rather with those habits of judgment in his culture that evaluate the quality of a person's ideas in terms of the polish and learning with which they are expressed. His own agricultural writings, as he states in a conscious declaration of literary independence, are designed to challenge these norms:

Scarce any Subject has had more of the Ornaments of Learning bestowed on it, than Agriculture has, by ancient and modern Writers: But a late Great Man, who was the *Cicero* of the Age, having perused all their Books of Husbandry, ordered them, notwithstanding their Eloquence, to be carried upon a Hand-Barrow out of his Study, and thrown into the Fire; lest others should lose their Time in Reading them, as he had done. . . . Now if these learned Volumes, so elegantly written, and so little to the Purpose, have done nothing but Mischief; 'tis Time that something should be writ different from them, in both Respects. (*N*, iii-iv; *HS*, 253)

Tull's declaration can be understood as a belated contribution to the seventeenth-century critique of language voiced by Bacon, Thomas Sprat, Joseph Glanvil, and John Locke, among others. As Bacon declares in *The Advancement of Learning*, "substance of matter is better than beauty of words."⁴⁹ They championed a new literalist, prosaic rhetoric in opposition to a view of language as grounded in a world of analogical correspondences and marked by conceit and by

figurative and allusive excess.⁵⁰ Even Virgil remained, for Tull, overly wedded to figures of speech and correspondingly inattentive to the literal. The logic of Tull's critique was to have far-reaching consequences, as the concept of the literary was redefined over time to exclude those modes of writing devoted to scientific and technical purposes. He would no doubt have applauded the "philosophical" contradistinction William Wordsworth was to draw years later in the preface to the *Lyrical Ballads* between "Poetry and Matter of Fact, or Science."⁵¹

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NOTES

¹ John Dryden, "An Account of the Ensuing Poem," preface to *Annus Mirabilis: The Year of Wonders, 1666*, in *The Works of John Dryden*, ed. Edward Niles Hooker and H. T. Swedenberg, Jr., 20 vols. (Berkeley: Univ. of California Press, 1956), 1:54–55. See Joseph Addison's preface to Dryden's translation of Virgil's *Georgics*, "An Essay on Virgil's *Georgics*," in Dryden, *The Works of John Dryden*, 20 vols., ed. William Frost and Vinton A. Dearing (Berkeley: Univ. of California Press, 1987), 5:153.

² See, for example, John Murdoch, "The Landscape of Labor: Transformations of the Georgic," in *Romantic Revolutions: Criticism and Theory*, ed. Kenneth R. Johnston and others (Bloomington: Indiana Univ. Press, 1990), 176–93; Karen O'Brien, "Imperial Georgic, 1660–1789," and Elizabeth Heckendorn Cook, "Crown Forests of Female Georgic: Frances Burney and the Reconstruction of Britishness," in *The Country and the City Revisited: England and the Politics of Culture, 1550–1850*, ed. Gerald MacLean, Donna Landry, and Joseph P. Ward (Cambridge: Cambridge Univ. Press, 1999), 160–79 and 197–212, respectively; and Rachel Crawford, "English Georgic and British Nationhood," *ELH* 65 (1998): 123–58.

³ Seneca, "Epistle 86," *Ad Lucilium Epistulae Morales*, trans. Richard M. Gummere, 3 vols. (Cambridge: Harvard Univ. Press, 1962), 2:319.

⁴ See John Martyn's preface to Virgil, *Pub. Virgilio Maronis Georgicorum Libri Quatuor: The Georgics of Virgil, with an English Translation and Notes*, ed. Martyn (Dublin, 1778), vii, xii.

⁵ Stephen Switzer, *The Nobleman, Gentleman, and Gardener's Recreation: or, an Introduction to Gardening, Planting, Agriculture, and the Other Business and Pleasures of a Country Life* (London, 1715), 18–19.

⁶ Jethro Tull, *The New Horse-Houghing Husbandry: or, an Essay on the Principles of Tillage and Vegetation, Wherein Is Shewn a Method of Introducing a Sort of Vineyard-Culture into the Corn-Fields* (London, 1731); revised and expanded as *The Horse-Hoing Husbandry: or, an Essay on the Principles of Tillage and Vegetation* (London, 1733). Hereafter abbreviated *N* and *H* respectively, and cited parenthetically by page number.

⁷ *Dictionary of National Biography*, 63 vols. (London: Smith, Elder, 1885–1900), 55:242.

⁸ Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton Univ. Press, 1985), 7.

⁹ Francis Forbes, *The Extensive Practice of the New Husbandry; in Which the Various Methods . . . Recommended by Mr. Tull, Sir Digby Legard, Mr. Duff, Mr.*

Randall, of York; Arthur Young, Esq; and the Complete Farmer, etc., Are Considered and Examined (London, 1786), 1–2.

¹⁰ William Benson, *Virgil's Husbandry, or an Essay on the Georgics: Being the Second Book Translated into English Verse. To Which Are Added the Latin Text, and Mr. Dryden's Version. With Notes Critical and Rustick* (London, 1724), xvi. Tull cites this passage verbatim in *Horse-Hoing Husbandry*, 44. Benson's translation of the first book of the *Georgics* appeared the following year, in 1725.

¹¹ *Cyclopaedia*, ed. Ephraim Chambers, 2 vols. (London, 1728), 1:182.

¹² See Adam Dickson, *Husbandry of the Ancients*, 2 vols. (Edinburgh, 1788). Chapter 5 of vol. 1 is entitled "Of the maxims of the Ancients, and some general directions to the farmer in his operations."

¹³ Francis Bacon, *New Organon*, in *The Works of Francis Bacon*, ed. James Spedding, Robert Leslie Ellis, and Douglas Denon Heath, 14 vols. (London: Longman's, 1857–1874), 4:97.

¹⁴ Bacon, *The Advancement of Learning*, in *Works*, 3:332–33.

¹⁵ Dickson, 1:192–93.

¹⁶ Dickson, 1:xviii–xix.

¹⁷ Switzer, preface to *The Practical Husbandman and Planter* 5 (August 1733), collected in *The Practical Husbandman and Planter*, 2 vols. (London, 1733–1734), 2:xxxii. Hereafter abbreviated *P*, and cited parenthetically by issue number (1 through 6) and page number.

¹⁸ Dickson, 1:218. See Marcus Terentius Varro, *Rerum Rusticarum*, 1.18.8, in *On Agriculture*, trans. William Davis Hooper, Loeb Classical Library 283 (Cambridge: Harvard Univ. Press, 1935), 230–33; and Lucius Junius Moderatus Columella, *De Re Rustica*, 1.4.4–5, in *On Agriculture*, trans. Harrison Boyd Ash, 3 vols., Loeb Classical Library 406–8 (Cambridge: Harvard Univ. Press, 1941), 1:55.

¹⁹ Peter Dear, "Totius in verba: Rhetoric and Authority in the Early Royal Society," *Isis* 76 (1985): 152.

²⁰ Dickson, 1:214. See Columella, 1.4.5.

²¹ Tull, *A Supplement to the Essay on Horse-Hoing Husbandry*, 2nd ed. (London, 1740), 220. Hereafter abbreviated *HS* and cited parenthetically by page number. Switzer, *The Practical Husbandman*, 5:xii. See OED for discussion of "experience."

²² Dear, *Discipline and Experience: The Mathematical Way in the Scientific Revolution* (Chicago: Univ. of Chicago Press, 1995), 13.

²³ See Shapin and Shaffer, chap. 2.

²⁴ Dear, *Discipline*, 21.

²⁵ Dear, "Totius in verba," 148.

²⁶ Dear, *Discipline*, 23.

²⁷ See Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: Univ. of Chicago Press, 1994), chaps. 2 and 3.

²⁸ See Edward Grant, "Aristotelianism and the Longevity of the Medieval World View," *History of Science* 16 (1978): 98. See also Dear, *Discipline*, 24.

²⁹ The relation between philosophical thought and the literary genres in which it is expressed is explored by Julián Marías in "Literary Genres in Philosophy," *Philosophy as Dramatic Theory*, trans. James Parsons (University Park: Pennsylvania State Univ. Press, 1971), 1–35.

³⁰ Virgil, *Virgil's Husbandry, or an Essay on the Georgics: Being the First Book Translated into English Verse. To Which Are Added the Latin Text, and Mr. Dryden's Version. With Notes Critical and Rustick*, ed. and trans. Benson (London,

1725), 9. The original Latin (as well as a modern translation) can be found in Virgil, *Eclogues, Georgics, Aeneid I–VI*, Loeb Classical Library, trans. H. Rushton Fairclough (Cambridge: Harvard Univ. Press, 1935), 151; hereafter abbreviated G and cited parenthetically by book and line number.

³¹ In his commentary on the *Georgics*, Mynors points out that the stubble and weeds left in the field after harvest “might prove heavy going for the ancient plough” and suggests that this was the primary motive for the “common custom” of setting fire to fields in ancient times (19).

³² Benson, *Virgil’s Husbandry* (1725), 9.

³³ For a detailed study of this *beatus ille* tradition and its importance in English literature, see Maren-Sofie Røstvig, *The Happy Man: Studies in the Metamorphoses of a Classical Ideal*, 2 vols., rev. ed. (Oslo: Universitetsforlaget, 1962–1971).

³⁴ Røstvig, 2:21.

³⁵ John Philips, *Cyder*, in *The Poems of John Philips*, ed. M. G. Lloyd Thomas (Oxford: Basil Blackwell, 1927), 1.360–72.

³⁶ John Milton, *Paradise Lost*, in *Complete Poems and Major Prose*, ed. Merritt Y. Hughes (New York: Odyssey Press, 1957), 9.23.

³⁷ Philips, *Cyder*, 1.326–30, 344–60.

³⁸ Juan Christian Pellicer, “John Philips (1676–1709): Life, Works, and Reception” (D.A. thesis, University of Oslo, 2002), 278.

³⁹ Pellicer, 275. See also Pellicer’s discussion of the question of grafting, as understood in ancient and in modern times, in his “Explanatory and Contextual Notes for *Cyder*,” 396–97.

⁴⁰ Philips, *Cyder*, 1.297–303.

⁴¹ Switzer, “Advertisement to Vol. II,” C4v. Although initially published in six monthly installments, *The Practical Husbandman and Planter* was subsequently reissued as two bound volumes with added prefatory matter.

⁴² Benson, *Virgil’s Husbandry* (1724), iv.

⁴³ Benson, *Virgil’s Husbandry* (1724), vi.

⁴⁴ Alexander Pope, *An Essay on Criticism*, in vol. 1 of *The Poems of Alexander Pope*, Twickenham Edition, 11 vols. in 12 (New Haven: Yale Univ. Press, 1939–1969), lines 320–25.

⁴⁵ Dryden, *Works*, 5:159.

⁴⁶ Benson, *Virgil’s Husbandry* (1725), note to line 151, n.p.

⁴⁷ See Columella, 2.2.4.

⁴⁸ On the question of disconnectedness and miscellaneity in scientific writing (as opposed to rhetorical completeness), see my “The Classical Silva and the Generic Development of Scientific Writing in Seventeenth-Century England,” *New Literary History* 32 (2001): 349–75.

⁴⁹ Bacon, *Advancement*, 3:285.

⁵⁰ On this transformation of language and prose style, see Blanford Parker, *The Triumph of Augustan Poetics: English Literary Culture from Butler to Johnson* (Cambridge: Cambridge Univ. Press, 1998), esp. chap. 2.

⁵¹ William Wordsworth, “Preface to Lyrical Ballads,” in *The Prose Works of William Wordsworth*, ed. W. J. B. Owen and Jane Worthington Smyser, 3 vols. (Oxford: Clarendon Press, 1974), 1:134 n.