The Logical Basis of Oxford's *Troilus and Cressida*

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> O madness of discourse
> That cause sets up with and against itself—
> Bifold authority, where reason can revolt
> Without perdition, and loss assume all reason
> Without revolt! This is and is not Cressid.
>
> *Troilus and Cressida* (5.2.141–145)[1]

William Shakespeare's *Troilus and Cressida* appreciates the truly fundamental in Geoffrey Chaucer's *Troilus and Criseyde* as fundamentally true: frustrating and sometimes paradoxical logic defines certain social dilemmas.[2] In turn, Chaucer's understanding of the rational faculty, which intuitively perceives the preexisting structure to interpersonal relations, draws concertedly on the work of the Roman scholar and Christian philosopher Boethius (c. 480–c. 525). Boethius' desire to translate the texts of Aristotle and Plato reflects his concern with logical prefiguration, which "comes across most powerfully in the *Consolation* [*of Philosophy*], where," as Rosalyn Rossignol notes, "he frequently refers to the arguments and examples of these writers to support his own logic-based analysis of his fate."[3] Boethian philosophy, as an Aristotelian structuralism that at once actualizes a teleological and a Neoplatonic framework, laid the foundations of scholasticism, and this normative intellectual movement retained adherents in England during the High Middle Ages thanks to the increased stability and resultant expansion of the universities at Oxford and Cambridge.

"Some time at a university," states Kathryn L. Lynch, "is not incompatible with the documentary records we possess of Chaucer's life or with the shape that his career had taken up to the early 1360s or would take afterwards."[4] "It is not . . . to be imagined," writes William Godwin, "that a young man so advantageously

circumstanced as to be designed to finish his general education at the universities," and then, as Godwin speculates, "to remove to the inns of court, was not made to partake of every advantage that the scholastic institutions of the city in which he resided could afford, for the cultivation of his infant mind."[5] Rather than the enjoyment rendered by "the nobler classics," details Godwin, "the daily amusement of scholars was in the unnatural style of Seneca and Boethius."[6] When but during the fourteenth century, as Godwin reports of Bishop Robert Lowth's complaint, "was not the science of logic most assiduously, perhaps too emphatically and earnestly pursued?"[7] No wonder, as Morton W. Bloomfield asserts, the rationalistic view of the world so impressively forwarded in Boethius' *Consolation of Philosophy* "pervades *Troilus and Criseyde* like reason itself."[8]

Nonetheless, Chaucer's abiding interest in the demands of logic seems at odds with fourteenth-century voluntarism, which Duns Scotus (1266–1308) had promoted alongside nominalism, and which came to dominate theological thinking with its emphasis on God's *potentia absoluta*. In separating rationality from God's omnipotence, however, Duns Scotus made possible the individual development of logic and mysticism. This epistemological bifurcation led in one direction toward rationalism, and in the other toward skepticism. A small band of scholars, including Thomas Bradwardine (c. 1295–1349), Nicholas Trevet (c. 1257–c. 1334), and John Wyclif (c. 1325–1384), who were dedicated to the powers of rationality, hereby emerged against the intellectual background of voluntarism and nominalism. This select few, relates Bloomfield, "developed logic as an autonomous tool, speculating about a three-modal logic"[9]—what John P. Burgess describes as the "relationships among *may be* and *is* and *must be*, or possible and actual and necessary"[10]—and used "a more mathematical notation than hitherto."[11] That mysticism increasingly influenced fourteenth-century theology made this small band of scholars acutely conscious of the importance of human reason. Their approach to scholasticism, as Chaucer appreciated, tended to extract meaning from its theological context; as a result, reason not only informed Chaucer's poetic methodology, but also imbued his delineation of the mental faculty. "Chaucer is a very rationalistic poet," insists Bloomfield, he believes in structure, order, and "the rules of the reason game."[12]

Hence, *Troilus and Cressida* recognizes in *Troilus and Criseyde*, as E. Talbot Donaldson affirms, "a work full of ironic contradictions and yet ringing true in a way that far more realistic literature fails to do."[13] There are, of course, noteworthy differences between the two works, but genre rather than compositional period accounts for many of these contrasts. Although *Troilus and Cressida* "reworks Chaucer's love poem," as Kris Davis-Brown relates, "drastically compressing its plot and foreshortening character development,"[14] such alterations do not impinge upon the rules of logic. Chaucer's literary descendent finds in *Troilus and Criseyde* an emphasis on the logical explanation of events in general and human behavior in particular, so that little surprise should attend Hector's anachronistic reference in the play to Aristotle. "You have both said well," he caustically remarks to two of King Priam's sons, Paris and Troilus, "And on the cause and question now in hand / Have glossed, but superficially—not much / Unlike young men," he adds, "whom Aristotle

thought / Unfit to hear moral philosophy" (2.2.163–167). Your minds, imputes Hector, are rather immature and shallow.

Concordance between the narrative poem and the play, however, should not mask the contradictory intellectual relays that scholasticism would have established with the work of the sixteenth-century logician Pierre de la Ramée (1515–1572)—better known under the name, which he eventually adopted, of Peter Ramus—whose influence on both the logic and rhetoric of *Troilus and Cressida* is undoubted. That this play at once examines the basic structure of human logic, the multifarious impresses that personally articulate that foundation, and the rhetoric associated with that articulation, testifies to a university-educated playwright. Biographical and historical evidence therefore identify the Seventeenth Earl of Oxford, Edward de Vere (1550–1604), rather than a provincial citizen of Stratford-upon-Avon, William Shakspere (1564–1616), as the author of *Troilus and Cressida*.

Shakspere probably attended the Edward VI Grammar School in Stratford-upon-Avon, where the curriculum would have covered the essentials of rhetoric as well as the basics of logic.[15] "The English humanists of the sixteenth century put into practice the ideals of studying classical literature which had been developed in fifteenth-century Florence," chronicles Stefan Daniel Keller, "and made far-reaching changes in the grammar school and university curricula." Thus, "where logic had held the main place," as Keller notes, "rhetoric and grammar now shared it with logic, as these disciplines became more important in the humanist curriculum." Keller cites Bishop Richard Fox's foundation of "Corpus Christi College, Oxford, in 1517," to illustrate his point. Fox "specified that lectures should be given on Cicero's *Orator*, his *Parts of Rhetoric*, Quintilian's *Institutiones*, and the *Declamationes* attributed to Quintilian. By the same token," maintains Keller, "classical rhetoric became ever more important at grammar school level."[16] Certainly, as Keller asserts, secondary education would have honed "Shakespeare's abilities in rhetoric," yet in comparison, Edward de Vere benefited not only from "the advantages of the best private tuition," as literary historian J. Thomas Looney remarks, but also from a university education—and Ramism dominated the Oxbridge landscape.[17]

In this regard, de Vere's tutelage under William Cecil (1520–1598) is of additional significance because of Cecil's own education.[18] Cecil "entered St. John's College, Cambridge," chronicles Martin A. S. Hume, "when he was fifteen years of age."[19] A zealous scholar, documents Edward Nares, Cecil "was accustomed to hire the college bell-ringer to 'call him up at four of the clock every morning.'"[20] At the time of Cecil's attendance, as Hume notes, the university was fostering an intellectual movement based on Ramism, "the young leaders of which at once became Cecil's chosen friends."[21] Ramus' "stress upon a practical approach to logic and the importance of knowledge from experience appealed to the English Puritans," explains Garry J. Moes. "He defined logic as a tool of demonstration rather than an abstract idea." [22] This approach suited those whom Cedric B. Cowing describes as the "godly merchants" of East Anglia and, with their endorsement, Ramism "took hold early [...] at Cambridge University."[23] Hence, Keller's focus on academic interest in rhetoric fails to appreciate the importance of the Cambridge Ramists, whose high profile

successfully attracted the attention of Oxford scholars too. In consequence, Ramism would remain prominent on the intellectual landscape of Britain into the second half of the next century—"As I hold with our countryman Sidney," writes John Milton (1608–1674) in *Artis Logicæ* (1672), "Peter Ramus is believed the best writer on the art."[24]

Beyond what Jack Cunningham calls the "puritan" in Cecil, there was a more personal reason for his affinity with Ramism.[25] Ramus, "after being under the protection of the Cardinal of Lorrain," as Nares details, "had turned Calvinist,"[26] but Protestantism served him ill. For, "among the sufferers most basely betrayed, and most cruelly used" in the St. Bartholomew's Day Massacre in Paris on 24 August 1572, as Nares reports, "was the celebrated Peter Ramus." Moreover, "it has been conjectured that Lord Burghley was meant to be included in the massacre."[27] Holding firm to his Protestantism in reaction to this bloody affair, and with his continued tenure of the Chancellorship of Cambridge University (1559–1598), Cecil retained his "faith" in Ramism. What is more, as Nares contends, Cecil was as influential at Oxford as he was at Cambridge. "Both universities seem almost equally to have been submitted to his care and the decision of his judgment."[28] Cecil's influence on university affairs even extended as far as Trinity College Dublin. Under Cecil's stewardship (1592–1598), as Cunningham remarks, Trinity "had a strongly Ramist ethos."[29] In short, Edward de Vere's familiarity with his guardian's Ramism is difficult to discount. Cecil, as Bronson Feldman emphasizes, "kept the young man at his books,"[30] de Vere graduated from Cambridge University in 1564,[31] and he gained a Master of Arts degree from Oxford University two years later.[32] De Vere acquired a formal knowledge of logic that Shakspere could not have obtained.

The fundamentals of this formalness concern protologic. A preexisting framework structures logic—"something protological," insists the analytical philosopher Robert Hanna, "is built innately into human rationality itself"—and Ramism appreciates this precondition.[33] "Philosophy was not the arcane pseudo-science of the theologians, but something else altogether," writes George Huppert of Ramus' principled attitude, "a method of reasoning—the only method—which was so natural, so simple, that it had always been practiced, even in pre-historic times."[34] "Thus, antediluvian men, who already understood mathematics," as Ramus avows in *Dialectique* (1555), "were skilled in logic."[35] To the detriment of philosophy, however, the "Peripateticians moved away from a genuine love of wisdom," which counsels the examination and review of inherited precepts, "and devoted themselves slavishly to the love of Aristotle."[36] In Ramus' judgment, the last of the creditable Aristotelian dialecticians was Claudius Galenus (c. 130–c. 200); hereafter, the Peripateticians effectively barred access to the consistent practice of logical principles. Ramus reopened that entrance.

At its heart, Ramus' understanding of rationality retains two-valued Aristotelian logic, which recognizes any proposition as either true or false. This system of logic uses the terminology of categorical (or attributive) and hypothetical (or conditional) propositions. The former type affirms or denies according to its predicate; the latter type contains two subcategories: the conjunctive, with the form

"if *A*, then *B*," and the disjunctive, with the form "either *A* or not *A*." Two-valued Aristotelian logic is "formal" in the modern sense of the term. Notwithstanding this fundamental retention, Ramus criticized Aristotle for certain pedagogical notions. Matthew Guillen explains that Ramus dismissed the Aristotelian beliefs that "rhetoric and dialectic were inseparably intertwined" with "logic a subset of rhetoric." For Ramus, rationality was not subservient to rhetorical expression, his enterprise "elevating the status of logic," and "putting an end to the *morbus scholasticus*," which Fox's sterile and inflated scholasticism represented.[37] Put succinctly, simplicity enhances functionality, and Aristotle's elaborations muddle his own account of logic. Furthermore, as James J. Murphy adds, "Aristotelians have distorted his books over many centuries," with Boethius' intervention being typically problematic: "in trying to clarify Aristotle," while retaining two-valued logic, Boethius compounds Aristotle's "confusions."[38]

In comparison, Ramus' perspective on rationality held that the reasoning faculty (*ratio naturalis*) required the art of logic, with the assistance of observation, experience, and induction, to produce trained reason (*ratio artificiosa*). "According to Ramus," as Peter F. Fisher details, "the ground of . . . *ratio naturalis* was to be found in rhetoric and grammar."[39] "The production of speech content privileged by the [Aristotelian] rhetorical tradition," explains Guillen, "depended on an auditory understanding of specific 'seats,' 'images' and 'common places'—what could be described as a memory theatre—with stock arguments and structures which had accumulated through centuries of use. These *loci communes* were supported by a complex art of memory techniques that nourished the rhetorical practice."[40] Ramus' approach maps the structure and flow of arguments. His compositional method, which includes the use of tables and diagrams, presents subject matter in discrete units. "In lieu of merely telling the truth," explains Walter J. Ong, "books would now in common estimation 'contain' the truth."[41]

Ramism was of interest not only to creative writers—because, as Manuel Breva-Claramonte comments, "Ramus initiates a new conception of linguistics: a definitely structural approach to language"[42]—but also to logicians, lawyers, and mathematicians—because, as Guillen remarks, "*loci*-based memory, a mentalization structured by division and composition, was simply transformed by Ramus into content structured in a set of visible or sight-oriented relations on the page."[43] Where Keller's interpretation of sixteenth-century education separates logic from rhetoric not only in grammar schools, but also in universities, Breva-Claramonte, Fisher, Guillen, and Ong build a more convincing picture of reciprocity between the two disciplines at the highest academic level, especially where Ramism is considered. Hence, Ramus remains a significant figure in the history of thought, as P. A. Duhamel contends, "for his revisions of the arts of logic *and* rhetoric."[44]

The humanistic curriculum at the grammar school in Stratford-upon-Avon would not have honed Shakspere's practical skills in the application of logic and rhetoric to the extent afforded by Oxford's formal tuition. In contrast, de Vere's education would have apprised him of the complex relationship between logic, cognition, and linguistic expression. In this paradigm, logic depended principally on a

preexisting structure; "thinking did not depend primarily on an abstract framework," explains Fisher, "but on the concrete perception of living minds without which the most formidable logical analysis was no more than a *tour de force*"[45]; and rhetoric articulated the linguistic expression of these perceptions. Literary masterpieces are not only the products of reasoning, but also the expression of reasoning in various forms of individual practice.

For de Vere, as for Ramus, a natural capacity attended logic. Logic studied the prototypical framework of thought, addressed the rules of argument, and aided rational fitness. "Following in the footsteps of Continental rhetorician Peter Ramus," writes Bernard J. Hibbitts, "leading English legal scholars such as Sir Edward Coke [1552–1634] and [Sir] Henry Finch [1558–1625] promoted the usage of schematic, dichotomizing diagrams to clarify legal concepts and arguments."[46] Both Edward de Vere and William Shakspere are likely to have encountered this methodology, but the formal roots of de Vere's grounding in logic went far deeper than Shakspere's did.

After leaving Oxford University, and echoing his patron's removal to the same Inn in May 1541, de Vere entered Gray's Inn in February 1567.[47] "It was no unusual thing, in those days," as Nares explains, "for young men of family or talents, who had any prospects of becoming members of the legislature, to go through a course of law at some one of our Inns of Court."[48] Removal to the Inns of Court, as Godwin's speculation about Chaucer's attendance suggests, had been a common route by which advantaged young men could complete their education. That less than a mile separated Cecil House from High Holborn facilitated de Vere's regular presence at Gray's Inn. The Inns of Court, where experienced lawyers gave lectures and moot proceedings were a part of the training, offered students a legal education tailored to actual practice.

De Vere's attendance paid off. "The 14th [*sic*] year of the reign of Queen Elizabeth was in 1572. This was about the time," state Paul Altrocchi and Hank Whittemore, "when Edward de Vere had 'shone' at her court."[49] Hereafter, the intellectual milieu of London helped Oxford to maintain this aura. For example, as Jess Edwards chronicles, Thomas Hood was "appointed mathematical lecturer to the City of London in 1598." A fellow of Trinity College, Cambridge, Hood had published a translation of Ramus' *Geometria* (1569) in 1590, and he maintained a desire to popularize mathematics. "Hood's lectures," observes Edwards, "were clearly part of that third university established in late sixteenth-century London, where knowledge was designed to be shared between university scholars and practical men. Their audience was an open one."[50] At this period, Shakspere could have enjoyed the same source of Ramism as Oxford did, but not to the same extent, owing to his inferior standard of education. That Hood, as Mathematical Lecturer to the Captains of the Trained Bands, corresponded with Lord Burghley adds another dimension to this Oxfordian-Stratfordian difference.[51]

Mind maps of the sort employed by Coke, Finch, and Hood, which applied what Duhamel identifies as Ramus' basic rule of logic—"every art should imitate nature"—established a representational and methodological tradition that remains vital. [52] "PowerPoint presentations, outlining tools and 'the scourge of bullet points,'"

avers Guillen in quoting Steven Maras, are "the most obvious evidence of lingering Ramist issue."[53] Less explicitly, but of similar importance, the organizational schemas of Ramism also anticipated the game-theoretic appeal to protologic. "The art of logic," writes Ramus in *Aristotelicae animadversiones* (1543), "is grounded in the dialectics of nature."[54] Thus, as Ramus insists in *Dialecticae institutiones* (1543), the faculty for logical thought is inborn. "Natural dialectic is the talent, reason, mind, image of God, in short, the blessed light that approaches eternal light; it is proper to man and is therefore born with him."[55]

Game Theory and Ramist Visualizations

Ramism and game theory share the same principles: nature endows humans with rational minds that can negotiate the preexisting structures of logic. Founded by John von Neumann in "Zur Theorie der Gesellschaftsspiele" (1928), and extended by von Neumann and Oskar Morgenstern's *Theory of Games and Economic Behavior* (1944), game theory has become a wide-ranging discipline. The basic theory concerns games of strategy. The word "strategy," "as used in its everyday sense, carries the connotation of a particularly skillful or adroit plan, whereas in game theory it designates any *complete* plan." In short, summarizes John Davis Williams, "*a strategy is a plan so complete that it cannot be upset by enemy action or Nature*; for everything that the enemy or Nature may choose to do, together with a set of possible actions for yourself, is just part of the description of the strategy."[56]

Game theory simulates the logical decisions made by individuals when such *players* have to consider the choices made by other players. The number of individuals faced with a particular decision—one, two, or more than two—combined with the number of available choices helps to categorize strategic games. Dilemmas that involve two or more individuals are termed *coordination problems*; coalitions mean that many multi-participant dilemmas can often be treated as two-person games; if the number of choices faced in each decision-making process is more than two, then these choices can be broken into a series of binary options. Much game-theoretic mathematical modeling therefore deals with two-person two-choice games. "Whether the outcome of a game is comic or tragic, fun or serious, fair or unfair," notes Steven J. Brams, "it depends on individual *choices*."[57] Each logically-minded participant in a coordination problem shares the same information concerning possible outcomes, anticipates the choices of his counterparts, and picks a strategy in the hope of maximizing his *score* (*payoff* or *utility*) according to those prospects.

In basic simulations, a player ranks each prospective outcome from best to worst in an ordinal sequence; in complicated models, he builds his strategic preferences into the payoffs. Hierarchies emerge from the dialectics of deduction, and Ramus suggested, as Harald Kleinschmidt explains, "that the order of the world could be . . . .successively divided into the hierarchical order of its constituent elements, right down to the smallest recognisable part."[58] Whether one believed in divine systematic formation or not, Ramus explicitly opened the human mind to relational dynamics and phenomenal ordering, and the notion of hierarchical structures soon

achieved currency beyond the confines of academia. Two of the schemas Ramus employed in this endeavor were matrices and decision trees. While both models have game-theoretic scope, matrices are most pertinent to the logical basis of Oxford's *Troilus and Cressida* because they offer a succinct depiction of the classified outcomes for social dilemmas involving two players facing a pair of choices.

Social dilemmas, as coordination problems that commonly occur in real-life interactions, provide abundant material for mathematical insight, with the application of game theory to literature encouraging the careful analysis of character motivation, interpersonal conflicts, and the effects of coordinated actions. A hermeneutic based on game theory does not lift arcane theory from one domain (mathematics) and inappropriately apply that theory to a disconnected discipline (literary studies), but posits rationality as the regulating structure of reflective thought rather than the sole motivation of behavior. For, in the thought processes that constitute individual consciousness, the reasoning faculty does not operate in isolation; rather, rationality traverses all aspects of mental constitution. Likewise, insightful authors acknowledge the psychical pressures that shape generic consciousness into individual expression. Edward de Vere's *Troilus and Cressida*, as a work that owes a significant debt to both Ramism and Chaucer's Boethian *Troilus and Criseyde*, cannot but appeal to game-theoretic interpretation.

Game Theory Applied to *Troilus and Cressida*

The impasse at the level of social groups in *Troilus and Cressida* is a game-theoretic *Deadlock* between the Trojans and Greeks. "After seven years' siege," decries the Greek general Agamemnon, "yet Troy walls stand" (1.3.12). Deadlock is a common case of strategic interdependence in which cost-benefit calculations usually precede either-or decisions. Figure 1 illustrates the game-theoretic utilities assigned to Deadlock; player choice is a matter of *cooperation* (*C*) or *defection* (*D*). Each pair of digits in the matrix refers to the Trojan and Greek payoffs, respectively—"the Greek debate . . . . about what constitutes value," confirms Anthony B. Dawson, "is matched by the Trojan argument"—with 3 the highest and 0 the lowest utility, respectively.[59]

		Grecian	
		Cooperate	Defect
Trojan	Cooperate	**1,1**	**0,3**
	Defect	**3,0**	**2,2**

FIGURE 1
THE TROJAN-GRECIAN DEADLOCK

Self-interest in the face of an opponent's altruism promises the highest possible outcome (winning the payoff of 3); mutual self-interest guarantees the next highest result (gaining the score of 2); mutual altruism returns the third highest

outcome (winning the payoff of 1); altruism in the face of an opponent's self-interest offers the lowest result (with a score of 0).

In the stalemate between the warring Trojans and Greeks, each side hopes for the maximum payoff. For, as the prologue makes clear, "expectation, tickling skittish spirits / On one and other side, Trojan and Greek, / Sets all on hazard" (0.20–22). Whether the impasse is active (warfare in which "honour, loss of time, travail, expense, / Wounds, friends, and what else dear" [2.2.4–5] is aggressively "consumed" [2.2.5]), or passive ("so many hours, lives, speeches, spent" [2.2.1] in respite) makes no strategic difference. One side's expression of this equilibrium merely seems to promote its expression by the other side, with the current "dull and long-continued truce" (1.3.263), according to Aeneas, making warriors such as Hector "resty grown" (1.3.264). "While here the truce is said to be long-lasting," remarks Dawson, "in the first two scenes war is being vigorously waged."[60] This type of inconsistency, claims Dawson, did not bother either the playwright or the playgoer, and game theory explains such creative and receptive indifference by emphasizing that a deadlocked war and a ceasefire without an armistice are alternative expressions of the same coordination problem.

From a Ramist perspective, Ulysses' disquisition on the "fever" (1.3.134) engendered by this impasse—the stalemate that "rend[s] and deracinate[s], / The unity and married calm of states" (1.3.99–100), and in which "Force should be right, or rather, right and wrong, / Between whose endless jar justice resides" (1.3.116–117)—is less an expression of "the Aristotelian idea that virtue follows a 'middle way' between two vicious extremes," which Dawson attributes to general critical comment, and more Dawson's own implicitly game-theoretic sense (in this instance) "that justice consists in adjudicating between opposing claims, one of which is right and the other wrong."[61] Ulysses' argument, which concerns the mediation between the antagonistic claims of two state powers, conjures up the quaternary structure of rational thought summarized by the inner four boxes of a two-player two-choice matrix, as instanced in figure 1. *Troilus and Cressida* hereby contains "the truth," as in Ong's description of a Ramist visualization of logical processes, "like boxes."[62] As if to confirm this interpretation, Ulysses continues his disquisition with a statement about power, which the quarto italicizes, as Dawson notes, "to emphasise its aphoristic quality."[63] This aphorism—"Then everything includes itself in power, / Power into will, will into appetite, / And appetite," reasons Ulysses, "an universal wolf, / So doubly seconded with will and power" (1.3.119–122)—has a fourfold aspect, with that aspect itself of a double binary nature.

The truth, like boxes in the Trojan-Grecian Deadlock, is stark: no matter what the other side does, as the four-term mathematical inequality that describes the descending payoffs—DC > DD > CC > CD—shows, each side achieves a better outcome if it defects. By defecting, a side is certain to avoid the two lowest outcomes, whatever its opponent does. Indeed, the play opens with the Trojan-Grecian conflict already having settled into equilibrium. This diachronic stalemate forces on the poet-persona a "Beginning in the middle" (0.28) of events, "but not in confidence / Of author's pen or actor's voice, but suited / In like conditions as our argument"

(0.23–25) to the prospect of "what may be digested in a play" (0.29); namely, no overall alteration in the affairs of state. Briefly put, the interstate politics of *Troilus and Cressida* illustrates the sort of strategic impasse that, as Morgenstern avows, "can never be broken by an act of knowledge."[64]

"It is scarcely surprising," notes historian Heather M. Campbell, in her study of the emergence of modern Europe, "that, when any struggle became deadlocked, the local rulers should look about for foreign support; it is more noteworthy," however, as she maintains, "that their neighbours were normally ready and eager to provide it."[65] For example, with the assassination of William the Silent (1533–1584), who had begun his campaign against Spanish rule over the northern Netherlands in 1567, Queen Elizabeth tendered practical support to the rebels. The Dutch accepted this offer with "an outpouring of gratitude. In fact," as Mark Anderson reports, "it was even thought that Elizabeth might rule over the Dutch as new subjects to the English crown." This possibility raised the question of a monarchical governorship. The Earl of Leicester, who had commanded the initial campaign for Elizabeth, was the obvious choice, but de Vere also coveted the position. "This was a candidacy," writes Anderson, "that de Vere took seriously. And in the Elizabethan court's Christmas revels of 1584, he gave his aspirations voice," when Oxford's Boys performed *A History of Agamemnon and Ulysses* at Windsor Castle on 27 December. "This 'lost' play," believes Anderson, "was probably a draft of part of Shake-speare's [*sic*] dark satire *Troilus and Cressida*," with Agamemnon's anger at a seven-year impasse reflecting the timeframe of William the Silent's campaign.[66] "Agamemnon and Ulysses also argue over some of the very issues at stake in the Lowlands," adds Anderson, and "a play staged for Queen Elizabeth about the siege of Troy would readily have been seen as a representation of the siege of the Netherlands."[67]

That the Trojan-Grecian impasse helps facilitate the social dilemmas internal to each party lends further support to the Oxfordian case concerning *Troilus and Cressida*. These inner problems reveal the attempts by particular individuals to promote their social rank. Ulysses' disquisition on degree, a speech that Dawson rates as "the most famous in the play," introduces this subject:[68] "The heavens themselves, the planets and this centre," intones Ulysses, "Observe degree, priority, and place, / Insisture, course, proportion, season, form, / Office, and custom in all line of order" (1.3.85–88). Thus, contends Ulysses, "How could communities" (1.3.103), "But by degree stand in authentic place?" (1.3.108). Queen Elizabeth, "no less an exponent of medieval notions of royalty than de Vere," writes Anderson of *A History of Agamemnon and Ulysses*, "must have found an appeal in de Vere's rhetoric of rank and deference. Foolish though it would have been to appoint her court playwright as a general and colonial governor, Elizabeth would not acknowledge as much until the last possible moment"—on 10 July 1585, making Sir John Norris temporary commander of the English expeditionary force in the Netherlands.[69] Elizabeth knew how to play the hierarchical game to her own advantage. On the one hand, as Ulysses acknowledges in *Troilus and Cressida*, concord is needed for group action—"When that the general is not like the hive / To whom the foragers shall all repair, / What honey is expected?" (1.3.81–83). On the other hand, as Ulysses also

appreciates, self-promotion produces dissonance in leveling a hierarchy: "O, when degree is shaked, / Which is the ladder of all high designs, / The enterprise is sick" (1.3.101–103). Without established social classes, maintains Ulysses, there will be internal strife. "Take but degree away, untune that string," he warns, "And hark what discord follows: each thing meets / In mere oppugnancy" (1.3.109–111). The choice is between a rigid hierarchy—controlled by primogeniture, inheritance, and accredited superiors—and a descent into chaos, which "when degree is suffocate, / Follows the choking" (1.3.126–127).

Queen Elizabeth faced a somewhat similar choice when faced with the open hostility between the Seventeenth Earl of Oxford and Sir Philip Sidney. The two men, states William Farina, "were rivals politically, personally, and poetically." [70] A long gestation attended this enmity. "De Vere matriculated at Gray's Inn," as Anderson documents, "around the same time as another young and charming prodigy—the frequent guest at Cecil House, Philip Sidney."[71] Sidney's earlier education had followed a similar route to Oxford's, but with far less success. "Sidney left Oxford," as David A. Richardson chronicles, "without taking a degree. After recovering from the plague in the spring of 1572, he may have spent a term at Cambridge."[72] This academic difference between the two noblemen, however, spilled over into other matters of degree. First, the promise of Anne Cecil's hand in marriage to Sidney fell through in 1571, with Cecil's daughter marrying de Vere later that year. Second, as the two men rose in prominence before Elizabeth, two literary factions formed around them. "The court litterateurs," as Looney remarks, "were divided into two parties, one headed by Philip Sidney, and the other by the Earl of Oxford."[73] The rivalry "came to a head on a London tennis court in 1579," as Farina documents, "when a dispute arose over whose turn it was."[74] The order of play became symbolic of the sociopolitical order, with Sidney unwilling to kowtow to Oxford, and Oxford unwilling to set a precedent in backing down.

Like Oxford, and despite his earlier educational travails, Sidney would have appreciated the logic behind this impasse, his French sojourn of 1572 having enabled him to "cultivate the friendship—and earn the admiration—of an extraordinary variety of people," as Richardson enumerates, "including Walsingham, the rhetorician Peter Ramus, the printer Andrew Wechel, and perhaps even the distinguished Huguenot Hubert Languet."[75] Sidney hereafter acted as a patron to Ramus.[76] The Ramist ethos shared by Oxford and Sidney led to a Deadlock. In effect, the tennis court oaths, which witnessed Oxford belittling the "puppy" Sidney for challenging him to a duel, demanded the intervention of a game-theoretic umpire. "Serious in her conception of 'degree,'" as Gāmini Salgādo asserts, Elizabeth acted.[77] "We forget sometimes," counsels Christopher Morris, "that in Shakespeare's England the feudal nobility still mattered," and that Queen Elizabeth "could be almost snobbishly respectful to them." [78] Oxford was assured of the outcome, Elizabeth found in the earl's favor, and rebuked the knight.

Hence, as Morris reasons, "Ulysses' speech on 'degree, priority and place' is not a sermon on the divine right of kings. It is a sermon on the divine right of

aristocracy."[79] Moreover, and to the immediate point, this lack of hierarchical respect prolongs the Trojan-Grecian impasse. "The general's disdained / By him one step below, he by the next, / That next by him beneath," reasons Ulysses, "so every step, / Exampled by the first pace that is sick / Of his superior" (1.3.130–134). That sickness "grows to an envious fever / Of pale and bloodless emulation," he complains, "And 'tis this fever that keeps Troy on foot, / Not her own sinews" (1.3.134–137). "Degree being vizarded," rages Ulysses, "Th'unworthiest shows as fairly in the mask" (1.3.83–84). In Ulysses' judgment, Achilles and Ajax are the major culprits: each commander has become pompous in overvaluing his own status.

Although, as Nestor acknowledges, Achilles carries "our dear'st repute" (1.3.339) abroad, as Nestor simultaneously laments, Achilles also mocks his superiors. The instinctive rhetoric of both Ulysses and Agamemnon, which draws on nature in accordance with *ratio naturalis*, evinces a Ramist inflection in confirming Nestor's opinion. Ulysses thinks that "seeded pride" (1.3.317) has to "maturity blown up / In rank Achilles" (1.3.318–319). Achilles' self-regard overrules his judgment. "A stirring dwarf we do allowance give," concurs Agamemnon, "Before a sleeping giant" (2.3.125–126). Rather than manufactured to demonstrate a theoretical principle, this metaphor would have earned Ramus' seal of approval, conflating as it does impressive rhetoric with two-valued Aristotelian logic—logic that Ulysses takes a step further by conjuring up the specter of paradox. Achilles' disrespect finds support from Patroclus, rails Ulysses, with their overweening self-regard making a mock of their leaders' studied rationality:

> All our abilities, gifts, natures, shapes,
> Severals and generals of grace exact,
> Achievements, plots, orders, preventions,
> Excitements to the field, or speech for truce,
> Success or loss, what is or is not, serves
> As stuff for these two to make paradoxes.
>   (1.3.180–185)

Even worse is Ajax's imitative behavior. "Ajax is grown self-willed and bears his head / In such a rein, in full as proud a place, / As broad Achilles," Nestor observes, "keeps his tent like him, / Makes factious feasts, rails on our state of war / Bold as an oracle" (1.3.189–193). Furthermore, Ajax undervalues the dangers hazarded by the Greek forces in their exposed position on the battlefield, and does so to promote his own status (or ordinal rank): "To match us in comparisons with dirt, / To weaken and discredit our exposure / How rank soever rounded in with danger" (1.3.195–197). Achilles and Ajax, "tax our policy and call it cowardice," fumes Ulysses, "Count wisdom as no member of the war, / Forestall prescience, and esteem no act / But that of hand" (1.3.198–201). Neither commander appreciates the *ratio artificiosa* of his superiors, who "By reason guide his execution" (1.3.211). Rankness of the unschooled, which demeans their rank (or dangerously exposed) position on the battlefield, is the Greek's internal problem.

This dilemma echoes the jockeying for social position among ambitious men in Renaissance England. "Erasmus was anything but a Jeffersonian democrat," comments Herschel Clay Baker, "but—with the notable exception of Vives—almost alone in the sixteenth century he deplored the misery of the downtrodden in a ruthless hierarchal society."[80] Although seditious sentiments were "more characteristic of the seventeenth than of the sixteenth century," a number of Erasmus' Protestant coevals, "eager to rise in the world . . . were more outspoken."[81] Just as the logical rhetoric of Ulysses and Agamemnon becomes something of a sparring match, so the Earls of Oxford and Leicester contested the prospective Dutch governorship.

With the "nature of the sickness found," Agamemnon asks Ulysses, "What is the remedy?" (1.3.141–142). Ironically, the Trojans provide a possible solution with their own internal strife. For, although the Trojans might experience more anxiety and less ennui in the Deadlock than the Greeks do—because a hostile force pens them in, however exposed that hostile force is—the impasse also prompts their warriors to consider the matter of individual status. The "resty grown" (1.3.264) Hector, who challenges any Greek commander to personal combat, does so because he is ashamed of his recent confrontation with Ajax, his first cousin, whose own attributes the Trojans despise. "There is no man hath a virtue that he hath not a glimpse of," according to Alexander, "nor any / man an attaint but he carries some stain of it" (1.2.21–22). "But how should this man that makes me smile," asks Cressida, "make Hector / angry?" (1.2.27–28). "They say he yesterday coped Hector in the battle," replies Alexander, "and / struck him down, the disdain and shame whereof hath ever since / kept Hector fasting and waking" (1.2.29–31). In effect, Ajax has reduced Hector (another of King Priam's sons) to the ranks—and, in praising Troilus to Cressida, Pandarus inadvertently confirms Hector's relegation in Trojan estimation: "No, nor Hector is not Troilus in some degrees" (1.2.60).

From Ulysses' perspective, however, Hector's challenge "Relates in purpose only to Achilles" (1.3.325). Hector's intention is as obvious, agrees Nestor, "as substance / Whose grossness little characters do sum up" (1.3.326–327). Read by a game-theoretic hermeneutic, this metaphor connotes the act of assigning utilities. Nestor's prediction of a synechdochic outcome, with the equal match between Hector and his opponent representative of the Trojan-Grecian war, immediately extends Ulysses' analogy. "For here the Trojans taste our dear'st repute / With their fin'st palate; and trust to me," he assures Ulysses, "Our imputation shall be oddly poised / In this vile action" (1.3.339–342). Individual combat (the insignificant or "vile" part) will merely ("oddly") confirm the Trojan-Greek Deadlock. The reputation ("imputation") of Greece—and by logical symmetry the reputation of Troy too—will continue to attend this uncomfortably insoluble impasse ("oddly poised").

Achilles' pride "must or now be cropped," frets Ulysses, "Or, shedding, breed a nursery of like evil / To overbulk us all" (1.3.319–321). With his calculating mind, Nestor now becomes the catalyst for Ulysses' "remedy" (1.3.142): "I have a young conception in my brain," reveals Ulysses, "Be you my time to bring it to some shape" (1.3.313–314). This cure must not only answer Hector's challenge, but also bring

Achilles and Ajax to heel. Notwithstanding the need to puncture the overblown pride of Achilles and Ajax, counsels Nestor, "their fraction is more our wish than their / faction" (2.3.88–89). Nestor's use of the words "fraction" and "faction" appeal to a game-theoretic hermeneutic; in effect, Nestor advocates playing each man off against the other in a situation of coordination that will both cut them down to size (a fraction of their original pomposity) and preclude their possible confederation (in a faction where cooperation meets cooperation) against their superiors. "By device," suggests Ulysses, "let blockish Ajax draw / The sort to fight with Hector" (1.3.374–375).

Agamemnon, who agrees on this course of action, plays his ludic part. In praising Ajax to Ajax himself, Agamemnon favorably compares Ajax's attributes to those of Achilles: "you are as strong, as valiant, as wise, no / less noble, much more gentle, and altogether more tractable" (2.3.136–137). The irony of being tractable is lost on Ajax. His *ratio naturalis*, according to Ulysses' slight, is incapable of *ratio artificiosa*. For, in an aside to Ajax's conditional clause—"An all men were o'my mind" (2.3.199)—Ulysses conjoins, "Wit would be out of fashion" (2.3.200). Such jokes, however, do not hide the serious implications of unreasonable pride. "He that is proud eats up himself," maintains Agamemnon, "pride is his own glass, his / own trumpet, his own chronicle, and whatever praises itself but in / the deed devours the deed in the praise" (2.3.141–143). Overblown pride can be fatally autotelic because, as the leitmotif of self-consumption in *Troilus and Cressida* affirms, the proud man devours himself. In *Troilus and Cressida*, the want of humility is a lack that speaks loudly, a need that cries out for remedy.

Ulysses, as the umpire in the strategic game between Achilles and Ajax, attempts to provide this cure. Employing not only the conjunctive, but also the disjunctive category of hypothetical proposition from Aristotelian first principles, Ulysses maps out a coordination problem in which "Two curs shall tame each other" (1.3.389). On the one hand, "If the dull brainless Ajax come safe off" (1.3.380), then "We'll dress him up in voices" (1.3.381). On the other hand, "if he fail" (1.3.381), then "go we under our opinion still / That we have better men" (1.3.382–383). Whether, "hit or miss" (1.3.383), believes Ulysses, "Ajax employed plucks down Achilles' plumes" (1.3.385).

In game-theoretic terms, as summarized in figure 2, the players are Achilles and Ajax, and each player must choose either to *avoid* or *confront* Hector—cooperation means avoiding Hector while defection entails confronting him. Confrontation in the face of a counterpart's avoidance vouchsafes the highest possible outcome (winning the payoff of 3), while avoidance in the face of a counterpart's confrontation promises the lowest result (with a score of 0). Between winning laurels as sole aggressor and earning rebukes as sole pacifist, each commander would prefer the shared honor of confronting Hector to the shared opprobrium of being labeled a coward. Thus, mutual confrontation guarantees the next highest result (gaining the score of 2), while mutual avoidance provides the third highest outcome (winning the payoff of 1).

	Ajax		
		Avoidance (cooperate)	Confrontation (defect)
Achilles	Avoidance (cooperate)	**1,1**	**0,3**
	Confrontation (defect)	**3,0**	**2,2**

Figure 2
Ulysses' Coordination Problem for Achilles and Ajax

Ulysses' coordination problem for Achilles and Ajax, as a dilemma in which both players should be willing to confront Hector, is another Deadlock. This outcome is equivalent to mutual game-theoretic defection.

Ajax might be, as Thersites jests, "like an hostess that hath no arithmetic but her / brain to set down her reckoning" (3.3.252–253). Dawson might attribute this reference to a "barmaid or tavern-keeper who must rely on her weak brain to sum up the bill," but before the introduction of computerized tills, bar staff needed to have a fair degree of computational prowess.[82] Moreover, as Ann E. Moyer argues, an Oxfordian awareness of the basic direction of academic trends toward mathematics underlies Thersites' statement. "By the late years of the sixteenth century," chronicles Moyer, "such steps tended mainly in the same direction, away from the 'theoretical' arithmetic of Boethius and toward computational, 'practical' arithmetic," as propounded by Ramus.[83] What is more, as the coordination problem between Achilles and Ajax begins to dawn on them, that dilemma demands a practical, ordinal awareness of possible outcomes, not a theoretical understanding of probabilities. If these payoffs equate to social degree, then the outcome to this dilemma, which sees Ajax accept Hector's challenge in the face of Achilles' avoidance, promotes Ajax to the highest available rank (the score of 3) and demotes Achilles to the lowest possible station (the score of 0). No wonder, as Thersites remarks, Ajax "stalks up and down like a peacock" (3.3.251), while the satiric tone of act 3 scene 3 suddenly closes on Achilles' moment of deep self-scrutiny. Like Ajax, Achilles needs only an ordinal awareness to acknowledge defection as his best course of action, but unlike Ajax, he does not react in time. Only after Ajax has assumed the plaudits for his willingness to challenge Hector does Achilles realize his game-theoretic tardiness. Achilles' new status is so low, "I myself see not the bottom of it" (3.3.299).

After requiting Hector's challenge, however, Ajax is even prouder than before. The historical analogy is revealing. That the selectively deferential Queen Elizabeth found in favor of Edward de Vere over Philip Sidney can only have added to the "insolence and pride" that John Aubrey blames for the earl's eventual downfall.[84] Complete success, then, did not crown Elizabeth's intervention in the tennis court dispute. Nor was Ulysses' strategy, with Oxford's art prefiguring his own life from Aubrey's perspective, an unmitigated triumph: an inverse proportionality describes the alteration in the two commanders' conceit, with only Achilles' pride suffering thorough diminishment. "The policy of those crafty / swearing rascals—that stale

old mouse-eaten dry cheese, Nestor, / and that same dog-fox, Ulysses—," proclaims Thersites, "is not proved worth a blackberry" (5.4.7–9). In retrospect, therefore, Ulysses' rant about Achilles and Patroclus—for taking their superiors' "abilities, gifts, natures, [and] shapes" (1.3.180) as material "to make paradoxes" (1.3.185)— carries a game-theoretic irony. Although Ulysses and Nestor have reaped a reward above Thersites' estimation, they were not as logical as they might have been. As prefigured by his instinctive rhetoric of *ratio naturalis*, Ulysses' (and by implication Nestor's) reason, as with the rationality of Ajax and Achilles, exhibits the potential for refinement. That Ulysses as well as Agamemnon uses "rhetorical tricks such as euphuism," as Anderson observes, confirms this untapped potential.[85] Affected and overly ornate language at once testifies to Ulysses' slightly clouded mind and clouds the issue for his interlocutors; as with Boethius' dialogue with the Aristotelian, Ulysses unintentionally compounds confusion.

Although Deadlock is not always as simple as it seems, the separation of Troilus and Cressida, which provides the third two-player two-choice dilemma in the play, is particularly intriguing. This situation is not a Deadlock; furthermore, Cressida's *ratio artificiosa* accounts for this strategic difference. She is more logical than Troilus, Achilles, and Ajax are. Notwithstanding Pandarus' uncertainty as to his niece's mental "discretion" (1.2.214), she is certainly versed in the art of logic, as her "discrete" skills in setting ordinal utilities and calculating possible payoffs show. The first of these two attributes prompts her to rate Troilus' love in excess of her uncle's estimation of the young man's ardor. "But more in Troilus thousandfold I see," she tells herself, "Than in the glass of Pandar's praise may be" (1.2.244–245). Her rejoinder to Pandarus' assertion that Helen admires Troilus—"Indeed a tapster's arithmetic may soon bring his particulars / therein to a total" (1.2.99–100)— confirms the second of her "discrete" skills. To repeat, the arithmetical prowess of old-fashioned bar staff is greater than Dawson allows, but more importantly, Cressida's strategically calculative turn of phrase in these two instances also points to her game-theoretic abilities. This simultaneity of logic and rhetoric exemplifies Ramus' insistence in *Brutinae quaestiones* (1547) that "although associated through usage, the aims and instruction of these arts are kept apart."[86]

In addition, specific outcomes for social dilemmas often pair opposing payoffs—the scores of 0 and 3, for example, mark cooperative-noncooperative behavior in Deadlock—and there is a lineal predisposition to disjunctive conditional thinking in Cressida's family. For, when jesting with his niece—one of his "kindred . . . . burrs" (3.2.91–93)—about Troilus' complexion, Pandarus' rhetoric reveals not only his disjunctive turn of hypothetical mind, but also that same tendency in Cressida. Troilus is not dark, she laughs. "Faith, to say truth," jokes Pandarus, "brown and not brown" (1.2.84). "To say the truth," replies Cressida, "true and not true" (1.2.85). Cressida is alive to both the paradoxes of rationality and the inversion of expectations latent within many coordination problems. When Pandarus charges Cressida as "such a woman" whom "a man knows not at what ward / you lie" (1.2.220–221), she retorts, "Upon my back to defend my belly, upon my wit to

defend / my wiles" (1.2.222–223). Tellingly, as another of her rejoinders to Pandarus suggests, Cressida thinks Troilus rather naïve or "green." Helen favors Troilus, goads Pandarus, as the laughter during their recent meeting revealed. "At what was all this laughing?" (1.2.131), asks Cressida. "Marry," Pandarus informs her, "at the white hair that Helen spied on Troilus' chin" (1.2.132). "An't had been a green hair," responds Cressida, "I should have laughed too" (1.2.133).

Certainly, when Troilus' emotions run high, he is inclined to eschew rational calculation. For instance, in the discussion over whether the Trojans should hand Helen back to the Greeks, Troilus' brother Hector wonders, as if attributing a minimum game-theoretic utility, "What merit's in that reason which denies / The yielding of her up?" (2.2.24–25). "Weigh you the worth and honour of a king / So great as our dread father," Troilus heatedly responds, "in a scale / Of common ounces?" (2.2.26–28). Troilus understands the utilities associated with this social dilemma, but discounts Hector's approach to settling the question of Helen's presence in Troy. "Will you with counters sum / The past-proportion of his infinite," he rages, "And buckle in a waist most fathomless / With spans and inches so diminutive / As fears and reasons?" (2.2.28–32). Do you invoke logic to liken the highest and lowest payoffs? Another of Troilus' brothers, Helenus, answers by criticizing Troilus for his lack of rationality. "No marvel, though you bite so sharp at reasons," he chaffs, "You are so empty of them" (2.2.33–34). Notwithstanding his brothers' advice, Troilus continues to disdain reason: his only answer to perceived violence is violence. "Here are your reasons," he tells them, "You know an enemy intends you harm, / You know a sword employed is perilous, / And reason flies the object of all harm" (2.2.38–41). "Manhood and honour," reiterates Troilus in asserting his machismo, "Should have hare hearts would they but fat their thoughts / With this crammed reason" (2.2.47–49).

Of course, certain coordination problems would ratify tit-for-tat action, but emotion overrules Troilus' rational faculty where the Trojan-Grecian war is concerned. "Reason and respect," he intones, "Make livers pale and lustihood deject" (2.2.49–50). Yet, failing to weigh a situation rationally, as Hector counsels, can amount to foolish fondness: "the will dotes that is inclineable / To what infectiously itself affects," he warns, "Without some image of th'affected merit" (2.2.58–60). Willfulness can infect, affect, and ultimately destroy reason. In comparison, consistency of thought was fundamental to Ramus. "Whatever is treated in an art," explains Duhamel of Ramism, "must be basic to the art and must belong to it because of a natural priority. The rule of homogeneity seems to be the one which he saw most frequently violated."[87] Ramus held that logic must not contain the illogical. To which danger, not only the matter of Troilus' reply to Hector, but also the muddled reasoning of that content, expose the young Trojan's basically unrefined and rhetorically infected reason. The analogy Troilus draws from a hypothetical situation has his senses informing his will, his will informing his decision-making:

> I take today a wife, and my election
> Is led on in the conduct of my will,

> My will enkindled by mine eyes and ears,
> Two traded pilots 'twixt the dangerous shores
> Of will and judgement: how may I avoid,
> Although my will distaste what it elected,
> The wife I chose? There can be no evasion.
>   (2.2.61–67)

Troilus "argues that one's choice ('election') is 'led on' by will, when the orthodox view," as Dawson notes, "is that the will chooses what reason ('judgement,' 2.2.65) presents to it as a good." One aspect of Troilus' confusion, as Dawson astutely observes, "arises from the slippage in the meaning of 'will' from 'desire' (2.2.62, 2.2.63) to 'the mental faculty that effects choice' (2.2.65)."[88] No wonder Hector decries the hematological tempers that prevent Troilus from thinking rationally: "is your blood / So madly hot," he demands, "that no discourse of reason, / Nor fear of bad success in a bad cause / Can qualify the same?" (2.2.115–118).

The willful Paris, another of Priam's sons, now joins the debate on Troilus' side. "Were I alone to pass the difficulties, / And had as ample power as I have will," he protests, "Paris should ne'er retract what he hath done / Nor faint in the pursuit" (2.2.139–142). "You speak," retorts his father, "Like one besotted on your sweet delights" (2.2.142–143). Hector views Paris similarly. To excerpt from an earlier quotation, he compares Troilus and Paris to those "young men whom Aristotle thought / Unfit to hear moral philosophy" (2.2.166–167). This anachronism expresses the contention that the basics of logic—and Aristotle's name, as Oxford's Ramism would have insisted, is the most appropriate one to affix to these first principles—are prefigurations. Zeal rather than sanguine logic, continues Hector, has control of Troilus' and Paris' decision-making. "The reasons you allege do more conduce / To the hot passion of distempered blood," he declares, "Than to make up a free determination / 'Twixt right and wrong" (2.2.168–171). Gratification and vengeance, "Have ears more deaf than adders to the voice / Of any true decision" (2.2.172–173).

What Troilus fears, as his expectations of his love match with Cressida reveal, are coordination problems that are too complicated for his current ratiocinative powers: "some joy too fine, / Too subtle-potent, tuned too sharp in sweetness," he admits, "For the capacity of my ruder powers" (3.2.20–22). Troilus' desire for Cressida, which makes his "heart beats thicker than a feverous pulse / And all my powers do their bestowing lose" (3.2.32–33), accentuates this fear. This lack of *ratio artificiosa* forces Troilus to rely on Pandarus during his pursuit of Cressida's love. Although Pandarus, as the one "gone between and between" (1.1.67) the prospective lovers, keeps Troilus and Cressida's channel of communication open, the situation he umpires is a coordination problem in which one player is determined on a single strategy: Troilus loves Cressida whether she requites his feelings (cooperates) or not (defects). Pandarus, aware of Troilus' tunnel vision, advises him to be patient. After "the kneading, the making of the cake, the heating of the oven, and / the baking,"

he counsels, "you must stay the cooling too or you may chance / to burn your lips" (1.1.22–24).

Ironically, Troilus' perspective of strategic inflexibility also deems Cressida to be following a single strategy. "She is stubborn," he bemoans, "chaste against all suit" (1.1.91). More accurately adduced, Cressida's strategy acknowledges her desire for but hides that desire from Troilus—"Then though my heart's content firm love doth bear, / Nothing of that shall from mine eyes appear" (1.2.254–255). In effect, she is waiting to disabuse Troilus of his mistake. "I'll be sworn 'tis true, he will weep you an 'twere a man / born in April" (1.2.148–149), Pandarus warns his niece. "And I'll spring up in his tears," replies Cressida in maintaining her resolve, "an 'twere a nettle against May" (1.2.150). Cressida's behavior, which manifests what sociobiologists call the *strategy of domestic-bliss*, and which answers to her sense that "Men prize the thing ungained more than it is" (1.2.249), ensures that Troilus is a trustworthy suitor by extracting a form of prenuptial investment from him. If Troilus' interest in Cressida is only casual, then her demureness should induce him to give up in frustration.[89] Her strategy of domestic-bliss, behavior that prompts Davis-Brown to describe Cressida as "coldly rational,"[90] confirms the relative maturity of her *ratio artificiosa* in comparison to the reasoning powers of Troilus, Achilles, and Ajax.

To Troilus' relief, Pandarus finally manages to break the impasse enforced by Cressida's rational caution, instituting an unofficial contract between them. Dawson, whose critical discourse often courts a mathematical interpretation, describes this agreement as a "legal *formula*."[91] The terms of this formula promise Troilus to Pandarus' niece and vice versa. In effect, Pandarus ratifies a coordinated relationship between Troilus and Cressida "In witness whereof the parties" are taken "interchangeably" (3.2.50). The mathematical subtext to what Dawson describes as these "contracts signed in duplicate" is a coordination problem with reciprocal payoffs.[92] Troilus has the tendency to visualize his desire in binary terms—"I was about to tell thee" of my love for Cressida, he informs Pandarus, "when my heart, / As wedged with a sigh, would rive in twain" (1.1.32–33)—but this inclination anticipates the two choices of the four-faceted dilemma that will soon face the young lovers. Cressida is more capable of logically accepting this coordination problem than Troilus is.

Textual evidence supports this claim. For, immediately after ratifying their mutual contract, whether Cressida is trepidatious or merely simulating apprehension, she displays a more seasoned attitude toward their future than Troilus does. "Fears make devils of cherubims," he tells her, "they never see truly" (3.2.59). "Blind fear that seeing reason leads," she replies, "finds safer footing than / blind reason stumbling without fear" (3.2.60–61). The resolute faith that characterizes Troilus' love worries Cressida. "This is not to say," emphasizes Brams, "that faith is irrational. On the contrary, being faithful means having preferences such that one's rational strategy is independent of the strategy of another player—that is, one's own values completely determine how one acts."[93] From a game-theoretic perspective, Troilus' willfulness prompts him to act as if he has a dominant strategy. Ironically, then, Troilus' admittance of blind love for Cressida—"in all Cupid's pageant there / is

presented no monster" (3.2.63–64) and his desire is like "firm / faith" (3.2.89–90)—expresses a partial awareness that such an attitude is a personal defect (or "my fault" [4.4.101]).

In contrast to Troilus' resolute faith in Cressida, her feelings toward him respect trained reason, with Cressida's thoughts being of a reflexive nature. "I have," she tells him, "a kind of self resides with you" (3.2.128). This "unkind self that itself will leave / To be another's fool" (3.2.129–130) empowers Cressida's strategic thinking with an awareness of Troilus' injudicious thoughts concerning her. Cressida's admission "Where is my wit? I know not what I speak" (3.2.131) therefore expresses the possibility of her honest dishonesty toward Troilus rather her own irrationality. "Troilus," comments Dawson, "smitten by Cressida's wit as well as her beauty, nevertheless seems aware of the possible calculation in her words and behaviour."[94] Any such understanding, however, is merely vague, while Cressida's admittance of an "unkind self" (3.2.129) suggests her cultural perceptivity: men assign irrationality to women. If I could believe in such an unnaturally reasonable woman, thinks Troilus—a woman who "keep[s] her constancy in plight and youth, / Outliving beauty's outward with a mind / That doth renew swifter than blood decays" (3.2.141–43)—then "How were I […] uplifted!" (3.2.148). Troilus pities the improbability of this occurrence, "But, alas, / I am as true as truth's simplicity / And simpler than the infancy of truth" (3.2.148–150), and his simple unreasonableness denies him the chance to know Cressida for the reasoning person she is.

In agreeing to disagree on the issue of faithfulness—"In that I'll war with you," states Cressida. "O virtuous fight," responds Troilus, "When right with right wars who shall be most right!" (3.2.151–152)—the lovers instantiate another impasse. Troilus predicts that he will break this game-theoretic Deadlock to his advantage ("sanctify the numbers" [3.2.163]) by securing an official marriage license, which Dawson deems an "imprimatur."[95] Sanctifying their coordination in this manner will guarantee Troilus and Cressida's relationship. All true lovers, when in need of similes but "truth tired with iteration" (3.2.156), will thereafter invoke the name of Troilus. As Ramus appreciated, and Troilus does not, however, proving a truth through iterative evidence alone (inductive reasoning) is no proof at all. Thus, with a logical Cressida and an immaturely rational Troilus, Oxford's play skillfully inverts the sexual politics of Chaucer's narrative poem. Chaucer is "a very rationalistic poet," as Bloomfield avows, but his depiction of Cressida lacks the subtlety of Oxford's bequest to feminism.[96]

From the sociohistorical context of each text, rationality is a male preserve; the complementary female preserve is emotionality. Chaucer encapsulates this divide, argues Helen Phillips, with the notion of domination in marriage (*maistrie*): "marriage as man's control of woman, political domination as the source of social harmony, and the psychological hierarchical harmony resulting from the proper subjugation of sensuality and emotion (deemed to be feminine in medieval thought) to mature rationality (deemed to be masculine)."[97] Agreeing with this historical picture, Bloomfield describes Criseyde's quest as a search for "human joy," Troilus as "in part a Boethian *manqué*," and the poet-persona as "in part a Christian Boethian"

(and presumably masculine).[98] While some critics of *Troilus and Cressida* concede that the "use of Chaucer is both extensive and sophisticated," laments Davis-Brown, "few compare the love story with its source in Chaucer in any detailed manner"; as a result, he maintains, "critics generally agree" that *Troilus and Cressida* "reduce[s] the complexity of the medieval characters."[99] Davis-Brown counsels scholars of Renaissance literature to reevaluate this attitude.

A game-theoretic reading of *Troilus and Cressida* supports this proposal. Thus, when Kenneth Muir states that the difference between the two authors' attitudes toward the lovers owes much to "the hardening of opinion towards Cressida in the intervening two hundred years," and that "she had become a type of inconstancy,"[100] he unintentionally supports the thesis that Cressida's (rather than Criseyde's) *ratio artificiosa* is more developed than Troilus' is. Game theory attributes any crystallization of attitude toward Troilus' lover to Oxford's appreciation of her logical hardheadedness and any inconstancy to the playwright's delineation of a rational mind taxed with the logical uncertainty of a particular kind of coordination problem. For, in certain social dilemmas, as Morgenstern avers, "always there is exhibited an endless chain of reciprocally conjectural reactions and counter-reactions"; however logical the player, "the paradox still remains no matter how one attempts to twist or turn things around."[101]

The sociopolitical effect on situations of coordination can be dynamic and players who are rational, rather than blindly resolute, will register the consequences wrought by this influence. What plunges Cressida into an endless chain of reasoning is the prospect (followed by the realization) of physical separation from Troilus. Calchas, whom the Greeks billet, successfully sues for his daughter's return in exchange for Antenor. As in *Antony and Cleopatra*, the eponymous lovers in *Troilus and Cressida* must confront an environmental change instigated by state rather than individual politics. Mark Antony—whose triumvirate with Octavius Caesar and M. Aemilius Lepidus is under territorial threat from Pompey, Menecrates, and Menas—must return to Rome; Cressida must cross the Trojan-Grecian battle lines and rejoin her father.

Neither Troilus nor Cressida welcomes state interference: Troilus "cannot bear it" (4.2.90), while Cressida "will not go" (4.2.91). Pandarus might have truly believed that "our kindred, though they / be long ere they are wooed, they are constant being won" (3.2.91–92) and "stick where they are thrown" (3.2.93), but he had not foreseen Cressida, his "kindred burr," being transplanted into an unfamiliar environment. Troilus agrees to accompany Cressida "to the Grecian presently" (4.3.6), but neither his acknowledgement of Greek astuteness, which simultaneously indicts his own lack of rational prowess, nor his conveyance of Cressida to Diomedes bodes well for Troilus in game-theoretic terms. Troilus deems the Greek commanders masters of the logical framework that awaits all rational minds—that "dumb-discursive devil / That tempts most cunningly" (4.4.89–90). In comparison, he admits to Cressida, "I cannot [...] play at subtle games" (4.4.84–86). Troilus even reiterates this self-awareness in again admitting the "fault" (4.4.101) of his unreasonable love for Cressida. "I with great truth catch mere simplicity," he

concedes, "Whilst some with cunning gild their copper crowns, / With truth and plainness I do wear mine bare" (4.4.103–105). "My wit," concludes Troilus, "Is 'plain and true'" (4.4.106–107).

Cressida's exchange for Antenor confirms Troilus' fears. "To her own worth," Diomedes tells Troilus, "She shall be prized, but that you say be't so, / I speak it in my spirit and honour, no" (4.4.132–134). In effect, the Greek commander will ascribe the utilities to his forthcoming relationship with Cressida: "I'll nothing do," he avows, "on charge" (4.4.132). Diomedes' statement is succinct and cogent. Although he distinguishes logic from rhetoric, he connects them in practice, like a Ramist. "O you gods divine," Cressida had sworn, "Make Cressid's name the very crown of falsehood / If ever she leave Troilus" (4.2.96–98). In the obvious sense of physical relocation, however, she now leaves Troilus. In Chaucer's rendition of the resultant dilemma, Troilus and Criseyde have previously agreed to fake their cooperation with the Trojan state. Having spent some time with Calchas for the sake of appearances, she and Troilus plan to defect from the Trojan-Grecian environs. "I will see you without fail on the tenth day," Criseyde assures Troilus, "unless death strikes me down."[102] "Provided that's true," he replies, "I'll endure until the tenth day."[103]

That Oxford's version of the story omits this detail does not alter the resultant coordination problem, which pits the lovers' faithfulness to each other (the C of cooperation) against their loyalty to Troy (the D of defection). In each case of non-complementary behavior, the person loyal to Troy gains the best possible outcome (the score of 3) by revealing the disloyalty of an erstwhile partner; by symmetry, the disloyal partner experiences the worst outcome (the score of 0), having betrayed Troy for an unfaithful lover. In the cases of complementary behavior, whereas combined disloyalty to Troy involves the faithful lovers' continued union but physical and moral ostracism from the city (the score of 2), combined loyalty to Troy involves the partners' realization of mutual unfaithfulness (the score of 1). In terms of the mathematical inequality that describes these descending payoffs, DC > CC > DD > CD, the separated lovers must endure a game-theoretic *Prisoner's Dilemma*. Figure 3 summarizes their situation:

		Cressida	
		Faithful to Lover (cooperate)	Loyal to Troy (defect)
Troilus	Faithful to Lover (cooperate)	**2,2**	**0,3**
	Loyal to Troy (defect)	**3,0**	**1,1**

FIGURE 3
THE PRISONER'S DILEMMA BETWEEN TROILUS AND CRESSIDA

This social predicament plunges Cressida into an endless chain of reasoning because she is rational enough to appreciate that a "paradox still remains no matter how one attempts to twist or turn things around," and that this chain of contrasting solutions (to expand a previous quotation from Morgenstern) "can never be broken by an act of knowledge but always only through an arbitrary act."[104] The strategically "green" (1.2.133) Troilus does not share Cressida's mental "discretion" (1.2.214); as an ironic result, he endures their separation as a trial but not a paradox. In contrast, Diomedes demonstrates what Dawson calls "precise intelligence,"[105] and this attribute puts him on the same rational plane as Cressida. Her dilemma—the fact that Cressida's unilateral defection guarantees her a better payoff than mutual cooperation affords—is clearer to Diomedes than to Troilus.

In leaving Troilus to join her father, Cressida had appealed not only to "Time" (4.2.98) to "Do to this body what extremes you can" (4.2.99), but also to place: "the strong base and building of my love" (4.2.100), she tells her uncle, "Is as the very centre of the earth / Drawing all things to it" (4.2.101–02). With her translocation to the Greek camp, however, this spatial metaphor favors Diomedes over Troilus. The Greek commander is a satellite within Troilus' outer orbit. Worse, from Troilus' standpoint, Cressida's passion, excited by her single night with Troilus, remains unspent. "If [only] I could temporise with my affection" (4.4.6), she had complained the next morning to Pandarus. This residual desire works in conjunction with the sociopolitical environment and intuitive game-theoretic reasoning to forward Diomedes' cause. The four-level structure of act 5 scene 2, which echoes the quaternary structure of a two-player two-choice strategy matrix, results.

This famous eavesdropping scenario, explains Dawson, is

> all about watching; in it, at the centre, Diomedes accosts the hesitant, half-willing Cressida, demanding sexual favour and impatient with what he regards as her teasing. They are watched by an increasingly distraught Troilus who himself is observed and cautioned by his Greek companion, Ulysses. At the edges of the scene hovers the ubiquitous Thersites, commenting sourly on the spectacle of betrayal and lust before him. And, of course, we the audience form the outer circle of this web of observation.[106]

The playwright, as Dawson observes, "had used this strategy of layered observation and split perspective before, in *Love's Labour's Lost*, 4.3, for example, and in the Mousetrap scene in *Hamlet*, but never to such devastating effect."[107] This devastation alights on Troilus; the unfamiliar turns familiar; the known becomes unknown.

What was good as a token of faithfulness in the Trojan environment—as Cressida's exhortation to Diomedes to "keep this sleeve" (5.2.65), a favor that she had originally accepted from Troilus, attests—is just as good in the different but similar environment of the Greek camp. Cressida's expectation concerning the single-minded faithfulness of Troilus—"O pretty, pretty, pledge," she intones, "Thy master now lies thinking on his bed / Of thee and me, and sighs and takes my glove

/ And gives memorial dainty kisses to it" (5.2.76–79)—is simply logical. To repeat, whereas Troilus' faithfulness to Cressida is resolute and blindly instinctive, Cressida's faithfulness to Troilus is open to trained reason. Cressida welcomes this leeway, while Troilus can only watch the "withered truth" (5.2.46) of his game-theoretic faith.

Thus, as if to confirm a *ratio artificiosa* not developed enough to appreciate the sense of Cressida's solution to their Prisoner's Dilemma, Troilus asks Ulysses, "Shall I not lie in publishing a truth?" (5.2.118). This question, notes Dawson, is "the first of a series of paradoxes that Troilus explores over the next 40 lines in an effort to reconcile his split image of Cressida and, indeed, the rifts in truth itself."[108] With one of these logical contradictions, Troilus acknowledges a "discourse" (5.2.141) that "sets up with and against itself" (5.2.142), yet the young Trojan ascribes this inconsistency not to paradoxical logic but to "madness" (5.2.141). Troilus' avowal, "This is and is not Cressid" (5.2.145), "derives from a structured sequence of reasoning," as Dawson believes, but is not, as Dawson further contends, "irrational"; rather, logic assumes the mantle of paradox without Troilus' full appreciation of that assumption.[109] Just as Troilus' physique requires more development—"No, faith, young Troilus, doff thy harness, youth. / I am today i'th'vein of chivalry," implores Hector, "Let grow thy sinews till their knots be strong" (5.3.31–33)—so his *ratio naturalis* needs further training.

What Troilus misconstrues as the irrationality of his own paradoxical discourse is actually a rational means of expressing in literary rather than mathematical language Morgenstern's identification of the "reciprocally conjectural reactions and counter-reactions" that characterize certain social dilemmas.[110] The linguistic techniques employed by Oxford evince this understanding. "The content of the oration became the object of reason and method," states Duhamel of Ramism; "the function of rhetoric was to gild the furnished material."[111] Oxford's invented adjectives seem to prefigure game-theoretic logic. The Trojan-Grecian Deadlock is actively protracted ("protractive" [1.3.20]); the payoffs for coordination problems can be symmetric ("corresponsive" [0.18]) or asymmetric ("unrespective" [2.2.71]); numbers, matrices, and game trees are alternatives to the soliloquies of logic ("dumb-discoursive" [4.4.89]); and logical dilemmas can be logically insoluble ("uncomprehensive" [3.3.199]). Oxford's use of oxymorons also contributes to his delineation of conjectural reactions and counter-reactions. Thersites' comment about Diomedes' wish for Cressida to be unfaithful, or "to be secretly open" (5.2.24), is especially apposite in this regard. Reasoning of the type that swallows its own tail can be self-effacing rather than irrational. Coordination problems, as Troilus unintentionally, unknowingly, but accurately describes them, display "Bifold authority, where reason can revolt / Without perdition, and loss assume all reason" (5.2.143–144).

An arbitrary solution to a social dilemma can be unpleasant, but sometimes that type of solution is the only one allowed; otherwise, as *Troilus and Cressida* attests, a player must step outside the ordinary rules of engagement: Diomedes implicitly usurps Pandarus' role as Troilus and Cressida's agent; Achilles, in order to diffuse his shame at Ajax's unforeseen promotion, orders his "fellows" to "strike"

(5.9.10) the "unarmed" (5.9.9) Hector; and Ulysses, beyond the extent of Oxford's play, but surely on the playwright's mind, breaks the stalemate at Troy with his deployment of the Trojan Horse.

In short, only Edward de Vere, Seventeenth Earl of Oxford, was capable of delineating in a Ramist manner the two-valued logic of Aristotelian first principles on show in *Troilus and Cressida*; only de Vere had what Virginia Woolf in *A Room of One's Own* (1929) describes as a truly "androgynous" (or two-valued) mind; and only he could have appreciated the necessary but unsportsmanlike solutions to such dilemmas.[112]

Endnotes

[1] Shakespeare, *Troilus and Cressida*, ed. Anthony B. Dawson (Cambridge, UK: Cambridge University Press, 2003).

[2] "*Troilus and Cressida*," chronicles Evangeline Maria O'Connor, "was first published in a quarto edition in 1609." Evangeline Maria O'Connor, *An Index to the Works of Shakespeare: Giving References, by Topics, to Notable Passages and Significant Expressions; Brief Histories of the Plays; Geographical Names and Historical Incidents; Mention of all Characters and Sketches of Important Ones; Together with Explanations of Allusions and Obscure and Obsolete Words and Phrases* (London: Kegan Paul, 1887), 378. Anthony B. Dawson, however, adds an important caveat. Although *Troilus and Cressida* "was only published in 1609, near the end of Shakespeare's career, *it was almost certainly written several years earlier*." Anthony B. Dawson, Introduction, *Troilus and Cressida*, by William Shakespeare, ed. Anthony B. Dawson (Cambridge, UK: Cambridge University Press, 2003), 1–70, quotation on 6 (emphasis added).

William Caxton was the first to publish *Troilus and Criseyde*, but the date of publication remains a little hazy: Simone Celine Marshall attributes Caxton's Westminster edition to 1483, Barry Windeatt to circa 1483, and Deanne Williams to 1484. Simone Celine Marshall, *The Anonymous Text: The 500-Year History of the Assembly of Ladies* (Bern: Peter Lang, 2010), 54; Barry Windeatt, Introduction, *Troilus and Criseyde*, by Geoffrey Chaucer (Oxford, UK: Oxford University Press, 1998), ix–xlvi, quotation on xlvi; Deanne Williams, *The French Fetish from Chaucer to Shakespeare* (Cambridge, UK Cambridge University Press, 2004), 110.

A number of prominent critics agree that Shakespeare drew extensively on Chaucer's narrative poem. "Shakespeare understood Chaucer's poem for what it is," remarks E. Talbot Donaldson, "a marvelous celebration of romantic love containing a sad recognition of its fragility." E. Talbot Donaldson, *The Swan*

at the Well: Shakespeare Reading Chaucer (New Haven, CT: Yale University Press, 1985), 3. Robert S. Miola has no doubts that Shakespeare's *Troilus and Cressida* "refashions Chaucer's *Troilus and Criseyde*." Robert S. Miola, *Shakespeare's Reading* (Oxford, UK: Oxford University Press, 2000), 137.

3 Rosalyn Rossignol, *Critical Companion to Chaucer: A Literary Reference to his Life and Work* (New York: Infobase, 2006), 32. Boethius wrote the *Consolation of Philosophy* "while he was awaiting execution (by having his head slowly crushed)." Michael B. Wilkinson and Hugh H. Campbell, *Philosophy of Religion: An Introduction* (London: Continuum, 2010), 62.

4 Kathryn L. Lynch, *Chaucer's Philosophical Visions* (Cambridge, UK: Brewer, 2000), 20.

5 William Godwin, *Life of Geoffrey Chaucer, The Early English Poet: Including Memoirs of his Near Friend and Kinsman, John of Gaunt, Duke of Lancaster: With Sketches of the Manners, Opinions, Arts and Literature of England in the Fourteenth Century*, 4 vols. (London: Richard Phillips, 1804), 1:35.

6 Godwin, 1:37.

7 Godwin, 1:317.

8 Morton W. Bloomfield, "Fourteenth-Century England: Realism and Rationalism in Wyclif and Chaucer," *English Studies in Africa* 16.2 (1973): 59–70, quotation on 68. Theodore A. Stroud and Bernard Levi Jefferson, as Bloomfield notes, are of the same opinion concerning this pervasiveness. Theodore A. Stroud, "Boethius' Influence on Chaucer's *Troilus*," *Modern Philology* 49 (1951–1952): 1–9. Bernard Levi Jefferson, *Chaucer and the* Consolation of Philosophy *of Boethius* (Princeton, 1917).

9 Bloomfield, 61.

10 John P. Burgess, *Philosophical Logic* (Princeton, NJ: Princeton University Press, 2009), 40 (emphasis original).

11 Bloomfield, 61.

12 Bloomfield, 66.

13 Donaldson, *The Swan at the Well*, 3.

14 Kris Davis-Brown, "Shakespeare's Use of Chaucer in *Troilus and Cressida*: 'that the will is infinite, and the execution confined,'" *South Central Review* 5.2 (Summer 1988): 15–34, quotation on 15.

15 "The roll of the Stratford-upon-Avon grammar school is lost," laments Jonathan Bate, "but Shakespeare was entitled to attend it free of charge, by virtue of his father's civic office[s]." Jonathan Bate, Introduction, *William Shakespeare: Complete Works (The RSC Shakespeare)*, ed. Jonathan Bate and Eric Rasmussen (London: Macmillan, 2007), 8–57, quotation on 51.

16 Stefan Daniel Keller, *The Development of Shakespeare's Rhetoric: A Study of Nine Plays* (Tübingen, Ger.: Francke, 2009), 15.

17 Keller, *The Development of Shakespeare's Rhetoric*, 15. J. Thomas Looney, *"Shakespeare" Identified in Edward de Vere, 17th Earl of Oxford*, Intro. William McFee, 2nd ed. (New York: Duell, Sloane and Pearce, 1948), 202.

18 The death of his father in 1562 left Edward a member of William Cecil's London

household.

[19] Martin A. S. Hume, *The Great Lord Burghley: A Study in Elizabethan Statecraft* (London: Nisbet, 1898), 8.

[20] Edward Nares, *Memoirs of the Life and Administration of the Right Honourable William Cecil, Lord Burghley: Containing an Historical View of the Times in which He Lived, and of the many Eminent and Illustrious Persons with whom He was Connected; with Extracts from His Private and Official Correspondence, and other Papers, Now First Published from the Originals*, 3 vols. (London: Saunders and Otley, 1828–1831), 3:406.

[21] Hume, *The Great Lord Burghley*, 9.

[22] Garry J. Moes, *Streams of Civilization: Cultures in Conflict Since the Reformation until the Third Millennium After Christ* (Arlington Heights, IL: Christian Liberty Press, 2007), 142.

[23] Cedric B. Cowing, *The Saving Remnant: Religion and the Settling of New England* (Urbana, IL: University of Illinois Press, 1995), 16.

[24] John Milton, *Artis Logicæ*, ed. Frank Allen Patterson (New York: Columbia University Press, 1935), 3.

[25] Jack Cunningham, *James Ussher and John Bramhall: The Theology and Politics of Two Irish Ecclesiastics of the Seventeenth Century* (Aldershot, UK: Ashgate, 2007), 4 n.25.

[26] Nares, 2:602 n.

[27] Nares, 2:602.

[28] Nares, 2:405–06.

[29] Cunningham, 3.

[30] Bronson Feldman, *Hamlet Himself* (Bloomington, IN: iUniverse, 2010), 24.

[31] See Ursula Zzirg, *Shakespeare and Michelangelo: The Style of Gods Eyed Awry; The Leonardo Code; Text and Images; Satires and Epigrams* (Victoria, BC: Trafford, 2005), 39.

[32] See Paul Altrocchi and Hank Whittemore, *So Richly Spun* (Bloomington, IN: iUniverse, 2009), 253.

[33] Robert Hanna, *Rationality and Logic* (Cambridge, MA: MIT Press, 2006), xviii.

[34] George Huppert, "The Age of Philosophy," *Studies in Early Modern France*, Vol. 2, *Signs of the Early Modern: Fifteenth and Sixteenth Centuries*, ed. David Lee Rubin (Charlottesville, VA: Rookwood Press, 1996), 16–28, quotation on 23.

[35] "Or donc les premiers hommes, qui avaient déjà connu les Mathématiques avant le déluge, se sont occupés de Dialectique." Peter Ramus, *Dialectique: Un Manifeste de la Pléiade*, 1555, ed. Nelly Bruyère (Paris: Librairie Philosophique J. Vrin, 1996), 11 (my translation). Web. 30 January 2013. <http://books.google.co.uk>.

[36] "Péripatéticiens ont délaissé le vrai amour de la sagesse et se sont adonnés servilement à l'amour d'un Aristote." Ramus, *Dialectique*, 13 (my translation). Web. 30 January 2013. <http://books.google.co.uk>.

[37] Matthew Guillen, *Reading America: Text as a Cultural Force* (Bethesda, MD: Academica Press, 2007), 44.

[38] James J. Murphy, Introduction, *Arguments in Rhetoric against Quintilian: Translation and Text of Peter Ramus's* Rhetoricae Distinctiones in Quintilianum, trans. Carole Newlands (Carbondale, IL: Southern Illinois University Press, 2010), 1–44, quotation on 15.

[39] Peter F. Fisher, "Milton's Logic," *Journal of the History of Ideas* 23.1 (Spring 1962): 37–60, quotation on 43.

[40] Guillen, 44.

[41] Walter J. Ong, *Ramus, Method, and the Decay of Dialogue* (New York: Octagon, 1974), 313.

[42] Manuel Breva-Claramonte, *Sanctius' Theory of Language: A Contribution to the History of Renaissance Linguistics* (Amsterdam: John Benjamin's Publishing Company, 1983), 73.

[43] Guillen, 44–45.

[44] P. A. Duhamel, "The Logic and Rhetoric of Peter Ramus," *Modern Philology* 46.3 (February 1949): 163–71, 163 (emphasis added).

[45] Fisher, 43.

[46] Bernard J. Hibbitts, "Making Sense of Metaphors: Visuality, Aurality, and the Reconfiguration of American Legal Discourse," *Cardozo Law Review* 16.2 (1994): 229–356, quotation on 321.

[47] For Cecil's details in this regard, see Hume, *The Great Lord Burghley*, 10. For both Cecil's and de Vere's details in this regard, see Joseph Foster, *The Register of Admissions to Gray's Inn, 1521–1889, Together with the Register of Marriages in Gray's Inn Chapel, 1695–1754* (London: Hansard, 1889), 36.

[48] Nares, 1:58.

[49] Altrocchi and Whittemore, 255.

[50] Jess Edwards, *Writing, Geometry and Space in Seventeenth-Century England and America: Circles in the Sand* (London: Routledge, 2006), 103.

[51] See E. G. R. Taylor, *The Mathematical Practitioners of Tudor and Stuart England* (Cambridge, UK: Cambridge University Press, 1954), 328.

[52] Duhamel, 168.

[53] Guillen, *Reading America*, 45. Inner quote: Steven Maras, "Reflections on Adobe Corporation, Bill Viola, and Peter Ramus while Printing Lecture Notes," *M/C Journal* 8.2 (2005). 31 January 2006. Web. 18 October 2013. <http://journal.media-culture.org.au /0506/05-maras.php>.

[54] "Ars dialectica est imago naturalis dialecticae." Peter Ramus, *Aristotelicae animadversiones*, 1543 (Stuttgart-Bad Canstatt, Ger.: Friedrich Frommann, 1964), 4 (my translation). Web. 12 October 2013. <http://books.google.co.uk>.

[55] "Naturalis autem dialectica, id est, ingenium, ratio, mens, imago parentis omnium rerum Dei, lux denique beatae illius, & aeternae lucis aemula, hominis propria est, cum eoque nascitur." *Dialecticae institutiones*, 1543 (Stuttgart-Bad Canstatt, Ger.: Friedrich Frommann, 1964), 6 (my translation). Web. 12 October 2013. <http://books.google.co.uk>.

[56] John Davis Williams, *The Compleat Strategyst: Being a Primer on the Theory of Games*

(New York: McGraw-Hill, 1954), 16 (emphasis original).

[57] Steven J. Brams, *Biblical Games: A Strategic Analysis of Stories in the Old Testament* (Cambridge, MA: MIT Press, 1980), 6 (emphasis original).

[58] Harald Kleinschmidt, "Thinking as Action. Some Principal Changes in Medieval and Early Modern Europe," *Ethnologia Europaea* 27.2 (1997): 83–104, quotation on 97.

[59] Anthony B. Dawson, Introduction, *Troilus and Cressida*, by William Shakespeare, ed. Anthony B. Dawson (Cambridge, UK: Cambridge University Press, 2003), 1–70, quotation on 14.

[60] Dawson, 107 n.

[61] Dawson, 100–01 n.

[62] Ong, 313.

[63] Dawson, 101 n.

[64] Oskar Morgenstern, "Perfect Foresight and Economic Equilibrium," *Selected Writings of Oskar Morgenstern*, ed. Andrew Schotter (New York: New York University Press, 1976), 169–83, quotation on 174.

[65] Heather M. Campbell, *The Emergence of Modern Europe: c. 1500 to 1788* (New York: Rosen Publishing, 2011), 53.

[66] Mark Anderson, *"Shakespeare" by Another Name: The Life of Edward de Vere, Earl of Oxford, the Man who was Shakespeare* (New York: Gotham, 2005), 204.

[67] Anderson, 204, 205.

[68] Dawson, ed., 98 n.

[69] Anderson, 206.

[70] William Farina, *De Vere as Shakespeare: An Oxfordian Reading of the Canon* (Jefferson, CA: McFarland, 2006), 21.

[71] Anderson, 33.

[72] David A. Richardson, *Sixteenth-Century British Nondramatic Writers* (London: Gale Research, 1996), 197.

[73] Looney, 122.

[74] Farina, 21.

[75] Richardson, 197.

[76] See David Scott Kastan, *The Oxford Encyclopedia of British Literature*, 5 vols. (Oxford, UK: Oxford University Press, 2006), 5:193.

[77] Gāmini Salgādo, Introduction, *Four Jacobean City Comedies*, ed. Gāmini Salgādo (Harmondsworth, UK: Penguin, 1975), 9–28, quotation on 10.

[78] Christopher Morris, "Shakespeare's Politics," *The Historical Journal* 8.3 (1965): 293–308, quotation on 300.

[79] Morris, 300.

[80] Herschel Clay Baker, *The Dignity of Man: Studies in the Persistence of an Idea* (Cambridge, MA: Harvard University Press, 1947), 232.

[81] Baker, 233, 232.

[82] Dawson, ed., 166 n.

[83] Ann E. Moyer, *The Philosophers' Game: Rithmomachia in Medieval and Renaissance Europe, with an Edition of Ralph Lever and William Fulke,* The Most Noble,

Ancient, and Learned Playe *(1563)* (Ann Arbor, MI: University of Michigan Press, 2001), 130.

84 John Aubrey, *Aubrey's Brief Lives*, 1949, ed. Oliver Lawson Dick (Jaffrey, NH: Godine, 1999), 305.

85 Anderson, 204.

86 "Artium omnium fines & institutiones separentur: usus tamen coniungatur." Petrus Ramus, *Brutinae quaestiones*, 1547 (Basle, Switz.: Peter Perna, 1577), 280 (my translation). Web. 30 January 2013. <http://books.google.co.uk>.

87 Duhamel, 166.

88 Dawson, ed., 121 n.

89 Richard Dawkins posits the strategy of domestic-bliss in *The Selfish Gene*, 1976 (Oxford, UK: Oxford University Press, 1989), 140–65.

90 Davis-Brown, "Shakespeare's Use of Chaucer in *Troilus and Cressida*," 20.

91 Dawson, ed., 149 n (emphasis added).

92 Dawson, ed., 149 n.

93 Brams, 37.

94 Dawson, 152 n.

95 Dawson, 154 n.

96 Bloomfield, 66.

97 Helen Phillips, *An Introduction to the* Canterbury Tales*: Reading, Fiction, Context* (New York: Palgrave Macmillan, 2000), 48–49.

98 Bloomfield, 68 n.23, 68, 68.

99 Davis-Brown, 15.

100 Kenneth Muir, "Troilus and Cressida," *Aspects of Shakespeare's "Problem Plays": Articles Reprinted from Shakespeare Survey*, ed. Kenneth Muir and Stanley Wells (New York: Cambridge University Press, 1982), 96–110, quotation on 99.

101 Morgenstern, 174.

102 "The tenthe day, but-if that deeth me assayle, / I wol yow seen with-outen any fayle." Geoffrey Chaucer, *Complete Works:* Boethius *and* Troilus (Oxford UK, Oxford: Clarendon Press, 1954), 4.1595–96 (my translation).

103 "'So this be sooth,' quod Troilus, / 'I shal wel suffre un-to the tenthe day.'" Chaucer, *Complete Works:* Boethius *and* Troilus, 4.1597–98 (my translation).

104 Morgenstern, 174.

105 Dawson, 15.

106 Dawson, 19.

107 Dawson, 19.

108 Dawson, 211 n.

109 Dawson, 22.

110 Morgenstern, 174.

111 Duhamel, 171.

112 Virginia Woolf, *A Room of One's Own*, in *Selected Works of Virginia Woolf* (Ware, UK: Wordsworth, 2007), 561–634, quotation on 624.