Iron Age as Renaissance Anthropocene: Periodization and the Ecology of War in Shakespearean History

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Iron Age as Renaissance
Anthropocene: Periodization and the
Ecology of War in Shakespearean History

TODD ANDREW BORLIK

Some say the world will end in fire: on June 29, 1613 it did. During a
performance of Henry VIII or All Is True, the Globe Theatre in London
burned to the ground. When cannons were discharged at the King's
entrance, paper wadding landed on the highly combustible thatch roof and, in
the words of a contemporary eyewitness, “ran round like a train, consuming
within less than an hour the whole house to the very grounds. This was the
fatal period of that virtuous fabric, wherein yet nothing did perish but wood
and straw, and a few forsaken cloaks.”¹ How would the semi-retired
Shakespeare have reacted to the news? When the Fortune burned in 1621, the
famed actor Edward Alleyn only made a laconic jotting in his commonplace
book. No such book belonging to Shakespeare has ever been found, and there
is no evidence to suggest he ever composed a farewell eulogy to his company's
playhouse. It would be tempting to speculate that Prospero's monologue on
the dissolving of “the great Globe itself” could have been a post-1613 addition
to The Tempest, the description of the theatre as a “baseless fabric” echoing
Wotton's “virtuous fabric.” Rather than defend such a conjecture, however,
this article looks to the Globe's fiery fate as it casts a retrospective glow on the
elemental antagonism between wood and iron, and on historiographical
narratives of environmental decline and apocalypse in Shakespeare's England.

From an ecomaterialist perspective, there is a degree of poetic justice
in the destruction of the Wooden O by cannon-fire. If, as Vin Nardizzi has
cogently argued, Elizabethan playgoers were conditioned to think of the
timber playhouse as a virtual grove, then the burning of the Globe by cannons
during Henry VIII would present a disturbing reminder of the devastation of
England's woodlands by the domestic iron industry that Henry himself had
helped kickoff when the supply of iron imports from Catholic Spain was
threatened in the wake of the Reformation.² In a kind of ecological rewind,
the “tragedy” of June 29, 1613 enacts upon the London stage, with the
playhouse itself as dramatis personae, the burning of wood required to forge
the cannon in the first place. In this ecomaterialist reading of the Globe fire,
the fact that the audience at All is True was too absorbed by the spectacle on
stage to notice the flames has some troubling implications: it seems to betray
the failure of Renaissance playwrights and their medium to bring attention to
the problem of deforestation. One might even go so far as to propose that the
Elizabethan entertainment industry, to the extent it glorified patriotic warfare,
was in fact complicit in the environmental degradation perpetrated by the burgeoning military-industrial complex. It is revealing that the theatre impresario Philip Henslowe, the owner of the Rose playhouse, acquired much of his capital from his brother’s lucrative post as an overseer of the ironworks in Ashdown Forest. Surprisingly little has been made of the fact that two of Shakespeare’s aristocratic patrons, the Earl of Southampton and the Earl of Pembroke, were both major investors in iron-manufacturing. Nor has adequate attention been given to Shakespeare’s possible ties with Sir George Carew, Queen Elizabeth’s Lieutenant of the Ordnance, who resided off and on in Stratford-Upon-Avon and is buried there in the Holy Trinity Church. Given the compelling links between the two major London theatre companies and the Elizabethan armaments industry, the numerous literary references to iron and ordnance in their repertory and its material presence in their stagecraft cannot be considered ideologically innocent.

To accuse Shakespeare of unilaterally promoting a hawkish foreign policy would, however, be a gross misreading. Moreover, Shakespeare and other contemporary authors like Michael Drayton would have harboured misgivings about the iron industry because of the dubious reputation of this metal in classical literature. In what was probably Shakespeare’s favourite book, the Roman poet Ovid, following Hesiod, depicts the history of the world passing through four phases: from the resplendent and pristine Golden Age of primeval humans to a violent and befouled Iron Age of incipient industrialization that swiftly triggers an environmental catastrophe. This mythopoetic narrative of environmental declension—a premonition of the Anthropocene insofar as iron enables humans to remake the earth in their image (1.102-03)—would have left an indelible imprint on Shakespeare’s understanding of deep history and its trajectory. More than just a hoary fable, Ovid’s grim vision of the Iron Age would have a topical resonance in the Tudor period because of the environmental realities of England’s booming iron industry. The introduction of the first blast furnaces at Queenstock in 1490 and Ashdown in 1496, and the development of single-piece casting technology by Ralph Hogg in the 1540s triggered a spike in domestic iron production, and represent major milestones on the road to England’s industrialized future. Shakespeare’s contemporaries did not envision themselves as basking in a Renaissance but would have been more likely to see themselves as the inhabitants of a sordid neo-Iron Age. Inspecting this label as both a precursor and alternative to the Anthropocene, the article aims to gauge the utility of such chronological designations and whether they might serve as a check on environmental hubris or merely confirm humanity’s sense of its dominion over the planet.

The Tudor Neo-Iron Age

According to the standard models of periodization adopted by historians and archaeologists, the British Iron Age began with the first evidence of ore-mining in the island around 800 BCE and ended with the entrenchment of the Romans and the start of recorded history in the first century CE. From an ecomaterialist viewpoint, however, there is a problem with the accepted
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nomenclature: iron-forging in the Iron Age was actually modest in comparison to the subsequent Roman era, which better deserves the label. While Ovid locates the commencement of this final epoch in pre-history, “then hutfull yron came abrode” (1.160), this ancient myth would have a certain topical resonance for his contemporary readers. In describing the technological transformations of pine trees into the Roman navy and of mined ore into iron weapons, Ovid advances an implicit rebuke of two of the major culprits behind the deforestation of the Mediterranean. Augustan Rome was coping with the consequences of this resource depletion, and, while Steve Hallet’s theory that a “peak wood” scenario contributed to Rome’s collapse has been questioned, it is fair to say that envy of Britannia’s then comparatively abundant stores of wood, ore, and tin would have been a key incentive for Caesar’s and Claudius’s invasions. Of course the occupying legions also required a stockpile of iron weaponry to maintain control of their Empire. Each Roman soldier’s kit contained fifteen kilograms of iron. Considering each legion numbered 5,000 troops, the native Britons must have perceived the Roman state as, in the words of Lee Bray, “profligate in its use of iron.” At the height of their power, the Romans were forging an estimated 2,250 tons of iron in Britannia each year. Following the Romans’ withdrawal in 410 CE, the metal economy of Britain collapsed, but small-scale smelting operations resumed with the arrival of the Saxons, and the fuel demands of Saxon blacksmiths, combined with the desire for more arable land, would have further whittled away the nation’s forest cover. The paleo-botanical record suggests that roughly 50 per cent of England’s primeval wildwood had been destroyed by the end of the Early Iron Age (c. 500 BCE). By the time the Normans compiled the Domesday Book in 1086, only 15 per cent of England was still wooded.

With this in mind, the historiographical label Iron Age must be regarded as something more than a metaphor of debasement. Rather it attempts to delineate the emergence of a more-than-human assemblage or melding of people and metals that ushers in a new epoch of environmental conditions (as supported by Paul Ruddiman’s theory of an “early Anthropocene”) marked by global conquest and trade, more intensive agricultural activity (due to improved iron-axe and iron-plow technology, which in turn fostered private land ownership), more invasive mining practices (imagined by Ovid as the Oedipal rape of a personified mother earth), more lethal weaponry, and greater demand for biomass resources to fuel forges and furnaces. Significantly, Ovid’s vision of the Iron Age is not simply a wistful lament for some bygone era of innocence; it is also a biting topical critique of the technological achievements on which the Roman empire was predicated, and the still on-going degradation that accompanied imperial expansion into places like Britannia, a conquest that would not be accomplished until four decades after the *Metamorphoses* was composed.

If Ovid dusted off Hesiod’s Iron Age to interrogate Roman narratives of the forward march of civilization, could Shakespeare’s contemporaries brandish Ovid to subvert the equation of industrialization with progress? Given the explosive growth of the domestic iron industry at this time, it seems worthwhile to examine the rhetorical uses of the Iron Age in early modern England. Entering the phrase “Iron Age” on EEBO throws up 752 hits in 585 records, and a survey of these texts reveals a few notable patterns. First, a large

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percentage of these sources are, predictably, religious jeremiads about moral decay. A second group blend Ovid with providential history to decry political decline: Nebuchadnezzar’s dream in the Book of Daniel of a statue made of gold, silver, bronze, and iron was widely glossed as a scriptural confirmation of Ovid’s four epochs of history, and in the Elizabethan era an interpretation circulated linking these four eras with the four invasions of England by the Romans, Saxons, Danes, and Normans.10 Another cluster glance back to the primeval Iron Age in antiquity, a well-known instance being the final instalment of Thomas Heywood’s “Four Ages” tetralogy, which is essentially a dramatic adaptation of Homer’s Iliad. By far the largest concentration of references to a contemporary Iron Age occurs between 1640 and 1660, during the English Civil War and its aftermath. This is unsurprising given that Ovid identifies chronic warfare as a tell-tale symptom of the final epoch of world history. Perhaps the best literary example of this conceit is The Iron Age (or The Four Ages of England) written in 1648 by the Royalist Abraham Cowley.

A disappointingly low number of texts forge an explicit link between the Iron Age and on-going environmental degradation. In a satiric epigram, the Queen’s godson, John Harington contrasts the slow physical growth of trees with the exponential growth of timber prices due to early modern industry:

That oaks for which, none ten years since was willing
To give ten groats, are grown worth thirty shilling.
Which made my muse so woed she said in rage
That thirst of gold makes this an Iron Age.11

Another Elizabethan epigrammist, Thomas Bastard, praises the trout-stocked streams and bird-haunted woods along Henry Wotton’s country estate (a stark contrast with the overfished rivers and depleted woods he laments elsewhere in his collection), and juxtaposes this rural idyll with the decadence of modern urban life:

O iron age of men, O time of rue.
Shame ye not that all things are gold but you?12

In branding the Iron Age an “age of men,” the surly clergyman offers something like a Renaissance formulation of the Anthropocene concept, conjoining human mastery of metals with human mastery of the environment, albeit the conquest is still incomplete and pockets of pristine nature remain. Perhaps the most outspoken critic of deforestation in the Jacobean period was Michael Drayton. His chorographical epic Poly-Olbion bewails the devastation wrought in the Wealden woodlands by the ironworks as evidence of a neo-Iron Age: “these yron times breed none that mind posteritie.”13 While Randall Martin has persuasively argued that a constant demand for weaponry was disrupting the Virgilian narrative of a “sword-into-ploughshares” transition from a wartime to a peacetime economy, Drayton here evokes Ovid to assert that a disregard of the past entails a rupture with the future (and vice versa).14 There is something odd, however, in Drayton’s presuming to rebuke ironmongers. In Song 17 of Poly-Olbion, the clanking hammers of the forges expel the wood nymphs from their sacred groves, including the dryad-like
nymph of Ashdown, the very forest whose woodlands had been exploited by
the family of Drayton’s sometime paymaster Philip Henslowe.

Playwrights and Gunmakers

Although recognized as a pivotal moment by military historians, Ralph Hogg’s
casting of new single-piece iron cannon in Buxted in 1543 has significant
reverberations for theatre history as well. In 1560 Hogg married one Margaret
Henslowe, sister of Philip Henslowe, who would later become the impresario
of the Admiral’s playing company. Margaret’s other brother John became a
partner in her husband’s iron-making business and kept the accounts between
1576 and 1581; it was these same papers that Philip salvaged a decade later to
jot down his book-keeping entries for the Rose playhouse. The most valuable
resource on the economics of the Elizabethan theatre business also affords a
first-hand glimpse into the operations of Tudor ironmongers. This might be
brushed aside as a mere happenstance: then as now, wealthy families often
intermarried and diversified their investments to avoid putting all their eggs in
one proverbial basket. But the coincidence nevertheless invites scrutiny,
hinting as it does at an alliance between the armaments and entertainment
industry, between iron-mongering and warmongering. As S. P. Cerasano
reminds us, “Henslowe’s theatre investments were not an end in themselves,
but a means to support his brother’s iron-mining in Sussex, his lucrative
involvement in animal-baiting, and his desire to become a regulator of the
wool trade in Kent and Essex.”

Such knowledge adds a new resonance to the booming of ordnance
in Renaissance plays. When Henslowe’s company performed Christopher
Marlowe’s Tamburlaine, the eponymous conqueror boasts of the titanic might
of his artillery flattening cities and re-shaping the topography of the earth.16 In
Jew of Malta, Calymath likewise speaks of “bombards’ shot and basilisks’”
battering down Malta’s walls, and Barabas arranges for another cannon charge
to be “shot off from the tower,” like the ordnance fired from the walls of
Tower of London on ceremonial occasions such as Lord Mayor Pageants or
the Queen’s birthday.17 Are such poetic tributes to cannonry in some way
implicated in the iron-smelting and armaments-manufacturing that
Henslowe’s family had operated? Could the “charges” heard at the Rose even
have been fired from guns supplied through John Henslowe’s contacts in the
arms trade? While Ralph Hogg died in 1585, the Henslowe brothers were still
involved in legal wrangles over their sister’s Buxted land-holdings and leases
with iron merchants in December 1592.18 So the Henslowe family still had a
vested interest in glorifying nationalism and exacerbating fears of Spanish
invasion in the 1590s when Philip was simultaneously investing in the Rose
Theatre, and making advance payments to playwrights, who may have been
more likely to receive funding for scripts that appealed to the man who held
the company’s purse strings.

This is not to claim that Marlowe and other Admiral playwrights were
consciously penning crude advertisements for arms dealers to flatter the
company’s financial backers. As previously mentioned, one of the most
prolific writers on Henslowe’s payroll was Michael Drayton, a scathing critic

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of ironworks. Unfortunately, of the eighteen plays Drayton helped write for the Admiral’s Men, only Part I of *Sir John Oldcastle* survives. However, a conspicuous number of the titles—such as *William Longsword*, *The Famous Wars of Henry I*, the three-part *Civil Wars of France*, *Owen Tudor*, and *Cardinal Wolsey*—as well as his voluminous extant output of non-dramatic verse, indicate that Drayton specialized in patriotic history, and peddled a vision of England as a militant defender of the Reformation. It thus seems unlikely that Drayton’s hawkish plays could have been as overtly hostile towards the iron industry and its ecological impact as *Poly-Olbion* and his *Tenth Nymphal*. While sabre-rattling jingoism resounds in many early modern histories, theatre scholars such as Andrew Gurr do see the Admiral’s repertory as appealing to a more stridently Protestant demographic that presumably would have supported a larger military budget to protect the “elect nation” from Catholic invasion.19

Critics have tended to view Shakespeare as far more measured about patriotic warfare, and more interested in Warwickshire real estate than investing in new industrial technologies. But was Shakespeare’s company in fact all that different? Shakespeare, too, appears to have had ties with the iron industry, and, like his fellow Warwickshireman Drayton, may have been aware of its despoiling the nearby Forest of Dean, which many early moderns believed to be part of the ancient Forest of Arden. In the 1590s, the Keeper of Dean was the 2nd Earl of Pembroke, Henry Herbert, who was also the patron of an Elizabethan acting company to which the young Shakespeare likely belonged at the start of his career. Following Henry Herbert’s death in 1599, Edward Wynter became Keeper or Warden, but the Third Earl of Pembroke, William Herbert, campaigned for the post and was granted it in 1608. He quickly set about exploiting the forest’s lucrative timber resources and investing heavily in the iron industry. In 1612, he erected four blast furnaces and three forges, and acquired rights to sell off 12,000 cords of wood per year (worth a whopping 2,400 pounds annually) to make charcoal for fuel.20 The consequences of this booming armaments trade would become blindingly apparent decades later, when Abraham Cowley would blame ironworks for obliterating Dean:

> The cursed weapons of destructive war  
> In all their cruelties have made her share;  
> The iron has its noblest shades destroyed,  
> Then to melt iron is its wood employed.21

While much of the worst destruction occurred during the Civil War, Herbert would have profited substantially from his investments in the early modern military-industrial complex that was devouring acres and acres of woodland. The nephew of Philip Sidney, the lover of Mary Wroth, a Chancellor of Oxford, a noted patron of the arts, and the dedicatee of the 1623 First Folio of Shakespeare’s plays, Herbert was also an arms manufacturer whose operations contributed to the deforestation of England.22 When Pembroke struck this deal, Shakespeare’s theatrical career was winding down, but the playwright’s other aristocratic patron, and the leading contender for the “Fair Youth” of the *Sonnets*, Henry Wriothesley, the Earl of Southampton, also developed iron furnaces and forges in Titchfield and Sowley in the 1590s.23 Shakespeare may possibly have sat out the plague of 1593 at Southampton’s
estate near Titchfield, and *Venus and Adonis* (dedicated to the Earl) refers to “copses” or small woodlands whose timber was managed for industrial fuel. In the remainder of this paper, I would like to examine some of Shakespeare's numerous references to iron and cannons alongside his possible contacts in the armaments industry to assess whether or not Shakespearean drama was responsive to the neo-Iron Age inaugurated by the arrival of the blast furnace and new cannon-casting technology.

**Shakespeare and Cannon-Warfare**

Of the forty-six uses of the word iron in Shakespeare's oeuvre, a sizeable number refer either to armour, as when Antony barks at his servant to put his “iron on” (4.4.3), or the sword, as when Sir Toby Belch urges Cesario to draw his “iron” (3.4.245). Frequently, however, Shakespeare associates iron with the modern artillery forged from it, and his history plays in particular seem keenly interested in documenting the revolutionary impact of gunpowder and iron-forging technologies on medieval warfare. In a memorable bit of reported dialogue in *1 Henry IV*, a dandified English lord enranges “Gunpowder Percy” when he pronounces it a
great pity
This villainous saltpetre should be digged
Out of the bowels of the harmless earth
Which many a good fellow had destroyed
So cowardly, and but for these vile guns
He would himself have been a soldier. (1.3.58-61)

Echoing Ovid's dispraise of mining as a violation of a personified earth's “bowels,” Shakespeare views gunpowder weaponry as presaging the end of the feudal era and the dawn of a second Iron Age.

The English had first deployed cannon in 1345 at the Battle of Crécy, and Shakespeare's history plays register the earth-shaking power of this new technology during the Hundred Years' War. Fulfilling his vow to turn the Dauphin's tennis balls to gunstones, Henry V brings “ordnance on their carriages” (3.0.26) with him in his invasion. When he bellows the famous line "Once more into the breach, dear friends!" he is urging his troops to storm the ruined barbican gateway at Harfleur that had been demolished by his new cannon.  

Shakespeare was not exactly a stickler for historical accuracy, however. While the English did fire cannons against the Scots and French in the fourteenth century, the “basilisks” and “culverin” of which Hotspur speaks when he mumbles “tales of iron wars” (2.3.48) in his sleep were not developed until nearly 200 years later. In a path-breaking study, Randall Martin has remarked on Shakespeare’s anachronistic references to gunpowder, artillery, and cannons, arguing that these would encourage “early modern spectators to consider the long-term environmental damage being wrought by gunpowder technologies.”  

The most blatant instance of this importing Renaissance weaponry onto the medieval battlefield would be *King John*, which includes no fewer than eight references to cannon technology that had not yet
been invented. The play is scarcely a minute old before John threatens, “The thunder of my cannon shall be heard” (1.1.26). In the siege of Angers, King Philip aims his cannon at the town, and John warns the citizenry,

The cannons have their bowels full of wrath,
And ready mounted are they to spit forth
Their iron indignation 'gainst your walls. (2.1.210-12)

In the final line, iron functions as both an adjective (connoting toughness) and a substantive, alluding to the iron of which cannonballs were forged, a reminder of the materiality of warfare. Shakespeare again infuses this metal with a negative charge when Hubert brandishes a hot iron to blind Prince Arthur, who shrieks: “Ah, none but in this iron age would do it!” (4.1.60). The brutality of Arthur’s death is gauged by the fact it even stuns a calloused smith in the midst of hammering iron (4.2.194), and the play consistently associates this metal with mercilessness, as if prolonged exposure to it results in a transhuman assemblage of flesh and iron like Spenser’s robo-warrior Talus. Through such image clusters, King John prophesizes the advent of iron cannons as heralding a new modern age of hard-hearted cruelty.

Despite the much larger body of criticism devoted to Hamlet, little has been made of its anachronistic references to ordnance. In the opening scene, Marcellus interrogates Horatio about the “daily cast of brazen cannon / And foreign mart for implements of war” (1.1.72). While “brazen” indicates bronze rather than iron guns, “daily” registers an unease about the constant production, reminding the audience of the military build-up under the Tudors in a play ostensibly set in twelfth-century Denmark. Shakespeare keeps up a barrage of artillery imagery throughout the tragedy: slanders travel “as level as the cannon to his blank” (4.1.42); in a famous pun Hamlet laments that God has “Fixed his canon gainst self-slaughter” (1.2.131); and he later teases Osric for referring to sword-hangers as carriages, a term properly used for gunnery frames (5.2.120). Complementing this imagery, several passages make it clear that early performances of Hamlet were accompanied by a score of cannon-fire. Claudius fires his “great cannon” each time he drinks in his opening scene (1.2.125-26), and again during the duel between Hamlet and Laertes (5.2.222-24). Cannon-fire crescendos in the play’s finale: Fortinbras fires a volley when he invades Elsinore, and his final command, “Go bid the soldiers shoot” refers not to muskets but to cannon, as the stage direction in the Folio text calls for “a peal of ordnance.” One explanation for this recurrent anachronism in Hamlet is that the Chamberlain’s Men had deployed a cannon in their recent production of Henry V, and were eager to duplicate the crowd-wowing effects of artillery fire, which, as Bruce Smith notes, was the loudest noise in the soundscape of early modern England.26

Due to the polyphonic nature of Shakespearean drama, his anthems to England are often laced with undertones of irony, and it must be said that Shakespeare’s numerous references to cannons are not always approbatory. The Chorus in Henry V calls the cannon “devilish” (glancing at gunpowder’s supposedly satanic rather than Chinese origins). Voicing the gunpowder era’s scepticism of the medieval cult of chivalry, Falstaff cynically appraises his ragtag infantry as “food for powder.” And whereas Henry imagines himself as leading cyborg-like soldiers whose eyes “ pry through the portage of the head

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Like the brass cannon” (3.1.10-11), Nim and the ironically named Pistol do not follow his charge, insisting they are “men of mould” (3.2.23) or earth, continuing Falstaff’s subversion of the chivalric ethos in the era of the cannon. While most critics since Vietnam have preferred to emphasize these moments to argue that Shakespeare looked askance at military heroism, other evidence suggests he may not have been so critical of the armaments industry. Besides his contacts with iron-manufacturing Earls of Pembroke and Southampton, Shakespeare may have been acquainted with an important figure in Elizabethan military history by the name of George Carew. In 1588, Carew was appointed Master of the Ordnance in Ireland, and four years later promoted to Lieutenant-General of the Ordnance in England. He also served as President of Munster, and his love of cannonry may explain Edmund Spenser’s fantasy of the iron man Talus quelling the Irish rebellion. Although a well-travelled soldier and diplomat, Carew had connections with Stratford-upon-Avon. In 1580 he had married Joyce Clopton, daughter of William Clopton, the former owner of the Clopton House in Stratford-upon-Avon, purchased in 1597 by the successful playwright Shakespeare. Born in 1562, Joyce would have been a near contemporary of Shakespeare, and it is highly likely that the two would have known each other growing up in a small town like Stratford. As Lieutenant-General of the Ordnance at the Tower, her husband worked for the Master of the Ordnance, a post awarded in 1596 to the Earl of Essex. Carew and Essex would have been responsible for procuring cannons, powder, and iron shot from gun-makers in the Weald and Dean. Carew’s belief that England required a massive arsenal of cannonry to achieve its imperial ambitions may account for his fascination with Henry V, and he reportedly wrote a history of Henry’s reign. When the Chamberlain’s Men staged Henry V, Carew and Essex were busily preparing to invade Ireland, to which Shakespeare makes a rare topical allusion. Although the Chorus envisions Essex bringing back the rebel Hugh O’Neill’s head “broachèd on his sword” (5.0.32), it would be more accurate to say that he planned to subdue the Irish with cannon-fire. This very well could explain why Shakespeare spotlights the power of cannonry in Henry V rather than the longbow that actually won the Battle of Agincourt.

From this survey, there is scant evidence in Renaissance plays implicating military technology in deforestation. Nowhere does Shakespeare overtly condemn the domestic iron industry as do Camden, Norden, Drayton, and Cowley. It would be unfounded speculation to claim that Shakespeare, like a television news network afraid to expose the misdeeds of its corporate sponsors, avoided criticizing ironworks because his courtly patrons and influential figures in Stratford like Baron Clopton were constructing or investing in them. Nevertheless, a theatre that revelled in the dramatic appeal of battle and cannon fire would find it difficult to effectively censure the arms trade and the environmental havoc it perpetrated. Greenblatt’s subversion/containment model may now seem badly shopworn, but critics may justifiably wonder whether such a theatre industry (especially one underwritten by the iron industry) could critique the theatre of cannon warfare, as such a message would be overpowered by the medium itself; tellingly, Falstaff never makes it to Agincourt and the greatness of Hamlet, in whom Shakespeare redefines heroism as mental rather than military, is applauded by peals of Fortinbras’s ordnance.
“The Great Cannon to the Clouds Shall Tell”: Conclusions

In closing, I would like to raise a few caveats with the argument sketched above: first, it is far too easy to pin all the blame for deforestation on villainous arms merchants. Agriculture and the wool-trade grubbed up many sixteenth-century woodlands, and iron was also used in more benign, everyday objects, such as nails, horseshoes, barrel hoops, cookware, etc. Secondly, it could be objected that this alternative view of the Anthropocene as an Iron Age exaggerates the scale of environmental destruction in pre-modern times, and is simply too reductive. New Materialism’s focus on the agency of matter, when applied too narrowly, threatens to obscure socio-political forces that propelled technological leaps that in turn transformed humanity’s relationship with the environment. It was not iron that was new in Tudor England but industrial innovations fuelled by the heightened fears of war with Spain that sparked the eightfold rise in iron production. Finally, the long-view of the Anthropocene as simply a new phase of the Iron Age could inculcate a sense of eco-despair, triggering what might be called the plus ça change problem. The prevailing view among environmental historians like Oliver Rackham is that deforestation in the Tudor period represents a continuation of long-prevailing trends stretching back to pre-history rather than a major rupture with land-use practices. The Ovidian nomenclature of the Iron Age may have likewise encouraged Shakespeare’s contemporaries to see current industrial advances as an inexorable outgrowth of humanity’s ancient mastery of metallurgy. The utility of the label “Iron Age” as a conservationist tool would thus be blunted or at best slice two ways: if it evoked melancholy at human depravity it could also lead to shrugging off new forms of technological exploitation as part of the irresistible momentum of history. How do we trace the historical origins of the Anthropocene without relaying a tacit message that our current predicament is simply another episode in a millennia-long saga and therefore nothing too worrisome?

Despite these flaws and risks, the Iron Age could still prove a useful way to reframe the deep history of environmental degradation, and has the merit of being a period concept that was actually in use during what we retrospectively dub the Renaissance or early modern period. Over the past decade, ecocriticism has made the limitations of periodization painfully clear, and theorists have begun to propose mind-stretching concepts such as Morton’s “hyperobject” and Cohen’s “eco-temps” to deal with what Timothy Clark has called “the problem of scale.” Examining iron as a period-busting material might help ecocritics to forge more complex narratives linking environmental pasts, presents, and futures. In the early 1600s, English entrepreneurs like the Earl of Cork were erecting massive ironworks in Ireland, mimicking the Roman industrialization of England, and the Virginia Company established an ironworks at Falling Creek in 1622 in a feat that oddly replicated—from the Powhatan point of view—the invention of iron in prehistory. Iron would remain a bulwark of the modern economy; fittingly, the iron bridge over the Severn Gorge has become the emblem of the Industrial Revolution, and this achievement was made possible by the
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transition (necessitated by the depletion of Dean’s woodlands) from charcoal to pit-coal, which lead to Britain’s emergence as the world’s first fossil fuel economy. In *Hamlet*, Claudius imagines the boom of his great cannon forcing the heavens to echo or “respeak earthly thunder” (1.2.126), as if he now commands an elemental force once thought the prerogative of the gods. Not even Shakespeare could have foreseen the long-term consequences of large-scale coal consumption, but an appraisal of the environmental developments of his age reveals that it was not an imperfect, unpredictable sway over the climate but a mastery of metals that was endowing humans with a god-like dominion over the planet.

Notes

13. Michael Drayton, *Poly-Olbion* (1612), 1:266. Drayton’s critique of the iron industry was informed by the work of some distinguished Tudor antiquarians, such as William Camden and William Harrison, and the surveyor John Norden, all of whom believed that prehistoric Britain had been heavily wooded, and conjured visions of ancient Albion as a vast forest in order to sound alarms about the ravages of ironworks. William Camden, *Britannia*, trans. Philemon Holland (1610), 306, 358; William Harrison, *Description of England* (1587), 211-12; John Norden, *Surveyor’s Dialogue* (1607), 214.
22. The Sidney family also owned ironworks operations in Kent, and some of the “caspers” praised in Jonson’s Penshurst would have supplied their furnaces; see *Sidney Ironworks Accounts 1541-1573*, ed. D. W. Crossley (London: Royal Historical Society, 1975).
30. Of course Renaissance theatre relied on iron for other purposes beside cannons and swords. Iron literally helped to hold the wooden polygonal playhouses together, and Henslowe’s *Diary* records numerous purchases from an “iermonger in sothwarke” for nails, “tennes,” and other sundries (11).

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