

**Georgic Apocalypse:
From Virgil to *Silent Spring***

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Introduction

This paper originates in a coincidence: last summer, in a green June week in Vermont's Northeast Kingdom, right at the time of the first hay cutting, I happened to be reading David Ferry's 2005 translation of Virgil's *Georgics*, when a friend, for reasons of her own, drew my attention to the opening pages of Rachel Carson's *Silent Spring*, the famous "Fable for Tomorrow". It had been some time since I had read *Silent Spring*, and I was struck by the remarkable parallel subsisting between Carson's "Fable"—in which an idyllic country town "in the heart of America" is suddenly beset by death and disease—and Virgil's description, in Book 3 of his poem, of a devastating plague that once visited the hills and valleys north of Trieste, toward the rising Alps.¹

Both are short episodes within larger works with much larger agendas; both are delivered in "once upon a time" mode; most saliently, both offer powerful, even gut-wrenching representations of death and devastation in the midst of familiar scenes of rural harmony and plenty. Whereas Carson's fable sets the stage for *Silent Spring*, with inescapable rhetorical effect, Virgil's plague scene arrives three-quarters of the way through his poem, and has been largely overlooked by literary critics. But it seemed to me that Virgil's formulation of what I have come to think of as *apocalyptic georgic*—a description of widespread catastrophe or crisis within the context of natural, agricultural, or landscape description—offered an important, unrecognized precedent for Carson's fable, and by extension for a range of literary and historical responses to environmental crisis, broadly defined, which we are perhaps too easily inclined to think of as distinctly contemporary in nature.

¹ Note: scanned images of Carson's "Fable" and Virgil's plague scene from Book 3 (from David Ferry's 2005 bilingual edition), are included as a supplement to this paper (in a separate PDF downloadable from the Agrarian Studies colloquium schedule page).

This may seem like a far-fetched, far-flung comparison; and it is not my intention here to claim any kind of direct or conscious link based on Carson's reading or education—I have no evidence that she was familiar with the *Georgics* or even particularly interested in classical literature. Rather, this paper will seek to unpack a set of resonances between Carson's fable and Virgil's plague, and more broadly between Carson's work and the *Georgics*, as a way of exploring a longer cultural history of environmental catastrophe and its contexts. In so doing, my goals are both to expand the useable interpretative terrain of the georgic—the classical literary mode associated with agriculture, about which I will say more in a moment—and to suggest a shift of focus, and a possibly fruitful new line of enquiry, for environmental literary history. Is apocalyptic georgic essential in some way to the overall georgic vision, and if so, how? Is it more readily applicable to some types of environmental disaster than to others? Does it appeal to certain kinds of historical moment? What new purchase does it give us, if any, on the nature-culture conundrum? And finally, what new perspectives does it offer on the accumulating environmental crises of our own moment?

In a sense, this is an attempt at *longue durée* literary analysis, offered not without a certain trepidation, but in the spirit of experiment; for the sake of starting a discussion. In addition to the Virgilian and Carsonian examples, I will offer a few intermediate instances of apocalyptic georgic, chiefly from 18th-century Britain (my primary area of expertise); finally, I will consider some post-*Silent Spring* developments. One terminological caveat: many readers may assume a set of specific religious connotations (the Book of Revelations, hell, judgment day, etc.) for the term "apocalypse"; but I'm using it here in its more general sense of any great disaster or catastrophe.

The *Georgics* and the georgic

The word *georgic* is a melding of two ancient Greek roots: *geo* = earth + *ergon* = work, or labor. The Greek *georgos*, a farmer, was literary an earth-laborer. In the first century BC, the great Latin poet Virgil adapted the Greek term for his 2,188-line poem about farming, the *Georgics*, written near the close of the Roman Civil Wars, a celebration of husbandry directed at a war-torn nation. Although in later periods the fame of the *Georgics* would be eclipsed by that of Virgil's other two poems, the *Eclogues* (or pastorals) and the *Aeneid* (the epic story of the founding of Rome), for many centuries the *Georgics* was regarded as one of the greatest artistic achievements

of all time, an unquestioned fixture within the repertoire of polite education.² The early 18th-century cultural critic Joseph Addison judged it "the most Compleat, Elaborate, and finisht Piece of all Antiquity"; John Dryden, Addison's older contemporary and the leading literary figure of the English Restoration, called it simply, "the best Poem, of the best Poet."³

The *Georgics* is divided into four books: Book 1 is about field crops, tools and the weather; Book 2 covers the care of vineyards and orchards; Book 3 deals with livestock; Book 4 discusses the management of bees. It is a didactic poem, describing *how to farm*, but in doing so it continually shifts its point of view: moving from you to he to she to one to I and back again, interspersing descriptive passages among its explicit directions, pausing here and there to offer historical background. While honoring the farmer—above all through its careful attention to the farmer's concerns—the poet also pities him, acknowledging the hardness of the farmer's labor, the uncertainty of the climate, the constant threat of pests and disease. At the same time, the *Georgics* draws larger connections, pointing out the many ways in which the farmer's world is linked through trade, politics and history to the farthest corners of the globe.

The georgic, in short, points out a way of writing about farming from a perspective of acute observation and intense sympathy. It explores the material conditions of agriculture—weather, soil, plants, animals, tools—as a means of binding together the past and the present, distant lands and near familiarities, the workings of the earth and the stars that govern the heavens. In so doing, it offers what one critic has called "an ideology of almost overwhelming attractiveness"—and one which has been readily seized upon by a wide variety of later writers during periods of intense agricultural change.

And yet the georgic occupies a strangely buried place in literary and cultural history. The model of poetic—which is to say, intellectual and moral—development Virgil bequeathed to the world moved from pastoral to georgic to epic: from shepherds and love, to farmers and work, to soldiers and war. This model held true through at least the 17th century, with poets from Spenser to Milton blending and exploring its varied possibilities. The 18th century witnessed a great popular flowering of georgic, with direct poetic imitations of the Virgilian model attempted on the

² The georgic's star seems to be rising again, however, with four new translations appearing so far this millennium: by Kristina Chew (Hackett, 2002); Peter Fallon (Oxford, 2004); Janet Lembke (Yale, 2005); and David Ferry (Farrar, Straus and Giroux, 2005).

³ Joseph Addison, "An Essay on the *Georgics*," and John Dryden, "[Dedication] To the Right Honourable Philip Earl of Chesterfield," both in *The Works of John Dryden*, volume V, pp. 137, 153.

subjects of cider, indigo, sugar cane, the wool trade, rural sports, landscape gardening, human health, public virtue and many other topics, in addition to broader examples exhibiting a more ambitious experimentation with the form.

The *Georgics* also, at least for an influential minority of readers over many centuries and across several European countries, served as a critical companion for agricultural study and management, an elegant, learned, pleasing distillation of a larger body of Ancient knowledge pertaining to rural affairs. At times, this took the specific form of assuming the *Georgics* as a core text, and its organization as a set of disciplinary principles, for proposed agricultural academies; more generally, the *Georgics* lent intellectual and spiritual authority to the pursuit of practical and scientific knowledge, whether conceived of in opposition to an ideal of disinterested aristocratic leisure or in contrast to mucky illiterate "custom".⁴

By the 19th century, however, the Romantic celebration of "wild" nature and the complicated consequences of accelerating industrialism made explicitly georgic attitudes and projects seem less relevant, and the term fell out of use. Ironically, a series of powerfully influential 20th-century accounts of the pastoral (William Empson, Leo Marx) would eventually expand pastoral's interpretative range back across the 19th century to encompass many attitudes that might once have been described as georgic, setting up a flexible dualism ("the machine in the garden") that effectively eliminated—one might say colonized—georgic's middle ground.⁵

Love and death

With that brief background, let's look more closely at Virgil's plague scene and its context. If the explicit subject of Book 3 of the *Georgics* is the care and management of livestock, its overriding themes are sex and death. For anyone with direct experience of farming, particularly livestock farming, these are by no means surprising connections, but they have combined to make Book 3 the most problematic of the four for many readers. ("I thought farming was about life," a young farm apprentice once told me, "but after I worked on a farm for a while, I realized that

⁴ For more on this usage of the *Georgics*, see for example Annabel Patterson, *Pastoral and Ideology* (1987), especially pp. 133-144, and Anthony Low, *The Georgic Revolution* (1985), ch. 4. Mauro Ambrosoli's *The Wild and the Sown: Botany and Agriculture in Western Europe, 1350-1850* (1992/1997) presents extensive material evidence for practical readings of the *Georgics* and other early agricultural texts. I develop this argument at length in my dissertation, *Farming by the Book: British Georgic in Prose and Practice, 1697-1820* (Princeton University, 2002).

⁵ William Empson, *Some Versions of Pastoral* (1935); Leo Marx, *The Machine in the Garden* (1964); also Henry Nash Smith, *Virgin Land* (1950).

farming is about death.") Together, Books 1 and 3 are sometimes described as "pessimistic georgic", Books 2 and 4 as "optimistic georgic"; if the alternation of outlook is indicative of a carefully crafted balance on Virgil's part, Book 3 in itself offers the strongest challenge to the notion that the *Georgics* presents an idealized, even romanticized vision of agricultural life.⁶ Whereas the so-called "Jupiter theodicy" provides a clear justification for the themes of hardship and hard work at the center of Book 1, the rationale for the bleak outlook of Book 3 is less immediately evident.⁷ The discussion of sex, it's worth noting, was perhaps as challenging for some commentators as that of death: At least one early 18th-century translator declined to proceed beyond Book 2, hinting that he was uncertain of his ability to render it into English with the requisite propriety.⁸

Virgil begins with horses and cows, offering rules for breeding in anthropomorphic terms of wedlock and childbirth. Cows may be bred from age four to age ten, the poet notes; these are also the years most useful for work. These considerations lead to the rueful, elegiac lines said to have been among Samuel Johnson's favorites:

⁶ An argument put forward by, for example, Victor Davis Hanson, who valorizes a manly Greek agrarian ideal, epitomized by Hesiod's *Works and Days*, as against an effeminate Roman version. See Hanson's *The Other Greeks: The Family Farm and the Agrarian Roots of Western Civilization* (1999).

⁷ The idea that Jupiter/Jove made material life difficult as a way of goading humanity into invention and resourcefulness, as expressed in Book 1, lines 121-147:

...*The Father himself*
Willed that the path of tillage be not smooth,
And first ordained that skill should cultivate
The land, by care sharpening the wits of mortals,
Nor let his kingdom laze in torpid sloth.
Before Jove's reign no tenants mastered holdings,
Even to mark the land with private bounds
Was wrong: men worked for the common store, and earth
Herself, unbidden, yielded all more fully.
He put fell poison in the serpent's fang,
Bade wolves to prowl and made the sea to swell,
Shook honey down from the leaves, hid fire away,
And stopped the wine that freely flowed in streams,
That step by step practice and taking thought
Should hammer out the crafts, should seek from furrows
The blade of corn, should strike from veins of flint
The hidden fire....
 ...
Toil mastered everything, relentless toil
And the pressure of pinching poverty. (see n. 8 below)

⁸ William Benson, *Virgil's Husbandry, Or An Essay on the Georgics, Being the Second Book Translated into English Verse* (1724), p. ii. Insisting on "the distinguishing Purity of this Piece, which may be justly stil'd the chastest Poem of the chastest Poet," Benson was scathingly critical of Dryden's 1697 translation of the *Georgics*, complaining that it displayed the workings of a mind "unalterably bent to Wantonness".

*Life's earliest years for wretched mortal creatures
Are best, and fly most quickly: soon come on
Diseases, suffering and gloomy age,
Till Death's un pitying harshness carries them off.*⁹ (ll. 66-68)

The poet emphasizes the importance of constant and careful selection, describing the features and behaviors to be preferred in horses bred for battle or for racing; the proper care of sire, dam and young; the training of young bullocks for the yoke; how to accustom young horses to harness and halter. Care for the sire is more important before conception; care for the dam, after. Controlled breeding requires the separation of bulls and stallions from heifers and mares; and the poet describes a bloody contest between two rival bulls, imagining how the defeated one retreats, regains his strength and returns to challenge "his now forgetful enemy", like "a wave begins far out to sea / ... and rolling to shore roars on the rocks / To crash cliff-high." This introduces another of Book 3's famous passages, the "*amor omnibus idem*" lines:

*Indeed all species in the world, of men,
Wild beasts and fish, cattle and coloured birds
Rush madly into the furnace: love is common
To all.* (ll. 242-244)

Lust drives the lioness from her cubs, rouses bears from their slumbers, causes the stallion to ignore his master; calls the boar to sharpen his tusks. Horses and humans alike will "conquer mountain steeps and swim through rivers" to satisfy their desire, heedless of reason, intoxicated by the gentle breezes of spring. Consider the story of Hero and Leander, the poet adds: "the youth / Inflamed to the bone by cruel love" (ll. 258-259), deaf to parental pleas, blind to the tragic possibilities of the future.

This climax closes the first half of Book 3, foreshadowing the violence of death that will occupy the end of the book. Before introducing the subject of his second part, the care of sheep and goats, the poet pauses to offer a few reflections on his task, again striking an elegiac note: "But time is flying, flying beyond recall, / While captivated I linger lovingly, / Touring from this to that" (ll. 284-285). I'm well aware, he confesses, how hard it is to describe such humble matters with grace and truth.

⁹ The translation I use throughout this paper is L. P. Wilkinson's *The Georgics* (Penguin, 1982). Line numbers reference the original Latin as presented in the Loeb Classics edition, *Virgil: Eclogues, Georgics, Aeneid 1-6*, translated by H. R. Fairclough (Harvard University Press, rev. edn 1935 and many later reprints).

Sheep need good quality forage and protection from the weather, Virgil says; goats require less care but are just as valuable, providing abundant milk as well as fiber. A discussion of pasture and other needs leads to a consideration of the seasonality of flock-tending, and then to an account of famous sheep- and goat-herding peoples in distant lands: the Libyan shepherds who spend whole months wandering the desert plains, the Scythian tribes, up by the Danube, who must contend with long winters of ice and snow and frigid winds. Short sections on fleece and milk, the uses of dogs and the hazards of snakes leads to a discussion of the diseases to which livestock are subject, and how to treat them. This in turn will bring us to the plague scene, occupying the final hundred or so lines of the book. Signs of sickness among sheep and cattle must be vigilantly watched for, the poet advises, because livestock diseases require swift action, in keeping with their own sudden violence:

*... Thicker than squalls
Swept by a hurricane from off the sea
Plagues sweep through livestock; and not one by one
Diseases pick them off, but at a stroke
A summer's fold, present and future hopes,
The whole stock, root and branch. (ll. 471-473)*

The interweaving of maritime, pastoral and vegetative imagery, as we have seen, is characteristic. "For proof of this," the poet continues, look to the long-deserted hills and valleys lying north of the Adriatic, where the effects of a great pandemic are still visible, where the memories of catastrophe are fresh:

*For there it was that once a woeful season
Of tainted atmosphere and plague arose,
Torrid with all the furnace-heat of autumn.
All manner of creatures, tame and wild, it killed,
Infecting pools, contaminating fodder. (ll. 478-481)*

What we learn first is significant: all animals, tame and wild, it killed; so that the sickness seemed to be everywhere—in the air, in the water, in feed and food. Nothing escapes its contagion. It brings a gruesome death:

*The road to death was crooked: first of all
A fiery thirst coursing through all their veins
Shrivelled their wretched limbs, then fluid in turn
Welled up, absorbing piecemeal all their bones
Rotted with the disease. (ll. 482-485)*

Note too that we are still talking exclusively about animal deaths here, although the description invites you to forget that detail. The bodies are handled with a pathos one might expect to be reserved for humanity, but Virgil makes no such distinction. The next eight lines relate how the ritual sacrifice of cattle (a more important use for cattle among the Romans than meat or milk production) broke down in the face of disease: cattle led to the altar fall dead before the priest can strike the blow; the entrails fail to take flame; the seer cannot read their message; scarcely a trickle of blood falls from the knife as it slits the throat. Surprisingly, perhaps, these scenes manage to heighten the sympathy between humans and cattle, revealing the profound, multifaceted dependence of humanity on animal creation, how its loss obliterates crucial elements of our interpretative landscape.

The dominant strain in the subsequent section is of the wrenching contrast between extraordinary suffering and the familiar rural world, the incomprehensible transformation of life into sudden and unexplained death:

*Then calves in the fields, amid abundant grass,
Are dying on all sides, or by full mangers
Gasping away their last sweet breath of life.
Mild dogs go raving mad. A racking cough
Shakes the sick pigs and chokes their swollen gullets. (ll. 494-497)*

"The once victorious racehorse" merits an extended description, pawing the ground and sweating, shuddering, bleeding from nose and mouth. "Relief was sought / By pouring wine through an inserted horn," but to no effect. The loss of the valued plow-ox, too, is described in painful, intimate detail:

*Look at that bull! Steaming under the strain
Of the plough he crashes, vomiting blood and foam,
And utters a last groan. Sadly the ploughman
Goes to unyoke the mate that mourns his brother
And leaves the plough stuck there, its work unfinished. (ll. 515-519)*

The farmers are left bereft and alone, forced to take up the work of their former companions:

*It was left for men to scratch the earth with mattocks,
Scrape with their nails for planting, and pull waggons
Creaking o'er hill and dale with straining shoulders. (ll. 534-536)*

Wild animals, too, suffer from the loss of their domestic counterparts, the poet says: wolves go hungry in the absence of flocks of sheep; deer lose their timidity. But then the pestilence expands its range still further:

*Now the tide
Strands on the edge of the shore, like shipwrecked corpses,
The brood of the boundless sea and every species
Of swimming creature. Seals in panic flight
Take to the rivers. Vainly the viper seeks
Security in the windings of her lair:
She, with the startled watersnake, whose scales
Bristle with terror, dies. The very birds
Find in the air no favour: even they
Plunge headlong, leaving life beneath the clouds. (ll. 541-547)*

Standard remedies were ineffective, "new treatments made things worse," even the most celebrated doctors could do nothing. The verse gains momentum, layering horror upon horror:

*... And now the Fury dealt out death
In droves, and even in the very stalls
Piled up the foully rotting carcasses
Until men learned to bury them in pits
Since hides were no more use and nobody
Could cleanse the flesh with water or reclaim it
With fire. They could not even shear the fleeces,
So eaten up were these with sores and filth,
Nor touch the rotting web. If any tried
To don the loathsome clothing, feverish blisters
And filthy sweat ran down his stinking limbs.
He had not long to wait: the accursed fire
Would soon be preying on his infected body. (ll. 556-566)*

—and then breaks off abruptly, leaving the reader at the end of the book with these frightening images seared into his or her mind.

So, what are we to make of this extended vision of death and disease within the *Georgics*? Virgil's primary literary example—and, by extension, philosophical inspiration—for the livestock-plague episode is generally agreed to be Lucretius' account of a great plague that struck Athens in 430-429 BC, during the Peloponnesian War. Lucretius' plague scene occupies the final 150 lines of the sixth and last book of his *De Rerum Natura* (*The Nature of Things*), a verse exposition of the physical theories of Epicurus, which also served as an important source and influence for the *Georgics* as a whole. Beyond this identification, however, Virgil's plague scene has received relatively little attention from classicists and literary critics. Richard Jenkyns's 700-

page study of nature and history in the works of Virgil, for instance, devotes less than half a page to the plague episode, noting the Lucretian precedent and the structural parallel with the similarly violent and abrupt ending of Book 1 of the *Georgics* (describing the devastation of civil war).¹⁰ L. P. Wilkinson too, in his critical monograph on the *Georgics*, emphasizes the episode's structural role within the poem, the parallel with Book 1 and the "ironic contrast with the blessings of country life at the end of Book 2."¹¹

Like much classicist discussion of the *Georgics* in general, these readings tack back and forth between an intricate, technical poetic analysis of the structure of Virgil's language and composition, and an equally detailed dissection of the factual (or otherwise) basis of the phenomena the poem describes.¹² An attempt at the latter by a German commentator in the 1950s concluded that the symptoms itemized by Virgil "tally most closely with haemorrhagic septicemia, which can occur concurrently with petechial fever, but that Virgil may have included some of the symptoms of anthrax, which has from time immemorial been much commoner than these in Europe," although none of these bear any plausible connection to the deaths of sea creatures, birds, fishes and snakes, and "some of the symptoms are still left unaccounted for." Wilkinson adds:

Dio records (45.17.7) among portents of the year 43 that the Po, after a big flood, suddenly receded, stranding a vast number of snakes; and that countless fish were cast up on the shore near the mouth of the Tiber; and that on top of this there was a terrible (human) plague nearly all over Italy. We do not know the date of the Noric plague, but it could have been 43: in which case Virgil or his informants might have seen dead snakes and fish and erroneously connected them with the animal and human plagues respectively.¹³

While such information is undoubtedly of interest, readings of this sort focus on the conditions of authorial production at the expense of reader reception history—the long later life of the text, in this case amounting to more than two thousand years. They reflect, moreover, a particularly stubborn contradiction within literary analysis of the *Georgics* as a whole, insisting that it either be primarily about agriculture (and therefore subject to scrutiny on "factual," scientific or practical grounds), or that it be supremely literary (and therefore interpretable by way of minute

¹⁰ Jenkyns, *Virgil's Experience*, p. 300.

¹¹ L. P. Wilkinson, *The Georgics of Virgil: A Critical Survey* (Cambridge University Press, 1969), p. 99.

¹² An extreme version of the former is represented by the fad for "numerical schematism" among classicists in the 1950s and '60s, the discovery of significant ratios among the number of lines devoted to different topics and sections in the work of ancient poets. See Wilkinson's *Critical Survey*, pp. 316-322.

¹³ Wilkinson, summarizing Will Richter, *Vergil, Georgica herausg. und erklärt* (1957), p. 206; on Dio, p. 208n.

linguistic analysis). My feeling is that for most readers—and indeed for Virgil—the *Georgics* is precisely both: a supreme literary rendering of agricultural concerns, constructed like all great literature around the rich factual details of existence, but not necessarily bound by them hand and foot. Some are foregrounded, others recede. All resonate.

With respect to the plague scene and its constitution as apocalyptic georgic, let me make three points here and save the rest for later in this discussion. The first relates to the question of sympathy, and specifically to the way in which human sympathy is manifested and exercised in our relationship with animals. What Virgil has drawn here is a very astute and strikingly contemporary apprehension of the conditions of domestication: the fact that many, if not most infectious diseases affecting humans come to us via our intimate working relationships with domestic animals.¹⁴ Virgil's artistic and emotional brilliance is to present this as an occasion for sympathy and loss, not fear and disgust: the horror of the scene is a horror of identification, not revulsion. In this way, it reinforces the lessons of georgic found throughout the poem as a whole: the shared experience of human and non-human creatures, mediated by work and ritual, subject to omnipresent physical and astronomical forces.

Wilkinson makes a suggestive observation in this regard, noting that Virgil's description of the plow-ox mourning its yoke-mate represents "the most explicit and elaborate expression of the sympathy that permeates the whole poem." Whereas Lucretius's description of a cow searching for its calf (the specific touchstone for this moment) represents a "natural maternal instinct," in the *Georgics* this has been transformed into a situation in which "both ploughman and yokemate are distressed at the loss of a fellow-worker. Their feeling is social"—and therefore, presumably, of a higher order (124). (In another footnote, the scholar muses: "Virgil's sympathy with plants and animals has no real parallel in pagan literature. When it reappears in St Francis of Assisi and his followers Christianity has taken the place of pantheism as the notional basis."¹⁵)

The second point has to do with the sense of causality presented in the Book 3 plague scene. What's remarkable here is the *absence* of any direct suggestion of divine retribution—or indeed,

¹⁴ A summary of the evidence for this view is given by Michael Greger, *Bird Flu: A Virus of Our Own Hatching* (Lantern Books, 2006), pp. 87-93.

¹⁵ It's interesting to note here that Lynn White, Jr., in his seminal essay on "The Historical Roots of Our Ecologic Crisis," points to St. Francis as "[t]he greatest spiritual revolutionary in Western history," in that he proposed "an alternative Christian view of nature and man's relation to it: ... substitut[ing] the idea of the equality of all creatures, including man, for the idea of man's limitless rule of creation." Originally published in 1967, White's essay is reprinted in *The Ecocriticism Reader* (quotes are on p. 14).

any real role for the gods at all. The failure of ritual sacrifice seems to imply not so much the gods' anger or even indifference but their inability to intervene, even for the sake of their own glory. The established lines of communication have been temporarily severed. In terms of culpability, Virgil specifically exonerates the plow-ox while at the same time pointing out that the ox's faithful, innocent labor cannot protect him from his painful death: "What good can his loyal service do him now / And all that heavy ploughing?" the poet asks.

*Yet immune
From Bacchus' gifts of Massic and immune
From harmful feasts when course is heaped on course
Oxen have leaves for fare and simple grass,
The health they drink is drawn from racing brooks,
Pure water, nor do cares disturb their slumbers. (ll. 525-530)*

But neither is there any forceful implication—the lines just quoted are as strong as it gets—that human luxury or self-indulgence or wickedness has brought the fury of the gods down on their collective heads. It just arrives, gathers force, and thunders across the landscape, sweeping all before it. The only conclusion seems to be that periodic death and disease on a colossal scale is somehow intrinsic to the terms of agricultural life—and specifically, here, to the terms of our relationship with the beasts. Intermittent, species-jumping plague is merely an extreme example of Jupiter's decree that "the path of tillage be not smooth" as a spur for human ingenuity (see p. 4, n. 6 above).

In the absence of any desperate or cathartic discourse of blame and judgment, the focus of attention within the thick of the disaster, beyond commiseration and sadness, shifts to pragmatics: how to alleviate suffering, if possible (a swallow of wine for a dying horse); how to carry on in the absence of your fellow laborers (scrape with your fingernails for planting); finally, how to deal with the bodies (men learned to bury them in pits) so as to limit, if possible, the further spread of infection. This is the third feature of georgic apocalypse worth noting, and again one that connects it to the larger georgic ethic. The only viable response to widespread death and devastation, it turns out, is continuous with the conditions of everyday life: labor, relentless labor and taking thought, so that step by step, gradual (if temporary) improvements may be gained.

Carson & Silent Spring

I am conscious of a kind of bathetic disjuncture in moving from Virgil to Rachel Carson, no matter how much we might admire and respect her significant achievements—literary, scientific

and political. It may take several centuries for anyone to be in a position to place the two writers' respective contributions side by side. But my goal is to unearth the diverse legacies of georgic, and here specifically of apocalyptic georgic, in order to gain a new perspective on the environmental present. Carson, as a major shaper of the 20th-century environmental movement, is a key milestone for this effort. Viewing Carson's work and legacy through the lens of the *Georgics*, moreover, offers new ways of thinking about our "post-natural" moment.

Let's begin, therefore, with some basic points of comparison. I have no evidence, as I mentioned earlier, for any direct influence of the Virgilian georgic on Carson's intellectual development, but there are some suggestive resonances between Carson's interests, instincts and impact and the georgic worldview.¹⁶ Put simply, what Carson and Virgil have in common are birds and the sea. For both writers, the sea serves as the baseline of natural description, the ultimate source of all metaphor, the unchanging changeableness of the universe. Birds are the emissaries of that element, messengers who move from sea to land and back again, reporting on what they find there. For Virgil, birds offer signs legible to both farmers and sailors, portents of the weather; for Carson they serve a similar purpose, less rooted in specific daily life perhaps but still pregnant with meaning for the health and functioning of the whole biotic system. With their seasonal migrations, birds confirm our links to annual cycles of seasonal change; but they can also be vectors for long-distance travel of disease organisms and environmental contaminants. Birds travel where we cannot go, connecting us with distant lands, both peopled and unpeopled.

Carson wrote three books about the sea before undertaking *Silent Spring*. Even as a child growing up in western Pennsylvania, Carson later recalled, she had always felt drawn to the ocean. After training as a marine biologist, Carson spent fifteen years working for the United States Bureau of Fisheries (later the U.S. Fish and Wildlife Service), writing and editing reports for her male colleagues and creating public outreach materials based on their findings. Her first book, *Under the Sea-Wind* (1941), sought to reveal the mysterious, complex lives of marine creatures to a general reading public, using meticulous, imaginative natural observation and description to render the story from the animals' point of view. Although reviews of *Under the Sea-Wind* were admiring, sales suffered in the wake of the attack on Pearl Harbor, just a month after its release. Carson's next book, however, *The Sea Around Us* (1951), became a bestseller.

¹⁶ Interestingly, Carson's most recent biographer, Mark Hamilton Lytle, adopted a georgic structure for his book, arranging Carson's life into four chapters corresponding to her four books and the four seasons (Spring, *Under the Sea-Wind*; Summer, *The Sea Around Us*; Fall: *The Edge of the Sea*; Winter: *Silent Spring*).

Informed by Carson's many visits to research stations, wildlife preserves and other facilities up and down the Atlantic Coast (including a trip to the Georges Bank aboard the US research vessel *Albatross III*), it told the story of contemporary oceanography, the deep-water world of whales, giant squid and other ancient creatures whose biology scientists were just beginning to unravel. It was excerpted in *The New Yorker*, received the National Book Award for nonfiction, was translated into 31 languages and sold 1.3 million copies in its first edition.¹⁷

Third came *The Edge of the Sea* (1955), a narrative field guide to seashore ecology, from the rocky, tidal beaches of the North Atlantic, to the sandy barrier islands of the mid-Atlantic and the mangrove and coral regions of the far south. With the completion of this trilogy Carson had become, in her own words, a "biographer of the sea." Her genius lay in her ability to condense disparate, dense scientific data into a compelling explanatory whole enlivened by narrative examples—a project, it's worth pointing out, not entirely unlike Virgil's redaction and metrical arrangement of expertise gathered from Varro, Cato and other Roman as well as Greek authorities. A writer in the *Atlantic Monthly*, reviewing *The Sea Around Us*, congratulated Carson for having produced "a first-rate scientific tract with the charm of an elegant novelist and the lyric persuasiveness of a poet."¹⁸

For Carson, the complex relationships and interdependencies of the marine world—at once terribly fragile and wonderfully resilient—were emblematic of the human condition. The stories in *Under the Sea-Wind*, she explained in an interview, "are as ageless as the sun and rain, or the sea itself. The relentless struggle for survival in the sea epitomizes the struggle of all earthly life, human and non-human."¹⁹ As her career developed, moreover, Carson became increasingly concerned with the ways in which the human element within that struggle was beginning to threaten the survival of the other parts. "I am much impressed by man's dependence upon the ocean, directly, and in thousands of ways unsuspected by most people," she wrote to a friend as she was working on *The Sea Around Us*. "These relationships, and my belief that we will become more dependent on the ocean as we destroy the land, are really the theme of the book[.]"²⁰ The study of ecology and evolution, —as illustrated, for instance, in the work of English zoologist and population biologist Charles Elton—was for Carson both a way of understanding the natural

¹⁷ I am relying here on Mark Hamilton Lytle, *The Gentle Subversive: Rachel Carson, Silent Spring and the Rise of the Environmental Movement* (Oxford University Press, 2007).

¹⁸ Quoted in Lytle, p. 81.

¹⁹ Quoted in Lytle, p. 51.

²⁰ Quoted in Lytle, p. 65.

world and humanity's role within it and an indispensable tool for improving natural resource management and mitigating the harmful effects of agriculture, industry, and other human pursuits. Through her work with the Fish and Wildlife Service and as an independent writer, Carson cultivated an extensive network of researchers and government scientists who shared her outlook and valued her ability to communicate these insights to a wider audience.

In Carson's hands, in other words, the georgic potential of the ecological perspective—both in terms of its insights and its applications—was richly explored and developed. Nowhere was this more true than in *Silent Spring*, published in 1962 and destined to be her last book. In it, Carson strove to retain the celebratory quality of her earlier writing about the natural world while at the same time constructing a meticulously documented polemic concerning the threats to that world. She was determined, she explained to a friend, not to let "the ugly facts dominate" the narrative. "[T]he beauty of the living world I was trying to save has always been uppermost in my mind."²¹ That attitude was reflected in the eventual title for the book, which supplanted working titles along the lines of *Man Against the Earth* and *At War With Nature*. Like the *Georgics*, *Silent Spring* is concerned with the interpretation of natural signs, with the right "reading" of the phenomenal world and how that reading should inform human actions. "[T]he natural landscape is eloquent of the interplay of forces that have created it," Carson wrote. "It is spread before us like the pages of an open book in which we can read why the land is what it is, and why we should preserve its integrity."²²

In a sense, *Silent Spring* functions as an extended example of apocalyptic georgic: an exposition of how landscapes of fertility and abundance were metamorphosing into landscapes of desolation and death. Carson's specific and most dramatic use of apocalyptic georgic, however, the opening "Fable for Tomorrow", operates differently within her text than does the plague scene within the *Georgics*: serving to draw the reader in to a more technical presentation of evidence, albeit one similarly interspersed with narrative interludes. "There was once a town in the heart of America where all life seemed to live in harmony with its surroundings," Carson begins:

The town lay in the midst of a checkerboard of prosperous farms, with fields of grain and hillsides of orchards where, in spring, white clouds of bloom drifted above the green fields. In autumn, oak and maple and birch set up a blaze of color that flamed and

²¹ Quoted in Lytle, p. 133.

²² Carson, *Silent Spring*, 25th anniversary edition (Houghton Mifflin, 1987), p. 64. Subsequent page numbers given in parentheses in the text.

flickered across a backdrop of pines. Then foxes barked in the hills and deer silently crossed fields, half hidden in the mists of the fall mornings. (1)

Carson's fable is remarkably restrained and efficient: a brief portrait in which every word does work. In a few short sentences, Carson mobilizes a long cultural heritage of georgic imagery (even I am tempted to call it pastoral in this instance), peaceful and reassuring: a small town in a rural landscape, where wildlife and farm life co-exist, where each season brings its own aesthetic delights, at once new and familiar; where "laurel, viburnum and alder, great ferns and wildflowers" fringe the roads. The town's natural beauty is an attraction for visitors, who come to see the bird migrations in the spring and fall, and "to fish the streams, which flowed clear and cold out of the hills and contained shady pools where trout lay" (2).

A mere two paragraphs set the scene; the next six render the contagion, with each paragraph shorter than the one before. It arrives as Virgil's plague does—mysterious, sudden and indiscriminate:

Then a strange blight crept over the area and everything began to change. Some evil spell had settled on the community: mysterious maladies swept the flocks of chickens; the cattle and sheep sickened and died. Everywhere was a shadow of death. The farmers spoke of much illness among their families. In the town the doctors had become more and more puzzled by new kinds of sickness appearing among their patients. There had been several sudden and unexplained deaths, not only among adults but even among children, who would be stricken suddenly while at play and die within a few hours. (2)

As in Virgil's plague scene, the doctors and healers are powerless. Children succumb alongside their parents; livestock of every variety sicken and die; those who survive lose their fertility. The orchards come into bloom, but the bees have all disappeared, "so there was no pollination and there would be no fruit" (3). Although Carson's account is severely pared-down compared to Virgil's, she too emphasizes the gruesome, unnatural mode of this strange plague. "The few birds seen anywhere were moribund; they trembled violently and could not fly" (2). Finally, at the close of the parable, she states explicitly that this was no act of a wrathful god or other external force. "No witchcraft, no enemy action had silenced the rebirth of new life in this stricken world. The people had done it themselves" (3).

Not counting the "Fable," *Silent Spring* has sixteen chapters, tracing the application and effects of chemical pesticides through the different arenas of the total environment: in surface and ground waters; in the soil; on plant communities; on animals, both wild and domestic; and on humans. Chapter 2, "The Obligation to Endure," lays out Carson's overall argument, emphasizing that she

was not suggesting "that chemical insecticides must never be used[,]" but that greater precautions should be taken, more restraint should be shown, and that the public should be given a stronger voice in the decision-making process. Later chapters document the devastating impact on bird and fish populations of ill-conceived aerial spraying campaigns to combat invasive pest organisms such as Dutch elm disease, Japanese beetles, gypsy moths and fire ants. Then there was the human cost: Carson surveyed the myriad routes of human exposure to toxic pesticides via food, home and garden products, and workplace applications in addition to aerial spraying; three chapters are devoted to detailing acute toxicity poisonings, cumulative risks and the links to cancer. Finally, there was the ecological revenge effect: abundant evidence that insect populations swiftly evolve resistance to chemical pesticides and that the elimination of natural predator populations along with target species in fact makes pest outbreaks worse.

Although Carson's representation of the human health risks associated with pesticide use may have been most disturbing for some readers, the widespread loss of animal life forms the emotional focus of the book. Chapter after chapter, Carson catalogued specific instances in which animals had become collateral damage in the war on pests—whether through direct or indirect ingestion of toxic chemicals, the loss of food species, or the loss of habitat—leaving their human observers stunned and saddened at their loss. Aerial applications of heptachlor to control Japanese beetles in Illinois in 1959, Carson related, took the lives of at least 80 percent of songbirds in treated areas, according to local sportsmen's clubs; "[d]ead rabbits, muskrats, opossums, and fish were also found in numbers, and one of the local schools made the collection of insecticide-poisoned birds a science project" (91). In British Columbia in 1957, a Forestry Division operation using DDT against the black-headed budworm killed nearly all the salmon in at least four major streams, including "a run of 40,000 adult Coho salmon" and "the young stages of several thousand steelhead trout and other species of trout[,]" *despite* a concerted effort to minimize contamination of waterways (138). Tens of thousands of dead birds were reported in England in 1960 and 1961 after the introduction of insecticide-treated seeds for cereal production, leading to a House of Commons investigation. "Pigeons are suddenly dropping out of the sky dead,' said one witness. 'You can drive a hundred or two hundred miles outside London and not see a single kestrel,' reported another." Foxes were also affected: "They were seen wandering in circles, dazed and half blind, before dying in convulsions" (123-4).

The examples, the incidents, the testimonials went on and on. Ironically, Carson's most vituperative critics invoked their own version of apocalypse as a cautionary tale against the

widespread acceptance of her argument. The end of pesticide use, one biochemist threatened, would mean "the end of all human progress, reversion to a passive social state devoid of technology, scientific medicine, agriculture, sanitation. It means disease, epidemics, starvation, misery, and suffering."²³ Despite the best efforts of these and other critics, however, the message of *Silent Spring* was a resounding success.²⁴ As Linda Lear has shown, US Department of Agriculture scientists and other officials were taken unawares by the magnitude of the public reaction to Carson's book; it seemed to access a level of common sense—and human sympathy—that transcended scientific expertise.²⁵ Interestingly, Carson's "fable" was a specific focus of attack for her critics, who charged that it was emotional and inflammatory; but as a way of compelling readers' attention, it worked perfectly. Its message was amplified and reinforced throughout the book. In a final twist, Carson cited evidence of pesticide resistance developing among mosquitoes, aquatic snails, and fleas—vectors for malaria, schistosomiasis and plague, respectively.

Cataloguing destruction

So what new insights into the nature of apocalyptic georgic do we gain by considering the *Georgics* in the light of *Silent Spring* and vice versa? Is there a trajectory of georgic apocalypse mapped out by these two endpoints? How do these new details impact our understanding of how the georgic functions overall? In the first place, given the power and stature of Virgil's text and its centrality within Western agricultural discourse, it seems inescapable that the *Georgics* plague scene functioned as a lens through which writers and observers made sense of a wide range of

²³ William Darby, head of biochemistry at Vanderbilt School of Medicine; Lytle, p. 174, quoting Thomas R. Dunlap, *DDT: Scientists, Citizens and Public Policy* (Princeton University Press, 1981), pp. 112-3. Eisenhower's secretary of agriculture, Ezra Taft Benson, reportedly stooped so low as to ask (redundantly, one might add) "why a spinster with no children was so concerned about genetics?" After the first two of three installments appeared in *The New Yorker* in June of 1962, the Velsicol Chemical Company threatened to sue the magazine and the book publisher, Houghton Mifflin, if they proceeded with publication. In this case Carson's public vindication came in November of the following year, when a massive fish kill in the Mississippi River was traced to the pesticide endrin, manufactured by Velsicol. See Lytle, pp. 175, 189-90; 165.

²⁴ Among immediate outcomes, the publication of *Silent Spring* led to a Presidential Advisory Committee investigation on pesticide use, which wholeheartedly confirmed Carson's conclusions. Longer-term impacts included the creation of the Environmental Protection Agency in 1970 and the banning of DDT for agricultural use in the United States in 1972. Carson received awards and honors from the National Audubon Society, the American Geographical Society, the Animal Welfare Institute and many other groups. Already suffering from cancer and radiation treatment as she completed the book, Carson died in April of 1964, less than two years after its publication.

²⁵ Linda Lear, "Bombshell in Beltsville: The USDA and the Challenge of 'Silent Spring,'" *Agricultural History* 66, 2 (Spring 1992), p. 154. See also Lear's full-length biography, *Rachel Carson: Witness for Nature* (Henry Holt, 1997).

episodes of natural horror and devastation, from epidemics, infestations and famines to floods, storms, earthquakes and volcanic eruptions. One could conceivably undertake a kind of taxonomy of disaster, considering which types lend themselves most readily to an apocalyptic georgic interpretation and/or which specific historic events seem have been most effectively glossed along those lines. But even if such a project were within the scope of the current paper, I suspect that it might founder on another signal feature of the phylogenetic order: its surprising ubiquity, the sheer frequency of its occurrence. After working on this paper for a while, I began to see instances or at least potentialities of georgic apocalypse everywhere I turned, and I don't think simply as a result of the ordinary contagion of a new interpretative outlook. Whatever period of history we look to, whatever corner of the globe, we can find instances of large-scale catastrophe and death. Events like Virgil's plague and Carson's fish-kills are not so much extraordinary as stochastic, existing outside of the annual cycle but rarely outside of living memory.

Consider, for instance, the history of livestock disease in the British Isles. "The word 'murrain' occurs more frequently in mediaeval stock accounts than any other noun," writes historian of British livestock husbandry Robert Trow-Smith. Studying medieval monastic records, Trow-Smith found that annual sheep flock losses suffered among the English abbeys ranged from a "normal figure of 17.8 percent" to a high of more than 70 percent. Scab arrived in Britain in 1272; the "red death" in 1331; "the pox" in the late 14th century. Looking at the 18th century alone, widespread losses to sheep rot were recorded in 1735, 1738, 1747, 1766, 1769, 1789, 1792, 1794 and 1798. Among cattle, the great plague in early modern England was rinderpest, known as the "contagious distemper." Endemic on the Continent, rinderpest would flare up periodically in Britain, brought in with gradually increasing imports of both live and dead animals. A particularly severe outbreak began in 1745 and was not fully contained until 1770, following an extended national campaign in which internal livestock movement was severely restricted and farmers were offered partial compensation in exchange for slaughtering, burning and burying infected animals.²⁶ Overall, it would seem that the history of livestock disease refuses to adhere consistently *either* to a narrative of subjugation in the face of improved veterinary science or to a narrative of escalation in response to mounting human populations and the increasing intensification of livestock production systems.

²⁶ Robert Trow-Smith, *A History of British Livestock Husbandry to 1700*, pp. 153-154, and *A History of British Livestock Husbandry, 1700-1900*, p. 35; J. M. Stratton, *Agricultural Records, A.D. 220-1968*, pp. 64-93. Rinderpest went on to exact catastrophic losses in sub-Saharan Africa in the 1880s and '90s, nearly wiping out cattle herds and doing terrific damage to wildlife populations.

Extreme weather was also a chronic killer: severe storms and resultant flooding in southern England in the early winter of 1703 took the lives of at least 8,000 people and 16,000 sheep; heavy snowstorms occasioned "much mortality among cattle, sheep and wild birds" in January of 1709, to take just two of an infinite number of possible examples. Speaking more broadly, years of bad weather lowered feed quality and quantity, rendering herds, flocks and people alike more susceptible to infection.²⁷ On a literary level, this explains why so many 18th-century British georgic poets paid explicit homage to Virgil's consideration of health and disease as an intrinsically georgic topic. John Dyer's four-book georgic on the British wool trade, *The Fleece* (1757), included an extended and earnest cataloguing of sheep ailments and their remedies; the physician-poet James Grainger offered a nauseatingly analogous assessment of the health-management issues confronting plantation owners in his West Indian georgic, *The Sugar-Cane* (1764).²⁸ John Armstrong, also a medical doctor, addressed the subject head-on in his *Art of Preserving Health* (1744), again divided into four books (1. Air, 2. Diet, 3. Exercise, 4. The Passions). Despite equivocal evidence, Armstrong's poem gave voice to the persistent idea that agricultural laborers enjoyed access to a peculiar stock of good health and robust digestion, thanks to an athletic lifestyle and clear country air. The ordinary evils he cautioned against are likewise all too familiar: overeating, lack of exercise, excessive drink. Following precedent, however, Armstrong included a plague scene at the close of his third book, apparently describing the return to the British Isles of the Black Death in the late 17th century: "Infectious horror ran from face to face, / And pale despair. 'Twas all the business then / To tend the sick, and in their turns to die."²⁹

Another, related aspect of apocalyptic georgic concerns the issue of temporality. It's important to note that Carson's scene, like Virgil's, is crucially not *post*-apocalyptic: the danger to which it draws attention exists in the present; while the threat it offers extends seamlessly and indefinitely into the future. Carson's somewhat unusual title, "A Fable for Tomorrow," underscores this point—hers is neither a cautionary tale of yesteryear nor a dark vision of a possible world to come. Although Virgil is nominally recounting an event that took place in the past, pointing by way of evidence to a specific desolated landscape, the vividness and precision of his

²⁷ Stratton, *Agricultural Records*, pp. 65, 67; Trow-Smith, *A History of British Livestock Husbandry, 1700-1900*, p. 34.

²⁸ For a careful reading of Dyer's account of sheep management, including diseases, see John Goodridge, *Rural Life in Eighteenth-Century English Poetry* (Cambridge University Press, 1995), pp. 144-66.

²⁹ John Armstrong, "The Art of Preserving Health," in *The British Poets*, vol. 69 (Chiswick: C. Whittington, 1822), p. 70.

description—together with its abrupt ending—gives it the impact of a story narrated in the present. The point is that this can happen at any time. The fictional apocalyptic literary tradition, by contrast, is, as its standard moniker indicates, characteristically post-apocalyptic: The disaster has passed; in many cases, it isn't even precisely identified, its contours are blurry.³⁰ The obsession of the post-apocalyptic novel is the new, radically altered landscape and the new social relations to which that landscape gives rise, none of which will ever be the same again.

Georgic apocalyptic visions, by contrast, as we have seen, are ultimately preoccupied with what it takes to get things back to normal. An informative instance in this regard (and a candidate that cries out for consideration in any case) is Daniel Defoe's *Journal of the Plague Year*, first published in 1722. Defoe's work is consummate narrative journalism, meticulously researched but craftily presented, purporting to be the eyewitness recollections of "a Citizen who continued all the while in London" during the catastrophic outbreak of 1665—although Defoe himself, born in 1660, could have had only imperfect, if vivid, recollections of the event. Although Defoe's story is very much a London story, an account of the effects of a great plague on a living, breathing urban landscape, it fits the mould of apocalyptic georgic in several respects. As in Armstrong's version, Defoe describes how the plague outbreak reconfigured the relationship between city and country: those who had the resources to do so fled the contagion for the relative safety of the rural world, knowing that they left their homes and other belongings to the mercy of a faltering urban civil order. Because Defoe's narrator recurs continually to the published bills of mortality—the weekly, parish-by-parish tallies of the dead and causes of death—he is concerned too to account for those who may have escaped enumeration by wandering off the urban map:

[T]here died at least 100,000 of the plague only, besides other distempers and besides those which died in the fields and highways and secret places out of the compass of the communication, as it was called, and who were not put down in the bills though they really belonged to the body of the inhabitants. It was known to us all that abundance of poor despairing creatures who had the distemper upon them, and were grown stupid or

³⁰ Stretching from Mary Shelley's *The Last Man* (1826) to Cormac McCarthy's *The Road* (2006), the tradition of post-apocalyptic fiction often seems to veer into fantasies of depopulation. Alan Weisman indulges in an illustrative non-fiction version of this fantasy in his recent book *The World Without Us*, an imagination of what would happen if all human beings suddenly disappeared from the earth (picture kudzu engulfing whole cities across the American South). Weisman closes the book with a radical policy recommendation: a worldwide restriction on reproduction to one child per woman. With such a clamp down on human fertility in place (there is no discussion of how such a measure would be brought about), he suggests, the human population would fall to 1.6 billion by 2100, "levels last seen in the 19th century," and at which we would experience "the growing joy of watching the world daily become more wonderful. The evidence wouldn't hide in statistics. It was be outside every human's window, where refreshed air would fill each season with more birdsong" (272-73).

melancholy by their misery, as many were, wandered away into the fields and woods, and into secret uncouth places almost anywhere, to creep into a bush or hedge and die.³¹

A good deal of Defoe's plague narrative is taken up with what might be called the logistics of plague conditions: the orders issued by the Lord Mayor and the Aldermen in their efforts to contain the infection—confining sick people to their houses, appointing surgeons to diagnose and nurses to care for the sick, procedures for airing contaminated bedding and furnishings, constables and churchwardens to oversee the burying of the dead—in short all the terrible and laborious *work* to be done to get through a plague visitation, with fewer and fewer hands available to do it. All this despite the fact that "[s]urely never city, at least of this bulk and magnitude, was taken in a condition so perfectly unprepared for such a dreadful visitation, whether I am to speak of the civil preparations or religious" (108). While Defoe dutifully acknowledges the propriety of religious preparations, his overwhelming interest is in the practical measures to be taken, whether planned or improvised, and with the tangible ways in which the city was transformed during the experience, with grass springing up between the paving stones of streets ordinarily bustling with the people, carts and coaches, now desolate and empty. The effect on individuals, in Defoe's account, is characterized not so much by religious fervor as by simple extremities of distress, manifesting itself sometimes in acts of depravity and selfishness and at other times in instances of heroism, "affection, pity, and duty" (131).

Finally, Defoe's *Journal* foregrounds one other aspect of apocalyptic georgic to which we should give some attention: the question of origins. If plague is not the naked scourge of divine justice, where does it come from? The opening paragraph of Defoe's narrative offers a strong hint:

It was about the beginning of September, 1664, that I, among the rest of my neighbors, heard in ordinary discourse that the plague was returned again in Holland; for it had been very violent there, and particularly at Amsterdam and Rotterdam, in the year 1663, whither, they say, it was brought, some said from Italy, others from the Levant, among some goods which were brought home by the Turkey fleet; others said it was brought from Candia; others from Cyprus. It mattered not from whence it came; but all agreed it was come into Holland again. (23)

Potential source locations are as numerous as the ships trading in and out of Amsterdam, all the ports at which they have previously called, and all the many sources of their varied cargo. In word, infinite. Here Defoe puts his finger on the essential relationship between georgic, trade, and empire—we might as well call it globalization—and on the necessary participation of georgic

³¹ Daniel Defoe, *A Journal of the Plague Year*, ed. Anthony Burgess and Christopher Bristow (London: Penguin, 1986), p. 116. Subsequent page references given in the text.

apocalypse within that relationship. Lucretius, in Book 6 of *The Nature of Things*, suggests that the Athenian plague outbreak was originally brought to the city by farmers and herdsmen, but Virgil sidesteps any explicit discussion of the origin of the contagion in his plague scene.³² Our sense of the likely origins of epidemic disease within the Virgilian model must come from elsewhere in the *Georgics*, but there it is abundant enough. Everywhere the poem is populated by references to distant lands, both within and beyond the reach of Roman rule, objects of trade if not of dominion. This is perhaps nowhere more true than in Book 2, the "optimistic" account of horticultural crops (trees and vines), which delights in listing the ramifying, exotic diversity of agricultural systems near and far. "What need to tell of balsams / Dripping from fragrant branches, or the berries / Of Egypt's evergreen acacia, / Of Ethiopia's cotton-white plantations / And the Chinese combing fleecy silk from leaves?" the poet asks rhetorically (II.118-121). What need, when the whole point of the poem is to celebrate the glories of an Italian agriculture that at once rivals and reflects that diversity?

Book 3, then, explores the flipside of that rich, extensive, profitable network of exchange. Trade is the lifeblood of agriculture (persistent fantasies of self-sufficiency notwithstanding), supplying not just cash but also tools, ideas, and—above all—new species, breeds and varieties. World historiography since Alfred Crosby has accustomed us to the idea of ecological imperialism, but 18th-century observers, like their classical forbears, believed that migration from the center to the periphery might just as likely be ineluctably linked to degeneration.³³ By the same token, pest species—including diseases, insects, even birds and small mammals—traveled in both directions along every trade route, whether invited or uninvited. In a sense, apocalyptic georgic can be read as an attempt to come to terms not with ecological imperialism exactly, but with the *ecology of imperialism*.³⁴ As Rachel Carson realized, the consequences could take centuries to play themselves out, as American and European chemical companies engineered new compounds to sell to government agencies taking it upon themselves to combat freshly targeted pest organisms introduced from continents on the other side of the globe.

³² A recent edition is *De Rerum Natura: The Nature of Things, A Poetic Translation*, translated by David R. Slavitt (University of California Press, 2008), although Slavitt takes the unusual step of excising some passages where he finds Lucretius redundant or too far off the scientific mark.

³³ Philip J. Pauly develops this theme within the colonial American context in his recent book *Fruits and Plains: The Horticultural Transformation of America* (Harvard University Press, 2007), especially Chapters 1 and 2.

³⁴ It has occurred to me in writing this paper that colonial contexts, especially in their early years, presented terrifyingly rich opportunities for the experience of apocalyptic georgic. Stephen Greenblatt's famous "Invisible Bullets" essay, reading Thomas Harriot's *Brief and True Report of the New Found Land of Virginia* (1588), is suggestive in this regard. See Greenblatt, *Shakespearean Negotiations* (University of California Press, 1988), ch. 2.

But to end on a lighter note: a satirical view of this situation features prominently in Voltaire's *Candide* (1759), when Candide is reunited with his former tutor, the philosopher Dr. Pangloss, and learns that the latter is dying of syphilis. Alas, Candide cries, how could such a fate have befallen so worthy a man? Surely such a scourge was sent by the devil? Not a bit of it, replies Pangloss, itemizing the long series of sexual exchanges by which his infection can be traced back to one of Christopher Columbus' shipmates, and concluding:

"It was absolutely necessary, in this best of all possible worlds, a vital ingredient, because if Columbus hadn't picked it up, on some island in the Americas—this affliction that poisons the organ of human procreation, which has even completely prevented procreation, and is plainly directly contrary to the purposes of nature—we would never have had either chocolate or cochineal dye."³⁵

The benefits and liabilities of globalization, in other words, are hopelessly interdependent, not to mention beyond the control of individual (or even ultimately state) intention. Candide is a suitable interlocutor for such a lesson, given his own drastic relationship with misadventure, both human and "natural", including war, shipwreck, disease, the devastating Lisbon earthquake of 1755, religious persecution, slavery, and all manner of further treachery. The New World, in Candide's experience, is as corrupt as the Old, if not more so. In the end, all Candide, Pangloss and their companions can do is learn to be content growing vegetables on the small farm where they fetch up outside of Constantinople. "All I know," Candide concludes, "is that we must cultivate our garden."

A new era of georgic apocalypse?

What, then, can we conclude? Briefly, I'd like to offer three final observations. The first is to point out that although Rachel Carson and many of her contemporaries were impressed by the radical novelty of the pesticide threat—the categorical, evolutionary shift represented by exposure to man-made chemicals (and nuclear radiation)—from the perspective of apocalyptic georgic this seems, grim as it is to say so, somewhat overstated. My point is not to adopt an historically relativist attitude to environmental crisis but to observe that in many ways the Virgilian perspective of an indiscriminate, generalized visitation of death and disease feels more accurate. (A strictly biological view of contagion, after all, often overlooks the larger socio-ecological consequences. In the fall of 1843, to take another example, a farmer in southeastern Pennsylvania

³⁵ Voltaire, *Candide, or Optimism*. Translated by Burton Raffel, (New Haven: Yale University Press, 2005), pp. 12-13.

reported that his potatoes had been struck by "a very strange fatality which the oldest inhabitants have never before witnessed... a disorder somewhat resembling the plague, generally called the rot."³⁶ Two years later the disease arrived in Ireland: within a few more years, the potato famine would slay a million souls and drive another million to emigrate. So is this merely a plant disease? Clearly not.) Indeed, Carson's argument that we had moved from an era of biological to an era of radioactive and chemical contagion now looks optimistic; although I think she would have been among the first to anticipate the situation we now face, in which widespread antibiotic resistance in combination with rapidly emerging epizootics means that in fact we have only multiplied the dimensions of our fragility. Our crises, moreover, are increasingly promiscuous: with climate change fueling habitat loss, which in turn speeds the appearance and spread of contagious disease, prompting calls for more pesticide use, etc.

Second, I think we need to acknowledge that there's something strangely attractive, something gruesomely compelling about these tales of past and present and likely future (georgic) apocalypse. It's a multifaceted pleasure, more than I can unpack here, partaking of the sublime (our uncontrollable urge to look at what scares us), but also of the gentler emotions of nostalgia and mourning that inform the other scenes of Book 3 of the *Georgics*, as we have seen. It seems likely that there is a kind of reversible fascination in the way tales of apparent past abundance—flocks of passenger pigeons so enormous they blotted out the sun, for instance—can shift into signs of imbalance, while tales of infestation—Biblical-scale plagues of grasshoppers, for example—can shade into evidence of bounteous plenty. There is a peculiarly georgic appeal, moreover, in the contemplation of past disasters in terms of the staggering evidence of labor they embody: all the houses righted, bridges rebuilt, downed trees sawn and stacked, linen washed and folded, fields replanted, flocks and herds nurtured and strengthened back into prosperity. There is such consolation in clearing up, and acres of humility to be drawn from signs that those who came before you have cleared up so many times before. It offers, among other things, a powerful way in to that full-bodied identification with the past the desire for which appears to be such a widespread human characteristic.

This attraction is manifested, of course, in the present academic and popular trend for "disaster studies," expertly practiced by Mike Davis, Ted Steinberg and others, and no doubt linked to specific historical moments (like Carson's and our own, like Virgil's, like Defoe and Voltaire's)

³⁶ Quoted in Alan L. Olmstead and Paul W. Rhode, *Creating Abundance: Biological Innovation and American Agricultural Development* (Cambridge University Press, 2008), p. 1.

characterized by concerns about globalization and its attendant symptoms: war, contamination, displacement, migration, urbanization, the loss of familiar rural ways of life. What Virgil gives us with the plague scene is precisely the ecological message that everything is connected, and that it is through agriculture that we come to know this. Carson, who understood this lesson well, drafts the science of ecology, in both its pure and applied forms, as a painstaking, laborious remedy for the ills other versions of science and labor have brought about. Maybe what it comes down to is, what kind(s) of contagion do you fear most? What kinds have you been encouraged to fear, and what kinds do you have no knowledge of? The significance of *Silent Spring* was that it shifted the focus of apocalyptic georgic concern. Today we have many voices striving to establish the most urgent area of current concern, and to tally what is left out of each possible frame.

Finally, this reconsideration of the Virgilian example of apocalyptic georgic and its legacy prompts me to wonder whether we should be sparing more thought for the animals as we contemplate our human ecological susceptibilities. Virgil and Carson together offer a model for sympathetic engagement with the practicalities of disease and suffering that seems somehow lacking even in current campaigns for humane livestock standards, which (to their credit) have gained significant legal and commercial ground in the past few years. Consider that in the foot-and-mouth disease outbreak in Britain in 2001, at least *six million* sheep, cattle and pigs were slaughtered and destroyed. Ironically, the foot-and-mouth disease virus is not typically fatal, but it is highly contagious, weakening animals and rendering them unprofitable. The high cull rate in the 2001 British epidemic has been ascribed to human negligence, a delayed initial response and faulty mathematical modeling. "The foot-and-mouth outbreak had serious consequences upon tourism—in both city and country—and other rural industries," a Royal Society report concluded in 2002, with woeful understatement.³⁷

Anthrax—which in the end seems to be the most likely single identity of the plague organism Virgil describes (a conclusion reflected in David Ferry's 2005 translation)—is in many ways the quintessential georgic plague. As a bacteria that can remain viable in the soil for up to seventy years, anthrax can appear as if from nowhere, liberated by the plowing of a field or the digging of a hole or ditch. Human anthrax infection can take three forms, in increasing order of fatality and decreasing order of incidence: cutaneous (acquired by handling contaminated wool or hides), gastrointestinal (acquired by eating contaminated meat), and pulmonary (acquired by inhaling

³⁷ <http://footandmouth.csl.gov.uk>, accessed 4/4/09 8:13 PM.

airborne spores).³⁸ The deliberate contamination of US Postal Service facilities by anthrax in 2001 sickened 22 people and killed five, with an estimated total decontamination bill of \$1 billion. Livestock producers are merely advised that the commonest early sign of anthrax is a dead animal, bleeding from normal body openings, with the body decomposing more rapidly than usual. In most states, such discoveries carry mandatory reporting requirements, with quarantine and vaccination to follow.³⁹ Anthrax has also been the focus of biological weapons research and counterterrorism agendas since at least World War II. The U.S. Department of Defense began vaccinating military personnel against anthrax in 1997; after 2001, discussion of which human professional groupings should be vaccinated against anthrax broadened.⁴⁰

But the contemporary environmental "crisis" most powerfully comparable to Carson's 1962 alarum is also, as it happens, the one with the firmest Virgilian linkages. So-called Colony Collapse Disorder, or CCD, the global die-off of honeybee populations that came to public attention in 2007, has been attributed to global warming, electromagnetic radiation, cell phone towers, pollen from genetically engineered crops, various parasites alone or in combination, excessive feeding of high-fructose corn syrup, overwork by large-scale migratory beekeepers, viruses, fungi, fungicides, herbicides, neonicotinoid insecticides, an newly emergent autoimmune disorder, or some combination of the all these. Estimates of the number of casualties run as high as 30 billion bees, or one-quarter of the former honeybee population in the Northern Hemisphere.⁴¹ Perhaps we should be reading Book 4 of the *Georgics*—which tells the story of Aristaeus, who lost his bees and had to figure out how to recover them—with an eye to possible historical precedents and divine palliatives. But that's another paper.

³⁸ The *Oxford English Dictionary* offers two definitions for anthrax: "1. A carbuncle, or malignant boil," and "2. The 'splenic fever' of sheep and cattle, discovered by M. Pasteur to result from the introduction of minute organisms into the blood of the animal, and their rapid reproduction there. Also applied to the carbuncular disease, otherwise called *malignant pustule*, caused in man by infection from animals so affected." Jeanne Guillemin provides a short historical summary in her anthropological study of the 1979 outbreak of anthrax in Sverdlovsk, Russia, which officially killed sixty-four people but was suspected by the CIA to have killed as many as a one thousand. See Guillemin, *Anthrax: The Investigation of a Deadly Outbreak* (University of California Press, 1999). I have also referred to the United States Centers for Disease Control website, <http://www.bt.cdc.gov/agent/anthrax/> for basic information.

³⁹ John Kirk, DVM, MPVM1 and Heidi Hamlen, DVM, MS, DACVPM, "Anthrax: What Livestock Producers Should Know," Oct. 2000; published in *California Cattlemen*, Dec. 2000.

⁴⁰ Guillemin, p. 246.

⁴¹ At least one writer on CCD, Rowan Jacobsen, has made the Carsonian echo explicit in the title of his book, *Fruitless Fall: The Collapse of the Honey Bee and the Coming Agricultural Crisis* (2008), but it's an obvious enough connection.

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