GIOVANNI BELLINI'S BLEEDING TREES: ANIMACY AND ARBOREAL THINKING IN THE ITALIAN RENAISSANCE STUMP

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A PAINTING ATTRIBUTED TO THE WORKSHOP OF GIOVANNI BELLINI (ca. 1509), now in the Courtauld Gallery in London, depicts the murder of St. Peter Martyr, the Dominican inquisitor from Verona, who was ambushed, hacked, and stabbed to death by a pair of Cathar heretics as he traveled from Como to Milan in April 1252 (fig. 1).[1] On the left, one of the assassins plunges a dagger deep into Peter's breast; he falls backward, supported by his right hand, with his face raised skyward. To the right, Peter's companion, Brother Dominic, his arms outstretched, makes a futile attempt to evade the second murderer.[2] The assassination of St. Peter was a popular subject for Italian artists in the fifteenth century, and Bellini's version follows earlier pictorial accounts by setting it within a wooded landscape.[3] A stand of trees, their tangled branches surmounted by a thick canopy, dominates the upper third of the painting, and a fortified town and mountain landscape are visible through a break in the foliage.[4] But Bellini's painting contains a set of intriguing details: Lurking within the trees are woodcutters, one of whom swings his axe, and in the lower right, a large stump—the legacy of a recently felled tree—oozes blood from its severed top.[5]

The stump does a number of things in the picture. As a matter of composition, it anchors the foreground and, together with strategically placed trees, contributes to the image's spatial construction. It operates as a symbol or mnemonic device, calling attention to Christian themes of death, resurrection, and salvation.[6] But in its details, this stump also communicates a great deal about

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1. Workshop of Giovanni Bellini, *The Assassination of Saint Peter Martyr*, ca. 1509. Oil on panel; 68.1 × 100 cm. (The Courtauld, London, Samuel Courtauld Trust; photo, The Courtauld/ Bridgeman Images.)

the tree it once supported. It was a young tree; the surface of its bark is smooth, and, like people, trees wrinkle with age. It was part of a family; the way it leans suggests a search for light below a canopy of older trees. It was recently pruned; new sprigs emerge from its side, replacing prior growth. We can also infer key details about how it was felled: that it involved an axe, not a saw (the exposed surface is ragged rather than smooth); that the tree fell to the left (the raised hinge in the heartwood faces that direction); and that the woodcutters were in a hurry (the hinge is large and ragged, indicating a lack of precision). Bellini has painted this unobtrusive stump in a way that calls attention to its material properties, its behavior, and the network of human and environmental agencies with which it interacted.[7]

In what follows, I reassess the significance of the tree stump in Italian painting at the turn of the sixteenth century: as a response to environmental pressures caused by deforestation, its role in anatomical practice, and its relationship to a philosophical and spiritual tradition that looked to the arboreal world to model ways of thinking. Italian painters depicted stumps in ways that reveal an interest in how trees grow, decay, and engage with the world around them. We see stumps that are large, stumps that are small, and stumps that are straight, misshapen, or twisted; bark that is black, brown, green, blue, smooth, cracked, or flaking. We see mushrooms, beetles, and birds, as well as discolorations that

suggest the presence of fungi, molds, and lichens. Stumps feature in recurring religious iconographies, such as the penitent St. Jerome (fig. 2), and also in pictures associated with poetic traditions and the pastoral. Stumps were more than framing devices, descriptive details, or symbols; they staged an ongoing investigation into what trees do, how they grow and decay, and how arboreal life entangles with the philosophical stakes of pictures.[8]

Recent scholarship in art history and related disciplines has drawn attention to the philosophical importance of plant life in the early modern period: how plants shaped human notions of the cosmos, the perpetuity of life, and even the idea of form itself.[9] While much of the attention has focused on trees and plants, stumps—the rooted remnants of trees that have been blown down, rotted, or cut—have an exceptional power to provoke. They not only possess the physical properties of trees—trunks, roots, and branches—but also display their innards: layers of sapwood, heartwood, and pith. Unlike trees and plants, stumps by their very nature exemplify a commingling of human and natural artifice that was central to early modern anxieties about the nature of nature and its relationship to human activity. Hardly passive features of the woodland landscape, stumps engage in their own acts of representation, participating in a discursive practice with painters that mediated vegetal and human modes of communication.[10]

STUMPS HALF BURIED

Historians have long recognized the cultural and symbolic significance of stumps, though they often lie half buried within broader discussions of landscape or in specific iconographic contexts. In his sweeping *Landscape and Memory*, Simon Schama calls attention to European culture's ongoing fascination with trees and arboreal life, which were central to religious beliefs, founding myths, and social and economic activities.[11] Stumps haunt the background of this study, both as a legacy of woodland exploitation and as a recurring feature in European visual culture. But stumps themselves—their particular power to seduce and prompt reflection—are rarely foregrounded, and Schama emphasizes the importance of woodland resources in northern Europe at the expense of Italian examples. With reference to the sixteenth-century German painter Albrecht Altdorfer, he notes how the forest itself became "the natural protagonist" in his pictures in ways that "proclaimed an unmistakable difference from anything attempted in Italian art."[12] The description perpetuates the notion that Italian renderings of trees (and stumps) were derivative of depictions in paintings and prints by northern artists that circulated south of the Alps.[13]

Central to Schama's study is the importance of trees and timber to Christian doctrine, which he characterizes as a "grafting" (a stump metaphor) of

2. Filippino Lippi, *Saint Jerome in Penitence*, ca. 1480. Oil on panel; 136 × 71 cm. (Galleria degli Uffizi, Florence; photo, Bridgeman Images.)

"Christian theology onto preexisting pagan cults of nature."[14] The theological importance of arboreal processes, sometimes foregrounding Italian examples, is taken up in the extensive historiography on the biblical history of the cross. In her study of the medieval legend of the True Cross, Barbara Baert notes how the life cycles of trees were central to Christian texts and images: in St. Bonaventure's *Lignum vitae*, in histories of the cross (from the tree of knowledge, to the cross, to its loss and rediscovery), and in mendicant traditions that looked to the natural world as a Book of Nature.[15] Gregory Bryda has demonstrated how wood as an artistic material, medium, and substance critical to daily life participated in image making related to the cross (as the church's only "nonhuman saint"), mediating the relationship between the church and the natural world.[16] Within this rubric, the various stages of arboreal life, including the stump, served as important metaphorical and mnemonic devices for devout Christians.[17]

It is in this network of associations that stumps feature most prominently in art historical scholarship, yielding studies on the importance of stumps to specific iconographies. Susan Donahue Kuretsky has examined how northern and Italian artists, such as Rembrandt, Van Leyden, and Lotto, deployed the stump as a symbol of death and resurrection in renderings of the penitent St. Jerome.[18] Others have explored the symbolic role of stumps in Flemish painting and in nineteenth-century American paintings to connote human ambitions about Western expansion.[19] By focusing on meanings specific to particular artists, these studies skirt additional questions: Why did stumps emerge so prominently in paintings in the first place? In what ways did artists employ them? And how did artistic engagement with stumps provoke new ways of thinking about relationships between human and sylvan life?

In engaging with these broad questions, I draw on studies that have looked anew at the agency of vegetal life, how it asserts itself, and its role in shaping philosophical and metaphysical discourses. Recent scholarship (much of it in the burgeoning field of critical plant studies) has examined the tendency in elite discourses since classical times to downplay the animacy of vegetal life, which is consistent with Aristotelian notions of plants' limited faculties.[20] In his "chain of being," Aristotle recognized a vitality in plants but characterized them as fundamentally passive in nature. While humans have thought, intellect, and—with animals—sense perception and locomotive faculties, plants merely nourish themselves, grow, and die, but not much else.[21]

The capacity of plants to push back against these notions has been highlighted in recent inquiries in philosophy and anthropology. In *Life of Plants: A Metaphysics of Mixture*, Emanuele Coccia has pointed to the profound ways in which plants engage with the world around them. As Coccia maintains, plants

"don't have hands which shape the world, yet it would be hard to find more capable agents when it comes to the construction of forms." Plants (or at least most plants) may not walk and gesticulate, but they "are the most subtle artisans of our cosmos."[22] In his anthropological study on how forests think, Eduardo Kohn theorized how nonhuman life participates in the creation of images and how plants have their own agency in the construction of semiotic relationships.[23] These studies demonstrate how plants challenge a post-Cartesian dichotomy between a thinking subject and (vegetal) object. As Coccia argues, the plant "transforms the biological fact of the living being into an aesthetic problem," creating a formal and aesthetic landscape "in which trees and people are considered together."[24]

Art historical approaches that reduce trees and plants to symbols and metaphors (rendering them fixed and static) reinforce the Aristotelian subjugation of plants and fail to account for their real and figured animacy. As I will show, stumps engage in their own acts of representation and theorize questions about life, death, rebirth, how living beings relate to one another, and attendant ethical considerations. To get there, I consider what stumps are and do, the forces that brought them to the fore in fifteenth-century Italy, and how painters responded to their communicative agency in novel ways often overlooked by art historians.

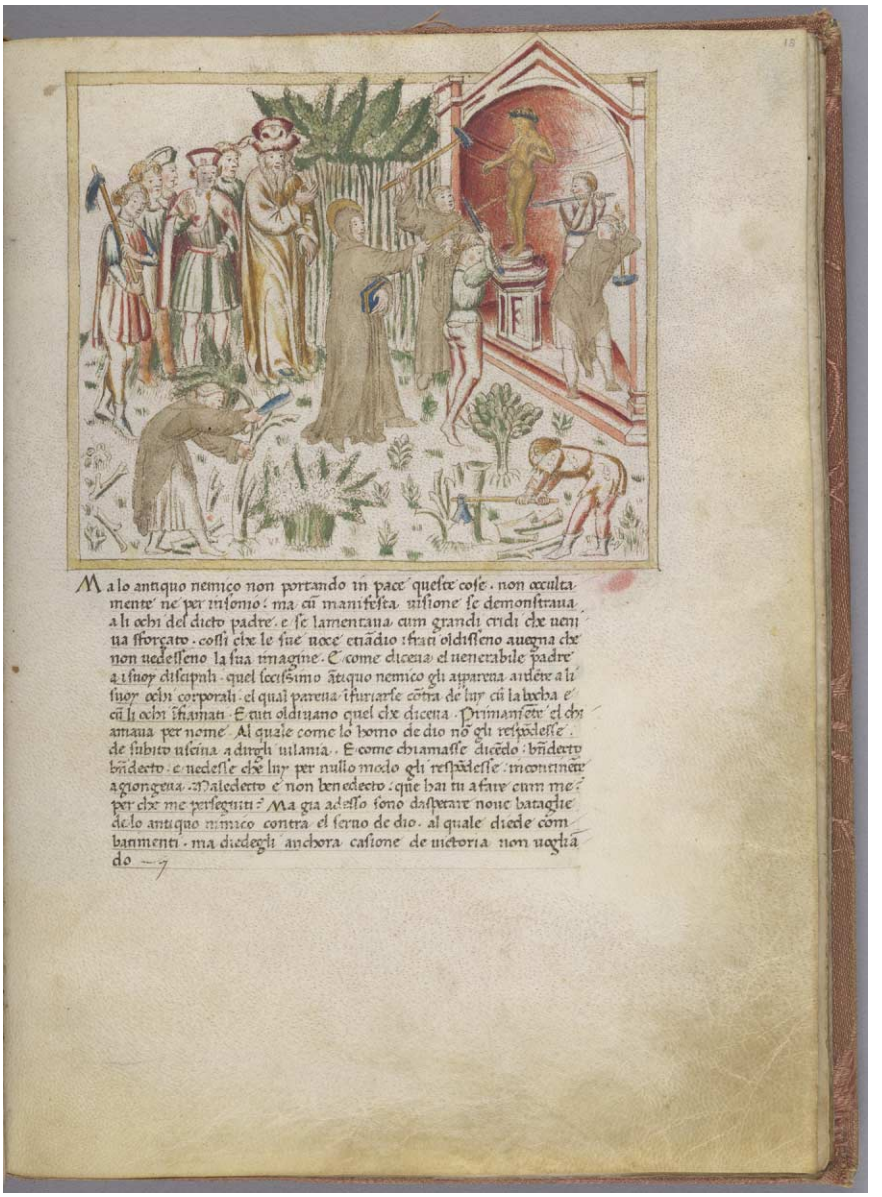
STUMPS UNEARTHED

To begin, I consider a much earlier use of stumps: as supports for Roman marble sculptures, such as the stump that braces the right arm of the Apollo Belvedere and prevents the statue from pitching forward (fig. 3).[25] As early as the trecento, antiquarians were assembling sculptures and fragments (some with tree stump supports) or providing their own.[26] Their formal arrangements offer evidence for understandings of stumps as rooted and immobile, subsidiary to the human protagonists they support. But a different relationship to stumps is suggested in a fifteenth-century manuscript illumination that describes the smashing of the pagan idols on Montecassino from the life of St. Benedict (fig. 4).[27] Here, a group of monks swing sledgehammers at another statue of Apollo on a pedestal, and, just below, a woodcutter takes an axe to a tree stump emerging from the soil in the foreground.[28] Stumps figure here as allusions to violence and to the body disassembled; the sculptural fragments—stumps of arms and legs, half buried—are remnants of the classical world and a period of early Christian iconoclasm.

A complex web of associations relating to stumps is evident in the word's etymologies. The English word "stump" is related to the Dutch *stomp* and German *Stumpf*, referring to anything blunt or truncated. In its earliest uses,

3. Apollo Belvedere, ca. 1508. Marble copy of fourth-century bronze by Leochares; 224 × 118 × 77 cm. (Vatican Museums, Rome; photo, Wikimedia Commons.)

the word referred not to trees but to the stumps of severed human limbs.[29] In French, by contrast, the word for tree stump, *souche*, relates to the Gaulish word *tsukka*, meaning stump, stock, or roots, which nods not only to the stump's severed top but also to its lower portion and lineage.[30] And in Italian, there are two principal words for stump: *tronco*, derived from the Latin truncus, which meant a tree trunk, a human torso, or simply something cut off or severed; and *ceppo*, derived from the Latin cippus, which meant the posts used to measure distances



4. *Destruction of Idol*, scene from Gregory the Great (Pope Gregory I), *Vita S. Benedicti* (MS M.184 fol. 18r), Italy, possibly Padua or Bergamo, ca. 1450. Colored pen drawings on vellum; 27 x 20 cm. (The Morgan Library and Museum, New York; photo, The Morgan Library and Museum.)

in the Roman road system.[31] These etymologies recall the stump's role in measurement, as well as violence against arboreal and human bodies situated within multigenerational temporalities.

Indeed, stumps, perhaps more than trees, provoke in manifold ways linked to their various attributes and characteristics. As the legacy of felled timber, they bear traces of human and divine violence: axe marks and saw wounds, tops shorn by wind, or bark blackened and cracked from lightning strikes. Once cut, stumps expose what is hidden within trees: vessels that transport nutrients and annual growth rings that document seasonal changes, floods, and fires. And as they rot, stumps call attention to wood decay and its biological and ecological agencies: worms that feed on trees' innards and umbrellalike mushrooms that erupt from its surfaces. Stumps also undergo processes of regrowth that involve different—and sometimes deceptive—biological mechanisms. A seedling in a stump's central pith indicates a new tree from a new seed, perhaps dropped by a bird that alighted there; by contrast, a second stalk sprouting from a stump's roots, even far away, is the same tree born of the same genetic material. New growth models different theories of rebirth: one a break with the past and the other involving continuity.[32]

These provocations surface in ancient stories, in references to arboreal violence and transformation. In Matthew 3:10, the stump figures in the famous warning delivered by St. John the Baptist to the Pharasees and the Sadducees: "Every tree that does not bear good fruit will be cut down and thrown into the fire."[33] In the Book of Job, the stump's potential for regrowth is contrasted with the plight of man: "For a tree there is hope, if it be cut down, that it will sprout again and that its tender shoots will not cease. . . . But when a man dies, all vigor leaves him."[34] And yet, stumps model an afterlife that is ongoing and multigenerational: In the Book of Daniel, preserving "the stumps and roots of a tree . . . means that your kingdom shall be preserved for you."[35] These stories are often characterized as tree metaphors, but they are also accounts of how stumps behave and transform over time.

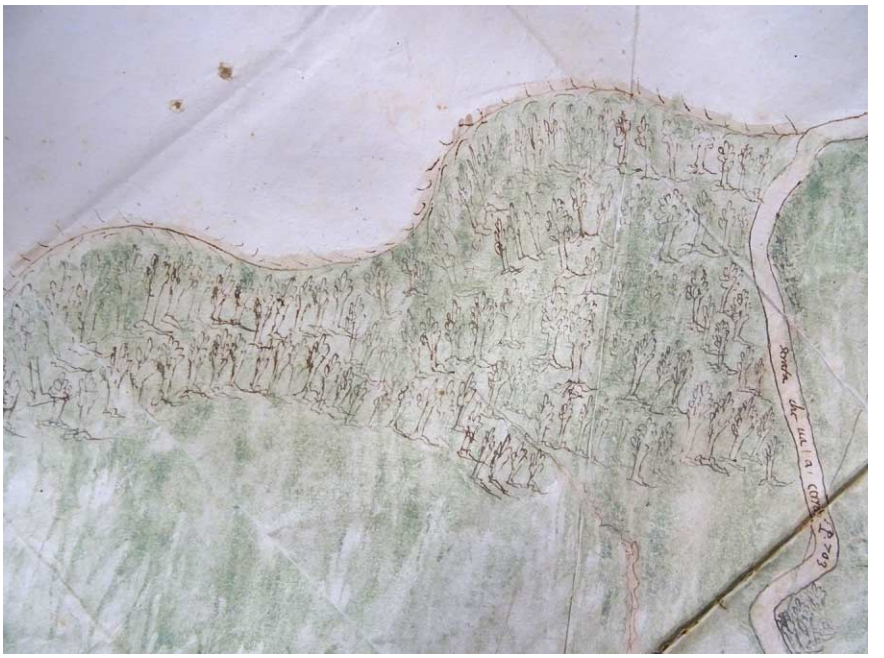
In *Being and Time*, Martin Heidegger introduced the notion of a forest clearing (*Lichtung*) as a dynamic space, illuminated by light, that makes way for Dasein/human understanding.[36] A critical aspect of Heidegger's notion of the clearing is that the world is not something that exists outside the mind, as an object represented, but rather something that reveals itself through encounters and requires a sort of poetic thinking to access it.[37] We might imagine Heidegger's forest clearing riddled with stumps, theorizing, through their attributes and behavior, responses to philosophical questions about life, death, regeneration, the nature of time, and states of being and becoming. One place where stumps asserted themselves in very real ways was in late fifteenth-century Italy, due to changes in land management and a cosmological framework that looked to trees and stumps to consider what it meant to be human.

CUT AND SPLICED

In Bellini's painting of St. Peter Martyr (see fig. 1), the stump is, at first blush, a *ceppo* in a double sense: It lies along the path that Peter and Dominic were traversing between Milan and Como, and it also anchors the foreground of the painted landscape. In other words, it measures both narrative and pictorial distance. In his treatise on painting, Leonardo da Vinci emphasized trees as critical to the spatial construction of pictures, advising artists on where to place them and the relative relationship between pictorial size and fictive distance.[38] As when a surveyor moves through the woods, carving initials to track his progress, the stump provides a guidepost for the eye and its movement through the picture.

But the stump also operates in a different way, implicating anxieties about the use of woodland resources and land management. Looking closely at Bellini's picture, we see not a wilderness but a landscape that is populated and in the process of being utilized: cattle grazing, soldiers surveying, and people transiting. In poetic literature, the woods were often characterized as dark and foreboding, the *selva oscura* of Dante, but in the lived experience of fifteenth-century Italians, the woodlands were heavily trafficked and provided essential raw materials for building and defense.[39] In the Veneto, authorities created the first *Boschi Publicci* and, in 1476, established a system dictating a hierarchy of forest utilization.[40] In Tuscany, large-scale construction projects, such as the cupola of the Duomo in Florence, imposed new demands on surrounding forests, including the large-scale extraction of fir, beech, and poplar.[41] The Italian woodlands were a locus of intense human engagement and a resource that was exploited, contested, and studied.

Within this system of woodland management, stumps played important roles in the generation of wood for day-to-day needs, in agricultural practices like grafting, and in the prevention of erosion. A sixteenth-century map of an Emilian river valley depicts the designation of land tracts for stumps used in coppicing and pollarding (fig. 5).[42] In coppicing, trees are cut to stumps at ground level, encouraging the growth of shoots that can be harvested for firewood or other uses. Pollarding is similar, but trees are cut eight to ten feet off the ground to protect the new shoots from foraging animals.[43] The map's author has sketched four rows of cultivated stumps, cut near the ground at the river's edge and successively taller at greater distances from the water. Italian artists, such as Andrea Mantegna, Sandro Botticelli, and Filippino Lippi, frequently incorporated coppiced and pollarded trees into their background landscapes (see, e.g., the coppiced trees to the right of St. Jerome in figs. 2 and 12). Their scars and nubs invoke temporalities that exceed the human lifespan and call attention to the sculptural and figural potential of trees and wood.



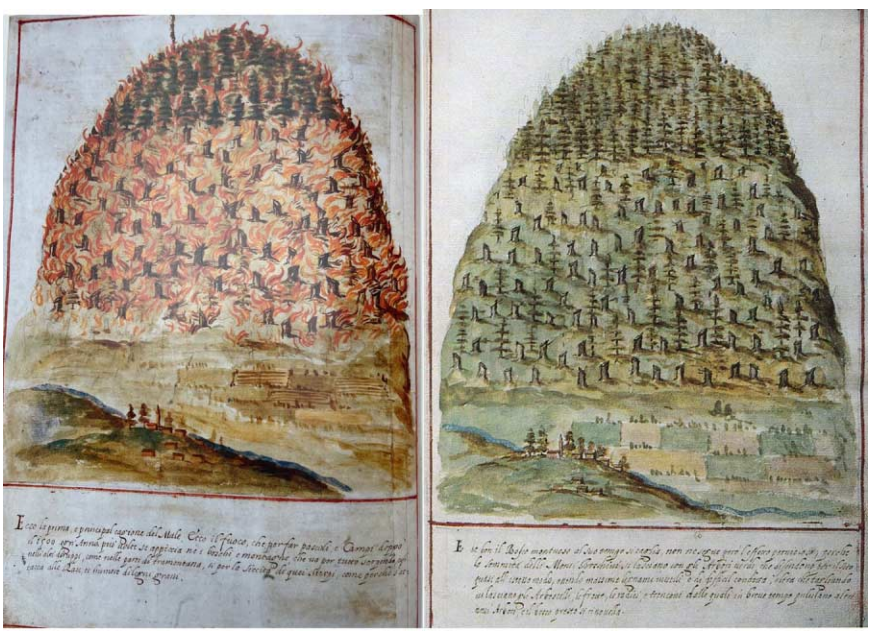
5. Map of the Secchia River Valley (detail) from *Confini* 205/7b; drawing 887, Parma, ca. 1590. (Archivo di Stato di Parma.)

Stumps also played an important role in the practice of grafting, which involves the insertion of a cutting from another tree into a stump's cambium, or living outer layer.[44] Since fruit trees cross-pollinate, grafting with a sprig from a known varietal ensures that trees produce the right kind of fruit for consumption. The stump provides nutrients to and essentially adopts the young cutting, a hybrid of natural processes and human intervention. Grafting has been practiced since ancient times. In Ovid's *Metamorphoses*, the nymph Pomona tended her gardens and orchards by using a pruning hook to carve incisions on branches "for the engrafted twig to thrive and grow in."[45] And in *De rerum natura*, Lucretius describes "men's fondness for ingrafting slips upon the boughs and setting out in holes the young shrubs o'er the fields."[46] He characterizes grafting as an emulation of nature's own practice as "the primal grafter," since "the berries and acorns, dropping from off the trees, would there beneath put forth in season swarms of little shoots."[47] The practice of grafting exposed practitioners to the mechanics of arboreal reproduction and the human capacity to manipulate arboreal processes.

Regrowth through grafting became a versatile conceptual model for writers and thinkers.[48] For Michel de Montaigne, the hybridity of grafting was analogous to writing, in which an idea from one source is spliced into another.[49] And

in medicine, sixteenth-century practitioners, such as Gaspare Tagliacozzi, invoked tree grafting to propose the grafting of human skin in medical procedures.[50] Critically, some surgeons looked to grafting not only as a conceptual or technical model but also as something with ethical implications. The grafting of trees by nature—the fact that it worked and was beneficial—served to sanction the practice in the human medical context, easing concerns that grafting of human flesh was cruel or an affront to nature.[51]

In the late fifteenth century, stumps also became a focal point for anxieties about the human impact on the environment, driven by demographic changes, new technologies, and agricultural practices. A surging population and the adoption of the pit saw (as opposed to the hand ax) meant that trees could be felled more effectively; stumps were then burned or removed to make way for agriculture and cattle. A Venetian manual on woodland resources, produced in 1608 by Iseppo Paulini but looking back to practices of a century earlier, describes the practice of woodland clearance and depicts a hillside of tree stumps consumed by fire and largely incinerated (fig. 6).[52] Fifteenth- and sixteenth-century surveys referred to the *distruzione* and *sradicamento* of mountain forests—a tearing out from the roots—with catastrophic consequences.[53] Without stumps, hillsides liquefied, contributing to downstream erosion and the silting of riverbeds.[54]



6. Illustrations of incinerated and restored hillsides, *Codex Paulini*, 12v, 10r. (Venice, Archivio di Stato di Venezia; photo, Franco Bastianon.)

Stumps were more than simple evidence of environmental despoliation; in fact, they were the opposite. As indicated in Paulini's manual, the ideal restored landscape was a hillside not of uniform trees but of both trees and stumps (see fig. 6). According to Paulini, when a forest is harvested, one should "leave the saplings . . . the roots and stumps from which soon other new trees appear, and the forest soon renews itself."[55] We might view the stumps in Bellini's St. Peter Martyr in a different light—not only as indicating violence but also as setting the stage for new growth (with allusions to Christian redemption). Stumps thus emerged prominently in paintings at a time of intense awareness of their importance in land management and agriculture, and, as we shall see next, they also became models for thinking about the human body and how it works.

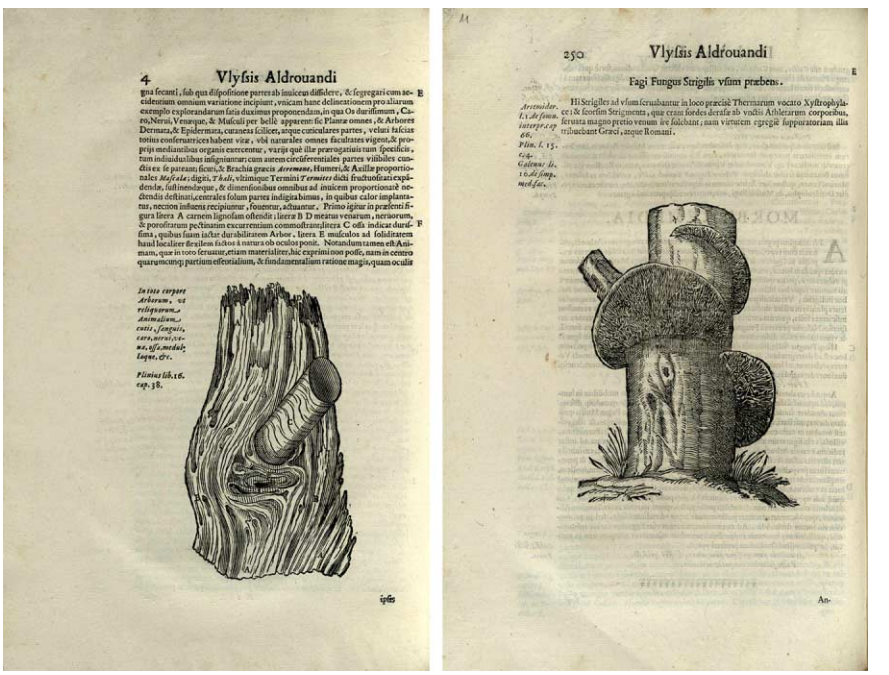
BLOODY AND BLEEDING

Returning to Bellini's painting, the most provocative feature of the stump is the blood that spills across its ragged surface and cascades onto the forest floor (see fig. 1). Given the stump's position just below Peter's assassination, one might initially mistake this blood as having sprayed outward during the murderer's repeated blows. But Bellini has depicted blood in every place where a woodcutter's axe slices through ligneous material: on the severed tree (which has just begun to fall) in the upper left, on the exposed face of the log nearby and a branch on the forest floor, and on the shattered surface of a second stump and limb-like appendage that rise at the center of the picture. This is not a splattering blood flung from afar, but an oozing blood that emerges from the crevices between bark and sapwood and from the pith at the tree's core.

In addition to their various roles in land management and agricultural practice, stumps call attention to the relationship between human and arboreal forms and processes, which were central to ancient stories that framed human experience. The stories of Ovid and Dante are filled with accounts of men and women transformed into trees and back again: Attis into the pine, where he "hardened into [the] trunk"; Daphne into the laurel, where her arms sprouted branches.[56] In stories of human-arboreal transformation, there are numerous accounts of trees that bleed. In book 2 of Ovid, as the Heliades transformed into poplar trees, their mother's attempts to rip off their bark left "a trickle of human blood, like drops from an open wound."[57] When Virgil's Aeneas yanked at bushes above the grave of Polydorus, blood oozed from their roots, and a groan was heard from deep in the ground.[58] And in Dante's *Inferno*, as the Harpies fed on the leaves of the souls of the suicides, encased in thorny trees, their damaged limbs bled.[59] Blood was just one index of an empathic relationship between trees and people that involved other features and substances. In

his foundational pastoral poem, *Arcadia* (written in 1480), Jacopo Sannazaro compared tree sap to human tears.[60] These narratives elide the distinction between body and trunk, arm and branch, and twig and finger, reflecting and suggesting observed similarities between anthropoid and dendritic structures.

The many literary references to trees and blood have contributed to the notion that Bellini's bleeding stumps were conceived in consultation with a sophisticated patron seeking to draw attention to his poetic interests.[61] But they also speak to a cosmological framework rooted in analogical thinking, especially as it relates to people and trees.[62] In his art of building, Leon Batista Alberti compared tree bark to skin, what lies beneath to flesh, and the pith to bones.[63] And in his treatise on trees, *La dendralogia*, the sixteenth-century naturalist Ulisse Aldrovandi, citing Pliny, adopted a nomenclature for tree parts that included blood, nerves, and veins.[64] Interestingly, the image accompanying Aldrovandi's discussion of the attributes of trees (published posthumously) takes the form of a stump, showing its various layers, branching structures, and ligneous figurations (fig. 7). The naturalist also considered the broader ecology of stumps and how they function, describing a stump and shelf fungus, its capillaries finely wrought (see fig. 7).[65] In this single volume, the tree stump



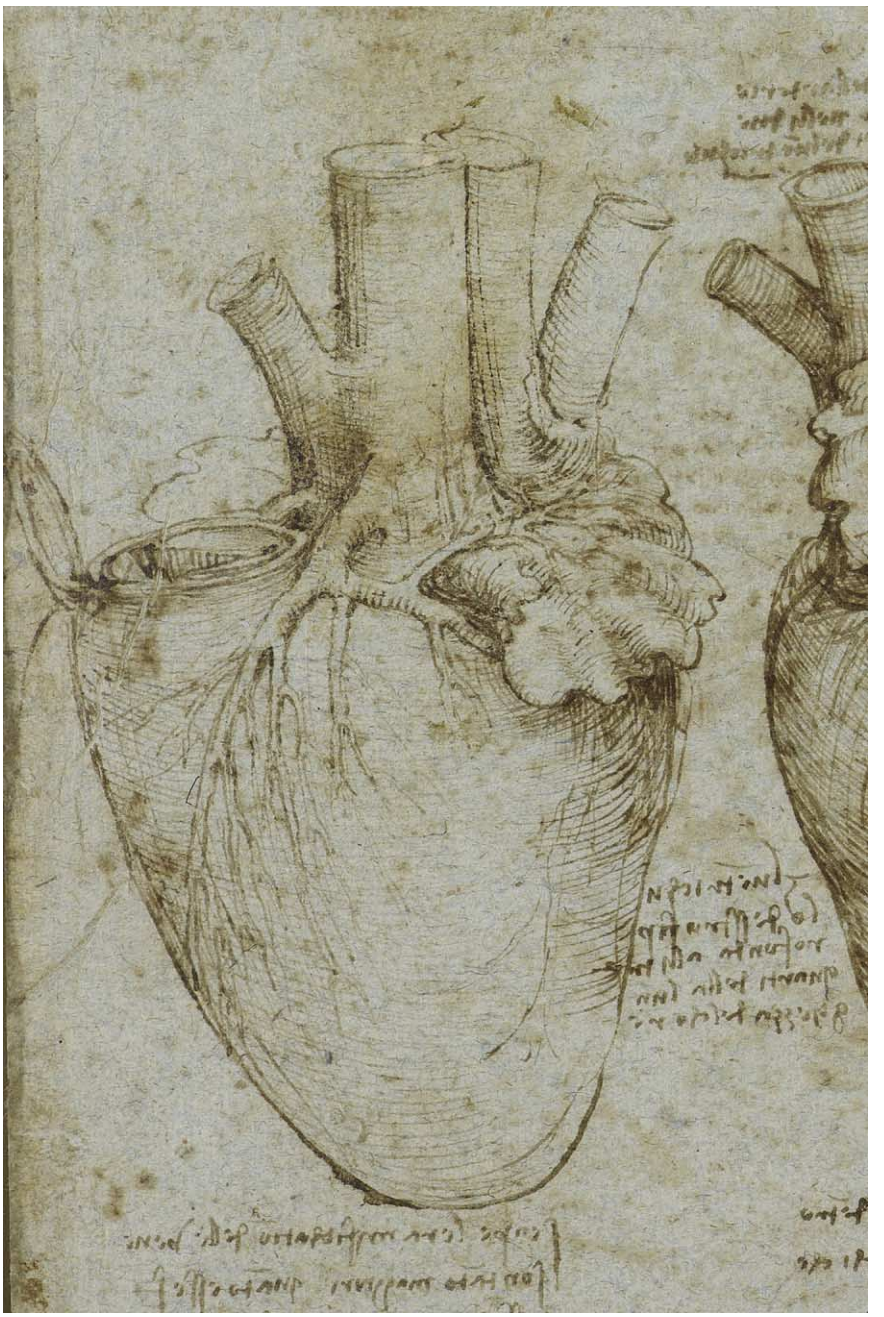
7. Ulisse Aldrovandi, *Dendrologia naturalis* (pp. 4, 250), Bologna, 1668. (Biblioteca Europea di Informazione e Cultura; images accessed from the Biblioteca Europea di Informazione e Cultura, DIGITOOL8842398.)

implicates epistemic systems drawn from classical texts, medieval metaphysics, and firsthand experience.

Stumps also emerge forcefully in anatomical practice, most famously in Leonardo da Vinci's drawings. As a general matter, Leonardo's notebooks demonstrate an ongoing preoccupation with the relationship between the human body and trees. In a pair of drawings of the nervous system, the spine and nerves take the shape of a slender conifer, with the network of fibers radiating downward and outward in conical form.[66] The nerve endings, indicated by single strokes of the pen, take on the spur-like shape of a conifer's needles. And in a depiction of the hepatic veins, the vessels radiate outward from the vena cava like a broad-leaved oak or maple, the limbs splitting into bipartite and tripartite branches.[67] That Leonardo was thinking about trees is evident in the accompanying text, which makes explicit reference to trees and to arboreal structures. In his renderings of the circulatory and nervous systems, he refers to the "tree of veins" and "tree of nerves," and in his description of the liver, he formulated a comparative morphology between humans and plants to describe how the venous system works.[68]

In Leonardo's most extraordinary example of anatomical and arboreal parallels, the human heart and related veins and arteries assume the unmistakable shape of a severed stump (fig. 8).[69] The main trunk, the aorta, extends directly upward, with crosshatching suggesting not just its tubular form but the texture of bark; a large secondary trunk bends gently outward to the right; and its roots (the coronary arteries) ramify downward and around the surface of the heart. The right atrium, with its muscular ridges that collect deoxygenated blood, assumes the unmistakable shape of a shelf fungus (for the depiction of a shelf fungus, see fig. 7). Furthermore, Leonardo has cropped the image at the approximate height where a woodworker would have applied his axe; the tubular walls of the arteries, indicated by parallel pen strokes, resemble the outer layers of a tree's bark and sapwood. Leonardo's studies of the structures of the human body attest to a comparative mode of thinking that involved what the axe reveals about trees and what the scalpel reveals about veins.

To return to the stump in Bellini's *St. Peter Martyr*, it does what trunk-like structures actually do: It pumps and spews blood. The painting fuses agricultural know-how, natural philosophy, and anatomy into this part of the arboreal whole. Integrated into a familiar northern Italian landscape, the stump was an efficient strategy to explicate human and arboreal relationships, enhancing the spiritual content of pictures. In paintings of St. Peter Martyr, the display of blood underscored the saint's role as an alter Christus whose suffering evoked that of the crucified Christ.[70] Bellini turned to the severed



8. Leonardo da Vinci, *The heart and coronary vessels* (detail), ca. 1511–13. Pen and ink on blue paper, full sheet of paper; 28.8 × 41.3 cm. (The Royal Collection Trust, RCIN 919073; photo, © Royal Collection Enterprises Limited, 2024, Royal Collection Trust.)

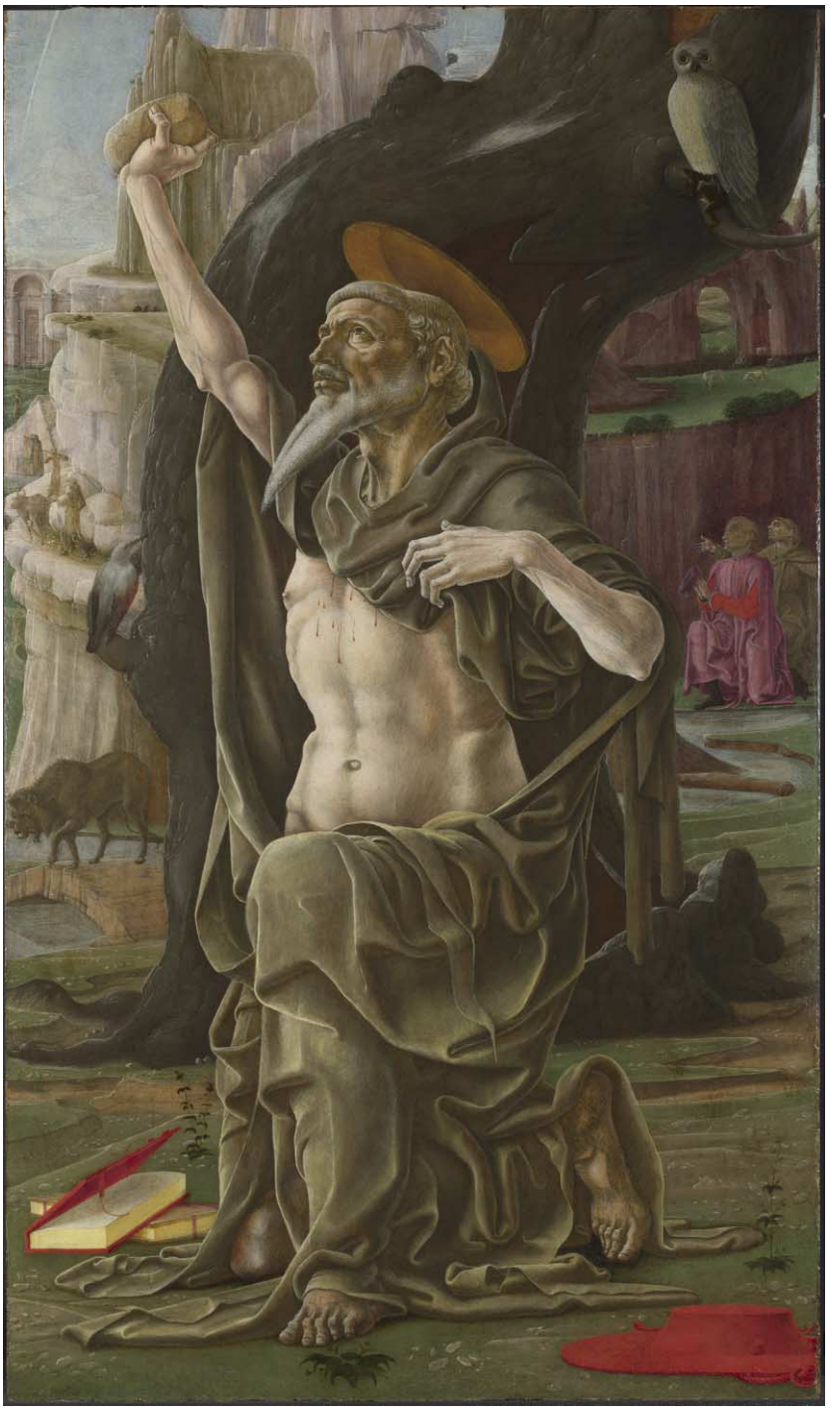
tree trunk—whose own vessels behave like human veins in the way they conduct sap and nutrients, and which had become an omnipresent feature of Italian landscapes—to underscore the pathetic nature of Peter's suffering as well as its universality.

GROWTH, DECAY, AND REGENERATION

We see this commingling of the human and arboreal most clearly, and with startling specificity, where stumps emerge as powerful protagonists in pictures. In Cosimo Tura's painting of St. Jerome, now at the National Gallery in London, the saint is nearly enveloped in the enormous stump behind him (fig. 9). It is sometimes noted how trees take anthropomorphic forms, but here, it is not the stump that looks human but St. Jerome who looks vegetal. His bark-colored robe opens to flesh within, and his raised heal and flowing garments take the shape of the stump's roots. The painting recalls textual accounts of St. Jerome that associated him with trees and arboreal life and referred to him explicitly as "of wood."[71]

Prior scholarship has interpreted Tura's stump as a metaphor suggested by the adjective *roboratus* (fortified with oak), sometimes used in poetic literature to describe the type of heroism indicated by Jerome's powerful stance.[72] But Tura's depiction also betrays an interest in the nature of wood and how it behaves. Despite the stump's imposing size, the deep grooves in the bark indicate not only a tree that has aged but also one infected by pests that invade trees and warp their surfaces.[73] That this inference was deliberate is indicated by Tura's addition at left of a bird—an Italian wall creeper—whose peculiar habits entangle processes of arboreal decay with Jerome's particular form of penance. Wall creepers live in crevices in trees and cliff faces—evocative of Jerome's own cave in the wilderness—and feed on grubs, beetles, and other insects lurking below the bark, leaving beads of sap on the surface.[74] Tura has depicted this wall creeper in action, its beak penetrating the wood just to the left of Jerome's chest, where blood issues sap-like from his wood-like flesh.

Tura's stump contains another provocation relating to the life cycle of trees, a detail that appears to have gone entirely unremarked in the literature: the tiny, delicate mushrooms that emerge in the soft earth near the base of the stump (see fig. 9). Mushrooms have been characterized as symbols of death in paintings, but fifteenth-century thinking on mushrooms was unsettled and far more complex. *Materia medica* noted the powerful medicinal properties of certain species, such as the *Agaricum*, while writers such as Nicander referred to them as an "evil ferment of the earth."[75] Here, the stalks and umbrellas are almost vanishingly small, on an order of scale radically different from St. Jerome, the stump, and other



9. Cosimo Tura, *Saint Jerome*, ca. 1470. Oil with some egg tempura on wood; 101 × 57.2 cm. (The National Gallery, London; photo, © The National Gallery, London.)

aspects of the picture. In the painting, as in real life, these mushrooms are visible only upon close inspection and only if one knows where to look: in the damp crevices between roots and moist soil.[76] By including these tiny fungi, just barely perceptible, at the locus where arboreal matter and Jerome's garments meet, Tura enlists the viewer in a broader rumination on how St. Jerome and the arboreal world intersect. Mushrooms, birds, and rotting bark operate not as symbols but as coparticipants in ecological processes that choreograph temporal and cyclical aspects of Christian sacrifice and redemption.

In another painting of St. Jerome, Filippino Lippi foregrounded a stump that betrays a similar interest in arboreal matter and how it works (see fig. 2). To the roots at left, which dangle above a brook or stream, Lippi has applied streaks of white paint to show that their tips tickle the surface of the water, a description of what stumps do: They locate and draw moisture. At bottom center, a large root not only clings to the rock below it but also digs into it, generating fissures in the rock's stratified layers. This is the first stage in the process of weathering, where tree roots, followed by chemicals released as trees decay, convert rock into soil.[77] Furthermore, as in Bellini's St. Peter Martyr, Lippi has painted the stump in a way that documents a specific arboreal history. The shard of wood that juts upward suggests it was sheared in an act of violence. Mushrooms indicate how the tree began to decay, invaded by fungi that feed on a weakened tree's sapwood. Even though severed and suffering, the tree/stump hasn't died; instead, it has generated a new tree out of its root stalk, indicated by the unbroken layer of bark that extends downward from the new shaft and wraps around the hollow cavity where the old tree once stood. This is not a single dead tree, nor even a dead tree and a new one, but an ongoing process of arboreal renewal and transformation.[78]

It is tempting to infer that Lippi and Tura had access to recently published incunabula on the protoscience of plants, such as the rediscovered botanical treatise of Theophrastus, which included detailed observations about the morphology, physiology, and ecology of plants.[79] But there is little evidence that painters had access to these texts at the time. Instead, their protoecological provocations share a way of thinking about plant life espoused by mendicant preachers, such as the Dominican friar Girolamo Savonarola, who drew on knowledge about trees and plants to instruct on moral and devotional matters.[80] In addition to his calls to reject ecclesiastical opulence for a faith rooted in ascetic sacrifice, Savonarola also encouraged the devout to think about spiritual and civic responsibilities with reference to the behavior of trees and plants. In a sermon delivered in December 1494, he spoke of the deleterious effects of weeds when discussing the opponents of faith; in his "Renovation Sermon" of January 13, 1495, he invoked the competition of trees for light when describing

the parable of the fig tree; and in his Good Friday sermon of April 1, 1496, he employed a metaphor rooted in the biochemistry of how plants grow ("like a plant, which exerts itself through the strength it receives from the sky, to draw moisture from the Earth and submits itself to its cause").[81] Like Savonarola's sermons, Tura's and Lippi's painted stumps operate as protobotanical tutorials, with lessons about how plants gather nutrients, compete, and behave.[82] In doing so, they subvert Aristotelian notions of the limitations of plant life; stumps not only grow and decay (exhibit nutritive capacity) but also reach like animals to alleviate thirst (a locomotive function). Painters were employing stumps not just as symbols or metaphors, but as vehicles to consider and draw attention to the ontology and relative vitality of vegetal life.

PROPAGATION

Through repetition and variation, often within the same iconography and in the same workshop, the stump became an ongoing mechanism to mediate the relationship between people and trees, a dynamic obfuscated by long-held assumptions about the construction and description of landscapes in pictures.[83] Until recently, art history has privileged the figure over the ground at the expense of landscape details.[84] Furthermore, the emphasis on attribution and locating the master's hand—when, as a matter of workshop practice, assistants often worked landscape details—has distracted from the nuanced treatment of arboreal life. But interesting things happen in the arboreal ground. The stump, an exemplary part of the arboreal whole, operates as a theoretical artifact generating new ways of thinking about the relationship between human and arboreal life.

In a series of paintings by Cima da Conegliano between 1495 and 1520, the stump undergoes a kind of morphosis in each successive reworking. In an early picture (Pinacoteca di Brera, Milan, 1493–94), Christ's crucifix is inserted between the bark and cambium layer of a large stump, as would be characteristic of grafting. Several years later (National Gallery, London, ca. 1510–20), the stump and cross have merged into a single shaft, which is still the locus of Jerome's attention. And in a third and final picture (Uffizi, Florence, ca. 1510–20), only the new tree remains, subsumed, like Jerome himself, in the landscape background. In Cima's workshop, the arboreal processes of morphosis become a metamorphosis, one that provides visual evidence of the saint's inner conversion.

Critically, there are moments when the reworking of stumps causes ruptures in the epistemologies they evoke, with startling consequences. In another St. Jerome by Cima, the saint holds a thin tree trunk onto which the cross is tied, as

if grafted (fig. 10). Abutting a rocky escarpment to the right, in Jerome's field of vision, is another tree trunk, around which a vine, forked at the top, twists. The detail recalls the (fork-tongued) serpent from the Garden of Eden, an association that painters often encouraged in ways both explicit and subtle.[85] The vine as biblical serpent has a botanical provocation rooted in how vines behave; they kill trees by strangling them, damaging the sapwood, and preventing the transmission of nutrients.[86]

But several years later, this pictorial representation (as if executed in carbon copy) was redeployed for different ends in a painting of the Virgin and Child by Cima, in which the vine's limb-like branches wrap around the trunk just as Christ does with Mary (fig. 11). The branches behave like arms and legs, and the *u*-shaped branch in between, in an anatomical analogy, is like a cord that binds the nursing Christ to his mother. Cima's painting draws attention to a different kind of arboreal relationship, one that cuts to the heart of Mary's relation to Christ in senses both biological and spiritual. While a vine can strangle and kill, there is another type of entangling tree—a nurse tree—that does the opposite: It offers nourishment, protection, and support.[87] The smaller, dependent tree often produces tentacular roots that survive when the larger tree rots away, producing anthropomorphic forms: young trees that rest their arms on "ghost stumps" whose innards have mostly disintegrated.[88]

There are allusions to the nurse tree in literature, in the story of Dryope, transformed into a tree, whose child nurses at the base of her trunk; in the

10. Giovanni Battista Cima da Conegliano, *Saint Jerome in the Wilderness*, 15th century. Oil on panel; 113.5 × 150 cm. (Harewood House, Leeds; reproduced by courtesy of the Harewood House Trust.)

11. Giovanni Battista Cima da Conegliano, *Madonna and Child*, 1512–17. Oil on canvas; 83 × 68 cm. (Rijksmuseum, Amsterdam; photo, Rijksmuseum, Amsterdam.)

writings of the medieval agronomist Pietro Crescenzi, who notes that certain plants protect one another; and in recent scientific studies, rooted in indigenous knowledge, that show how mother trees nurse tree children through subterranean roots and fungal networks.[89] Cima's painting implicates a body of knowledge about trees, their structure, and their relationship to one another rooted in an investigative approach to how the woodlands work and an interest in how trees care for one another. The picture shows how the tree stump, whose conventional ontology and semiotic meaning are often linked—as

something rooted and whose meaning is fixed—has an animacy in the hands of painters, whose ongoing experimentation can redefine how the human and arboreal entwine.

CODA: STUMP SPEECH

Returning to Bellini's painting and his stump a final time, we might note the blank *cartellino* attached to the nearby branch, as if awaiting Bellini's signature (see fig. 1). Bellini and other Italian artists often signed their works on fictive *cartellini* attached to twigs or branches, as in Bellini's *St. Frances in the Wilderness* (where a twig bears his name, "Johannes Bellinus").[90] This insistent association between language, authorship, and arboreal life recalls the prominence of trees in contemporaneous theories involving divine authorship: namely the Doctrine of Signatures, the notion that the divine finds expression in the marks—or signatures—it leaves externally in the (divinely) created world.[91]

In Latin, there is, in addition to "truncus," another word to describe the stump: "caudex," meaning tree trunk or block, which evolved to become the "codex" or bound book, the format adopted for biblical texts in the early middle ages. Among the various pictorial modes in which the stump frequently appears is its role as a physical support for biblical codices in moments of revelation or contemplation. In Vittore Carpaccio's St. Jerome, part of his polyptych in Zadar, the saint clasps his hands in front of a caudex with an open codex affixed to its surface (fig. 12).[92] This association between the stump and scripture emerges in artistic practice in other ways: in the stumps and stump-like lecterns that populate late fifteenth-century Italian pictures and in the extraordinary intarsiated lecterns of the Olivetan order, in which fictive prayer books are inlaid and fused to the reading surface of wood lecterns whose morphology resembles stumps.[93] One way the tree stump prompts a response is the way it reveals itself by disgorging its inner growth rings and vessels: a spatial representation of its temporal and nutritive existence. Works that juxtapose book and stump posit a relationship between two modes of communication, one scriptural and the other arboreal, written in the growth and decay of trees and on their exposed surfaces.

Indeed, in their treatment of stumps, Italian paintings engage with this (bio)semiotic question: the relationship between human and vegetal modes of communication.[94] In his critique of logocentrism in the development of language, Walter Benjamin characterized artworks not as "engaged in a translation of the language of things into a language of humans, but as staging an encounter between the two."[95] St. Augustine alluded to this—and to the role of arboreal life in this ongoing dialogue—when he wrote that trees "display their forms, which

12. Vittore Carpaccio, *Saint Jerome with Kneeling Donor*, top middle panel of the *Polyptych of Saint Martin*, ca. 1487. Oil on panel; 112 × 72 cm. (Museum of Sacred Art, Zadar; photo by G. Tomljenović, 2017, courtesy of the Croatian Conservation Institute.)

give shape to the visible structure of our world, for perception by our senses." While lacking cognitive capacity, Augustine continued, trees "nonetheless wish to be known."[96] But known how? Stumps in Italian paintings posit an answer in the way they grow, die, and regenerate; in the way their roots search for water; in the way their bark wrinkles; and in the way they harbor birds, beetles, and other creatures, all of which provoke thinking about human concerns and relations to the divine and nature. A final detail in Filippino Lippi's *Saint Jerome* (see fig. 2) provides an intriguing example of the biosemiotics of stumps in operation: A large beetle has emerged from the stump's cavity and scurries across its surface. Often identified as a cockroach in literature, it has the segmentation, color, and surface sheen of a hermit beetle (*Osmoderma eremita*), once common in central Italy and so named because it spends most of its life in the cavities of old-growth stumps.[97] Long before this beetle earned its scientific name, Lippi responded to its hermit-like behavior in his painting of the quintessential eremitic saint.

NOTES

1. The Courtauld picture is based on a slightly earlier painting by Bellini (1505–7), now in the National Gallery in London. For a bibliography of both pictures, see Mauro Lucco et al., eds., *Giovanni Bellini* (Treviso, 2019), 562.

2. According to early written accounts, Dominic suffered four mortal wounds and died several days later. For a biography of St. Peter of Verona, primary sources relating to his murder, and information on the development of his cult, see Donald Prudlo, *The Martyred Inquisitor: The Life and Cult of Peter of Verona* (Burlington, VT, 2008).

3. For the iconography of St. Peter Martyr beginning in the thirteenth century, see Prudlo, *Martyred Inquisitor*, 94–95. For recent scholarship on Bellini, including his treatment of landscape, see Johannes Grave, *Giovanni Bellini: The Art of Contemplation*, trans. Cynthia Hall (Munich, 2018); Davide Gasparotto, ed., *Giovanni Bellini: Landscapes of Faith in Renaissance Venice* (Los Angeles, 2017); Oskar Bätschmann, *Giovanni Bellini* (London, 2008).

4. The landscape setting is consistent with written accounts of Peter's martyrdom, which placed the assassination in the wooded Alpine foothills near Barlassina. Prudlo, *Martyred Inquisitor*, 64.

5. A recent conservation treatment revealed that the National Gallery picture also depicted blood issuing from severed branches. See the presentation by conservator Jill Dunkerton at https://www.youtube.com/watch?v=;;ckdatlMWWJw. On the bleeding trees in both pictures, see Lucco et al., *Giovanni Bellini*, 560–62; Jennifer Fletcher and David Skipsey, "Death in Venice: Giovanni Bellini and the Assassination of St. Peter Martyr," *Apollo* 133, no. 347 (1991): 4–8.

6. For mnemonic systems in premodern art, see Frances Yates, *The Art of Memory* (Chicago, 1966); Paolo Rossi, *Logic and the Art of Memory: The Quest for a Universal Language*, trans. Stephen Clucas (Chicago, 2001); Mary Carruthers, *The Book of Memory: A Study of Memory in Medieval Culture*, 2nd ed. (Cambridge, 2008).

7. For an overview of traditional methods for felling trees and tools used, see Roy Underhill, *The Woodwright's Shop: A Practical Guide to Traditional Woodcraft* (Chapel Hill, 1981). For a vivid description of the mechanics of felling trees and the risks involved, see Suzanne Simard, *Finding the Mother Tree: Discovering the Wisdom of the Forest* (New York, 2021), 35.

8. My study includes Italian paintings produced between 1450 and 1540, though stumps featured in visual culture throughout Europe and in other time periods. For a forthcoming survey of stumps (and

stump symbolism) in Europe over a more prolonged time frame (including, but not limited to, Italian examples), see Katherine T. Brown, *Arboreal Symbolism in European Art, 1300–1800* (Abingdon, 2025).

9. For a summary of recent scholarship on plants, sometimes referred to as "critical plant studies," see Anna Lawrence, "Listening to Plants: Conversations Between Critical Plant Studies and Vegetal Geography," *Progress in Human Geography* (2021): 1–23, https://api.repository.cam.ac.uk/server/api/core/bitstreams/3df67d27-3e1f-4aad-b43d-93d4aa05539e/content. Notable contributions include Emanuele Coccia, *The Life of Plants: A Metaphysics of Mixture* (Cambridge, 2019); Monica Gagliano et al., eds., *The Language of Plants: Science, Philosophy and Literature* (Minneapolis, 2017); Michael Marder, *Plant-Thinking: A Philosophy of Vegetal Life* (New York, 2013).

10. Stumps featured not only in paintings but also in the full range of visual media circulating in the fifteenth and sixteenth centuries, including prints, tapestries, manuscript illuminations, pictorial intarsias, relief sculptures, and sketchbooks employed in artists' studios. But technical developments in painting afforded a degree of precision in the rendering of color, texture, and surface features critical in calling attention to what I identify as the stump's discursive potential.

11. Simon Schama, *Landscape and Memory* (New York, 1995).

12. Schama, *Landscape*, 99. For an earlier study on the importance of landscape in Altdorfer's pictures, see also Christopher Wood, *Albrecht Altdorfer and the Origins of Landscape* (London, 1993).

13. On the role of trees in landscape, see also Robert Pogue Harrison, *Forests: The Shadow of Civilization* (Chicago, 1992); Daniel Cosgrove and Stephen Daniels, eds., *The Iconography of Landscape* (Cambridge, 1988).

14. Schama, *Landscape*, 216.

15. Barbara Baert, *A Heritage of Holy Wood: The True Cross in Text and Image* (Leiden, 2004). As Baert writes, the cross itself, the most holy object in Christianity, "is a twig, a tree, it buds and withers, it is dead and lives again"; *Heritage*, 380.

16. Gregory C. Bryda, *The Trees of the Cross: Wood as Subject and Medium in the Art of Late Medieval Germany* (New Haven, CT, 2023).

17. For the tree as metaphorical and mnemonic device, see also Pippa Salonius and Andrea Worm, eds., *The Tree: Symbol, Allegory, and Mnemonic Device in Medieval Art and Thought* (Turnhout, 2014); Sarah Ritchey, "Spiritual Arborescence: Trees in the Medieval Christian Imagination," *Journal of Christian Spirituality* 8, no. 1 (2008): 64–82.

18. Susan Donahue Kuretsky, "Rembrandt's Tree Stump: An Iconographic Attribute of St. Jerome," *Art Bulletin* 56, no. 4 (1974): 571–80.

19. See, e.g., Michael Weemans, "Herri Met de Bles's Way to Calvary: A Silenic Landscape," *Art History* 32, no. 2 (2009): 307–31; Nicolai Cikovsky, Jr., "'The Ravages of the Axes': The Meaning of the Tree Stump in Nineteenth-Century American Art," *Art Bulletin* 61, no. 4 (1979): 611–26.

20. See note 9.

21. Aristotle articulates his hierarchy of living things in his treatise on the soul, *De Anima*, trans. R. D. Hicks (Cambridge, 1907). For a summary, see Hicks, introduction to *De Anima*, xxxix–xl.

22. Coccia, *Life of Plants*, 12.

23. Eduardo Kohn, *How Forests Think: Toward an Ecology Beyond the Human* (Berkeley, 2013).

24. Coccia, *Life of Plants*, 13.

25. For a history of the Apollo Belvedere, see Francis Haskell and Nicholas Penny, *Taste and the Antique* (New Haven, CT, 1981), 148–51. The stump is visible in a sixteenth-century drawing by Francisco de Holanda. Haskell and Penny, *Taste*, 11.

26. On the rediscovery of Roman statues and sculptures during the Renaissance and its impact on art and aesthetics, see Leonard Barkan, *Archaeology and Aesthetics in the Making of Renaissance Culture* (New Haven, CT, 1999).

27. MS M.184 fol. 18r, Morgan Library, New York.

28. On the site of the temple of Apollo on Montecassino, Benedict constructed an oratory to honor St. John the Baptist, as recounted in *The Golden Legend*. See Jacobus da Voragine, *The Golden Legend: Readings on the Saints*, trans. William Granger Ryan (Princeton, NJ, 1993), 189.

29. *Oxford English Dictionary*, "stump," last updated September 2024, https://doi.org/10.1093/OED/1084176220.

30. *Dictionnaire de l'Académie Française*, "souche," last accessed March 2025, https://www.dictionnaire-academie.fr/article/A9S2198.

31. On the Italian etymology, see Ottorino Pianigiani, *Vocabulario etimologico della lingua italiana* (Rome, 1907), 1:260, 2:1475–76.

32. On the growth and decay of trees, see James P. Kimmins, *Forest Ecology* (London, 1987). For a summary of how trees decay, noting how stumps and logs exhibit these processes, see R. A. Eaton and M. D. C. Hale, *Wood: Decay, Pests and Protection* (London, 1993). On the capacity of trees and stumps to provoke philosophical reflection, see Galen A. Johnson, "Forest and Philosophy: Toward an Aesthetics of Wood," *Environmental Philosophy* 4 (2007): 59–67.

33. Matt. 3:10. In iconographic analyses, the passage is frequently cited as the reason St. John the Baptist is so often depicted with a tree stump. All biblical citations are from the New American Bible.

34. Job 14:7–10.

35. Dan. 4:23.

36. Martin Heidegger, *Being and Time*, trans. John Macquarrie and Edward Robinson (New York, 1962), 171.

37. For a discussion of Heidegger and the clearing within a large historiography, see Ronald P. Morrison, "Wilderness and Clearing: Thoreau, Heidegger, and the Poetic," *Interdisciplinary Studies in Literature and the Environment* 10, no. 1 (2003): 143–65.

38. Leonardo da Vinci, *Treatise on Painting*, trans. John Francis Rigaud (Amherst, 2002), chaps. 241, 249, advising on the sizing and coloration of trees to realize paintings in perspective.

39. On the management and use of woodlands in early modern Europe, see Harrison, *Forests*; Roland Bechmann and Kathryn Dunham, *Trees and Man: The Forest in the Middle Ages* (New York, 1990).

40. See Karl Appuhn, *A Forest on the Sea: Environmental Expertise in Renaissance Venice* (Baltimore, 2009), 97, 111.

41. Ilaria Becattini, "Dalla Selva alla Cupola: Il trasporto del legname dell'Opera di Santa Maria del Fiore e il suo impiego nel cantiere brunelleschiano," in *The Years of the Cupola—Studies* (2015), http://duomo.mpiwg-berlin.mpg.de/STUDIES/study003/study003.html#abstract_eng.

42. Archivio di Stato, Parma, Confini, b.205/7b, dis.887, depicting a wooded area near the source of the Secchia River, ca. 1590. For a discussion, see Diego Moreno et al., "The Archaeology of Woodland Ecology: Reconstructing Past Woodmanship Practices of Wooded Pasture Systems in Italy," in *Silvicultures: Management and Conservation*, ed. Fernando Allende Álvarez et al. (London, 2019), 27–62, at 34.

43. For coppicing and pollarding in European paintings as evidence of early modern woodland management practices, see Jan Lacina, "Coppice Woods and Pollard Trees in the Visual Arts," *Journal of Landscape Ecology* 9, no. 2 (2016): 97–108. For an overview of practices of coppicing and pollarding in early modern Europe, see Paul Warde, *Ecology, Economy and State Formation in Early Modern Germany* (Cambridge, 2006).

44. For a discussion of grafting and its history, see Ken Mudge et al., "A History of Grafting," *Horticulture Reviews* 35 (2009): 437–93.

45. Ovid, *Metamorphoses*, trans. Rolfe Humphries (Bloomington, 1961), 14.630–33, p. 357.

46. T. Lucretius Carus, *Of the Nature of Things: A Metrical Translation*, trans. William Ellery Leonard (London, 1916), 243.

47. Lucretius, *Nature of Things*, 243.

48. For a general discussion, see Denis Ribouillault, "Ingenuity in the Garden: From Poetics of Grafting to Divine Mathematics," in *Ingenuity in the Making: Matter and Technique in Early Modern Europe*, ed. Richard Oosterhoff et al. (Pittsburgh, 2021), 156–73.

49. For a discussion of Montaigne and grafting, see Antonia Szabari, "Montaigne's Plants in Movement," in *Early Modern Ecologies: Beyond English Ecocriticism*, ed. Pauline Goul and Philip John Usher (Amsterdam, 2020), 263–85, at 271.

50. See Paolo Savoia, "Nature or Artifice? Grafting in Early Modern Surgery and Agronomy," *Journal of the History of Medicine and Allied Sciences* 72, no. 1 (2017): 67–86.

51. See Savoia, "Nature or Artifice?," 79–80, discussing the autobiography of the seventeenth-century surgeon Leonardo Fioravanti.

52. Franco Bastianon, *Il Codice Paulini: Ecologia, Economia e Politica in un Codice del '600* (Vittorio Veneto, 2017). James Pilgrim will consider Paulini's manual in more detail in a forthcoming book project, *Art and Environmentalism in Renaissance Italy*, still in the early stages of development.

53. See Franco Bastianon, *Il Cansiglio dal 1548 al 1699* (Vittorio Veneto, 2019), 18.

54. Bastianon, *Codice Paulini*, 116.

55. "Se ben il bosco montuoso al suo tempo si taglia, non ne segue pero l'effetto pernitiosa; perche la sommitá delli [sic] monti Boschini si lasciano con gli arbori verdi che difendono per il suo quasi all'istesso modo, essendo massime legnami inutile e di difficil condotta, oltra che tagliando vi lasciano gli arborescelli, le fratte, le radici, e tronconi dale quali in breve tempo pululano altri novi arbori, e il bosco presto si rinovella"; Bastianon, *Codice Paulini*, 149.

56. Ovid, *Metamorphoses*, trans. David Raeburn (London, 2004), 10.104–5, p. 387; 1.547–52, pp. 32–33.

57. Ovid, *Metamorphoses*, trans. Raeburn, 2.357–60, p. 64.

58. Virgil, *Aeneid*, trans. John Dryden (New York, 1909), 3.2195–98, 2211–16, p. 132.

59. Dante Alighieri, *The Inferno*, trans. John Ciardi (New York, 1954), 13.33/35, p. 103.

60. "Era allor piena d'erbe salutifere, E di balsamo e 'ncenso lacrimevole"; M. Jacopo Sanazzaro, *Arcadia* (Milan, 1806), 66.

61. "The bleeding trees suggest a theologically and classically educated patron familiar with Peter's special devotion to the blood of the Crucified Christ and with that episode in Virgil [of the murdered Polydorus] (*Aeneid*, Book III, 27/28)"; Fletcher and Skipsey, "Death in Venice," 7.

62. For cosmological beliefs in the late fifteenth and early sixteenth centuries that contributed to analogic ways of thinking (rooted in an association between macrocosmic and microcosmic forms and forces), see Michel Foucault, *The Order of Things*, trans. Alan Sheridan (London, 1970), 19–49.

63. Leon Battista Alberti, *On the Art of Building*, trans. Joseph Rykwert et al. (Cambridge, 1998), 46.

64. Ulisse Aldrovandi, *Dendrologia naturalis scilicet arborum historia* (Bologna, 1668), 1:4.

65. Aldrovandi, *Dendralogia*, 1:250.

66. Leonardo da Vinci, *Drawing of the nervous system*, ca. 1508, pen and ink, Royal Collection Trust, Windsor, RCIN 919034, verso, https://www.rct.uk/collection/919034/recto-notes-on-the-respiratory-system-with-a-marginal-sketch-verso-the-nervous.

67. Leonardo da Vinci, *The vessels of the liver*, ca. 1508, pen and ink, Royal Collection Trust, Windsor, RCIN 919051, verso, https://www.rct.

68. Leonardo da Vinci, *The heart compared to a seed*, ca. 1508, pen and ink over black chalk, Royal Collection Trust, Windsor, RCIN 919028, recto, https://www.rct.uk/collection/919028/recto-the-heart-compared-to-a-seed-verso-the-vessels-of-liver-spleen-and-kidneys. For a discussion and relevant text, see Anna Maria Penati, "Leonardo, la natura, il giardino, il paessaggio," in *La Sala delle Asse del Castello Sforzesco: Leonardo da Vinci, All'ombra del Moro*, ed. Claudio Salsi and Alessia Alberti (Milan, 2020), 132–53.

69. Leonardo da Vinci, *The heart and coronary vessels*, ca. 1511–13, pen and ink on blue paper, Royal Collection Trust, Windsor, RCIN 119073, verso.

70. For St. Peter Martyr as an alter Christus, see Diana Hiller, "Saintly Blood: Absence, Presence, and the alter Christus," *Parergon* 32, no. 1 (2015): 183–212.

71. Jacobus de Voragine, for example, wrote that "Hieronymous is of gerar, that is holy, and of nemus, that is to say wood"; *The Golden Legend, or Lives of the Saints, Englished by William Caxton, First Edition 1483* (London, 1900), 5:94. For a discussion of Jerome and wood, see April Oettinger, "Anthropomorphic Trees and Animated Nature in Lorenzo Lotto's 1509 St. Jerome," in *Green Worlds in Early Modern Italy: Art and the Verdant Earth*, ed. Karen Hope Goodchild et al. (Amsterdam, 2019), 49–68.

72. See Stephen J. Campbell, *Cosmè Tura of Ferrara: Style, Politics and The Renaissance City, 1450–1459* (New Haven, CT, 1999), 88.

73. For an overview of how trees decay and the surface manifestations, see Kimmins, *Forest Ecology*; Eaton and Hale, *Wood*. See also Sarah Watkinson et al., *The Fungi* (Waltham, MA, 2016); Neville J. Dix and John Webster, *Fungal Ecology* (London, 1995).

74. For the habitat, behavior, and feeding patterns of wallcreepers, see Rob Hume, *Europe's Birds: An Identification Guide* (Princeton, NJ, 2021), 456–57.

75. A. H. Reginald Buller, "The Fungus Lore of the Greeks and Romans," *Transactions of the British Mycological Society* 5 (1914–16): 21–66, at 33. Dioscorides noted that mushrooms were an encapsulation of extremes, "for they are either good for food or poisonous"; quoted in Buller, "Fungus," 38. For ancient and early modern literature on fungi and mushrooms, see Frank M. Dugan, *Fungi in the Ancient World: How Mushrooms, Mildews, Molds, and Yeast Shaped the Early Civilizations of Europe, the Mediterranean, and the Near East* (St. Paul, 2008).

76. For an account of mushroom hunting in managed and damaged environments much like fifteenth-century Italy, see Anna Lowenhaupt Tsing, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins* (Princeton, NJ, 2015).

77. Leonardo alludes to this process in the Codex Atlanticus, fol. 187r (ex 67r-a). For a discussion, see Penati, "Leonardo," 141–42, which cites an additional bibliography.

78. The new tree extends upward, and a crucifix—a materialization of Jerome's vision—has been lashed, as if grafted, to the top. Details like this are not exceptional. In *The Story of Joseph*, Biagio d'Antonio depicted a decaying stump with splintered bark and a rotted cavity through which mushrooms are visible; its roots also draw water from a pool of water below, a notion reinforced by the nearby dog who lowers his head and neck to drink. See https://www.getty.edu/art/collection/object/103RAS.

79. For a history of botanical science, including the influence of Theophrastus on late fifteenth- and early sixteenth-century understandings of plants, see Alan G. Morton, *History of Botanical Science: An Account of the Development of Botany from Ancient Times to the Present Day* (London, 1981). See also Frank N. Egerton, "A History of the Ecological Sciences, Part 2: Aristotle and Theophrastus," *Bulletin of the Ecological Society of America* 82, no. 2 (2001): 149–52.

80. In Lippi's case, one of his principal patrons, Francesco Volari, was a fervent follower of Savonarola, whose fiery sermons ignited crowds in Florence. On Valori and Lippi, see Patrizia Zambrano and Jonathan Nelson, *Filippino Lippi* (Milan, 2004), 39.

81. See Girolamo Savonarola, *The Selected Writings of Giorolamo Savonarola: Religion and Politics, 1490–98*, ed. Anne Borelli and Maria Pastore Passaro (New Haven, CT, 2006), 165 ("The couch grass . . . wants to impede the good plants so they do not grow"), 67 ("As time went on, [the fig tree] came to produce nothing but leaves in such abundance that . . . it overwhelmed the other plants, which were unable to grow"), 26 ("They strain with every effort to ready themselves for it and to draw it to themselves, like a plant, which exerts itself through the strength it receives from the sky, to draw moisture from the Earth and submits itself to its cause").

82. By referencing Savonarola's sermons, I am not suggesting that Lippi's painting was based on these preachings but rather that it responded to a culture in which plant life offered a model for thinking about spiritual and ethical obligations.

83. On repetition and difference as a process that generates innovation, see Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (New York, 1994).

84. For a recent discussion on privileging of the figure over ground in Venetian landscape painting, see Jodi Cranston, introduction to *The Green Worlds of Renaissance Venice* (University Park, PA, 2019). See also David Young Kim, *Groundwork: A History of the Renaissance Picture* (Princeton, NJ, 2022).

85. For example, in Masolino's *Temptation of Adam and Eve* in the Brancacci Chapel, a serpent with the head of a woman wraps vine-like around the tree of knowledge, a motif taken up again by Michelangelo in his *Fall and Expulsion* in the Sistine Chapel. In Jacopo Bassano's *Rest on the Flight into Egypt* in the Biblioteca Ambrosiana, Milan, the serpent has decoupled into indexical components: a sinuous vine that twists around a tree and a lizard that shimmies up the bark beside it. See https://www.ambrosiana.it/en/opere/the-rest-on-the-flight-into-egypt/.

86. On the way vines strangle trees, see Peter Wohlleben, *The Hidden Life of Trees*, trans. Jane Billinghurst (Vancouver, 2016), [296].

87. For a discussion of nurse tree relationships, see Wohlleben, *Hidden Life*, [245].

88. A nurse tree can take other forms in ways that find intriguing parallels in Christian images. In the form of a fallen tree, known as a "nurse log," it provides nutrients to new saplings in the same manner that Mary's prone body gives rise to a tree in paintings of *Il sogno della Vergine*. See, e.g., Simone dei Crocifissi, *sogno della Madonna*, Pinacoteca di Ferrara, https://commons.wikimedia.org/wiki/File:Simone_dei_crocifissi,_sogno_della_vergine,_1355-90_ca._01_dal_convento_del_corpus_domini_a_ferrara.jpg.

89. For the story of Dryope, see Ovid, *Metamorphoses*, 9:324–93; on the notion of plants protecting one another in the writings of Pietro di Crescenzi, see Bechmann and Dunham, *Trees and Man*, 6; on the notion of a mother tree and subterranean fungal networks, see Simard, *Finding the Mother Tree*.

90. On the *cartellino*, see Kandice Rawlings, "Liminal Messages: The Cartellino in Italian Renaissance Painting" (PhD diss., Rutgers, 2009). See also Alessandro Della Latta and Karin Gludovatz, eds., *Signaturen: Auktoriale Präsenz zwischen Schrift und Bild, 1400–1700* (Berlin, 2023).

91. On the doctrine of signatures, see Foucault, *Order of Things*, 19–49. For primary texts that discuss the doctrine of signatures, see Paracelsus, *The Hermetic and Alchemical Writings of Aureolus Philippus Theophrastus Bombast, of Hohenheim, Called Paracelsus the Great*, trans. Arthure Edward Waite (London, 1894), 171–94; Jacob Boehme, *Signature of All Things and Other Writings* (New York, 1912).

92. Note also the additional arboreal details, like the coppiced tree, the grafted branch, and a dead twig and leaves that hang in front of Christ's head.

93. For a description of one such lectern, see Giovanni Brizzi, *Il coro intarsiato dell'Abbazia di Monte Oliveto Maggiore* (Milan, 1989), 117. Paintings that convert stumps or stump-like arboreal forms to branches include Filippino Lippi's *Apparition of the Virgin to Saint Bernard*, ca. 1485–87, in the Badia Fiorentina, and Giovanni Bellini's *Saint Jerome with Saint Christopher and Saint Louis of Toulouse*, ca. 1513, in the Church of San Giovanni Crisostomo, Venice.

94. On the notion of biosemiotics and plant life, see Monica Gagliano et al., eds., *The Language of Plants: Science, Philosophy and Literature* (Minneapolis, 2017).

95. Patricia Vieira, "Phytographia: Literature as Plant Writing," in *The Language of Plants: Science, Philosophy and Literature*, ed. Monica Gagliano et al. (Minneapolis, 2017), 215–33, at 222.

96. St. Augustine, *City of God* 11.27. For a discussion, see Michael Marder, "To Hear Plants Speak," in *The Language of Plants: Science, Philosophy and Literature*, ed. Monica Gagliano et al. (Minneapolis, 2017), 103–25, at 121.

97. On the hermit beetle, see Wohlleben, *Hidden Life*, [237]. See also Emanuela Maurizi et al., "Guidelines for the Monitoring of *Osmoderma Eremita* and Closely Related Species," in "Guidelines for the Monitoring of the Saproxylic Beetles Protected in Europe," ed. Giuseppe Maria Carpaneto and Paolo Audisio, special issue, *Nature Conservation* 20 (2017): 79–128, https://doi.org/10.3897/natureconservation.20.12658.