Moving accidents by flood and field": The Arable and Tidal Worlds of George Eliot's *The Mill on the Floss*

Jayne Elisabeth Archer, Richard Marggraf Turley, Howard Thomas

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"MOVING ACCIDENTS BY FLOOD AND FIELD": THE ARABLE AND TIDAL WORLDS OF GEORGE ELIOT'S *THE MILL ON THE FLOSS*

BY JAYNE ELISABETH ARCHER, RICHARD MARGGRAF TURLEY, AND HOWARD THOMAS

We often think of *The Mill on the Floss* (1860) as a pastoral work. Eithne Henson, commenting on this novel, writes: "there is a pastoral nexus in [Eliot's] fiction that connects the historical past . . . with childhood, more particularly female childhood, and landscape."[1] In fact, the human practices and natural forces which shape the ecosystems and environment of Dorlcote Mill and its immediate surroundings are not pastoral—they are arable. The land attached to the Tulliver's home is worked land, not pasture, and the skill with which it is farmed is integral to the plot. To be sure, sheep and cows graze the outlying lands ("Far away . . . stretch the rich pastures"), and George Eliot's narrator is confident that St. Ogg's, with its "well-crushed cheese and . . . soft fleeces," will be familiar to "refined readers . . . through the medium of the best classic pastorals."[2] But Mr. Tulliver is an arable farmer—as the novel opens, on a day in February, the Tulliver lands are "touched . . . with the tint of the tender-bladed autumn-sown corn" (3). Owning cornfields, orchards, mill, and malt-house, the Tullivers are able to process and produce food for themselves and the immediate locality. The distinction between pastoral and arable—and indeed, between pastoral and georgic—is crucial to understanding what is at stake in Eliot's novel, as well as why and how what happens happens.

The tendency of critics and readers to conflate the pastoral as literary genre with pasture as a way of life and a means of subsistence persists in the use of the term "post-pastoral" in agricultural studies of literature.[3] In spite of the important contribution made by ecocriticism to literary and cultural analysis, we have become progressively less able to decode the agricultural world inhabited by the Tullivers—a world familiar to Eliot's first readers, whether from personal experience or encountered second-hand through the much-debated crisis in British agriculture during the 1840s and 1850s. The critical neglect of the arable world of *The Mill on the Floss* is symptomatic of a widespread

disengagement from worked land and centers of food production—a process of disengagement that Eliot's novel documents with human sympathy whilst remaining devoid of sentiment. Writing in 1859–60 about events that take place in the 1830s, Eliot focuses on a crucial historical moment when patterns of life such as those followed by the Tullivers were being lost—and, with those lifestyles, knowledge of the language and systems of the worked land. Recovering that arable world is essential if we are to fully appreciate the role of the environment in shaping the characters and events described in the novel as well as Eliot's response to one of the most pressing socio-economic issues of her (and our) day: the impact of free market economics on food production and distribution, on agricultural livings and rural communities, and on river and land management across Britain.

This essay captures the arable setting of *The Mill on the Floss*, drawing attention to the crucial relationship between the arable and tidal worlds that converge at Dorlcote Mill, and which, in their complex, unpredictable and vital interaction, drive the narrative from beginning to end. Indeed, *The Mill on the Floss* is as much a tidal novel as it is an arable one.[4] Situating Dorlcote Mill along the tributary of a tidal river and amid arable land is, we argue, a very deliberate decision by Eliot, who undertook purposeful research into the arable and tidal worlds she details. As we will discuss, the novelist's trip to Weymouth in September 1859 was more significant to her description of the inner workings and domestic spaces of a watermill than has hitherto been acknowledged; moreover, Thomas Miller's *Our Old Town* (1857), which scholars have identified as possible inspiration for the novel's account of Mr. Tulliver's physical assault on Wakem, contains other significant details that are found in Eliot's novel. We also suggest contemporary reports of storms that caused widespread flooding and loss of life as well as destruction of property and crops throughout Britain during August 1857—hitherto neglected in accounts of the novel's genesis—provided vital stimulus for Eliot's portrayal of inundation in the novel.

The events described in *The Mill on the Floss* could not have occurred anywhere else in England. Nor could they have happened at any other time: as Jules David Law observes, between 1825 and 1845—the approximate period in which the novel's events take place—the technologies of river and mill management, largely unchanged for centuries, were "on the verge of historical transformation."[5] In part, this "transformation" was driven by the repeal of the Corn Laws in 1846 and the proliferation of industrial mills along tidal rivers, but it was also a consequence of the naturalization of the language and

metaphors of free market economics that had been taking place since the second half of the eighteenth century. Advocates of Adam Smith's political economy used the image of a river of corn to argue that prices, freed from regulation, would find their natural level. Critics of Smith, including Samuel Taylor Coleridge, appropriated this metaphor to argue that in the course of finding a level, deregulation was likely to result in inundation and destruction to property, land and lives. By documenting transformations in agricultural livings and economies, and in giving a material reality to Smith's metaphor, Eliot does not condemn or seek to arrest these changes. She cannot, with any certainty, determine the long-term outcomes of this process; as Law points out, the consequences of "technological advances in fluid management . . . [were] not yet known," and the same could have been claimed of the repeal of the Corn Laws.[6] Instead, Eliot bears witness to a particular moment, one of irreversible change in the history of arable farming, food production, and processing in Britain, and, importantly, she asks her readers to attend to the possible cost and consequences for those who struggle to make their livings at the meeting point of arable land and tidal waters.

I. AN ARABLE POETICS

In the period 1849–53, British agriculture was widely perceived to be in crisis.[7] Changing patterns of trade, combined with a series of poor harvests, the long-term effects of the amendment of the Assize of Bread and Ale in 1822 and the more immediate impact of the repeal of the Corn Laws in 1846, meant that farmers had either to adapt to compete with increasing volumes of cheap imports, or abandon the land altogether. With grain prices falling, many farmers and millers were forced out of business; tenant farmers in particular needed greater security. In response to this situation, *The Times* commissioned James (later Sir James) Caird, a Scottish agriculturalist and MP, to undertake a survey of English agriculture. His county reports were published in 1851 as *English Agriculture in 1850–51*. Prices of agricultural produce and tenancies are at the forefront of Caird's analysis, but so also are the importance of maintaining farm buildings, equipment and land, and the need to embrace new technologies. For the purposes of the present essay, perhaps the most striking aspect of Caird's work is his observation that farmers no longer pass on knowledge of the fundamentals of farming in their respective localities. In his epistles to each county, Caird finds it necessary to draw attention to basic errors and

reiterate best practice: how to prepare and apply manure; the need to rest land and rotate crops (and to rotate using complementary crops); the recycling of waste products; and the best and most cost-effective ways in which to augment and work with particular soils in order to maximize yields. Whilst conceding that some of the measures needed to safeguard British agriculture must be left to politicians, Caird argues that farmers can begin to help themselves by observing and imitating the practices of the "best farmers" in their areas, and by sharing knowledge and experience.[8] What he does not say, but Eliot in *The Mill on the Floss* does, is that if farmers are leaving the land, the most important mechanism for the transmission of best practice—father to son, master to apprentice, generation to generation—will be broken beyond repair.

The Mill on the Floss opens at the turn of the 1830s; the Tullivers are unaware of the coming crisis in agriculture. Indeed, this was the post-Napoleonic "golden age" for British farmers, "when [grain] prices were high"—a "golden age", that is, for landowners and millers, if not for the farm laborers and consumers who had to pay these high prices (132). Although scholarship on *The Mill on the Floss* has acknowledged the novel's many hints toward the final flood, it has neglected the fact that agricultural crisis—crisis of a more permanent, because less easily reparable, kind—is also foreshadowed:

> We live from hand to mouth, most of us, with a small family of immediate desires—we do little else than snatch a morsel to satisfy the hungry brood, rarely thinking of seed-corn or the next year's crop. (24–25)

"Most of us" may well consume "seed-corn" today without thinking of "next year's crop," but for those who worked the British soil in the first half of the nineteenth century, such an act would have been unconscionable: "seed-corn" preserves the possibility of food and livelihoods for future generations, helping build long-term resilience in spite of natural disasters in the present. What may seem a throwaway remark by Eliot's narrator demonstrates the potentially disastrous consequences for people who no longer know how to safeguard their food.

The worked land is written into the language and metaphors used to describe the domestic, social and economic relationships at the heart of *The Mill on the Floss*. But the novel also testifies to the gradual transformation of that language as words such as "seed," "wheat," and "bread" are increasingly disconnected from material reality and instead

assume meanings that are primarily or even wholly figurative. Not surprisingly, Mr. Tulliver, who makes his livelihood from his knowledge of the variety, value, and uses of seeds, is the character most often associated with an arable poetics. "Mingled seed must bear a mingled crop" is the narrator's comment on Tulliver's assault on Wakem. As Dwight H. Purdy observes, this phrase echoes a passage in Leviticus as well the sower parables of the gospel of Matthew and, in particular, the parable which provides the title of book 5 of the novel, "Wheat and Tares" (*KJV*, Matt. 13:24–30).[9] Purdy sees in Eliot's deployment of parables in *The Mill on the Floss* the author's exploration of "moral complexity," but the Bible lands and Dorlcote are both agricultural societies, for whom the doubled nature of parables holds particular significance.[10] "Wheat and Tares," like the other sower parables, remembers real-world advice to farmers, entreating them to keep watch over their fields and to take appropriate measures to manage weeds, whilst also encoding metaphorical significances—most often, in theology and Biblical exegesis, the nature of the God's Kingdom and the difficulty of disentangling heresy from orthodoxy.[11]

Those who lived in close proximity to the worked land might have perceived in "Tares" an allusion to a more dangerous and immediate material reality, and, moreover, one we find elsewhere in Eliot's novel. In the eighteenth and nineteenth centuries, farmers had little to fear from tares. Tares (also called vetch, genus *Vicia*) was farmed throughout Britain, usually used as animal fodder or in crop rotation, and the county surveys commissioned by Sir Arthur Young for the Board of Agriculture in the 1790s and first two decades of the nineteenth century devoted chapters to its cultivation.[12] It was inconvenient if tares infiltrated wheat fields, but because its physical appearance is distinct from wheat, it was easy to eradicate. For farmers in the first half of the nineteenth century, the more familiar and dangerous weed alluded to in the "ζιζάνια" (zizania) of Matt. 13:24–30 was darnel (*Lolium temulentum* L.), a cereal mimicker virtually indistinguishable from wheat.[13] The substitution of "darnel" with "tares" in English bibles dates back to the second Wycliffe Bible of 1394. However, for those who work with wheat and its weeds, tares doesn't make sense in the context of Matt. 13:24–30, and post-Medieval scriptural exegesis retained the association with darnel. For this reason, and because a large proportion of his congregation had roots in agricultural communities, John Wesley favored the use of darnel in Bible translations and commentaries. In his notes on Matt. 13:25 he writes: "*His enemy came and sowed darnel*—This is very like wheat, and commonly grows among

wheat rather than among other grains: but *tares* or vetches are of the pulse kind, and bear no resemblance to wheat."[14]

Eliot develops the theme of an impure grain supply in order to conceptualize the more inscrutable question of human nature. Maggie's dark coloring, which identifies her as a Tulliver rather than a Dodson—her father's daughter rather than her mother's—is explained in terms of the contrast between varieties of wheat (red and white) and bread (dark and white): "the child's healthy enough," Mr. Tulliver declares, responding to his daughter's unorthodox behavior, "there's nothing ails her. There's red wheat as well as white, for that matter, and some like the dark grain best" (68). This metaphor echoes and plays with Matt. 13:24–30, for in certain parts of England, red wheat was identified with darnel.[15] Bread made with red wheat, like bread made with grain infiltrated by the black seeds carried by darnel, had a darker, denser appearance and a strong, bitter taste. Cheaper than bread made with uncontaminated flour and/or flour made from white wheat, many consumers—including Maggie, it would seem—acquired a taste for it.

It is to be expected that a farmer and miller would explain the differences between a brother and sister in terms of the cereal crops which are his living, but Eliot subtly reworks Matt 13:24–30, using the parable to break decisively from centuries of scriptural exegesis by ensuring that neither side of the binary oppositions of wheat and tares/darnel, white and red wheat, brother and sister, Dodson and Tulliver, or orthodoxy and heresy is privileged. This is developed further in an allusion to another of the sower parables: Matt. 13:3–8. Mr. Tulliver's apparent hypocrisy, as demonstrated when he asks Tom to write a curse in the family bible, is described using the example of one of the seeds which fails to find purchase in "unfavourable" ground:

> Certain seeds which are required to find a nidus for themselves under unfavourable circumstances, have been supplied by nature with an apparatus of hooks, so that they will get a hold on very unreceptive surfaces. The spiritual seed which had been scattered over Mr. Tulliver had apparently been destitute of any corresponding provision, and had slipped off to the winds again, from a total absence of hooks. (312)

Sally Shuttleworth discusses this passage as evidence of Eliot's rejection of the Darwinian concept of adaptation.[16] However, Mr. Tulliver is not resistant to change and innovation. He recounts with pride his father's planting of an orchard ("My father was a huge man for planting" [277]) and the construction of a "malt-house" (300). Both

actions would have helped diversify the business, helping protect the family against unpredictable harvests and markets.

Eliot's portrayal of the miller as a largely sympathetic, if flawed, character stands in contrast to a long-standing literary tradition in which millers were often portrayed as deceitful or corrupt. The sharp satire we find in Geoffrey Chaucer's and Tobias Smollett's treatments of the miller has become what Eliot's narrator calls the "tragi-comic" and "old-fashioned family life" of the Tullivers (308).[17] This change in tone can be related to the gradual, historical displacement of the miller from necessary, feared, and powerful in his community to inessential and pitiable, on the verge of becoming an anachronism. Stripped of its potential for genuine profits, milling, like farming in *The Mill on the Floss*, is in danger of becoming an "expensive hobby" rather than a viable profession (478). The nature of this transformation can be viewed by a consideration of Eliot's treatment of the central business of a miller: bread. By law, the Tullivers cannot bake bread for sale from the flour they produce, but bread is often consumed in Eliot's novel, with status, rewards and punishments defined according to whether it is consumed on its own ("dry") or with butter, bacon, treacle, or cheese. Towards the end of the work, bread is nearly always used figuratively, to denote the ability to make enough money to live by. Eager that his son should enjoy the social and economic status formerly enjoyed by millers like himself, Mr. Tulliver aims to enable his son Tom to be more than a "miller and farmer" by giving him "an eddication as'll be a bread to him" (6).

Other aspects of agrarian life are in danger of losing connection with material reality and being consigned to the realm of the figurative. It is ironic, but also suggestive, that Mr. Stelling, who is teaching Tom how not to be a farmer and miller, uses ploughing as a metaphor for education, concluding that "Tom's brain, being peculiarly impervious to etymology and demonstrations, was peculiarly in need of being ploughed and harrowed by these patent implements" (156). An education in the classics, incorporating the georgic tradition as exemplified by Hesiod, Horace, and Virgil, has displaced and replaced the material reality of working the land; "plough," "harrow," "culture," and "crop" have meaning only in so far as they are metaphors for the process of learning.[18] As Mr. Glegg points out, this education will not include knowledge of the worked land: "Mr. Stelling," he remarks, "isn't likely to teach him [that is, Tom] to know a good sample o' wheat when he sees it" (77). Tom, unlike his father, will not be able to sort corn from darnel and white wheat from red.[19] Maggie, whose prospects are

very different, uses "bread" in the same doubled sense as her father, declaring: "The only thing I want is some occupation that will enable me to get my bread and be independent" (569). This sliding signification, in which "bread" ceases to mean the material substance produced by the combined work of a farmer, miller, and baker, is more profound than N. N. Feltes acknowledges when he perceives in this novel "the tension . . . between old and new economic forms."[20] Education and social advancement, as they are presented by Eliot, deploy arable poetics against itself in order to remove Tom and Maggie from the land and the business of food production for good.

The Tulliver family tragedy is symptomatic of a widespread and irreversible disengagement from the land and, with it, the traditional knowledge passed on from generation to generation. When we first meet them, the Tullivers are firmly embedded within their landscape, its systems and processes, having inhabited a watermill at Dorlcote over five generations, and having endured "the last great floods" (299). Mr. Tulliver's concern with continuity in ownership of Dorlcote Mill seems to border on obsession, not least when he refers to the "story as when the mill changes hands, the river's angry" (299). His distrust of Mr. Pivart, when the latter man purchases the land upstream, may seem like jealousy and distrust of outsiders:

> 'New name? Yes—I should think it is a new name,' said Mr. Tulliver, with angry emphasis. 'Dorlcote Mill's been in our family a hundred year and better, and nobody ever heard of a Pivart meddling with the river, till this fellow came and bought Bincome's farm out of hand.' (174)

But there is logic behind Tulliver's sentiments. As Caird points out, knowledge of how to work with land, grain, and water was passed down through the generations or from employer to employee (in the case of Luke). To break the line of oral tradition and introduce a manager who has not grown up with this landscape risked disaster. Unfamiliar with the flow of the Floss and Ripple and with the soil at Dorlcote, it is understandable that Jetsome, Wakem's appointed mill manager, is unable to make the mill turn a profit: "he's letting the business go down," Tom says, quoting Luke, while Mr. Deane observes that Dorlcote "isn't answering so well as it did" (454). There is good reason to doubt whether "new names" will possess the knowledge of farming, milling and river management necessary to maintain these businesses, and thus safeguard the local community through effective river management and a secure food chain.

The Tullivers' connectedness to Dorlcote is contrasted with the narrator's awareness of a generational loss of that same sense of belonging:

> Our instructed vagrancy, which has hardly time to linger by the hedgerows, but runs away early to the tropics, and is at home with palms and banyans—which is nourished on books of travel and stretches the theatre of its imagination to the Zambesi—can hardly get a dim notion of what an old-fashioned man like Tulliver felt for this spot, where all his memories centred, and where life seemed like a familiar smooth-handled tool that the fingers clutch with loving ease. (299)

Nowhere is this "instructed vagrancy" more apparent than in the work of critics who have approached the flood and drownings with which *The Mill on the Floss* concludes as challenges to interpretation and as problems to be solved.[21] Readers whose knowledge of working rivers comes through textual encounters are likely to overlook the inevitable loss of property and life demanded of river dwellers, and, perhaps paradoxically, the sense of community and history these challenges help foster.

Early twentieth-century criticism scrutinized the flood as what Anny Sandrin, writing in a slightly different context, calls "a short-cut to a tragic *dénouement*."[22] E. A. Baker described the flood as a "melodramatic contrivance," and, perhaps most famously, F. R. Leavis declared: "The flooded river has no symbolic or metaphorical value. It is only the dreamed-of perfect accident that gives us the opportunity for the dreamed-of heroic act."[23] As Law observes, for scholars such as Baker and Leavis it is Eliot's seeming adherence to a "realist" agenda elsewhere in the novel that prompts an interrogation of the role of the flood, as "the novel's dominant 'material facts' of river and flood" seem to be at odds with its "abrupt, improbable, and catastrophic ending."[24] More recently, critics have refocused attention on Eliot's careful foreshadowing of the final inundation. Like the arable poetics discussed in the last section, allusions to flooding and drowning are woven into the language and the thematic and emotional currents of the novel; they illustrate states of mind and the internal conflicts that are at the heart of the work—passion, compassion, temptation, vanity, desperation, despair, and forgiveness—to the extent that Larry Rubin goes so far as to claim that "it seems almost artistically impossible for the book to end in any other way."[25]

Both approaches run the risk of forgetting the fact that watermills situated on tidal rivers and their tributaries have always been and always will be prone to flooding, and that people who inhabit those watermills are at risk of drowning during a flood. A mill is not, as Sandrin claims, an example of "buildings erected by men to resist, curb, and even challenge the forces of nature."[26] It is a building powered by the waters that may also destroy it, and the strength of the current kills in more than one way—the millrace spins millstones free, killing millers in the process. The regular surges of water which makes Dorlcote an ideal location for harnessing waterpower also mean that when the Floss's tidal bore coincides with heavy rainfall and winds, flooding and threat to life are not improbable, but inevitable.

Another recent trend in scholarship, then, has been to attend to the "dominant 'material facts' of river and flood" by relating the Floss to actual rivers known to Eliot and to historical instances of floods, storms and drowning.[27] This approach, in which flooding and drowning are shown to be crucial aspects of Eliot's "realist agenda," takes impetus not simply from historicist and ecocritical theorizations, but also in Eliot's and George Henry Lewes's accounts of the process of researching and writing the novel. Attempts to identify the Floss with a single river and Dorlcote with a single mill, and which seek to establish one-to-one correspondences between fiction and fact, are, however, misguided. As we will show, the Floss (together with its tributary, the Ripple) and Dorlcote are many rivers and many mills, gleaned from observation and careful research, and each one provides an essential part of the novel's arable and tidal worlds.

It has long been acknowledged that Eliot's detailed description of life inside Dorlcote Mill, including both the scenes of domestic life and the hard, noisy, and continual work of milling itself, was likely informed by her knowledge of Arbury Watermill in the parish of Chilvers Coton, Warwickshire.[28] Eliot's childhood home, Griff House Farm, was situated on the Arbury Estate, and as a girl she would have had access to the interior spaces of this working watermill.[29] It seems plausible that such striking details as the "floury spider," "spidernets . . . like . . . faery lace-work," "the sweet, pure scent of the meal," and the mill as "a little world apart from . . . outside every-day life" testify to close observation and personal experience, with Maggie Tulliver's childlike sense of wonder closely mirroring that of the young Eliot (30).[30] What critics have not acknowledged is the rich history of contested water rights shared by Arbury and other watermills in Chilvers Coton.[31] To give a couple of examples, in 1601, Margaret Knollys and John Wright

went to court over rights to a nearby watermill, "Milnehamme otherwise Wall greene otherwise Goose greene" (the various names suggest the competing claims), together with the stream which had served the mill for over three hundred years. In the following year, 1602, all six watermills in the parish appear to have been used to drain a flooded coalmine, and in the process "a very good orchard" and adjoining food-producing land seems to have been ruined.[32]

These historical cases are important because they introduce themes that are crucial to the fictional history of Dorlcote Mill: competing water rights; the relationship between watermills used for food processing and other forms of mills and local industries; and the precarious nature of the business of processing and producing food by a river. When Mr. Pivart, who, "having lands higher up the Ripple," takes "measures for their irrigation," Mr. Tulliver suffers an "infringement" of what he believes to be his "legitimate share of water power" (173). There are other instances of customary water rights being compromised by changing practices at watermills upstream.[33] What is crucial in the case of Tulliver vs. Wakem—and what makes it illustrative of the uncertain futures faced by independent businessmen who worked with water in the first half of the nineteenth century—is the fact that the likely impact of technical innovations in river management was impossible to predict. Cases of contested water rights prior to Tulliver vs. Wakem, in which the effects on water flow were more certain, were settled by arbitration, in accordance with Riparian doctrine (the body of laws and precedents concerning water rights).[34] But Riparian doctrine could only adjudicate conflicts of interest created by the known quantities and effects of established technologies, such as dams, watermills, and canals. Tulliver vs. Wakem concerns the long-term impact on land of recent technological advances in irrigation. There were no legal precedents for such a dispute, and the science of hydrography was in its infancy. There is an undeniable logic to Mr. Tulliver's "principle that water was water" (173), and it is difficult to argue with the seemingly innate knowledge of men like him and other mill owners who had been effective river managers for centuries:

> water's a very particular thing; you can't pick it up with a pitchfork . . . It's plain enough what's the rights and the wrongs of water, if you look at it straight-forrard; for a river's a river, and if you've got a mill, you must have water to turn it; and it's no use telling me Pivart's erigation and nonsense won't stop my wheel; I know what belongs to water better than that. (174–75)

But for Pivart, Wakem and even Mr. Deane, water is not simply water, and a river is not simply a river: both are means to profit. Translated to the world of business, and viewed as commodities and energy, water and rivers are no longer "plain" and "straight-forrard"; they are subject to the uncertainties of prediction and interpretation.

What was lacking in Arbury watermill and in the watermills of Chilvers Coton was the vulnerability to tidal forces that is so crucial to *The Mill on the Floss*. Eliot's search for other sources of inspiration for Dorlcote Mill and, specifically, its situation on a flood-prone tidal river seems to have arisen from her decision to conclude the novel with an "*inundation*." Her previous novel, *Adam Bede*, begins with a type of inundation: Thias Bede is drowned in a "brook . . . full almost to overflowing with the late rain," and the flooding of the hay harvest, with the knock-on effect for livestock, is anticipated.[35] The idea of inundation appears to have been Eliot's starting point in developing *The Mill on the Floss*, meaning that the novel was, in a sense, written backwards, with the necessary ending determining all that goes before. In a journal entry for 12 January 1859—Eliot's earliest allusion to this novel—she notes: "We [Eliot and Lewes] went into town [London] today, and looked in the Annual Register for cases of *inundation*."[36] From the *Annual Register*, Gordon Haight observes, Eliot copied into her *Commonplace Book* several "accounts of the disastrous floods of 1770 and 1771, mostly along the Tyne in the north of England"—the Tyne being a tidal river—but also including one at Coventry.[37]

Written accounts could not provide sufficient information about the complex ecological and social systems that coalesce at a tidal watermill. In September 1859, Eliot, accompanied by Lewes, embarked on two research trips. Following Haight, critics have dismissed the first of the two destinations, Weymouth, as seemingly yielding nothing of use to Eliot.[38] Admittedly, Lewes, in a letter to John Blackwood dated 6 September 1859, comments: "Weymouth does not turn out what we wanted."[39] Haight, in his critical edition of *The Mill on the Floss*, quotes this remark in isolation.[40] Read in context, however, Lewes's meaning is rather different:

> although Weymouth does not turn out what we wanted, we made a discovery yesterday which will repay all. G. E. is in high spirits, having found a Mill and Millstream, to his heart's content; and we are going to hire a labourer's cottage for a day or two, and live a poetical primitive life, the results of which will appear in Maggie.[41]

("Maggie" was the working-title of *The Mill on the Floss*.) Whilst Weymouth itself did not provide Eliot with what she wanted, somewhere nearby clearly did. Lewes enlarges on this discovery in his journal entry for the previous day, 5 September 1859: "we . . . went all over a Mill which was kindly shown us by the Miller. This was the very thing for Polly who has a Mill in her new novel and wanted some details."[42] The journal entry is dated from Radipole, a village one-and-a-half miles north from Weymouth. Situated on the Wey, a short river of 8.8 km which rises at the foot of the South Dorset Downs, Radipole takes its name from a lake that leads into Weymouth harbor. The 1860 census for this village lists two working watermills.[43] One, comprising Mill House and Mill Cottage, was worked by Richard Green, miller, who occupied the Cottage with his wife and two daughters, and George Drake, miller, who—with a housekeeper, Margaret Dickenson—is registered at Mill House. The house beside Mill Cottage was occupied by Job Abbott, miller's carter, his wife and three children. A second watermill, Causeway Mill, was the residence of James Blackmore, miller, his wife Elizabeth, Thomas Elsworth, assistant miller, Anne Grabham, general servant, and William Lucas, "Miller (workman)." Three houses adjacent to Causeway Mill were occupied by people who seem to have been employed by the Mill, including Thomas Ellis, miller's carter.

Eliot's trip to Weymouth did, then, yield some significant material for her, although not everything she sought. Whilst Radipole provided interior settings and, perhaps, the intricate network of human relationships necessary for the operation of a watermill, it was not situated on a tidal river and its river was not also used to power mills devoted to the production of material other than food. These factors, which were crucial to Eliot's careful evocation of what happens when the tensions between tidal forces and agrarian landscape are strained to crisis point, seems to have been provided by a second research trip. Later in September 1859, she and Lewes travelled to Gainsborough, Lincolnshire, where they stayed in the house of a shipbuilder on Bridge Street, by the River Trent. In her journal, Eliot notes: "On Monday the 26th we set out on a three days' journey to Lincolnshire and back—very pleasant and successful both as to weather and the objects I was in search of."[44] Gainsborough, as several critics have remarked, provided Eliot with several of the "objects" she was to include in her description of St. Ogg's—the stone bridge, the willow tree and Old Hall, for example.[45] Ironically, what they have not noted is that the only flour-producing mills at Gainsborough in 1859 were windmills,

not watermills. Indeed, the real significance of Gainsborough to the socio-economic and agri-environmental world of *The Mill on the Floss* has been largely overlooked.

The River Floss, like the Trent but unlike the Wey, is a tidal river. The importance of this feature is made evident in the novel's opening lines: "A wide plain, where the broadening Floss hurries on between its green banks to the sea, and the loving tide, rushing to meet it, checks its passage with an impetuous embrace" (3). In particular, the Floss shares with the Trent a feature unusual among English rivers: the tidal bore. The bores, actual and fictional, share the same name: the Aegir. Eliot was able to observe the bore (which reaches a height of approximately 1.5 m) during her stay at Gainsborough, the furthest point inland reached by the Trent Aegir, and thus the place where the sea meets river in "an impetuous embrace."[46] The bore occurs twice each year, at the spring and autumn equinoxes (around 20 March and 22 September respectively, the latter occurring in the same week as the traditional Harvest festival), and Eliot perhaps timed her stay in Gainsborough to have coincided with the latter event. The bore also features twice in the novel: in the opening chapters, the young Maggie and Tom walk alongside "the great Floss . . . to see the rushing spring-tide, the awful Eagre, come up like a hungry monster" (43)—we will return to the river's hunger later in this essay; and, of course, at the novel's conclusion, the mature Maggie looks out on the swollen Floss, flowing "swift with the advancing tide" (583). Maggie's death is explicitly connected to the combination of flood and the autumnal tidal bore, as "the now ebbing tide added to the swiftness of the river" (595). The equinoxes bookend the events described in the novel; determining both the formation of the tidal bore and the farming calendar, they demonstrate the powerful bond between tidal and arable worlds.

The Mill on the Floss is a tidal novel in that its material and metaphorical realities, its flow and level, are informed and shaped by the tide. The Floss's status as a tidal river shapes the land through which it runs; it makes that land fertile, and it offers those who live on its banks a power that is simultaneously productive and threatening. Offering its inhabitants the promise of self-sufficiency, the strength of its waters also endangers that self-sufficiency by enabling import, export and the translation of natural resources into commodities: "On this mighty tide the black ships—laden with the fresh-scented fir-planks, with rounded sacks of oil-bearing seed, or with the dark glitter of coal—are borne along to the town of St. Ogg's" (3). Producers of corn were more likely to use the Trent to transport this staple to

distant markets than to harness its power in order to convert it into flour. The port at Gainsborough had been expanding since 1800 and opened its docks to foreign goods in 1841; the main cargo throughout this period was corn. For Mr. Deane, this trade makes it possible to grow profits—not by increasing yields, but by finding new markets:

> Somebody has said it's a fine thing to make two ears of corn grow where only one grew before; but, sir, it's a fine thing, too, to further the exchange of commodities, and bring the grains of corn to the mouths that are hungry. And that's our line of business . . . (451–52)

Rivers like the Trent supported a complex system of industries which exerted distinct pressures on its waters, banks and floodplain. Gainsborough was home to a number of non-food-producing mills, including an iron mill, cotton mill, and paper mill. It thus provided Eliot with a model for a river capable of supporting light and heavy industries and, equally, bringing disaster—loss of land, home and life—to those who lived and worked on its banks. This decision enabled Eliot to extend her analysis of the crisis in agriculture to consider a related issue: the suspected, but as yet unproven role of industrial mills in increasing instances of flooding in the 1850s and 1860s. Farmers who had their land flooded argued that the effect of heavy rainfall was exacerbated by the increasing "presence of mills whose dams held back the water and raised the water level, causing rivers to flood more easily and more often."[47]

Why did Eliot note that in Gainsborough she found the "weather" she was looking for? One possible reason can be found in newspaper reports of what was called the "Great Inundation," a series of storms and flooding across England over a two-week period in August 1857.[48] Accounts of inundation, such as *Sorrow on the Land: Containing an Account of the Inundation Occasioned by the Bursting of the Bilberry Reservoir, on February 5th, 1852*, made for popular reading matter.[49] Reports of the storms of August 1857 were no exception, and in their emphasis on the damage suffered by mill owners and farmers as well as the blame leveled at the former by the latter, they echo Eliot's dramatization of tensions between these two interests. The author of "Violent Storms and Heavy Floods," an article in the 22 August issue of *The Huddersfield Chronicle and West Yorkshire Advertiser*, observed that "The terrible storm on Friday night seems to have raged over the whole extent of the north, east, and west of England, it having gone over the south of England on the preceding day."[50] The

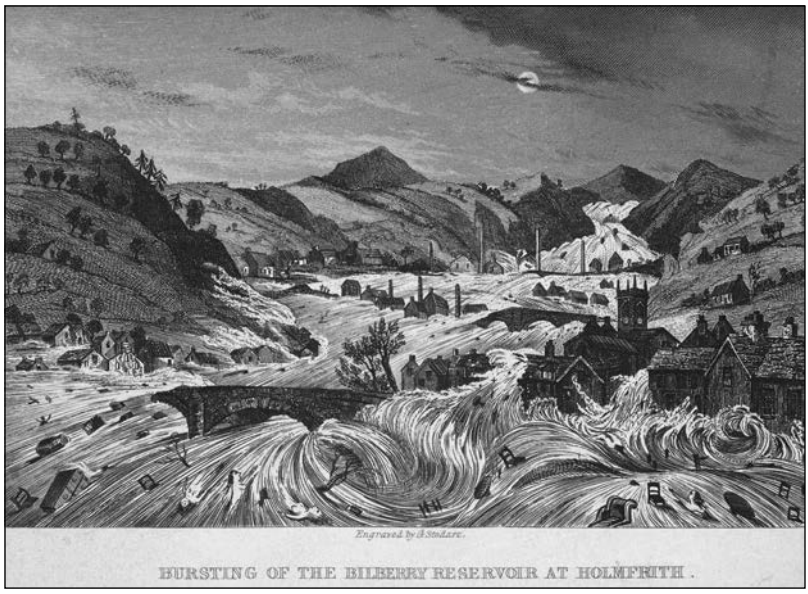

Figure 1. 'Bursting of the Bilberry Reservoir at Holmfirth,' illustrated frontispiece, *Sorrow on the Land: Containing an Account of the Inundation Occasioned by the Bursting of the Bilberry Reservoir, on February 5th, 1852, whereby eighty lives and a large amount of property were destroyed* (London: J. Mason, 1852). © The British Library Board, General Reference Collection 1301.a.15

storm was at its most destructive in the area around Gainsborough and the West Midlands; Nottingham and the towns on the River Trent suffered the worst injury in terms of and loss of life, property and food-producing land.[51] "The Late Thunder Storm and Flood," printed in the *Nottinghamshire Guardian* (20 August 1857), describes "One of the most terrible thunder storms which have ever visited Nottingham . . . [extending] its ravages over the greater part of this and the adjoining counties."[52] The storms and "Great Inundation," which lasted for over two weeks, were judged to be "unprecedented in . . . magnitude and violence since the year 1795."[53] The account published in *The Huddersfield Chronicle and West Yorkshire Advertiser* focuses on the destruction to mills, with substantial damage to stock, dams and machinery (including a "grind stone" which was struck by lightning and cut in half). The rainfall caused the River Trent to rise "to an almost unprecedented height, inundating the whole country for miles round . . . hundreds of acres were under water, and both higher up and lower

down the river the flood prevailed to an even more terrible extent." The floodwaters "rose so high as to invade the kitchens and drive the inhabitants to take refuge in the upper portion of their dwellings," and "The Trent after the storm presented a strange appearance. Its waters, swollen and discoloured by the rain, rushed along with terrible impetuosity, carrying everything before them."[54]

The accounts published in several newspapers focus on the damage done to crops during the all-important harvest.[55] The *Nottinghamshire Guardian* reported that in Walesby, "Old hop diggers prognosticate that next season the grounds which have been under water will prove to their respective owners 'dead hills,'" whilst in Cropwell Butler, "The injury sustained by the crops (which are at present in the field) cannot at present be calculated, but it must be very considerable, as the sheaves appear regularly cotted [sheltered] together, and are fast becoming green ones."[56] Similarly, a correspondent from Doncaster, writing for *The Sheffield and Rotherham Independent* (15 August 1857), notes that where reaping had already gone ahead, "wheat, both cut and uncut, has become sprouted," and that "[t]he present prospect is . . . more serious than for many years past—diminishing the yield of wheat as well as rendering what may be preserved all but worthless for human food."[57]

As well as accounts of the August 1857 storms, Eliot's decision to travel to Gainsborough might have been prompted by a history of the town published in that same year: Thomas Miller's *Our Old Town* (1857). *Our Old Town* is part travel guide, part memoir, as Miller—born and bred in Gainsborough, but part of London's literary circles by 1839—leads his readers through the buildings, streets, characters, traditions and stories of his hometown.[58] Miller's narrator, like Eliot's, writes as a local with intimate knowledge of the buildings and land described; returning to the place of his birth, he also writes about events which took place just over twenty years ago, in the 1830s. Referring to Gainsborough as "Our Old Town" throughout, this is both a particularized and a universalized memoir. As Miller's narrator breaks to sketch local characters and historical vignettes, fact, fiction and half-remembered myth seem to blend: it is the work of a novelist as much as a local historian. Reading Miller's description of Gainsborough as it was (or, rather, as it seemed to its inhabitants) in the first few decades of the nineteenth century, and comparing it with the present reality of 1859, Eliot would have been able to assess both the transformation in ways of living as well as perceptions of those transformations for witnesses caught in the human drama.[59] *The Mill on the Floss* is

positioned on the same threshold of change. As if to acknowledge her indebtedness to Miller, who refers to Gainsborough as "Our Old Town" (rather than by name) throughout his work, Eliot's first mention of St. Ogg's is as "one of those old, old towns" (129).

Although critics have cited Miller's work as a possible source for the feud between Tulliver and Wakem, *Our Old Town* contains other striking echoes of the agri-environmental world of *The Mill on the Floss* and especially its depiction of mills, flooding and food production and processing.[60] The sense of continuity in ownership of a mill that is so important to Tom Tulliver and his father is expressed in an anecdote from *Our Old Town* which contains several telling details that we find in Eliot's description of Dorlcote:

> in one of them [old houses in Gainsborough] I found an early black-letter copy of the works of this ancient English bard [Chaucer], on the fly-leaf of which was a register of the births and deaths of the old family in which this heirloom had so long remained. They were millers four hundred years ago, and their descendants are still in the same trade and the same house . . . Though the family possess no records dating so far back as the erection of the first water-mill, they have documents which show that it had been rebuilt five times before the present windmill, which is very ancient, had been erected. Once it was destroyed by fire, once by flood, which inundated the whole of Our Old Town, and once it was struck by lightning, and twice it had to be rebuilt through sheer decay, as it had all but tumbled to the ground. There are old black-letter sentences cut on the beams of the present building, such as "O Lord, save our mill from thunder, lightning, and the storm." These ancient documents are still kept in an iron-lined and iron-banded chest, called by the family "the ark[.]"[61]

Like the Tulliver family bible, the "black-letter" edition of Chaucer's *Works* contains on its flyleaf a record of generations of millers. Like Dorlcote, the Gainsborough mill has been in the continuous possession of a single family for many generations, and during that time, it has been rebuilt several times in response to both natural disaster and decay. The beams of the mill contain a prayer that could be made to St. Ogg himself. The oak chest with iron lining may remind us of the "old oak chest," with its "iron holder" and smaller "tin box" in which Mr. Tulliver keeps "the deeds o' the house and mill" (251). The name given to that chest, "the ark," reminds the family that deeds, books and memories are all they have to keep them safe from inundation.

One of the most vivid sections of *Our Old Town* is Miller's account of the regular flooding of the farmlands and attempts to minimize

Figure 2. 'A Winter Scene,' from ch. VII, 'Our Old Town Flooded,' Thomas Miller (1857), *Our Old Town* (London: Brown and Co.), p. 163. © The British Library Board, General Reference Collection 12350.d.14

loss of life in town. Gainsborough, he remarks, quoting *Othello*, has suffered "moving accidents by flood and field":

> for in the winter the fields and marshes for miles around were flooded. . . . [T]hese floods made dreadful havoc of both houses and goods, spoiling almost everything in the cellars and on the ground-floors, and throwing, for months after the waters had subsided, melancholy gloom over Our Old Town. . . . In summer, harvests waved up to its very walls, and in winter the wailing of plovers might be heard, when all was still, in its ancient streets . . . for the wide-spreading floods manured the lands, and the spotted heifer lowed knee-deep in the summer grass[.][62]

This description of destruction and despair followed by a healthy harvest growing in the fertile soil left by the flood is perhaps echoed in the conclusion of *The Mill on the Floss*, in which the flood—and,

by implication, the deaths of Maggie and Tom Tulliver—is specifically linked to the health of the arable land by Dorlcote Mill:

> Nature repairs her ravages—repairs them with her sunshine, and with human labour. The desolation wrought by that flood had left little visible trace on the face of the earth, five years after. The fifth autumn was rich in golden corn-stacks, rising in thick clusters among the distant hedgerows; the wharves and warehouses on the Floss were busy again, with echoes of eager voices, with hopeful lading and unlading. (598)

Maggie and Tom are the only deaths to occur as a result of the flood, and critics such as Sandrin see the above passage as Eliot's attempt to particularize the tragedy: "Not being universal, this flood cannot deprive the world of its future," Sandrin concludes.[63]

"Nature," which incorporates "human labour" as well as elemental forces, is impersonal and unsentimental. Nature does not mourn Maggie and Tom, and although this lack of sympathy is at odds with our feelings as readers, we know that life will continue. But there is something darker and more uncertain in this passage which, read in light of the arable and tidal worlds Eliot has so carefully delineated, suggests that many may, in fact, be deprived of a future. It is only the "fifth autumn" that is "rich in golden corn-stacks"—"corn-stacks" indicating that the land is now being worked and harvested. What has happened to the four autumn and five spring harvests before it? Presumably, the land has taken five years to recover sufficiently to be capable of supporting crops. This equates to five years of dearth for those working the land along the Floss. Notably, only the "wharves and warehouses" bustle with life and trade. We are left to wonder what will have happened to the livelihoods of farmers and millers during those years without income and with damage to property in need of repair. The narrator's silence is striking, and the uncertainty we are left with at the novel's conclusion is perhaps illustrative of the situation facing British agriculture at the turn of the 1860s.

III. RIVERS OF CORN

In *An Inquiry into the Connection between the Present Price of Provisions and the Size of Farms* (1773), John Arbuthnot argued for "a free port for corn": "let every act that regards the corn laws be repealed . . . let corn flow like water, and it will find its level."[64] The metaphor of commerce as a river was used by proponents of free trade, and, in particular, advocates of the deregulation of food and commodity prices.

Adam Smith, whose *Wealth of Nations* (1776) was published shortly following Arbuthnot's *Inquiry*, argued for "unlimited, unrestrained freedom of the corn trade" as the "only effectual preventative against the miseries of a famine."[65] Amid the debates in the run-up to the repeal of the Corn Laws, the metaphor was elaborated, with the concept of water finding its "proper course and just level" being associated with flood and inundation.[66] In this rhetoric, water is no longer just water, and its imaginative power is harnessed in order to rebrand trade as an inscrutable force of nature that human beings cannot hope to control.

Coleridge used this metaphor against itself, in order to intervene in the debate and to draw attention to the need to consider the ethical implications of free trade. Responding to a recent published description of "monopolists and farmers" and reports of attacks on mills in protest against high food prices, Coleridge took the metaphor of a river of corn to its logical conclusion:

> I have often heard unthinking people exclaim, in observing differences of price in different parts of the country, What has become of Adam Smith's *level*? I, God knows, am no friend to those hard-hearted comparisons of human actions with the laws of inanimate nature. Water will come to a level without pain or pleasure, and provisions and money will come to a level likewise; but, O God! What scenes of anguish must take place while they are coming to a level! But still the sneer against Adam Smith, as to the simple fact, is absurd. The tide in the rivers Trent and Parrot flows in in a *head*. Now if a spectator should exclaim to a writer on fluids, What has become of your *level* now? Would he not answer, stay and see![67]

"Water will come to a level without pain or pleasure": this passage might remind us of the closing chapter of *The Mill on the Floss*, in which an impersonal nature repairs her damages whilst we, as readers, are cast adrift by the human tragedy. Eliot, like Coleridge, asks us to consider the "scenes of anguish"—the lengthening of the food chain and the breakdown in self-sufficient communities—that will occur if corn prices are deregulated and free trade in natural resources (including water) is allowed. In the context of this essay's discussion of the River Trent as inspiration for the Floss (and the Parrot for the Ripple), Coleridge's mention of the Trent's tidal bore is also suggestive, for it is at the "head," the meeting point of incoming tide and outgoing river that both Gainsborough and Dorlcote Mill are situated.

Dorlcote is positioned at a confluence of many forces—agrarian, tidal, social, industrial, and economic. Without interposing any

ideological agenda, Eliot asks her readers, as Coleridge does his "spectator," to observe and consider what will happen when those forces converge—what forms of knowledge and ways of life will be lost, what familial and local bonds are likely to be broken, who will profit and who will starve, and, importantly, how we might feel about the human lives caught up in this meeting. What, for Coleridge, remained a thought experiment, was happening in the reality of Eliot's Britain.

By considering *The Mill on the Floss* as a response to Coleridge's critique of free trade, this essay suggests one possible answer to the conundrum that is Eliot's reading of Charles Darwin. It is well known that Eliot read Darwin's *On the Origin of the Species* as soon as it was published. She read it whilst writing *The Mill on the Floss*, and her famous critique of *On the Origin of the Species* was made in a letter to Barbara Bodich: "to me the Development theory and all other explanations of processes by which things came to be, produce a feeble impression compared with the mystery that lies under the processes."[68] This critique indicates not disagreement with, nor surprise at the theory, but a disappointment at Darwin's failure to provide sufficient "illustrative facts" with which to impress his concepts on the reader. In *The Mill on the Floss*, Eliot provides something approximating such an illustration, based on her careful research into arable, tidal, and environmental worlds, pressures, and relationships. An important part of that world is the hunger, death, and the desperate scramble for food which Darwin identifies amid the prettiest scenes of nature—what Terry Gifford calls "the cycles and tensions of the dynamics of the creative-destructive universe."[69] For this reason, and because Eliot relates natural disasters to the material and cultural realities of the wider world of trade, industry and commerce, Rosemary Ashton has called *The Mill on the Floss* a "natural history."[70] Eliot's novel demonstrates both her research into the behavior of flowing water and the limitations of our knowledge of "water work" when humans make interventions into the complex ecosystem of a river plain (175).

Earlier in this essay, it was noted that Eliot makes repeated use of parable in this novel. *The Mill on the Floss* is itself a parable, in which the "material facts" of corn and water are inseparable from their figurative associations in the rhetoric of free trade. The narrative arc, which traces a family tragedy, is also a story about the changing significations of corn and water. Arable livings were being consumed by the transformation of agriculture into agri-business. The Floss, a "hungry monster," devours Maggie and Tom, and a generation is lost. As Mr. Glegg observes, when food is a subset of the "money business,"

"you may be taking one man's dinner away to make another man's breakfast" (250).

Aberystwyth University

NOTES

[1] Eithne Henson, *Landscape and Gender in the Novels of Charlotte Brontë, George Eliot, and Thomas Hardy* (Aldershot: Ashgate, 2011), 103.

[2] George Eliot, *The Mill on the Floss* (London: Vintage, 2010), 3, 129. Hereafter cited parenthetically by page number.

[3] On the "post-pastoral," see Terry Gifford, "Post-Pastoral," in Gifford, *Pastoral* (London: Routledge, 1999), 146–74. On agricultural studies in literary and cultural analysis, see Susan M. Squier, "Agricultural Studies," in *The Routledge Companion to Literature and Science*, ed. Bruce Clarke and Manuela Rossini (London: Taylor & Francis, 2012), 242–52.

[4] On "tidal encounters" and "tidal poetics" in nineteenth-century literature, see Damian Walford Davies, "Romantic Hydrography: Tide and Transit in 'Tintern Abbey,'" in *English Romantic Writers and the West Country*, ed. Nicholas Roe (London: Palgrave, 2010), 218–36. The authors would like to thank Professor Walford Davies for his helpful comments and advice on "tidal poetics."

[5] Jules David Law, *The Social Life of Fluids: Blood, Milk, and Water in the Victorian Novel* (Ithaca: Cornell Univ. Press, 2008), 78. In the period 1300–1850, the basic machinery and processes used in the watermill remained much the same. Advances in the technology employed in grain-producing mills during these centuries can be followed in Terry S. Reynolds, *Stronger than a Hundred Men: A History of the Vertical Water Wheel* (Baltimore: Johns Hopkins Univ. Press, 1983).

[6] Law, 79.

[7] For assessments of the crisis in British agriculture in the mid-nineteenth century and its impact on communities, see Alun Howkins, "The English Farm Labourer in the Nineteenth Century: Farm, Family and Community," in *The English Rural Community: Image and Analysis*, ed. Brian Short (Cambridge: Cambridge Univ. Press, 1992), 85–104 and Michael Winstanley, "Agriculture and Rural Society," in *A Companion to Nineteenth-Century Britain*, ed. Chris Williams (Oxford: Blackwell, 2008), 205–22.

[8] James Caird, *English Agriculture in 1850–51*, 2nd ed. (London: Longman & Co., 1851), sig. A1^{r}.

[9] See Dwight H. Purdy, "The Wit of Biblical Allusion in *The Mill on the Floss*," *Studies in Philology* 102.2 (2005): 241. The Old Testament passage is Lev. 19:19, "Thou shalt not sowe thy field with mingled seed."

[10] Purdy, 241–42.

[11] On the agricultural significance of this parable in ancient Jordan and Syria, see Lytton John Musselman, "Zawan and Tares in the Bible," *Economic Botany* 54.4 (2000): 537–42. For the parable as a commentary on the relationship between heresy and orthodoxy, see Robert K. McIver, "The Parable of the Weeds among the Wheat (Matt. 13: 24–30, 36–43) and the Relationship between the Kingdom and the Church as Portrayed in the Gospel of Matthew," *Journal of Biblical Literature* 114.4 (1995), 643–59.

[12] See, for example, *General View of the Agriculture of the County of Suffolk*, 3rd ed., ed. Arthur Young (London: Richard Phillips, 1804), 90–93 and *General View of the Agriculture of the County of Oxfordshire* (London: Sherwood, Neely, and Jones, 1813), 162–65.

[13] See, for example, David Moore, writing of "Darnel" in 1843: "This is the only one of our British grasses which is deleterious, and therefore rather to be avoided than encouraged" (*Concise Notices of British Grasses, Best Suited for Agriculture*, 2nd ed. [1843; repr. Dublin: James McGlashan, 1850], 58).

[14] John Wesley, *Explanatory Notes upon the New Testament*, ed. William Nicholson, 4th ed. (New York: J. Soule and T. Mason, 1818), 59n25.

[15] M. A. Courtney and Thomas Q. Couch, *Glossary of Words in Use in Cornwall* (London: English Dialect Society, 1880), 20; cited in David C. Fowler, "John Trevisa and the English Bible," *Modern Philology* 58.2 (1960): 95n72.

[16] See Sally Shuttleworth, *George Eliot and Nineteenth-Century Science: The Make-Believe of a Beginning* (Cambridge: Cambridge Univ. Press, 1984), 60.

[17] See Geoffrey Chaucer, "The Reeve's Tale," in *The Riverside Chaucer*, ed. Larry D. Benson, 3rd ed. (Oxford: Oxford Univ. Press, 2008), 78–84 and Tobias Smollett, *Humphry Clinker* (London: Penguin Classics, 2008). Smollett's narrator claims that "the miller, or the baker, is obliged to poison [the public] and their families, in order to live by his profession" (136).

[18] Alluding to Lev. 19:19, Philip Wakem laments the fact that his classical education has left him inexpert in any single area: "I think of too many things—sow all sorts of seeds, and get no great harvest from any one of them" (371).

[19] This displacement is reiterated in a proverbial saying quoted on two occasions by Mr. Glegg: "When land is gone and money's spent / Then learning is most excellent" (78, 241). It might allude to a passage from Genesis—one which returns us to the theme of food supply: "And when money failed in the land of Egypt, and in the land of Canaan, all the Egyptians came vnto Joseph, and said, Giue vs bread: for why should we die in thy presence: for the money faileth." (Gen. 47:15)

[20] N. N. Feltes, "Community and the Limits of Liability in Two Mid-Victorian Novels," *Victorian Studies* 17.4 (1974): 356.

[21] Mrs. Moss exclaims: "'I'm sorry to see brother so put out about this water work'" (175).

[22] Anny Sandrin, "Time, Tense, Weather in Three 'Flood Novels': *Bleak House*, *The Mill on the Floss*, *To the Lighthouse*," *The Yearbook of English Studies* 30 (2000): 98.

[23] Ernest Albert Baker, *The History of the English Novel, Vol. 8: From the Brontës to Meredith* (New York: Barnes & Noble, 1937), 247; F. R. Leavis, *The Great Tradition: George Eliot, Henry James, Joseph Conrad* (London: Chatto & Windus, 1948), 45. Kathleen Blake responds to criticism of the "drastic, even perhaps overstrained" ending of the novel ("Between Economies in *The Mill on the Floss*: Loans versus Gifts, or, Auditing Mr. Tulliver's Accounts," *Victorian Literature and Culture* 33 [2005]: 231). This trend in criticism is summarized and discussed by Larry Rubin, "River Imagery as a Means of Foreshadowing in *The Mill on the Floss*," *Modern Language Notes* 71 (1956): 19–20.

[24] Law, 73.

[25] Rubin, 19. On the significance of river imagery in the novel, see also Richard Kerridge, "The Moving Waters of Rivers," in Sue Ellen Campbell and others, *The Face of the Earth: Natural Landscapes, Science and Culture* (Berkeley: Univ. of California Press, 2011), 135–45, esp. 140.

[26] Sandrin, 104.

[27] See, for example, Kathleen McCormack, *George Eliot's English Travels: Composite Characters and Coded Communications* (London: Taylor & Francis, 2005), 87–88 and Brian Lancaster, "George Eliot's Other River," *Notes and Queries* 54 (2007): 150–51. McCormack argues that the Thames influenced Eliot's representation of the Floss, and Lancaster identifies the Wandle (a tributary to the Thames), together with the case of Chasemore vs. Richards (1853–59) as a model for the Tulliver vs. Wakem case.

[28] See Peggy Fitzhugh Johnstone, *Transformation of Rage: Mourning and Creativity in George Eliot's Fiction* (New York: New York Univ. Press, 2012), 41 and Nuneaton and Bedworth Borough Council, "George Eliot Country: A Guide" (2008), 12, http://www.nuneatonandbedworth.gov.uk/download/. . ./george_eliot_country/.

[29] Arbury Watermill is now a Grade 2 listed building. A description can be found on the British Listed Building online database, http://www.britishlistedbuildings.co.uk/en-308567-arbury-mill-warwickshire.

[30] Dorothy Dodds, *The George Eliot Country* (Nuneaton: Nuneaton Borough Council, 1966), 16–18. Other mills in Chilvers Coton, mostly dating from the sixteenth and seventeenth centuries, are detailed in the relevant volume of *Victoria County History*: "Parishes: Chilvers Coton," in *A History of the County of Warwick: Volume 4: Hemlingford Hundred*, ed. L. F. Salzman (1947), 173–78, http://www.british-history.ac.uk/report.aspx?compid=42675.

[31] These cases and others are summarized in "Parishes: Chilvers Coton."

[32] National Archives, Kew [NA], Chancery Proceedings Series 2, C3/293/5; NA, Feet of Fines, Warwickshire Eas., CP 25/2, 16 Jas. I.; NA, Chancery Proceedings Series 1, Jas. I, F. 4/53; NA, Chancery Proceedings Series 2, C3/293/5; NA, Chancery Proceedings Series 1, Jas. I. G. 4/47.

[33] For examples, see Steven L. Kaplan, *Provisioning Paris: Merchants and Millers in the Flour and Grain Trade during the Eighteenth Century* (Ithaca: Cornell Univ. Press, 1984), 225. Owners of watermills who diverted water for their own use were guilty of "hoarding" water—a crime equivalent to "hoarding" grain or other staples.

[34] On the development of Riparian doctrine in the early nineteenth century, see Joshua Getzler, *A History of Water Rights at Common Law* (Oxford: Oxford Univ. Press, 2004).

[35] Eliot, *Adam Bede*, ed. Carol A. Martin (Oxford: Oxford World's Classics, 2008), 36. On the latter point, Seth Bede remarks: "It'll be a sore time for th'haymaking if the meadows are flooded again. The brook's fine and full now: another day's rain 'ud cover the plank, and we should have to go round by the road" (47–48). This close correlation between a drowning and a ruined harvest is precisely what we find, amplified, at the conclusion of *The Mill on the Floss*.

[36] Eliot, *The Journals of George Eliot*, ed. Judith Johnston and Margaret Harris (Cambridge: Cambridge Univ. Press, 1998), 86.

[37] Gordon S. Haight, introduction to Eliot, *The Mill on the Floss*, ed. Haight (Oxford: Clarendon Press, 1980), xiii. The accounts were taken from the *Annual Register* 13 (1770): 167–68 and *Annual Register* 14 (1771): 155–60. Eliot's transcriptions are Beinecke Library, Yale University, New Haven, CT: Register of the George Eliot and George Henry Lewes Collection, iv. 6, fol. 77–81.

[38] See, for example, Johnstone, 41.

[39] George Henry Lewes to John Blackwood, 6 September 1859, in *The George Eliot Letters*, ed. Haight, 7 vol. (New Haven: Yale Univ. Press, 1954–55), 3:145.

[40] Haight, v.

[41] Lewes to Blackwood, 6 September 1859, in *The George Eliot Letters*, 3:145.

[42] Lewes, "Weymouth Journal," 5 September 1859, in *The George Eliot Letters*, 3:148.

[43] A transcription of the 1861 census for Radipole is available online: http://www.opcdorset.org/RadipoleFiles/Radipole1861censusOPC.html.

[44] Eliot, *The Journals of George Eliot*, 80.

[45] See, for example, Nancy Henry, *George Eliot: A Critical Biography* (Chichester: John Wiley & Sons, 2012), 112.

[46] Richard Stone, *The River Trent* (Chichester: Phillimore & Co., 2005), 9, 124.

[47] Lancaster, 151. See also Kaplan, 227.

[48] "The Late Thunder Storm and Flood," *Nottinghamshire Guardian* 596 (20 August 1857), 7. Lancaster notes that "the years 1852, 1853, and 1860 saw serious flooding in England and Wales as rivers burst their banks and inundated farmland," but he neglects to mention the storms of August 1857 (151).

[49] See *Sorrow on the Land: Containing an Account of the Inundation Occasioned by the Bursting of the Bilberry Reservoir, on February 5th, 1852, whereby eighty lives and a large amount of property were destroyed* (London: J. Mason, 1852). The work is attributed to "A Wesleyan Minister."

[50] "Violent Storms and Heavy Floods," *The Huddersfield Chronicle and West Yorkshire Advertiser* 387 (22 August 1857), 7. See also "Very Heavy Floods, This Morning," *The Huddersfield Chronicle and West Yorkshire Advertiser* 386 (15 August 1857), 8. Reports from other parts of the country include "Destructive Storm at Whitby and Neighbourhood" and "Terrific Storm at Scarbro," *The York Herald* 4425 (15 August 1857), 11; "The Late Storms," *Lloyd's Weekly Newspaper* 769 (16 August 1857), 7; "Heavy Thunderstorms," *Liverpool Mercury* 3022 (17 August 1857); "The Late Thunderstorm," *The Morning Chronicle* 28284 (17 August 1857), 5; "Violent Storms," *The Morning Post* 26093 (17 August 1857), 6; "Great Floods," *The Leeds Mercury* 6678 (18 August 1857), 4; "The Late Violent Thunder Storms," *Caledonian Mercury* 211 (18 August 1857); "The Late Terrific Storm," *The Belfast News-Letter* 12847 (19 August 1857); "The Great Floods of Thursday and Friday Last," *The Derby Mercury* 3422 (19 August 1857), 8; "The Thunder Storm Last Week," *The Leicester Chronicle* (19 August 1857), 1; "The Thunderstorms and Floods," *Liverpool Mercury* 3023 (19 August 1857), 6; "Storm and Railway Accident," *The Essex Standard, and General Advertiser for the Eastern Counties* 1392 (19 August 1857); "The Late Storm in England," *Glasgow Herald* 5804 (19 September 1857), 3; "Violent Storms: Loss of Life and Property," *The Bradford Observer* (20 August 1857), 3; "Violent and Destructive Thunder Storms," *Plymouth and Cornish Advertiser* 4787 (20 August 1857), 8; "The Late Storms," *The Essex Standard* 1392 (21 August 1857); "The Late Storms," *The Hull Packet and East Riding Times* 3789 (21 August 1857), 6; "Violent Storms," *The Newcastle Courant* 9530 (21 August 1857), 5; "Tremendous Storm and Enormous Destruction of Property," *The Royal Cornwall Gazette, Falmouth Packet, and General Advertiser* 2826 (21 August 1857), 6; "The Late Storms," *Berrow's Worcester Journal* 8075 (22 August 1857), 6; "Tremendous Floods Last Saturday," *Manchester Times* 804 (Saturday 22 August 1857); "Violent Thunderstorms," *Cheshire Observer and General Advertiser* 182 (22 August 1857), 8; "Tremendous Storm and Destruction of Property," *The Ipswich Journal* 6172 (22 August 1857); "Extraordinary Floods," *The Lancaster Gazette* 3672 (22 August 1857), 6; "Great Floods," *The Leeds Mercury* 6680 (22 August 1857), 10; "The Violent Storm—Alarming Railway Accident," *The Huddersfield Chronicle and West Yorkshire Advertiser* 387 (22 August 1857), 6; "Great Floods" and "The Late Storm at Work," *The York Herald* 4426 (22 August 1857), 10.

[51] "Heavy Storms and Flood at Manchester," *Daily News* 3511 (17 August 1857) describes the destruction of a cotton mill and damage to crops. "Destructive Flood

in Manchester," *The Morning Post* 26093 (17 August 1857), 6 focuses on the damage suffered by mills situated along the River Medlock.

[52] See "The Late Thunder Storm and Flood," *Nottinghamshire Guardian* 596 (20 August 1857), 7. Eyewitness accounts were published in the letters pages of *The Times*.

[53] "The Late Thunder Storm and Flood," 7.

[54] *The Huddersfield Chronicle and West Yorkshire Advertiser* 387 (22 August 1857), 6.

[55] See, for example, "The Corn Trade During the Past Week," *Daily News* 3518 (25 August 1857), 8; "The Harvest," *The York Herald* 4427 (29 August 1857), 9; "The Harvest Prospects," *The Leeds Mercury* 6681 (25 August 1857), 3; "Review of the Corn Trade," *Cheshire Observer and General Advertiser* 183 (29 August 1857), 6; and "The Weather and the Crops," *The Sheffield and Rotherham Independent*, 1973 (15 August 1857), 7.

[56] *Nottinghamshire Guardian* 596 (20 August 1857), 7. The long-term effects of the nationwide destruction of harvests were inflation of corn prices—meaning sizeable profits for those farmers who had been able to save their crops—and an influx of cheap supplies from the US. For contemporary reports, see "Profits of Farming," *Bell's Life in London and Sporting Chronicle* (12 February 1860), 3.

[57] "The Weather and the Crops," 7.

[58] Miller was born and raised in Gainsborough, but from 1835 he was based in London. Eliot and Lewes owned one of Miller's earlier works, *Beauties of the Country; or, Descriptions of Rural Customs, Scenery, and the Seasons* (1837). See William Baker, *The Libraries of George Eliot and George Henry Lewes* (Victoria, BC: English Literary Studies, Univ. of Victoria, 1981), item 645, page 93.

[59] On Gainsborough in the first two decades of the nineteenth century, see Ian Waites, *Common Land in English Painting, 1700–1850* (Woodbridge: Boydell Press, 2012), 110–12.

[60] Among his character sketches, Miller tells the true story of a miller who, having "spent fifty golden pieces in carrying on a lawsuit against the owner of the water-works in his day" and on losing the trial, fought and then assaulted his adversary (Thomas Miller, *Our Old Town* [London: Brown and Co., 1857], 133–34).

[61] Miller, *Our Old Town*, 25–26.

[62] Miller, *Our Old Town*, 181–82. The quotation "moving accidents by flood and field" is from William Shakespeare, *Othello*, act 1, scene 3, line 13.

[63] Sandrin, 103.

[64] John Arbuthnot, *An Inquiry into the Connection between the Present Price of Provisions and the Size of Farms* (London: Printed for T. Cadell, 1773), 88.

[65] Adam Smith's "digression concerning the Corn Trade and Corn Laws" is in book 4, chapter 5 of *The Wealth of Nations* (*The Wealth of Nations: Selected Edition*, ed. Kathryn Sutherland [Oxford: Oxford World's Classics, 2008], 325).

[66] Thomas Hodgskin, *Popular Political Economy* (London: C. Tait, 1827), 218. See, for example, Thomas Hodgskin, *Popular Political Economy* (London: C. Tait, 1827), 217, 218; William Jacob, *Tracts Relating to the Corn Trade and Corn Laws* (London: John Murray, 1828), 17; *On the Corn Laws, by an Essex Farmer* (London: John and Arthur Arch, 1834), 33; James Charles Dalbiac, *A Few Words on the Corn Laws* (London: John Ollivier, 1841), 26.

[67] Samuel Taylor Coleridge, Letter to the Editor of *The Morning Post*, 8 October 1800, in Coleridge, *Essays on His Times in The Morning Post and The Courier, Part 1*, ed. David Vorse Erdman (London: Routledge, 1978), 255. In *The Courier*, 30 May 1811, Coleridge wrote: "*Things* may find their level; but the *minds* and bodies of

men do not" (*Essays on His Times in The Morning Post and The Courier, Part 1*, ed. Erdman, 255n8).

[68] Eliot to Barbara Bodich, 5 December 1859, in *The George Eliot Letters*, 3:227. See K. M. Newton, "Eliot's Critique of Darwinism," in *Modernizing George Eliot: The Writer as Artist, Intellectual, Proto-Modernist, Cultural Critic* (London: A&C Black, 2011), 7–26.

[69] Gifford, 154.

[70] Rosemary Ashton, *The Mill on the Floss: A Natural History* (Boston: Twayne Publishers, 1990).