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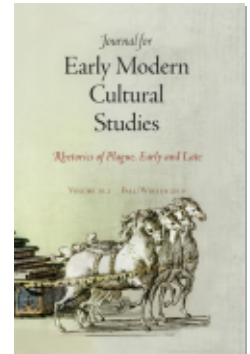
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OF MICE AND MOISTURE: Rats, Witches, Miasma, and Early Modern Theories of Contagion

LUCINDA COLE

ABSTRACT

*A common assumption in scholarship on the plague is that early moderns failed to appreciate any etiological relationship between rats and disease. This assumption is complicated when plague is regarded as an instance of biblical “pestilence,” an unstable term that can and does include famine, corrupted air, murrains, crop failures, and swarming animals. Within this theologically driven context, rats function in two ways: culturally, as mirrors of lustful, soulless, gluttonous, forever-multiplying human beings; naturally, as agents of famine, as symptoms of putrified air, or as warm-blooded disease vectors. In their obscure origins and in their ability to inflict harm on the human population both directly and indirectly, rodents bear an analogous and even homologous relationship to witches who, as King James puts it in his *Demonology*, are “like the Pest” (50). This essay explores the connection between rats and witches in several key texts to demonstrate how distinctions between the natural and supernatural essential to nineteenth-century germ theory were in the process of being defined during the early modern period.*

In sixteenth-century England, plague, the witchcraft craze, and several reported rat infestations corresponded with a period of climatological instability.¹ The period between 1350 and 1850 was characterized by a general cooling, bringing about what archaeologist Brian Fagan calls “a lethal mix of misfortunes”: famine, serial epidemics, bread riots, and chaos. “Witchcraft accusations soared,” he points out, in England and France the greatest number of prosecutions occurring in the severe weather years of 1587 and 1588 (91).² Drawing on Fagan’s analysis, economist Emily Oster argues that, “in a time period when the reasons for changes in weather were largely a mystery” (216), witches readily served as a scapegoat for deadly climatic

patterns and the crop failures and diseases that accompanied both; she demonstrates a correspondence between the rise of European witchcraft trials and temperature fluctuations during the Little Ice Age. This environmental context for the identification and prosecution of witches, often overlooked by historians of witchcraft more focused on national and sociopolitical factors, is crucial to understanding how witches, rats, and plague became associated in the early modern imagination as part of a developing theory of contagion.³

This essay examines the ways in which rats, the plague, and witches were tied to beliefs about fetid or otherwise corrupt air supposedly generated from the earth. Rodents and witches are also dialectically linked—at least in the popular imagination—to unnatural or uncanny modes of reproduction. Even today, as John Kelly points out, the transmission of human plague can be puzzling; its chain of infection is highly mediated and can take several, not always predictable, forms. In one of the more common, a rat community's food supply has been disrupted by "ecological disaster"; the rats search for food in human settlements and, as infected rodents succumb to the plague, the parasitical flea *X. cheopis* is driven to find other hosts (19). Once infected, humans easily spread the disease. Surrounded by death, famine, and disease but without the benefit of germ theory, both elite and nonelite writers during the sixteenth and seventeenth centuries recognized that plague was spread through contact, often with animals, but cast about for etiological explanations. In drawing on classical and biblical sources, they struggled to reconcile those authorities with empirical evidence and a nascent, contemporary tradition of naturalistic, rather than purely metaphysical, explanations. Supernatural explanations of the plague vied with material analyses, and especially with theories of "bad air," that marked the corruption of a fallen, postlapsarian earth.

William Austin's *Epiloimia epe or Anatomy of the Pestilence* (1666) offers a compendium of etiological theory—Lucretian, Aristotelian, and Galenic—reframed for and resituated in a Christian worldview. This poem discloses some of the ways in which rats, plague, bad air, and witches were entangled in complex, often recursive analyses in which metaphysical and material explanations are both distinguished and conflated. Austin argues that the plague first appeared after the Flood; while initially a sign of God's "indignation" (57), subsequent plagues can be perceived as endemic to a fallen world. After raising the Lucretian theory of "plague seed" (50)—according to which the plague is thought to breed in "pregnant" or "cloudy" air

(50)—Austin considers what appears to be a notion of *anima mundi* wherein “Mother Earth” is a living, breathing, consuming, farting entity:

Our *Mother Earth* some reckon such a flat,
As *pudding* makes, and never washes *gut*:
Eats carrion and digests not, then at last
Belches and blows us backward with the blast. (53)

In this image (possibly recalling the London earthquakes of 1649 and 1650), the living earth gives up her dead, putrifying, undigested things in a “blast” of bad air. Following the earthquake comes a famine. While Mother Earth can provide a “kinde embrace,” (54) she also, and unpredictably, becomes niggardly, giving food “onely fit to choke us” so that we are “starv’d at nurse” (54). In Austin’s vision of an ailing world, humans are a microcosm of their mother: “we must languish and be sick as ill as she” (55).

In another respect, this description seems indebted to Virgil’s *Aeneid*, a text Sheila Barker argues is largely Aristotelian: pestilence is but “one symptom,” she writes, “of nature’s universal degeneration and corruption, a cycle initiated in the heavens and permeating all the lower spheres” (664). Yet Austin relocates the plague to a Judeo-Christian context, invoking the time-worn narrative that leads from Eve, through the daughters of Gaia and Uranus, to contemporary witches. Insisting that “cruel diabolical intent” may be “wrought by the weakest instrument,” Austin argues that woman first “curst the earth,” which “may be cursed still”: “Furies are females,” he declares, “and who Furies made, / Gave them their whips to labor in their trade” (55). Even as they are situated within an environmental context of the corrupted air and bad harvests of a fallen earth, witches become “the *King of Mischiefs* agents” in spreading contagion:

Records will tell you *Plague*’s an *hellish* itch.
That first attacks a *sorcerer* or *witch*.
No matter *in what manner* they receive it,
Whether as *pain* or *pleasure*, so they give it. (55)

If sorcerers and witches are not the only cause of plague, given their alliance with the Devil, they are its first victims and the source of subsequent contamination.

While it is difficult to know which particular documents or “*Records*” about witchcraft Austin had in mind, this semiotic constellation among

witches, decay, and plague goes back at least to the fifteenth century. In his *On the Demon-Mania of Witches* (1580), for example, Jean Bodin reports on four would-be witches in Constance whom peasants accused of stirring up a storm that, in his words, “ruined the fruit for four leagues around” (136). Bodin—whose work, as James Sharpe notes, was “very influential, especially among English writers” (22)—claims that Satan will often try to take credit for natural disasters, sometimes convincing his witches that “they bring, or drive away the plague and tempest and the famine” (136) when he has simply accurately predicted a God-given storm. “Very often,” however, Bodin continues, the witches are responsible (136) and one must guard against them as one would the plague. Demonstrating the view that religious faith can mitigate or overcome all kinds of contagion, Bodin argues for good spiritual husbandry. “For as long as blasphemies on the one hand and atheism on the other have credit,” he warns, “one must not hope to drive away evil spirits, nor plagues, nor wars, nor famine” (145). Then in a revealing simile, Bodin equates witches with “vermin,” a category that includes toads, caterpillars, and flies:

Not that it is possible to drive witches away completely without there always being some, who are just like toads and grass-snakes on the ground, spiders in houses, caterpillars, and flies in the air who are engendered by corruption and who attract the poison from the earth, and the infection from the air. But well cultivated land, purified air, and cleared trees are not so subject to this infection. And if one lets the vermin multiply, it engenders corruption and infects everything. (145–46)

“Engendered by corruption,” witches, like vermin, invite or impel plague-like conditions: they “attract the poison from the earth, and the infection from the air.” In this respect, they are catalysts for the kinds of ecological and epidemiological conditions that can be rectified, to some extent, by “purif[ying]” the air through cultivation and reclaiming waste lands, including forests, for productive uses.⁴

Although accounts of the plague within natural philosophy may not have emphasized the status of witches as disease vectors, they retained Bodin’s sense that vapors can carry good and evil. Drawing upon humoral theory, Thomas Lodge explains infection in such terms in his famous treatise on the plague, published in 1603. “Contagion,” writes Lodge, “is an evil qualitie in a bodie, communicated unto an other by touch, engendring one and the same disposition in him to whom it communicated” (sig. B2v). Plague, he writes,

proceedeth from the venemous corruption of the humours and spirits of the body, infected by the attraction of corrupted aire, or infection of evil vapours, which have the property to alter mans bodies, and poyson his spirits after a straunge and dangerous qualitie. (sig. B2v)

Ecological disruption (“corrupted aire”) is internalized as communicable disease, “the venemous corruption” that infects and disseminates. In natural philosophy, then, as in Bodin’s polemical text, distinctions between the natural and spiritual or psychological are characteristically blurred and undermined; there is little substantive difference between Bodin’s “infection from the air” and Lodge’s “infection of evil vapours,” except that where Bodin blames the influence of Satan, Lodge focuses on heat. “Pestilent sicknesses,” the latter claims, will be “troubled with thicke, cloudy, moyst, and ill smelling vapours,” with the wind coming from the warm south (sig. C2v). Such warm moistness brings with it what Lodge calls “such creatures as are engendered of putrifaction” or “foretokening putrifaction and corruption in the earth” (sig. C2v). In this instance, Lodge alludes to the popular belief that, like some other “imperfect creatures,” such as snakes and frogs, mice and rats do not require copulation in order to procreate, but can reproduce spontaneously under the right climatic conditions, primarily heat and moisture.

This assumption, which can be found in Ovid’s *Metamorphosis*, is repeated in one of Europe’s most important sixteenth-century texts of natural philosophy, Giambattista Della Porta’s neo-Pythagorean *Natural Magick* (1584). Della Porta, citing Pliny, among others, claims that “Mice are generated of Putrefaction”; after the flooding of the Nile, mice emerged, “their fore-parts living and their hinder parts being nothing but earth” (28). Admitting of “some dispute among the Authors,” Edward Topsell reproduces Pliny’s account in his *Historie of Foure-Footed Beastes* (1607): “the generation or procreation of Myce, is not onely by copulation, but also nature worketh wonderfully in engendering them by earth and small showers” (506).⁵ Rats, in his view, “belongeth also to the rank of mice” and are similarly creatures of putrefaction; their long and “venomous” tail “seems to partake with the nature of Serpents” (519). Plague, rats, and mice, then, are thought to have a common origin—corrupt, warm, and humid air from the earth. Rats and mice share the status of “imperfect” creatures with frogs, toads, worms, and scorpions, and are similarly thought to be capable of spontaneous generation; as Topsell puts it elsewhere, such creatures may “be engendered by seed and putrified matter and afterwards beget more of his owne kind” (542). We

see in such accounts how vermin are cast as mediating agents within the self-generating and self-perpetuating cycles of bad weather, environmental stress, corrupted air, moral degeneration, and communicable disease that haunt the early modern imagination. Differences among authors about the precise causes and effects of epidemics, vermin infestations, and ruined harvests tend to be subsumed within these larger presuppositions about miasmatic pollution.

VERMIN IN *MACBETH*

It would be convenient to argue that, under the empirical imperatives of seventeenth-century natural philosophy, Bodin's metaphorical vermin of contagion were replaced by literal ones, as scientists began to recognize a relationship between rats and disease. Perhaps a few did. In her informative article on plague and Continental art, Barker repeats the contention that, as early as the fourteenth century, travelers in Europe had observed an association between shipboard rats and the spread of plague, a context she uses to examine rat infestations in paintings by Raphael and Poussin; another example, Vincenzo Cartari's 1556 *Le imagini de I dei de gli antichi*, she claims, offers what appears to be a "scientific explanation," linking dead rats to pestilence (665). Yet, while such depictions certainly exist, it is also true that European literature includes few accounts of rat die-offs that, for many other cultures, operated as a tell-tale sign of the plague.⁶ Instead, English texts treat rats in one of two ways: either as the vehicles of a God-given pestilence associated with famine, or as emissaries of demonic forces associated with spiritual contagion. And neither, to borrow Diane Purkiss's phrase, seems to demonstrate "empiricism's triumph over the supernatural" (201). In 1664, for example, John Barrow recounted the story of his son's possession by demons appearing in the form of rats and tempting the son with "Pasties," or sweet food. "Then they would demand his Soul," writes Barrow, "bidding him give it to the Devil, but he refused to condescend to them" (60). Because rats are frequently vilified as competitors for food supplies, particularly grain, Barrow's demons offer a diabolical image of food hoarding, underscoring the characteristic conflation of metaphysics and materiality, damnation and privation. Rats, witches, and spiritual contagion similarly figure in William Drage's 1665 treatise *Daimonmageia*, which includes cases of witches sending their "Imps, or young Spirits, into some, sometimes in form of Mice, sometimes of Flies" (15) who then bewitch cattle, men, "Plants and Fruits of the Earth" (16). Such documents evidence what, in *Instruments of Darkness*,

Sharpe calls “practical demonology,” his attempt to describe a hybrid phenomenon erased in many contemporary discussions of witchcraft (101). Unlike “Continental versions” of witchcraft (presumably characterized by sabbats and pacts with Satan reported by elite or learned texts), or “English” ones (presumably associated with *maleficium* or village bewitchings), folk demonology, argues Sharpe, “did not lay too great emphasis on the devil,”

yet saw witches as his agents and placed them in the great struggle between good and evil, between God and Satan, which was central to the learned demonologists. . . . They were people who had entered into some sort of compact with evil and occult forces and were dangerous; people who had lost their own souls to the devil and were all too ready to harm those who had not. (101)

That the danger of these witches is often, even characteristically, figured in terms of the threats they pose to food supplies underscores their affiliation with Barrow’s demon rats. Along with rats, storms, killing frosts, blasted harvests, and drought are the environmental arsenal of the demonic in the early modern folk tradition.

Macbeth exploits the associations between natural and spiritual contagion, drawing upon practical demonology and miasma theory to stage imaginistically the relationship among vermin, plague, and witches. Shakespeare’s tragedy was written and first performed, as far as we can tell, sometime between 1605 and 1607 during the height of one of London’s plague seasons.⁷ As F. P. Wilson notes, the language Ross uses to describe Macbeth’s Scotland could very well have been used to characterize plague-ridden London (98), where “sighs and groans and shrieks that rend the air / Are made, not marked” and

. . . where violent sorrow seems
A modern ecstasy. The dead mans knell
Is there scarce asked for who, and good men’s lives
Expire before the flower’s in their caps,
Dying or ere they sicken. (4.3.169–74)

References to pestilence are apparent throughout the play. Storms, murrains, and crop failures are the calling cards of the three witches in act 1. A “feverous” earth and crop failures are alluded to in act 2, and again in act 4. Throughout, Macbeth’s rise to power is cast as a kind of epidemiological horror, contagion in the body politic mirroring that of the natural world.

The most insistent patterns of imagery pertain to atmospheric conditions and miasma. Banquo describes miasma as giving rise to the witches—the “earth hath bubbles, as the water has / and these are of them” (1.3.79–80)—and Hecate, their queen, announces her plan to “raise . . . artificial sprites” (3.5.23) out of a moondrop “distilled by magic slights” (3.5.26). Hecate’s “little spirit,” her imp, “sits in a foggy cloud” (3.5.34–35). “Fair is foul and foul is fair,” cry all three witches, “Hover through the fog and filthy air” (1.1.11–12). That language is ambiguous: in addition to describing a moral climate in which what appears innocent may in fact be evil, the interchangeability of “fair” and “foul” may also reflect the instability of the “filthy air” during the Little Ice Age, when persistent storms off the North Sea battered the Scottish Lowlands and England.⁸ In any case, the cold and rainy climate of Macbeth’s Scotland foreshadows and evokes a chain of miasmatic associations that bind ecological, moral, and physiological corruption. Moral, political, and ecological contagion, in other words, are imagined in mutually constitutive terms. “Infected be the air” whereon the witches “ride,” curses Macbeth, and “damned all those that trust them” (4.1.115).

Macbeth reinforces a theocentric view of multiplying “evil” where swarming vermin play much the same role in the spiritual as they do in the ecological economy. The traitor Macdonwald, for instance, is described as a kind of breeding ground for the carriers of pestilence, the flies and vermin that carry moral corruption as well as disease: “Worthy to be a rebel, for to that / The multiplying villainies of nature / Do swarm upon him” (1.2.10–12). Like Bodin’s creatures of putrefaction, the witches in this play attract “poison from the earth, and the infection from the air,” but Bodin’s is not the only source for this connection between witches and miasma. James I’s *Demonology* (1597) also describes witches as a kind of spiritual pestilence in a dialogue between Epistemon and Philomathes.⁹ Witches, Epistemon says, are especially harmful to those who are “of infirme and weake faith,” to which Philomathes responds, “Then they are like the Pest, which smites these sickarest [sic], that flies it farthest, and apprehends deepliest the perrell thereof” (49–50). Philomathes invokes the idea that the very fear of contagion makes one vulnerable to it; one might similarly see Macbeth, who lacks faith, as opening himself to the witches’ spiritual pestilence. After he murders Duncan, Macbeth is linked metaphorically not only to the witches but to vermin and other creatures of putrefaction: “O, full of scorpions is my mind, dear wife!” (3.2.59). Eventually, at least in the eyes of Malcolm, he becomes identified with Satan himself. “Not in the legions / Of horrid hell,” Malcolm

says, “can come a devil more damned / In evils to top Macbeth” (4.3.57–59). Whether or not one accepts Malcolm’s view that Macbeth is “Devilish” (4.3.118), it is clear that Macbeth’s mind, like his wife’s, is “infected” by things “unnatural” (5.1.61–63). As the Doctor says of the latter, “Unnatural deeds / Do breed unnatural troubles; infected minds / To their deaf pillows will discharge their secrets” (5.1.61–63).

As these passages suggest, to acknowledge vermin as carriers and mediators of spiritual as well as physical contagion does not depend on answering definitively questions long central to scholars of early modern witchcraft—and to some critics of the play—about whether or not Macbeth, Shakespeare, or his audience actually “believed” in witchcraft and familiars.¹⁰ It may, however, require rethinking notions of the familiar that ignore a given animal’s natural or cultural function, and that therefore would treat rats, cats, dogs, hares, frogs, and newts as being interchangeable. If Purkiss is correct to see the familiar as a “collaborative construction,” a compromise formation between the elite and popular versions of witchcraft, rendering the “witch a perverse kind of mother” (130), then it is appropriate to ask out of what natural and cultural materials her hybrid children are made. Here, this means asking whether Shakespeare and his audience could distinguish rodents from other vermin as disease vectors—whether or not, in other words, rats occupy a special position in early modern disease etiology, or in witchcraft, and thus in the play. On this question, *Macbeth* is suggestive but problematic.

Rodents are used to evoke the general context of pestilence very early in *Macbeth*, when one of Shakespeare’s witches, taking revenge on a woman who had refused to share some food, imagines herself following this woman’s husband across the seas:

Her husband’s to Aleppo gone, master o’th’ Tiger.
But in a sieve I’ll thither sail,
And like a rat without a tail,
I’ll do, I’ll do, and I’ll do. (1.3.7–10)

At least since the eighteenth century, this odd image has been regarded as an example of Elizabethan folklore. Glossing the stanza in his 1773 edition of Shakespeare, George Steevens writes, “it was imagined” that “though a witch could assume the form of any animal she pleased” she could not alter her sex: “the tail would still be wanting” (705). But given the emphasis on pestilence elsewhere in the play, Shakespeare’s rat is a suggestive choice. What made a rat—rather than, say, a toad—an especially powerful vehicle

for *Macbeth's* witch is its association not only with famine and bad air, but with danger, destruction, and a toxic sexuality. In addition to being regarded as a proliferating by-product of putrefaction, rats were figured, when full grown, as among the most lustful of creatures. Topsell refers to the white mouse as a long-standing image of lust but "all mice," he continues, are "most desirous of copulation" (506). Rats he regards as even more sexually dangerous than mice, capable of going into something resembling elephant musth, excreting a toxic fluid: "For if the urine do fall upon the bare place of a man, it maketh the flesh rot unto the bones" (520). The sexually charged bodily fluids of rats can corrupt human flesh irreparably; it is itself a refracted image of pestilential decay.

The greatest danger of rats' sexuality, however, is their prodigious power of reproduction. Able to reproduce quickly and in great numbers, they are a constant threat to the human food supply, one magnified in periods of ecological disaster or dearth. Topsell claims that mice conceive every fourteen or sixteen days, exceeding "all other beasts" in the "number they bring forth" (506); a contemporary scholar estimates that two black rats and their progeny breeding continually for three years can produce 329 million offspring (Kelly 66). In a culture in which grain was the dominant food source for all but the rich, and dependence on grain increased in inverse ratio to income, the productive capacity of rats and mice therefore posed significant threats to life and livelihood.¹¹ Europeans of all classes were familiar with stories about famines caused by rats and mice, notably the biblical account of the plague in Egypt, but naturalistic, contemporary narratives were common as well, especially of rats on ships. Garcilaso de la Vega, for example, emphasizes the "great Destructions, and even Plagues" that struck Peru until around 1572, "caused by the incredible multitudes of Rats and Mice" brought by the Spaniards. "Swarming all over the Land," these voracious rodents ate seeds and killed fruit trees, nearly forcing the colonists to "abandon their Dwellings" had not "God in mercy caused that Plague to cease on a sudden," when it was at its extremity (385). Similarly, Samuel Clarke's account of the first English Bermuda plantation tells of a "great Plague" sent upon the English by "reason of a few Rats" who, having hidden themselves aboard a meal ship, "multiplied so exceedingly" that eventually—despite cats, dogs, ratsbane, trapping, and even setting the woods on fire—the rats took over the island, eating "all up" (27–28), thereby precipitating a disease called the "Feages." Clarke ends his narrative with a strangely hybrid explanation—part religion, part naturalism—about how eventually supplies from England

and “some rest and ease” helped the disease to abate and “suddenly it pleased God (by what means was not known)” to “take [the rats] away” (28).

When *Macbeth* is read within and against this context, it is perhaps not a stretch to see how Shakespeare’s image of the would-be demon rat simultaneously evokes and displaces a theocentric discourse of the plague that turns on an historical relationship between famine and pestilence, between food shortages and infectious disease. As Deborah Willis argues, much of *Macbeth* involves scenes of feeding or deprivations of food, even as “the witches’ motives and the extent of their powers remain maddeningly opaque” (215). This elusiveness may be explained, in part, by acknowledging the witches’ historical function within plague discourse as both carrier and symptom of a mysterious and destructive mode of contact. They are, as Philomathes says, “like the Pest,” and contagion, as we have already seen in Austin’s *Anatomy of the Pestilence*, was baffling enough to demand a variety of explanations, with most literate persons agreeing that its origins taxed the capacity of human understanding. In their inexplicable origins and connection to pestilence, witches, in turn, bear a homologous relationship to vermin. In *Curiosities* (1637), a popular commonplace book, Robert Basset poses the question of why “unnecessary frogs and Mice doe breed...of their owne accord, seeing other animals for Mans use breed not, but by propogation?” (211). The answer, we are told, lies in the power of God, whose reasons must be trusted. Because plagues of mice are connected to other inexplicable natural disasters, such as floods and droughts, rodents serve as instruments of divine power. Basset writes: “Even as the High Procurator of the great World, provides store of all manner of Viands for his little world (Man)”:

so also he chastiseth this neglecting Man, when he subtracts and withdraws from him the fruits of water, earth, Ayre, and beasts for mans owne faults: wherefore sometimes waters either abound by inundations, sometimes by drought are extenuated, and scarce; sometimes the Ayre by contagion infects, sometimes fire rageth so, that from whence these breed, it can no more be certainly arrived, than whence the swarmes of these Animals, and the innumerable diseases of man do also breed. (211–12)

In Basset’s theocentric view, the “innumerable diseases of man”—including psychological disease—are analogous to these “swarmes” of mice, inexplicable and dangerous but permitted, if not always directed, by God.

In much the same way that rats compete with humans for food, witches compete with God for access to human souls. “Contagion” is the weapon within this battle, and sexuality is the ground upon which the battle was

often thought to be waged. Very early in learned witchcraft literature, such as in Heinrich Kramer and James Sprenger's *Malleus Maleficarum* (1486), witches are represented as "enemies of the human race" not only because they "change the perceptions and befoul the emotions of man" (23)—mental or psychological contagion—and not only because they "bring diseases" (23), a form of natural contagion; they are also enemies because in addition to these "thousand ways of doing harm" (23), they have power over human sexual function and appetite. And like vermin, they are ontologically unstable. Kramer and Sprenger argue that demons and witches are unable to assume a bodily form without the aid of "inspissated" air, air that "partakes of some of the properties of earth" (109):

And devils and disembodied spirits can effect this condensation by means of gross vapours raised from the earth, and by collecting them together into shapes in which they abide, not as defilers of them, but only as their motive power which gives to that body the formal appearance of life, in very much the same way as the soul informs the body to which it is joined. (109)

Even under these circumstances, witches cannot assume "natural" shapes "except in the case of some small creatures" such as toads, salamanders, and rats (109). While, admittedly, the *Malleus Maleficarum*'s specific narrative of origin rarely appears in sixteenth- and seventeenth-century popular literature, even here witches continue to be surrounded by creatures of putrefaction, especially frogs, spiders, and rats.¹² For Shakespeare's witch to imagine herself in the form of the rat, then, is in keeping with an established relationship between contagion and sexuality—specifically, with unnatural modes of reproduction—as is her related threat to "drain" the sailor "dry as hay" (1.3.18). Since demons were thought to be the effect of "inspissated" air, without a natural bodily form, they were sometimes imagined as collecting semen from humans—ideally, according to Kramer and Sprenger, to have semen removed by a witch involved in the "carnal act" (113). Carnally gathered semen is better than semen produced through "nocturnal pollutions" since the latter, they write, "arises only from the superfluity of the humours" (113). In imagining herself draining the sailor "dry as hay," Shakespeare's witch may therefore be announcing (albeit in a near-comic revenge fantasy) a sexual encounter during which she gathers semen: "I'll do, I'll do, and I'll do." The copulating and childless other of the copulating and childless Macbeth, the witch is poised, like him, for some as-yet-to-be-named reproduction of

evil. Her highly mediated and therefore unnatural act of copulation is made possible by the rat whose form, thanks to the “inspissated” air, she is able to assume, if only imaginatively. Rats and “filthy Aire” remain embedded in the mutually reinforcing languages of infestations, plague, ecological distress, and moral blight that characterizes Scotland under Macbeth’s unnatural and unquiet rule.

Whether or not one is willing to endow Shakespeare’s image with such specific meaning, it remains clear that vermin, witches, and disease are closely tethered in the play, as they are in both the learned and popular early modern imaginations. So close is the relationship between witches and rats that one physician, writing sixty years after *Macbeth*, felt compelled to mount a defense not only of the humans accused of witchcraft but of their pet vermin as well. Referring to a 1645 case in which a woman was executed for keeping a frog in a box, Thomas Ady argues that “Oathes that have been usually taken against many persons in that kinde, are not to be regarded, though true”:

as that such a one hath been seen to have a Rat or Mouse creep upon her, or under her Coats, or was heard talking to her Imps, these are not material testimonies, but are foolish and senseless arguments, not grounded in the Word of God. . . . for it is as lawful to keep a Rat or Mouse, or Dormouse, or any Creature tame, as to keep a tame Rabbit, or Bird; and one may be an Imp as well as another. (135)

Harboring mice or rats, he continues, does not prove “that the Devil is in it” (135). While Ady addresses his argument to judges and jurymen against reasoning from the appearance of specific familiars—“Mice, Dormice, Grashoppers, Caterpillars, Snakes”—to the assumption of demonic forces, that rats and mice are included in his list indicates how closely witches were connected not only to “vermin” but to creatures of putrefaction, all of which, or whom, turn out to be a more or less sophisticated version of the maggot. As Ady continues, he knew a “Gentleman” who, “to please his Phantasie in trying conclusions, did once keep in a Box a Maggot that came out of a Nut, till it grew to an incredible bigness” (135).

RODENTS IN NATURE/CULTURE

When Shakespeare’s weird sister cackles over her imagined transformation into a randy rodent, we get a brief glimpse of what Bruno Latour calls a “nature-culture,” a collective that has not yet been neatly carved up, as ours

has, into the “social” and the “real,” into religion and science (105–09). Within this context, rats and mice are too ontologically unstable—and in this regard they differ from dogs and cats—to be regarded as disease carriers. Yet this same instability allows them, like witches, to embody a mysterious contagion whose modes of unnatural reproduction rodents, in turn, mimic. Ironically, then, it is *by virtue* of their slippery natures that rats can appear in early modern accounts of pestilence as something resembling a disease vector. In their relationship to moisture and “bad air,” rodents herald disease; as instruments of God’s wrath, they are heaven’s gluttonous emissaries.¹³ They move easily between the medical and religious imaginary, yoking what, for us, may appear to be very different worlds.

Early modern descriptions of rat infestations—one in Essex in 1581, for instance, another in Rotterdam in 1670—indicate that while writers failed to make a connection between *rattus rattus* and *Y. pestis*, the rats’ co-implications in theories of bad air and theologically driven accounts of the plague allowed them to play a role that structurally mimics that of pathogens. In his report on Spain, Topsell links rats and plague without making a causal connection: “There are such a number of these mice in Spaine,” he writes, “that many times their destruction caused pestilent diseases, and this thing hapned amongst the Romaines when they were in Cantabria, for they were constrained to hier [sic] men by stipends to kill the mice, and those which did kill them, scarce escaped with life” (543). What Topsell probably means by his statement “their destruction caused pestilent diseases” is that the sheer number of rodent corpses created a noxious environment of decay in which disease could and did breed. While his description does not imply a theory of flea-borne germs, it does acknowledge that, by virtue of their seemingly endless reproducibility, and given the effluvia that die-offs create, rodents can be as dangerous in death as they are in life.

To read early modern contagion theory is therefore to accept that naturalistic explanations of disease co-existed with, and were often indistinguishable from, theocentric ones; within this theologically charged environment, the terms “plague” and “pestilence” could refer to such divine scourges as disease, famine, bad air, crop failures, murrains, or the swarming of animals. What anthropologist Edward Green argues of African theories of disease might also be said of early modern British contagion: “indigenous contagion beliefs express essentially the same process of infection as modern germ theory attempts to, but in an idiom to which we are unaccustomed” (18). One encounters in the writings of fifteenth-, sixteenth-, and seventeenth-

century physicians and theologians uncanny moments in which the etiology of disease is described in a theologically inflected dialect, a dialect apparent even in later, more devotedly “empirical” writers who have banished witches from their explanatory models. In *A Brief History of Epidemic and Pestilential Diseases* (1800), for example, Noah Webster, attempting to reconcile descriptions of plague in ancient, scriptural, and medieval sources, confronts the question of causality in what appears to be naturalistic terms. Webster first points out that “throughout the history of the Jews, and in the Prophets, pestilence, famine, and the sword, are often mentioned in connection with each other,” and it “will probably appear, that famine and pestilential diseases do at times reciprocally produce each other, and that war not infrequently occasions both” (27). “But there is ground to believe,” he continues, “that famine and pestilence are usually the effects of one common cause” (27): weather, or what he calls “a pestilential state of the elements, as fatal to vegetable as to animal life” (144). In a study that includes an impressive series of tables detailing the weather patterns, comet sightings, murrains, and crop failures for every recorded account of pestilence, Webster makes the case that “famine and pestilence are equally the *effects* of . . . a temporary derangement of the regular operation of nature” (144). Such “derangements” include comets, volcanoes, droughts, rains, overpopulated cities—any number of conditions that give rise to a “corrupt state of air” (204). Yet this seemingly empirical imperative is linked to a religious one, which is to authenticate biblical accounts of the great plagues of Egypt whose climate, he argues, was especially conducive to pestilence. For Webster, as for his predecessors, plague and famine appear as part of the same complex of medical, historical, environmental, and theological discourses.

From the work of Kramer and Sprenger in 1486 to that of Webster in 1800, then, resemblances between the spiritual and the natural worlds, far from being opposed to early modern science, are one of the means through which its concepts and practices are organized. Medical history in the sixteenth and seventeenth centuries appears as part of a natural philosophy in which the categorical distinctions that define contemporary germ theory—distinctions between nature and culture, and between natural and supernatural—were in the process of being defined. Reading the early modern rat means assuming a double or even triple vision and regarding rats in their complexity: culturally, as mirrors of lustful, soulless, gluttonous, forever-multiplying human beings, and naturally, as warm-blooded disease vectors within a theocentric theory of contagion. It means being aware (as I think

Shakespeare was) of their complicated ontology, even that of individual body parts. On the one hand, for example, the rat's tail clearly serves a tropological function as a penis surrogate. As Topsell writes of rats, "And when they are in copulation, they embrace with their tails, filling one another without al delay" (506). On the other hand, however, what makes Topsell's description something other than "merely" symbolic is that the tail of a rat is actually part of a complex vascular system used for cooling and heating that operates very much like a penis, swelling and shrinking in accordance with the functions it performs.¹⁴

In *We Have Never Been Modern*, Latour argues that, while we often imagine modernity as the birth of humanism, this is itself a modern habit "that overlooks the simultaneous birth of 'nonhumanity,'" which includes "things, or objects, or beasts" as distinctions between nature and culture were being drawn (13). Rather than treating nature as something "out there," Latour emphasizes, as Shakespeare did, the constructed and fragile quality of our nature-culture divide. Latour's concept of nature-culture strikes me as being critical if we are to avoid some of the more reifying practices of a postmodernism that would dissolve the natural world into a series of representations in which "contagion" is simply part of the "modern condition" and nonhuman animals are erased from both the historical and epistemological record. Instead, I would treat rats as the quintessential Latourian quasi-object, a hybrid byproduct of early modernity whose ontological status shifts as explanation requires. Especially during periods of climatically produced crop failure (as seems to be happening now in India), rats continue to serve as direct competitors with humans for food, as dangerous disease vectors, and, symbolically, as our abjected soulless others. Like witches, they are not easily relegated either to the realm of "nature" or "culture." Living with humans, eating with humans, and serving as surrogates for humans in contemporary medical practice, rats might even be regarded as our collective "familiar" still.

NOTES

1. The pioneering study of the plague is by Wu Lien-teh, a volume published in 1936 that includes articles by scholars from many different disciplines. Contemporary general studies of plague include Herlihy, McNeill, and Kelly, the latter providing a useful summary of scholarship on environmental factors and the plague (17–38). On plague and climate change, see Kelly 42–43 and 58–77. On climate change and witchcraft persecutions, see Fagan and Oster. On plague and famine, see the essays in Walter and Schofield.

2. Temperatures began to drop around the beginning of the fourteenth century and the world was warming again by the early 1800s. The coldest segments of The Little Ice Age were in the 1590s and then again between 1680 and 1730, with the temperature about two degrees Fahrenheit lower than it had been in previous centuries; cooling was exacerbated by a number of volcanic eruptions that affected weather patterns for years at a time. See Fagan 47–59.

3. During the 1990s, there seems to have been a trend to read witchcraft almost exclusively in terms of gender relations, perhaps as a corrective to an earlier tradition. Typical in this regard are Willis and Dolan. The reading to follow is not opposed to this mode of interpretation but complicates it by regarding witches within the context of concerns more central to ecocriticism and animal studies.

4. On this change of associations in the seventeenth and eighteenth centuries, see Markley, “Casualties and Disasters.”

5. In his description of the African Mouse, Topsell also raises the widely held belief that mice die as soon as they drink: “it shoulde seeme their temperament, or constitution is so moyst that nature can endure no addition” (506). Similarly, some early mousetrap designs induced rodents to run or fall into pots of water.

6. In the attempt to explain this phenomenon in his essay on the history of plague, Wu quotes a paper read by Glen Liston who argues that, in the cooler climates of Europe, the plague was often “mixed,” or both bubonic and pneumonic, so “it followed that a mortality among rats was less frequently observed preceding or occurring concomitantly with the disease among men” (9).

7. I follow Barroll’s argument that apparent references to the Gunpowder Plot in *Macbeth*, traditionally used to date the play, must be reconsidered in light of what we know about theater closings during the plague years (133–47).

8. See Markley, “Summer’s Lease.”

9. I am not offering James’s *Demonology* as a source for the play but using it to discuss what I take to be a larger and still culturally active set of associations within practical demonology. On James I, see Willis 116–58; Purkiss 199–230.

10. See, for example, Greenblatt.

11. “The lower the income available to a household, the greater was the dependence on grain” (Walter and Schofield 7).

12. Famously, Elizabeth Stiles was associated with a rat familiar (Purkiss 137) and in Ben Jonson’s *Masque of Queens* twelve witches are “all differently attir’d,” some with “Rats on the Head; some on their shoulders” (sig. A4v). Some of the more striking associations between rats and witches are in European art, such as the works of Jacob de Gheyn II.

13. In her informative article “Imagining Vermin in Early Modern England,” the historian Mary Fissell uses conduct books to argue that, while vermin were not associated with disease in the seventeenth century, they were associated with food, for which they competed with humans. Fissell is right to assert a connection between rats and gluttony; this association goes back at least as far as Chaucer and by the seventeenth century had become a matter of convention. But my argument differs from Fissell’s in treating food and disease as part of the same cultural imaginary. Within this context, rats cannot be purely symbolic.

14. On the tail as vascular system for the rat see, for example, Dawson and Keber.

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