Medieval Birds: Science Meets Poetry in the *Parliament of Fowls*

**Jennie M. Carr and Courtney E. Rydel**

Washington College, Maryland

Our collaboration, between myself, a medievalist and ornithologist Jennie Carr began with a question from a curious student in my literature class where we were reading Anne Bradstreet’s poem “In Reference to Her Children, 23 June 1659.” The student, Julie Armstrong wanted to know if birds did, in fact, leave a nest for good once they were fledged or if they returned, as Bradstreet claimed. In other words, did Bradstreet’s metaphor describe the actual behavior of birds she would have seen in the New World, or was it mere poetic fancy? Jennie, a fellow assistant professor at Washington College, who specializes in birds and bird behavior, affirmed that yes, birds typically leave their parents’ nests, never to return. Furthermore, she suggested that Bradstreet, attuned to the nature that was constantly threatening to encroach upon the early settlements of the Massachusetts Bay Colony, may have observed this dynamic herself and been inspired by it to compare her own increasingly independent children to the birds that left their parents forever. Jennie’s information prompted a renewed discussion in my next class on Bradstreet’s relation to her surroundings and how nature imagery played a role in the poetry the class was reading. Following up on this insight, Jennie and I began a project on Geoffrey
Chaucer’s *Parliament of Fowls*, exploring how a better understanding of actual bird behavior as well as medieval “scientific” knowledge could enhance our students’ understanding of literature as well as our own understanding of how both our disciplines created and communicated knowledge.

In this essay, we will explain some of the insights into Chaucer’s poetry that this collaboration yielded, grouped around four main themes. These themes were:

- love and desire, with a critique of human mating practices through comparison with the avian;
- the parliamentary debate form and political context of the poem;
- comparing Chaucer’s observations and classifications to how ornithologists understand these species today;
- and birdsong in the poem, both as representation of animal calls and as theme.

Our initial research for this project was supported by a grant from SANDBOX, an initiative at Washington College in Maryland, originally funded by the Mellon Foundation. SANDBOX supports projects that blend the arts and humanities with science and the environment, enriching our community on Maryland’s Eastern Shore with events such as the interactive art gallery we created, in which guests could experience the *Parliament of Fowls*. Beyond this interactive exhibit, we have given public lectures on how the poem can be illuminated from an ornithological perspective.

This ecocritical, interdisciplinary approach to Chaucer’s birds in the classroom complicates traditional literary approaches, which have tended to read the birds as representations of humans. Decentering the human perspective, even temporarily, can enable us to reconnect the *Parliament of Fowls* to the natural world and attend to the “animal real,” as Carolynn Van Dyke calls it. This “animal real” invites us to take seriously cross-species
connections instead of reducing animals to metaphor or a resource for thinking about humans.²

Available in the *Riverside Chaucer*, as well as in the shorter collection *Chaucer’s Dream Visions and Other Poems* edited by Kathryn L. Lynch (2006), and available online in translation by A.S. Kline ([https://www.poetryintranslation.com/klineasfowls.php](https://www.poetryintranslation.com/klineasfowls.php)), the *Parliament of Fowls* fits effectively into survey courses on British literature or medieval literature, and specialized seminars in Chaucer, courtly love literature, dream vision literature, or environmental literature.³ Depending on the focus of your course, you may wish to teach the entire poem—with lessons on the dream vision form and the larger vision of the cosmos that starts the poem—or start at line 295, when the narrator encounters the goddess Nature, and the action of the poem focused on the birds starts, which I found worked better. An emphasis on the birds as birds can bring in a larger audience, especially students interested in environmental issues or the natural sciences.

Below we offer activities and supplementary materials that teachers can use in their own classes on the *Parliament of Fowls*, some of which may also apply to other medieval works such as the *Canterbury Tales*. These materials include pictures from our interactive art gallery installation in downtown Chestertown, Maryland in October 2016; audio clips of the birds named in the *Parliament of Fowls*; a chart of the list of species that appear in the poem along with their classifications and Chaucer’s behavioral descriptions; and QR codes that link to videos, which students can play on their phones or tablets, of short passages of the *Parliament of Fowls* in Middle English, complete with closed-caption translations into modern English. We have also included citations of secondary literature for further reading on the *Parliament of Fowls* in the hopes that such a list will assist students and researchers looking to further investigate this fascinating poem.

**BIRDS, LOVE, AND MATING**
Chaucer’s poem may be one of the earliest associations in English literature of February 14, Valentine’s Day, with love and desire—a connection that immediately resonates with students. In the dream vision of the *Parliament of Fowls*, a wide-ranging assortment of bird species have flocked together on St. Valentine’s feast day to woo their mates, in a scene that draws on the association of birds with love and faithfulness. In preparation for reading the poem, students can be assigned to do some online research on the history of Valentine’s Day, leading to a class session in which students work collaboratively to compare the online sources they found. Evaluating these articles on the basis of authorship, cited sources, information and other criteria, students can both glean historical knowledge and start to learn how the knowledge created by scholars of the Middle Ages is presented to, and used by, the general public.

For a few good examples of online resources with various levels of academic rigor, public-facing scholarship and citations, we recommend the following:


- Camlann Medieval Village, “St. Valentine’s Day,” Feb 2017, [http://www.camlann.org/st_valentine%27s_day.htm](http://www.camlann.org/st_valentine%27s_day.htm)


Better still, from the website of the British Library, you can even show students images of key manuscripts, including Harley MS 733, a manuscript containing the Parliament of Fowls, available at “The Parliament of Fowls” at https://www.bl.uk/collection-items/the-parliament-of-fowls?_ga=2.197256495.1003470224.1526760685-1642907309.1500654923, which shows students the text in an original, medieval manuscript. Better still would be to also show them images of British Library Additional MS 43490, f.24, the oldest known surviving Valentine’s Day love letter in English, available online at https://www.bl.uk/collection-items/~link.aspx?_id=650E2879F71A49F09FC19C480CE2AE14&z=z, which was written by Margery Brews to her fiancé John Paston in February 1477. By seeing the primary sources that support this narrative connecting the Parliament of Fowls to early Valentine’s Day commemorations, students can better understand how medievalists use textual artifacts to produce knowledge that is then widely disseminated.

According to Chaucer’s narrator, the thirty-five species of birds had assembled to choose their mates on Saint Valentine’s day, as directed by Nature, personified as a goddess. A single exquisite formel, a female eagle, perches on Nature’s hand, and Nature often looks at her in delight and kisses her beak, opening this scene with an image of female companionship and cross-species affection, suggesting the close relationship between noblewomen who hunted and their trained raptors. Since Nature insists “by ordre shul ye chese, / After youre kynde” (ll.400-401), the eagles, considered the noblest of birds, begin the selection process “in order.”

Three male eagles, called tercels, all offer themselves as suitors to the formel, each with a different
reason why he is the best choice. One says he loves her the best, another says he has loved her
the longest, and the third says he would offer her the truest service. The tercels traditionally
have been interpreted as representations of the suitors in marriage negotiations for Anne of
Bohemia, Richard II’s beloved first wife.\textsuperscript{5} This portion of the poem (ll. 414-83), can be read as a
parody of contemporary courtly love discourse, or taken more seriously as an exploration of
what made someone loveable or worthy of favor according to medieval courtly standards.
Inquiring of students how these standards do (or do not) match their own expectations for
potential love interests can prompt very lively debate.

The eagles’ courtship and mating efforts, however, reflect real bird behavior, and the
birds clearly act like birds rather than like humans, a dimension lost if readers interpret this poem
as primarily an allegory about human behavior. As Leslie Kordecki wryly observes, Chaucer’s
poem is based in reality: “Birds clearly mate, often in the spring, often with much articulation.”\textsuperscript{6}
Though not all birds mate in the spring—owls, for example, do not, and some species of jays
already have chicks in the nest by February—male birdsong is noisier in the spring, and in the
spring their song relates more clearly to defending a female and attempting to keep other males
away to protect the paternity of the nest.\textsuperscript{7}

In the poem, the goddess Nature insists that although male birds such as the tercels can
make initial choices, it is necessary “That she agre to his eleccioun, / Whoso he be that shulde be
hire feere” or spouse (ll. 09-10). Although the female mate’s consent is crucial for forming
bonds between social mates—the birds who copulate and raise chicks together—it is generally
the female of the species who makes the choice among competing male suitors, with absolute
control over her choice. Male birds do not have the initial power in that relationship, as
Chaucer’s poem suggests. Many female birds, especially among passerine (perching) birds, will
later take additional mates besides their social mate. While it’s advantageous for a female bird to
have a social mate helping her raise the chicks in the nest, her extra-pair matings enhance the genetic diversity of her offspring, and thereby increase the overall chances of survival for at least some of her young.\textsuperscript{8} Indeed, even some of the medieval traditional associations of particular bird species with sexual promiscuity, such as sparrows and cuckoos, prove to be accurate descriptions of their sexual activity.\textsuperscript{9}

Anthropocentric readings of the poem often emphasize how the formel, able to choose among her male eagle suitors and ultimately decide \textit{not} to take a mate for a year, exercises unusual agency for a female character. Scholars have read the \textit{Parliament of Fowls} as a critique of the greater constraints placed by contrast on human women—in the words of Sara Gutman, “locating a space at the center of the garden for female agency.”\textsuperscript{10} Although the formel’s decision not to take a mate is a “reversal of hierarchy” and a “subversive outcome” according to Kordecki, ultimately traditional male subjectivity is not actually threatened here, since the poem contains that which is “nonhuman and nonmale.”\textsuperscript{11} The formel eagle’s decision, has often been read as a demonstration of female agency, a choice of chastity, a rejection of heterosexuality, and perhaps even evidence of a queer orientation.\textsuperscript{12}

Yet the poem acknowledges the power that female eagles, in the wild, have had all along; in presenting realistic bird behavior \textit{as an allegory} for human behavior, the poem is raising the question of women behaving just as the tercel does. Unlike other species named in Chaucer’s \textit{Parliament} that mate for a season, eagles typically mate and stay together for life, making the choice of a mate even more fraught with significance for the formel than other species. Eagles take a mate relatively late in life, at approximately five years of age; the formel eagle, therefore, may simply not be ready to take a mate, and her hesitation could be read as an indication of physical immaturity. Furthermore, eagles may choose to forego nesting for a year, particularly in times of poor resources, behavior that has also been observed in other species of large raptors.
and in sea birds; species with high energy demands and sometimes variable resources can make that choice. Eagles have long lifespans and routinely survive for 20 years or longer in the wild. Therefore, a delay in choosing a mate combined with intermittently foregoing raising chicks may be best with regards to balancing the energetic costs and benefits of raising young, thereby maximizing life-long reproductive success. Thus, the formel’s decision to delay taking a mate—while still available to be read allegorically as an example of choice, female agency, and deferral of heterosexual reproduction—is also scientifically accurate.

This background information on real-life bird mating patterns makes human desires newly strange and ripe for interrogation through the medium of Chaucer’s text. Debates in class, informed by this knowledge, can center on questions that interrogate present day cultural mores as well as Chaucer’s text. Questions may be posed as to:

- Who has more control or power to choose in human heterosexual relationships?
- How do same-sex relationships change that dynamic?
- When is pursuit of the object of one’s affections socially acceptable, and to what extent before such pursuit becomes coercive?
- How much does competition among suitors enhance desirability?
- How do our contemporary media depict love, sexual desire, and heartbreak in comparison to Chaucer’s depiction?
- Why might humans project certain dynamics onto animals?

Such questions and others can set up a lively debate, giving our students an opportunity to examine their own assumptions about romantic and sexual relationships. The first question in particular can provoke a lot of discussion, so a time limit may be helpful if you want to explore
multiple topics; alternatively, these questions work well as short writing prompts, either before class or at the outset.

Furthermore, the formel’s consent to or refusal of consent to a sexual relationship opens up a larger discussion of choice, free will, and sexual consent. Bird decision making, ornithologists have discovered, is relatively complex and sophisticated, because they have to decide where to land, what to eat, with whom to eat, and with whom to mate, making them surprisingly good vehicles for considering choice and decision making. Critics of the Parliament of Fowls have focused on how the formel’s refusal or deferral of choice explores the nature of human free will and choice, which was a major topic of fourteenth-century philosophical debates. That scholarship can prompt other discussions in the classroom about choice in romantic relationships. What makes a choice free, and how do social constraints or peer pressure affect that freedom? How is choice contingent on circumstances? What makes consent freely given, or not, and how do we as a society treat consent in terms of sexual and romantic relationships? Can we as a class become more attentive to thinking about consent? These questions, as vital for students today as they were for medieval audiences, lead into the debate section of the poem, in which a satirical parliament demonstrates various groups of birds arguing about how the formel should choose her mate.

PARLIAMENTARY DEBATE AMONG THE BIRDS

The main action of the Parliament of Fowls, of course, is the titular parliament in which the gathered birds, exasperated by the three quarrelling male eagles’ inability to determine who deserves the formel, decide to offer their own advice. Thanks to funding from SANDBOX, in October 2016 we created an interactive installation in an art gallery minutes from Washington College’s campus. The creation of the Parliament and the initial debate among the three tercelet
eagle suitors, all competing for the formel, was described in sequence on posters hung on the walls, followed by a series of four posters that represented each of the groups of birds: Fowls of Ravine or Birds of Prey, represented by the male falcon; Waterfowl, represented by the female goose; Seed Fowl, represented by the female turtledove; and Worm Fowl, represented by the male cuckoo. Each poster featured images from medieval bestiary manuscripts and named the birds collected in one of Chaucer’s four categories within the Parliament, along with a QR code. Scanned on a tablet or smartphone, the QR code opened a video on the device, featuring Courtney and two of her students, Erin Smedley and Valerie Wilson, delivering dramatic readings of selected stanzas from the poem.

The Falcon video can be found at this link: https://youtu.be/_ZwhSwch3c
The Turtledove video can be found at this link: https://youtu.be/Y7fjgN9wmho
The Goose video can be found at this link: https://youtu.be/lh0tKHquleA
The Cuckoo video can be found at this link: https://youtu.be/d9adE0SOExg
The video of the Formel announcing her decision: https://youtu.be/3Au2luaDJL8

All the videos are closed-captioned with a Modern English translation, and the links to the videos posted on YouTube are available below. These videos can be used in a class, or the verses can be excerpted or focused upon more acutely in a close reading exercise.

We used the structure of the Parliament to generate suspense for the participants, who did not know the ending of the poem until after they voted on which of the four solutions, described in the videos and summarized on the final poster, struck them as the most persuasive; they put colored paper with their choice into a small birdhouse (image 1). After voting, they were invited to scan the QR code for the final video and learn how Chaucer resolved the competition for the formel, with her declining to take any mate for the next year. Inviting students and the larger public into the poem to determine the “best” answer themselves led to greater engagement with
the poem. Among all gallery attendees—students and others—the Goose was, in the end, the winner by a wide margin.

Image 1 (Photo Credit Courtney E. Rydel)

In class, one could choose to withhold the end of the poem, which would be even easier if students are reading the Parliament in a course packet rather than within a collected edition. One could then ask students what they think the ending will or should be, as an icebreaker, and follow up with the students after they voted to learn more about their reasons, and why they thought their answers were best. Helping students to think through the rationales given (and the assumptions underneath the rhetoric about relationships and what is valued in them) can be a useful tool to prompt close reading and deeper discussion of the ideas about human relationships embedded in the poem. Furthermore, each of the groups’ argument could be assigned to small
groups of students to analyze and argue in a class debate, especially since it’s a relatively small portion of Middle English to attempt in the original language.

Their arguments can be summarized as follows. A male falcon suggests that the tercels fight to determine who deserves to have the female eagle. The goose, representing the Waterfowl, says that she would advise each tercel that unless the formel loved and chose him, he should choose another mate. Speaking for the Seed Fowl, the turtledove declares that she believes the tercels should stay faithful to the female eagle until death, even if she rejected them, because faithful service matters most. Representing the Worm Fowl, the cuckoo scoffs that he does not care what the male eagles do. Since they could not agree, they should all just remain permanently single!

By calling it a parliament rather than a “court of love” or another such term, Chaucer links this avian assembly to the politics of his time. Whereas literary historians think Chaucer composed the *Parliament of Fowls* before his term as a Member of Parliament in 1386, Chaucer did not need to have yet served in the English Parliament to be familiar with it as a body of dissent and debate, often riven by factions. These groups in the *Parliament* have often been interpreted by scholars as representations of various social classes, heightening the real-life significance of their divergent solutions. (Given how often medieval allegories would represent social groups through animal figures or other allegorical devices, this scholarly interpretation fits with the expectations of medieval readers.) The birds of prey are often interpreted as knights, the nobility, or upper classes more generally, given their high status and the falcon’s eagerness to fight; the water fowl are connected with the commoners or the emerging urban merchant class, represented by the goose’s pragmatic solution; the seed fowl, represented by the turtledove’s idealistic reply, are associated with the clergy; and the worm fowl, given the cuckoo’s dismissive comment, are read as representations of bureaucrats, or lawyers, or the lower classes generally,
all fairly disinterested in the love lives of the social elite. This interpretation of class hierarchy as “natural” inflects Nature’s proclamation that the “royal” tercelet will go first. (In actuality, among migratory birds whichever males return first can get the best territory so they get the best mates and have the most success, though the timing is all really about when females arrive; there is no pecking order in terms of different birds within species or across species as to when they select mates.)

Students can be prompted to think through how these social classes and groupings match the types of response the representatives give, and what we might learn about class dynamics and factions in Chaucer’s England based on the connections scholars see in this allegorical poem:

- Why might the worm fowl be interpreted as a “lower class” group?
- Why would the clergy be connected to the turtledove’s ethos of undying love?
- How might the emerging urban class, potentially represented by the waterfowl, have a new perspective on the traditional courtly love debates of the nobility?

Even students with minimal background on fourteenth-century England can usually propose good solutions to the first and third questions, though often they find the idea of the clergy having any connection to ideals of romantic love more confusing. However, in a class that includes Chaucer’s portrait of the Prioress from the Canterbury Tales’ “General Prologue,” or a mystic like Margery Kempe or Julian of Norwich, students should be able to identify the overlap between how erotic and spiritual love were conceptualized in the Middle Ages. In addition to considering how these arguments intersect with the concerns of various class groups in medieval England, students can turn to the gendered dynamic at play in the parliamentary debate itself.

Although the Parliament is not as dominated by female voices as some of Chaucer’s other works, the Goddess Nature presides over the gathering, and two of the four representatives of bird groups are female. Both turtledoves and geese are noted for being more vocal than
other species, with turtledoves being more prevalent in terms of making calls year round, and
goose honking to each other, communicating what is going on, as opposed to species that
concentrate their calls in the mating season. Yet neither species is known for having more vocal
females than males; Chaucer’s choice seems to point towards an interest in female voices and
perspectives, rather than reflecting bird behavior. Students may also want to query female
agency and voice from that political perspective, considering how women politicians today are
represented, and where they get a say in national or local life and policy making, on which types
of issues, and if their own voices and authority are as easily silenced as, say, Chaucer’s goose.

OBSERVATION AND SCIENTIFC CLASSIFICATION

Chaucer’s own observations of bird behavior were the likely impetus for his discussions
of twenty-three birds that are either not included in, or are described differently from, his
identified sources for the Parliament of Fowls. One of the most surprising discoveries we
made during our collaboration was just how accurate Chaucer’s observations of bird behavior
were. Chaucer describes the birds with a combination of accurate observations of bird behavior
(for example, that hawks eat quail) and popular myths about birds (that the owl’s cry portends
death). Overall, however, much of what Chaucer presents in the poem is what his audience
could observe of bird behavior. For example, the initial gathering “[o]f foules every kynde” (l.
365) might seem unlikely, as predator and prey flock together peacefully. However, winter is a
common time when mixed flocks tend to gather together for protection from predation.

Students interested in how medieval people understood birds can easily explore a
compilation of sources on “The Medieval Bestiary” website, created by independent scholar
David Badke, available at http://bestiary.ca. Students could be assigned, either singly or in
pairs, to look up the bestiary information about various bird species that Chaucer describes in his
poem, and compare the often excessive and moralizing presentation in the bestiary sources to Chaucer’s relatively sober, behavior-focused characterization. They might consider:

- Why Chaucer chose to have more realistic birds alongside more fanciful, proverbial descriptions?
- What did medieval people find fascinating about birds?
- Do students recognize any of the superstitions or ways of understanding these animals that persist today, or have our stereotypes around certain animals (such as chickens or swans) dramatically changed?

Though Chaucer designates four groups, he introduces the birds according to other schemes as well. The predatory birds are all introduced together: eagle, tyrant, goshawk, falcon, sparrowhawk, merlin. These animals were also often associated in medieval bestiaries and literature not just with freedom and predation, but also with captivity and control, given their role in falconry and hunting—a sport often enjoyed by noblewomen. The poem characterizes a series of birds based on their distinctive cries: swan, owl, crane, magpie, jay, and much later, separately, the goose and crow. Next come a series of moral judgments—mostly proverbial and spurious accusations—on the lapwing, starling, robin, kite, and later on, separately, the parrot, cuckoo, drake, and cormorant. Several birds are associated particularly with the subject of mating itself: sparrow, turtledove, pheasant, parrot, and more indirectly the nightingale. Only two birds, at opposite ends of the social spectrum, are described in terms of how they service humans: the falcon hunts for the king, whereas the rooster acts as clock for villagers. Thus, the birds of the *Parliament of Fowls* simultaneously inhabit the real world of their actual function, as in Chaucer’s *Nun’s Priest’s Tale* when Chaunticleer the randy rooster is highly valuable property to the peasant woman who owns him, and the symbolic world of Chaucer’s *House of Fame* or
the *Squire’s Tale*, in which eagles and falcons, respectively, can impart wisdom and undergo heartbreak as part of elaborate courtly love triangles.

To give visitors to the art gallery a more visceral, experiential sense of how Chaucer’s groupings of birds into four categories based on diet and habitat contrasts with scientific classification today, Jennie and her students built an evolutionary tree, which grew from the floor onto the ceiling emulating a natural and *literal* tree. The tree transitioned to black washi tape on the ceiling to depict the various branches and groupings of birds based on the latest genetic analysis and associated *evolutionary* tree of the major taxonomic orders used to classify modern birds. The tree transitioned to black washi tape on the ceiling to depict the various branches and groupings of birds based on the latest genetic analysis and associated *evolutionary* tree of the major taxonomic orders used to classify modern birds (Image 2).
The tree transitioned to black washi tape on the ceiling to depict the various branches and groupings of birds based on the latest genetic analysis and associated *evolutionary* tree of the major taxonomic orders used to classify modern birds (Image 3).\(^{21}\)
Evolutionary Tree

Image 3, from *Science*
Within this representation of the evolutionary tree that we constructed inside the SANDBOX gallery, modern orders of birds represented in Chaucer’s *Parliament of Fowls* were indicated by washi tape of varying colors for a visual depiction of the biological diversity included in the poem. (Indeed, for many literature scholars who last encountered biology coursework a decade or more ago, the advances in how scientists classify animals may be something of a surprise.) For the bird groups that Chaucer named in his poem, the posters that identified the various groupings also had the colors of the washi tape for their broad taxonomic order of classification, so that visitors could see how Chaucer grouped the species and whether or not they correspond with their actual evolutionary relationships both within and among the modern avian orders (as depicted in washi tape on the ceiling above the audience).

The thirty-five species represented in Chaucer’s poem can be classified into twelve modern avian orders. For the ease of teachers, we have included a chart that shows the groupings of birds that Chaucer creates and how it corresponds to the taxonomic orders in the evolutionary tree proposed by Jarvis and colleagues in 2014. We specified the species, translating Chaucer’s terminology to our modern names for the bird species to which Chaucer was likely referring given modern and historical geographical ranges. On the chart below we’ve highlighted how Passeriforms (perching birds) are distributed across Chaucer’s classifications, based on his observations of their diet and behavior (Image 4).

<table>
<thead>
<tr>
<th>Species common name</th>
<th>Taxonomic order*</th>
<th>Chaucer’s classification</th>
<th>Chaucer’s description</th>
</tr>
</thead>
<tbody>
<tr>
<td>northern goshawk</td>
<td>Accipitriformes</td>
<td>Birds of prey</td>
<td>“the goshawk that hurts other birds for its outrageous hunger”</td>
</tr>
<tr>
<td>Eurasian sparrowhawk</td>
<td>Accipitriformes</td>
<td>Birds of prey</td>
<td>“the hardy sparrowhawk, the quail’s foe”</td>
</tr>
<tr>
<td>golden eagle</td>
<td>Accipitriformes</td>
<td>Birds of prey</td>
<td></td>
</tr>
<tr>
<td>red kite</td>
<td>Accipitriformes</td>
<td>Birds of prey</td>
<td>“the coward kite”</td>
</tr>
<tr>
<td>merlin</td>
<td>Falconiformes</td>
<td>Birds of prey</td>
<td>“the merlin that strives to catch the lark”</td>
</tr>
<tr>
<td>peregrine falcon</td>
<td>Falconiformes</td>
<td>Birds of prey</td>
<td>“the gentle falcon that perches on king’s hand”</td>
</tr>
<tr>
<td>Species</td>
<td>Order</td>
<td>Family</td>
<td>Classification</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------</td>
<td>----------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Eurasian jay</td>
<td>Passeriformes</td>
<td>Birds of prey</td>
<td>“the scornful jay”</td>
</tr>
<tr>
<td>Carrion crow</td>
<td>Passeriformes</td>
<td>Birds of prey</td>
<td>“the thief,” “the crow with voice of care” “the raven wise”</td>
</tr>
<tr>
<td>Northern raven</td>
<td>Passeriformes</td>
<td>Birds of prey</td>
<td>“the owl that brings warning of death in its cry”</td>
</tr>
<tr>
<td>Tawny owl</td>
<td>Strigiformes</td>
<td>Birds of prey</td>
<td>“the dove with eyes so meek”</td>
</tr>
<tr>
<td>Eurasian collared dove</td>
<td>Columbiformes</td>
<td>Seed fowl</td>
<td>“the wedded turtledove, with her heart so true”</td>
</tr>
<tr>
<td>European turtledove</td>
<td>Columbiformes</td>
<td>Seed fowl</td>
<td>“the peacock, with his angel clothes bright”</td>
</tr>
<tr>
<td>Indian peafowl</td>
<td>Galliformes</td>
<td>Seed fowl</td>
<td>“the rooster, that is the clock of villagers”</td>
</tr>
<tr>
<td>Red jungle fowl</td>
<td>Galliformes</td>
<td>Seed fowl</td>
<td>pursued by the sparrowhawk</td>
</tr>
<tr>
<td>Common quail</td>
<td>Galliformes</td>
<td>Seed fowl</td>
<td>“the pheasant, who mates with hens by night”</td>
</tr>
<tr>
<td>Red-legged partridge</td>
<td>Galliformes</td>
<td>Seed fowl</td>
<td>“the thrush old, the winter thrush”</td>
</tr>
<tr>
<td>Song thrush</td>
<td>Passeriformes</td>
<td>Seed fowl</td>
<td>“the nightingale, that calls forth the new green leaves”</td>
</tr>
<tr>
<td>Common nightingale</td>
<td>Passeriformes</td>
<td>Seed fowl</td>
<td>“the sparrow, that lusty bird”</td>
</tr>
<tr>
<td>House sparrow</td>
<td>Passeriformes</td>
<td>Seed fowl</td>
<td>hunted by the merlin</td>
</tr>
<tr>
<td>Eurasian skylark</td>
<td>Passeriformes</td>
<td>Seed fowl</td>
<td>“the parrot full of delicacy”</td>
</tr>
<tr>
<td>Rose-ringed parakeet</td>
<td>Psittaciformes</td>
<td>Seed fowl</td>
<td>“the alert and watchful goose”</td>
</tr>
<tr>
<td>Greylag goose</td>
<td>Anseriformes</td>
<td>Waterfowl</td>
<td>“the jealous swan that sings sweetest before it dies”</td>
</tr>
<tr>
<td>Mute swan</td>
<td>Anseriformes</td>
<td>Waterfowl</td>
<td>“the drake, destroyer of his own young”</td>
</tr>
<tr>
<td>Mallard</td>
<td>Anseriformes</td>
<td>Waterfowl</td>
<td>“the stork, avenger of adultery”</td>
</tr>
<tr>
<td>White stork</td>
<td>Ciconiiformes</td>
<td>Waterfowl</td>
<td>“the crane, the giant with the sound of a trumpet”</td>
</tr>
<tr>
<td>Common crane</td>
<td>Gruiformes</td>
<td>Waterfowl</td>
<td>“the heron, the eels’ foe”</td>
</tr>
<tr>
<td>Grey heron</td>
<td>Pelecaniformes</td>
<td>Waterfowl</td>
<td>“the glutinous cormorant”</td>
</tr>
<tr>
<td>Great cormorant</td>
<td>Pelecaniformes</td>
<td>Waterfowl</td>
<td>“the false lapwing, full of treachery”</td>
</tr>
<tr>
<td>Northern lapwing</td>
<td>Charadriiformes</td>
<td>Worm fowl</td>
<td>“the cuckoo, ever unkind” “murderer of hedge sparrow”</td>
</tr>
<tr>
<td>Common cuckoo</td>
<td>Cuculiformes</td>
<td>Worm fowl</td>
<td>“the swallow, the murderer of honeybees”</td>
</tr>
<tr>
<td>Barn swallow</td>
<td>Passeriformes</td>
<td>Worm fowl</td>
<td>“the tame robin”</td>
</tr>
<tr>
<td>European robin</td>
<td>Passeriformes</td>
<td>Worm fowl</td>
<td>“the jangling magpie”</td>
</tr>
<tr>
<td>Eurasian magpie</td>
<td>Passeriformes</td>
<td>Worm fowl</td>
<td>“the starling, that secrets can betray”</td>
</tr>
<tr>
<td>Common starling</td>
<td>Passeriformes</td>
<td>Worm fowl</td>
<td></td>
</tr>
</tbody>
</table>

*As proposed by Javis et al. 2014;*

Chaucer's species of "tyrant" is not listed here due to vagueness of description and uncertainty of species identity.

Our evolutionary tree is complicated by the fact that European settlers in the Americas often called unfamiliar bird species by the name of entirely different species familiar to them. For example, early European settlers prescribed the name “American robin” to a bird that had a similarly orange breast as their more familiar “European robin.” However, the former is a type
of thrush, while the latter is in fact an Old World flycatcher, and although both are passerines (perching birds), they are in fact quite different in form and function. An additional complication when we built the tree was interpreting Chaucer’s reference to parrots, of which there are no native species in England. However, it is possible, and perhaps likely, that his inspiration was in fact the rose-ringed parakeet, a parrot frequently brought from its native range in India and sub-Saharan Africa by traders during that time and prominently featured in medieval bestiaries.

Some representatives of modern bird orders were categorized correctly into one of Chaucer's four groups. For example, all members of Accipitriformes (diurnal birds of prey) and Anseriformes (waterfowl) were correctly grouped. However, the largest and most diverse order (Passeriformes, the perching birds, highlighted in blue in the list provided) was particularly problematic for Chaucer because representatives of this order were found in three of the four groups he presented (all groups but "Waterfowl"). These discrepancies were driven by the fact that Chaucer’s groups were dictated by diets and behaviors, the poet having no knowledge of the concept of genetic relatedness. As such, since corvids – crows, jays, and ravens – are passerines that routinely and opportunistically consume eggs and nestlings, it is not surprising to see them appear among the Birds of Prey. In addition, we now know that falcons (Falconiformes, represented by the merlin and peregrine falcon in Chaucer's "Birds of Prey" group) are close relatives of parrots (represented by the rose-ringed parakeet in the "Seed fowl" group) and are but distant relatives of hawks and eagles. However, it is not surprising that Chaucer groups hawks/eagles with falcons given their similar ecological roles and predatory behaviors; it would be many hundreds of years until the discovery of DNA.

Additionally, Jennie identified twelve species of birds that appear in Chaucer’s poem and have also been found on Maryland’s Eastern Shore, the region of our college, as either vagrant,
resident, or introduced species. As part of the SANDBOX exhibit, photographs of these twelve species (dubbed the “Parliament of Maryland”) was displayed to help local visitors further connect to the exhibit and to Chaucer’s poem (Image 5).
The Galapagos Islands

The Galapagos Islands are home to five different bird species from twelve taxonomic orders. Of the eleven species represented in the area, ten species of the Galapagos finch have been called Darwin's finches after their discovery by Charles Darwin during his voyage on the HMS Beagle. The finches are distinguished by their beak shapes, which have evolved to fit specific plant foods.

Photos were obtained via stereo-raster imaging of the fossils, further supporting the inter-

connected nature and ever-growing importance of climate science in our modern age of observations.

Images from: "Galapagos Birds: An Introduction to the Region's Finches and Other resident Species," by Mark Gornall; Illustrated by Tom Gornall. Copyright 2011 by Mark Gornall and Tom Gornall. All rights reserved.

This page contains images and text related to the birds of the Galapagos Islands. The page features images of various bird species, each accompanied by a brief description of their identification and significance.
Educators could easily incorporate this sort of activity into their courses to provide a more explicit local connection between the *Parliament of Fowls* and the physical location in which their course is being offered, or the students’ hometowns, which may provide a greater regional/global perspective. This activity can easily be accomplished using eBird (https://ebird.org/), a Cornell Lab of Ornithology-facilitated online repository of species location information uploaded by citizen scientists around the globe, with a particular emphasis on North American bird sightings. Students could use this freely available online database to search which species on the *Parliament of Fowls* bird list have appeared in their locality, including how often and at what times of year the species have been sighted.

The list provided in Image 5, the chart created by Jennie, shows Chaucer’s organization of the birds and Chaucer’s descriptions of their behaviors. Chaucer’s behavioral descriptions range from fanciful to factual with some of the factual descriptions indicating an intimate, first-hand knowledge of bird behavior. In the Birds of Prey category, many of the descriptions are accurate, with a cultural nod to the popular pastime of falconry. However, there is no evidence to support Chaucer’s description of the owl as the one who “that of deth the bode bryngeth” (l.343), or rather the owl’s ability to foresee someone’s impending demise and to cry out as an omen of death. Nor is there any scientific evidence that kites are particularly cowardly. One area of particularly thoughtful behavioral insight within the Birds of Prey comes with respect to the descriptions of the corvids, which Chaucer characterizes as “the raven wys; the crowe with vois of care” (l.363), and “The thef, the chough” (l.345). Crows and ravens are extraordinarily intelligent, with an innate ability to problem solve and use the materials in their environment in a resourceful and creative way. Thus, Chaucer’s description of the corvids as wise thieves has much basis in reality.
The descriptions of the Waterfowl, too, vary in their accuracy. Though erroneous, the popular medieval assumption that swans sing sweetest before death—as Chaucer says, the swan “ayens his deth that syngeth,” “right before his death that sings” (l.342)—is the genesis of our modern term “swan song.” The characterization of the drake, stork and cormorant stem from traditional moral lessons (ll. 360-2), although the biological bases of these descriptions are tenuous at best.25 However, Chaucer’s description of geese proves true when he calls the species “the waker goos” or watchful goose (l.358). Geese are especially watchful as they nest in open, exposed areas, each parent taking turns remaining vigilant at the nest to ward off any encroaching threats.

The descriptions of the Seed Fowl are more poetic. For example, Chaucer’s claim that the nightingale’s song brings forth green leaves, “clepeth forth the grene leves newe” (l.352), is a way to link its calls with the emergence of new growth in the spring time (l. 351-2). However, some of these lyrical descriptions have a strong biological basis, including “The wedded turtil, with hire herte trewe,” “wedded turtledove, with her heart so true” (l.355). Pairs of this species may choose to mate for life and are often easily observed resting and roosting together, harkening back to matrimonial fidelity. On the contrary, sparrows are correctly portrayed as “Venus sone,” or particularly lusty (l.351): some species of passerines (including sparrows) will copulate with an individual who is not their social mate.

The reviled Worm Fowl comes in for the most negative description. Chaucer describes them as “the foules smale / That eten, as hem Nature would enclyne, / As worm or thyng of which I telle no tale” (ll.324-6). In truth, they eat both worms and insects for their food. Chaucer’s greatest contempt is reserved for the cuckoo, “ever unkynde” (l.357). It lays its eggs in the nest of other species, to the detriment of the host. Adult cuckoos may remove host eggs before laying their own.26 In addition, cuckoo chicks tend to be bigger, hatch and grow more
quickly than their host species, and may resort to drastic means to reduce competition for food, including killing or ejecting the chicks or eggs of their host; this behavior supports Chaucer’s description of cuckoos as “murderers of sparrows.” Since the instinct to continue feeding an open, hungry mouth is ingrained in birds, the parents continue to feed the cuckoo chick even after their own chicks have been killed. Old World cuckoos have evolved a close relationship with their host species, and unlike the seemingly non-discriminatory brood parasitism of North American cowbirds, Old World cuckoos tend to parasitize one (or a few) select host species that their chicks and eggs mimic in appearance and behavior so as to avoid detection by the host.27 The intricacies of host-parasite competition and deception can only be fully examined using modern-day technology and monitoring techniques unavailable in medieval times. Thus, although it is unlikely that medieval people could appreciate the full complexity of this host-parasite relationship, or bird behavior more generally, it is clear that Chaucer and his contemporaries were very attuned to nature and animal behavior.

**BIRDSONG IN THE PARLIAMENT**

In medieval poetry, when birds are not serving as allegorical stand-ins for humans or as mouthpieces for conflicting perspectives in a debate, as in the twelfth-century English poem *The Owl and the Nightingale*, they feature as a sonic feature of an outdoor landscape. Due to birds’ associations with singing and therefore speech, medieval folk commonly projected rationality, talking, and reason onto birds; they also applied other less positive associations: birds as talkative, indiscrete, lecherous, and otherwise prone to excess, as both bestiaries and texts like Chaucer’s poetry discuss. Both positive and negative stereotypes about birds are illustrated in the popular, perhaps apocryphal anecdote about Francis of Assisi preaching to the birds after human audiences dismissed his message. Birds possess sufficient rationality and comprehension
of speech to listen to Francis, but the very fact that the avian audience could remain stationary and listen to Francis’ sermon in silence—the claim that even senseless, soulless beasts were receptive to his message—indicts by comparison the less receptive human audience, who refused Francis’ preaching.28

Birdsong is more prominent in the spring, as the Parliament of Fowls acknowledges with its concluding communal song that welcomes in “somer, with thy sonne softe” (ll. 685), because during the mating season, male birds are attempting to attract female partners with their calls, but more so, sing to protect their mated females from the copulatory attempts of other males. Chaucer begins the Canterbury Tales “General Prologue” with observations about the sexual habits of birds in April, correctly connecting their procreation to their song: “And smale foweles maken melodye / That slepen al the nyght with open eye / (So Priketh hem Nature in hir corages)” (ll. 9-11). Today, scientists call Chaucer’s “smale foweles” passerine birds, the order of birds whose toes enable them to perch, many of whom famously “maken melodye” in springtime as a form of mate and territory defense. On a related note, many, if not all, birds are capable of using unihemispheric slow wave sleep during which they are able to sleep with half of their brain at time, while the other half can simultaneously remain vigilant for predators. Thus, yet again, Chaucer accurately observes bird behavior when he claims they “slepen al the nyght with open eye,” and may be referring to that watchfulness rather than their amorous activities, as commonly thought by medievalists.

Bird calls are the heart of the mating process for many species. The Parliament of Fowls’ depiction of birds settling mating disputes via extended conversation does quite literally reflect the nature of bird song; songs produced by males in neighboring territories are used as a means of defending mates while avoiding the tangible risks associated with physical altercations. Thus, spring choruses of melodic bird song really are heated or extended exchanges in the
defense of mating opportunities. Birds pair off, though some will separate if they don’t produce surviving offspring during the course of a summer or, in the case of species who pair with their mates for years, if they have no surviving chicks over multiple seasons. Although Chaucer imagines eagles engaging in what Kordecki calls “a literal avian battle,” raptors’ courtship is quite different. If a rival tries to intrude on territory or take a female, he will have to give up, since the male eagle who already has that territory or that mate has the advantage. If two tercelets did fight, it might involve squawking or possibly flying at each other, but it would not likely escalate to an all-out fight to the death, since it’s in nobody’s interests to end up mangled (though it is possible if two males are evenly matched and fit to fight). Mated pairs will sometimes do an aerial display, with a big spin with interlocked talons, which a medieval observer such as Chaucer—or a bird watcher today—could misinterpret as a battle between competing males. Though Chaucer imagines the falcon, and by extension, all the birds of prey as spoiling for a fight, in reality, birds are far more pragmatic, and less bloodthirsty, than their human counterparts.

While the birds mostly “speak” in English during the course of the Parliament of Fowls, at one point Chaucer represents their natural sounds. When the sun is starting to go down on this day-long dispute among the three male eagles, the assembled birds finally become so exasperated that they are given a stanza to cry out, protesting. Then three of them cease their reasoned discourse and break into bird calls:

The goos, the cokkow, and the doke also
So cryede, “Kek kek! kokkow! quek quek!” hye,
That thourgh myne eres the noyse wente tho. (ll. 498-500)

The narrator’s ears are overcome with the cries of these three species, who also all speak later in the poem (the duck responds to the turtledove at lines 589-93). Whether we are meant to
understand that all the birds have been crying out “naturally” the entire time and the narrator has “translated” their speech for us, or that the goose, cuckoo, and duck have departed from human speech into their own species’ calls, is left up to the audience to interpret. As Melissa Ridley Elmes notes, “Although the inclusion of bird calls is a convention in Middle English lyrics intended to be sung, this incorporation of bird noises at line 499 appears to be its first use as a literary device in a written text not affiliated with musical lyrics.”31 These bird calls are part of the meter of the verse, incorporated as part of the poem rather than meant to be sung. Chaucer’s onomatopoeia connects the reader with the distinctive cries of these common birds, one of their most familiar characteristics.

We incorporated this real sonic dimension in our gallery exhibit, with a loop playing of the calls of each of the species in the poem, sound clips which Jennie obtained from https://www.xeno-canto.org, a website devoted to the identification, verification, and classification of bird vocalizations recorded around the world. These clips have been provided as part of our supplementary materials. Playing some of these calls in a classroom, or having students listen to the recordings, or better still go outside and listen to birdsong in the spring, is another way to focus attention on sound, and prompt students to think about sound and song in nature:

- What do they notice when they read poetry aloud? How does music affect us differently than speech?
- What emotions do these bird calls evoke?
- If students attempted to represent these bird calls in their own onomatopoeias, what combinations of sounds and words would they create?

Given that the poem concludes with a roundel (ll. 680-92) that purports to bring the birds into harmony both musically and in terms of restoring social order and tranquility, the
Parliament of Fowls invites readers to think about the symbolic function of song more deeply. How does listening to this birdsong differ from reading the roundel aloud? How do we interpret bird song through the lens of the purpose of our own human song? How satisfying do students find this conclusion via song, and the formel’s deferral of mating for another year? The final song moves the story along to the dreamer’s reawakening and the narrator’s repositioning of himself among “othere bokes” (l. 695), steadily taking the poem from the world of the birds to the human world of books and ample literary references to birds, both accurate and imaginative.

CONCLUSION

Ultimately, in Chaucer’s Parliament of Fowls, we appear to enter into the world of the nonhuman, the avian, with a strong emphasis on female agency and deferral—even perhaps refusal—of heterosexual love. Nevertheless, we also enter into the world of the human observer out among the watchful, noisy geese, reliably crowing roosters, and the loyal turtledoves, into the world of the encyclopedias that served as Chaucer’s sources, the world of bestiaries with their codification of proverbial knowledge and characteristics of birds, often inaccurate. At the very moment that we think we are accessing the most nonhuman, animal-focused world of the birds, we are simultaneously being connected to this longer tradition of human knowledge about birds. By connecting our students with primary sources about Valentine’s Day, bestiaries, experiences of bird calls and ornithological knowledge, we can enliven their experience of the poem and open questions about class, gender, love, society and human nature that are as relevant now as they were six centuries ago. Along the way, perhaps we can start talking more to our friends in the sciences. For Chaucer at least, the division between lover of poetry and observer of birds simply did not exist.
SUPPLEMENTARY RESOURCES

Dropbox link to the files of birdsong of all species mentioned in the *Parliament of Fowls*:

https://www.dropbox.com/s/ac8umnm13i9iulx/Bird%20calls.zip?dl=0

Dropbox link to the file of the *Parliament of Maryland* PDF:

https://www.dropbox.com/s/95iotdx19d1dq90/Parliament%20of%20Maryland.pdf?dl=0

Videos of sections of the *Parliament of Fowls* read in Middle English by Valerie Wilson, Erin Smedley, and Courtney E. Rydel, with translations in closed captioning:

- The Falcon video can be found at this link: https://youtu.be/_zZwhSwch3c
- The Turtledove video can be found at this link: https://youtu.be/Y7fjgN9wmho
- The Goose video can be found at this link: https://youtu.be/lh0tKHquleA
- The Cuckoo video can be found at this link: https://youtu.be/d9adE0SOExg
- The video of the Formel announcing her decision: https://youtu.be/3Au2luaDJL8

Link to British Library website with images of Harley MS 733, manuscripts of *Parliament of Fowls*:

https://www.bl.uk/collection-items/the-parliament-of-fowls?_ga=2.197256495.1003470224.1526760685-1642907309.1500654923

Link to British Library website with images of the oldest known surviving Valentine’s Day love letter in English:

https://www.bl.uk/collection-items/~/link.aspx?_id=650E2879F71A49F09FC19C480CE2AE14&z=z

Link to *Science* magazine article with image of evolutionary tree of birds based on whole-genome analysis:

http://science.sciencemag.org/content/346/6215/1320.full

Link to website Xeno-Canto, sharing bird songs from around the world:

https://www.xeno-canto.org

Link to eBird, a Cornell Lab of Ornithology-facilitated online repository of species location information uploaded by citizen scientists: https://ebird.org/
Link to online resources with varying levels of citation and scholarly rigor on Valentine’s Day and the connection to the *Parliament of Fowls*:

- Camlann Medieval Village, “St. Valentine’s Day,” Feb 2017, [http://www.camlann.org/st_valentine%27s_day.htm](http://www.camlann.org/st_valentine%27s_day.htm)

Notes

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Modern tests on the genetic diversity of eggs in a given nest have shown that female sparrows do have many extra-pair matings. Susan Schibanoff notes that sparrows were traditionally associated with lechery, as Chaucer indicates elsewhere (“‘Imaked…in Fraunce: Nature’s Queer Poetics in the *Parliament of Fowls*,” *Chaucer’s Queer Poetics: Rereading the Dream Trio*, University of Toronto Press, 2006, pp. 279).


14 This dating circa 1380 is largely contingent on the theory that the poem was inspired by Richard II’s marriage negotiations for Anne of Bohemia, but it does appear to be one of his earlier works.


16 Kordecki rightly notes that the “royal” tercel goes first, an “unnatural” decision, and observes how strange it is for other birds to weigh in on the choice (*Ecofeminist Subjectivities: Chaucer’s Talking Birds*, p 65).
The English parliament would not see its first sitting female MP until Nancy Astor in 1919. Kordecki remarks that, not counting the formel eagle who speaks “a mere thirteen lines at the end,” “the poet designates only two of its twelve bird speakers as female: the gabby goose and the romantic turtledove” (*Ecofeminist Subjectivities*, 64); however, Kordecki is not counting Nature, and overlooks the significance of half the “representatives” of groups in this parliament as female.


For more on mixed species flocks forming in winter as a strategy to avoid predators, see Tim Caro, *Antipredator Defenses in Birds and Mammals*, University of Chicago Press, 2005.


This tree was based on an article published in *Science* on whole-genome analysis of birds’ evolutionary linkages, publicly available here (see especially figure 1, which is reproduced as Image 3): [http://science.sciencemag.org/content/346/6215/1320.full](http://science.sciencemag.org/content/346/6215/1320.full). See Erich D. Jarvis et.al., “Whole-Genome Analyses Resolve Early Branches in the Tree of Life of Modern Birds,” *Science* 346 (2014): pp. 1320-31.

Found at [https://www.dropbox.com/s/95iotdx19d1dq90/Parliament%20of%20Maryland.pdf?dl=0](https://www.dropbox.com/s/95iotdx19d1dq90/Parliament%20of%20Maryland.pdf?dl=0).

Photo credits from open source images obtained from the photo sharing site Flickr: peregrine falcon, resident species (photo by BartNJ), Mute swan, introduced species (photo by pennyghael2), European starling, introduced species (photo by Ken Gibson), Golden eagle, nonbreeding resident species (photo by Greg Clarke), House sparrow, introduced species (photo
by Mathias Appel), Great cormorant, transient species (photo by Greg Peterson), Common raven, resident species (photo by Eugene Beckes), Northern lapwing, transient species (photo by Andrej Chudy), Merlin, migratory species (photo by mistermauro), Barn swallow, resident species (photo by Greg Peterson), Mallard, resident species (photo by Sheldrake1), and Northern goshawk, nonbreeding resident species (photo by Chris Earley).


29 Kordecki claims: “Actual birds may well debate their pairing and may well exhibit hostility to each other in their verbalization” (*Ecofeminist Subjectivities*, 64). Since songs in themselves serve as warnings to neighbors to stay away, the songs are hostile, though they are not debating the “pairing” of birds itself. Physical altercations, however, are particularly rare.
Kordecki suggests that in the case of a single female eagle desired by two or more males, a battle would be “plausible,” but in actuality there is no evolutionary advantage in extensive fighting.

Elmes p. 234.