# 3

# HOUSE SPARROW

## (English sparrow; *Passer domesticus*)

**House sparrows, introduced into Philadelphia in 1869 to control insect pests, are declining in numbers.**

*Figure 3.1* House sparrow (*Passer domesticus*) attacking winged insect in Independence Mall, December 13, 2012. At this time of year, flying insects are rare.

From Ecology of Center City, Philadelphia by Kenneth D. Frank. Published in 2015 by Fitler Square Press, Philadelphia, PA.

*Figure 3.2* Male house sparrow, showing winter plumage and insect prey in beak. It is the same individual as in figure 3.1.

In his report to City Councils in 1862 about infestations of insects in shade trees, Joseph Leidy noted that Philadelphia failed to attract insect-eating birds. He advised introducing turkeys, guinea fowl, and chickens into the public squares, and diverting water from fire hydrants to pools to attract wild insect-eating species. He recommended that the city avoid planting silver maples, and instead plant pest-resistant species, such as ailanthus; and that stiff brushes be used to sweep insects off trunks and larger branches.[1]

## Introduction of house sparrows into Philadelphia

Over the next five years, infestations of insects in Philadelphia increased, as did petitions demanding that City Councils import English sparrows from Europe to consume them. (The term "house sparrow" has replaced "English sparrow," a former common name for *Passer domesticus,* a species whose ancestry is broadly distributed in Europe, Asia, and North Africa.[3]) Since 1851 these birds had been introduced for pest control in cities in New York, Maine, Rhode Island, Massachusetts, Connecticut, and Texas.[4] In 1868 John W. Bardsley of Germantown decided to take matters into his own hands and set sail for England, where he planned to collect house sparrows for introduction into Philadelphia. While he was in England, City Councils in Philadelphia officially designated him as its authorized agent for importing the birds. He brought back more than a thousand and surrendered them to city authorities, who released them in 1869.[5] On May 18, 1869, *The Evening Telegraph* reported that Philadelphia's mayor, Daniel M. Fox, signed an ordinance appropriating "the sum of one hundred ($100) dollars…to pay John W. Bardsley for services rendered in procuring sparrows lately imported by this City."[6]

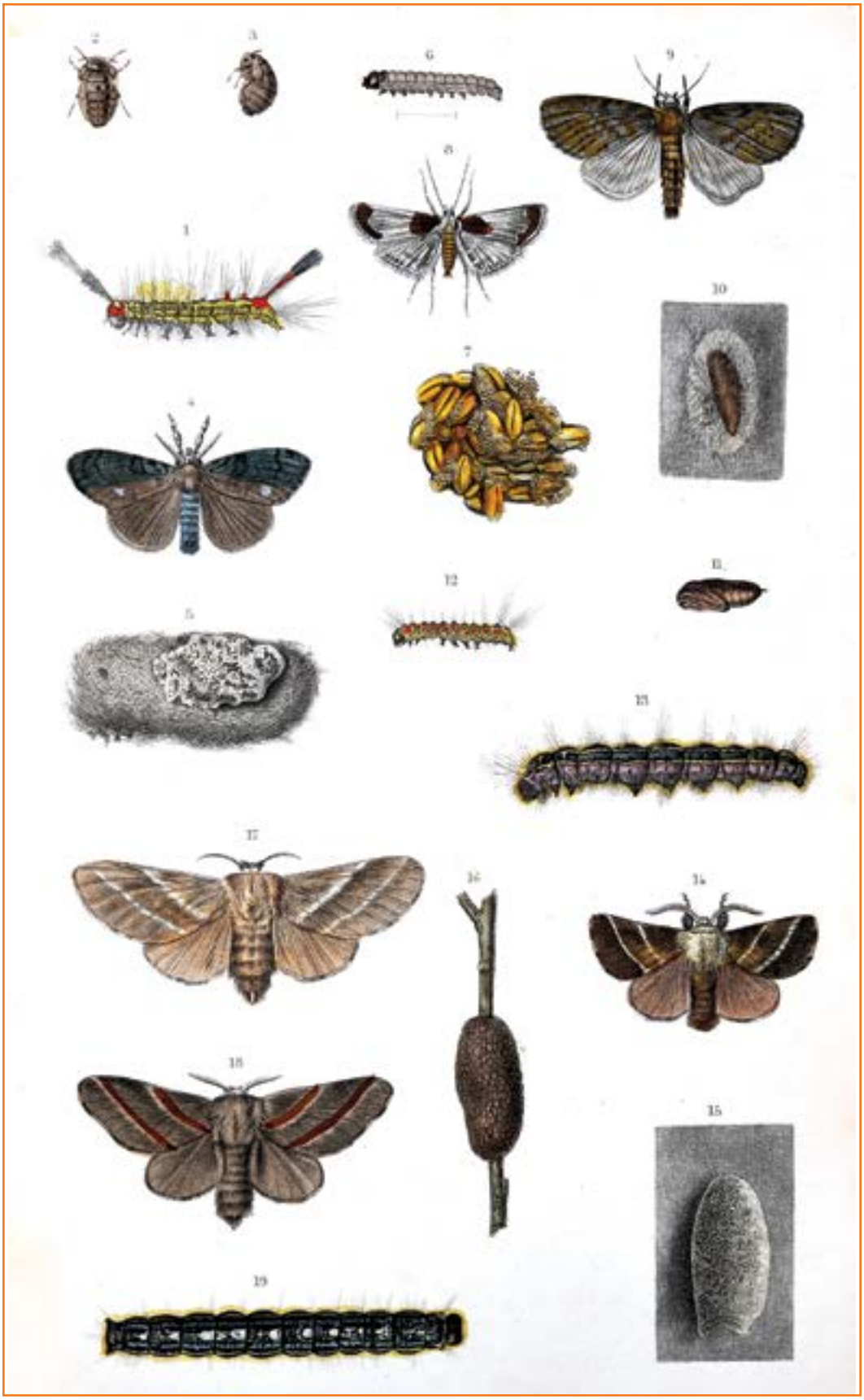

*Figure 3.3* Plate VII from Thaddeus William Harris's *Treatise on Some of the Insects Injurious to Vegetation,* published in 1862.[2] The colorful caterpillar on the upper left is a pest that Joseph Leidy reported to City Councils in Philadelphia in 1862. It is the larva of the white-marked tussock moth (*Orgyia leucostigma*), a male of which is illustrated just below it. Above it are two wingless females of this species. The other insects are all moths in various stages of development, and all were regarded as pests.

## Exponential proliferation

Twenty years later, populations of house sparrows were multiplying so fast that they prompted a federal investigation that produced a 440-page report, *The English Sparrow* (Passer domesticus) *in North America: Especially in Its Relations to Agriculture.*[7] The author, William Bradford Barrows, concluded that populations of house sparrows had increased geometrically and now covered over a million square miles of North America. Barrows's report did not put to rest a bitter controversy over whether house sparrows were on balance helpful or harmful.

## The sparrow wars

In Philadelphia, the chief protagonist in the "sparrow wars" was Thomas Gentry, who deplored introduction of the house sparrow.[8] His main adversary was Boston's Thomas M. Brewer, who defended the species.[9] Allied with Gentry against Brewer was Elliot Coues,[10] an accomplished ornithologist based in Washington, DC.

Gentry complained that Philadelphians, by feeding sparrows, spoiled them as agents of biological control:

> Charities poured in upon them from every source, and the gullible Philadelphian soon commenced to lavish more than usual attention upon these creatures of foreign extraction. The birds often fared much better than their poor human brethren. These fancied "saviors of vegetation" finally became well housed and well fed. Their good qualities were loudly applauded, and the law was constrained to throw around them its ægis of protection.
>
> But a change soon came over the aspect of affairs. Too much pampering had engendered a spirit of laziness. Accustomed to an easy life, the birds assembled three times a day to receive their allowances of food. The results of such folly soon began to be apparent. The squares became alive with caterpillars. The rusty vaporer crawled everywhere. Sparrows were never more plentiful. They abandoned their carnivorous propensities, in a great measure, and took to vegetable diet with a cheerful chirp.[11]

Gentry also held Bostonians culpable:

> The sparrow is rapidly exterminating the native songsters and insect-eating birds from our cities and large towns…It was only the other day that the shrikes *(Collurio borealis)* made their appearance upon Boston Common and began to decimate the ranks of the sparrows a little, when a crusade was instituted against them, by some person or persons who had the affair at his or their whimsical command. This was undoubtedly the first indication of a natural healthy reaction against the sparrows which has occurred, but it was most fatuitously nipped in the bud.[12]

Gentry condemned the house sparrow on grounds that were economic, ecological, aesthetic, moral, racist, and chauvinistic. The sparrow wars spread to the popular press, captured a wide audience, and engaged the American people in the first great national conversation on biological control. The controversy itself is controversial. One historian has argued that anti-immigration sentiment drove it.[13] Another has contended that anti-immigration sentiment had nothing to do with it; he views it as a scientific milestone: one of the first major debates among professional scientists in America, and one of this country's earliest ecological battles.[14] Sociologists have interpreted it as a metaphor for diverse social concerns of the day.[15]

*Figure 3.4* Engraving published in 1889. The caption is: "OUR IMPORTED PROTECTORS, MUTUAL DISGUST. English Sparrow to Irish Guardian of American Peace—'Do your own nahasty work, sir: W'english sparrows, sir, didn't come 'ere to eat hup your nahasty H'american worms."[16]

## Methods to control population explosion

Barrows's report, published by the U.S. Department of Agriculture, came down decisively on the side of Gentry, despite Gentry's lack of standing as an ornithologist.[17] It concluded that "the English sparrow is a curse of such virulence that it ought to be systematically attacked and destroyed before it becomes necessary to deplete the public treasury for that purpose."[18] It found the species to be harmful to agriculture,

horticulture, and native birds. The report adopted Gentry's proposal to repeal laws protecting the English sparrow. It recommended enactment of laws legalizing the killing of the English sparrow and the destruction of its nests, eggs, and young, and making it a misdemeanor to give the English sparrow food and shelter. It called for enactment of laws protecting its predators: the great northern shrike, sparrow hawk, and screech owl. Finally, it proposed that every town and village appoint an official whose duty it would be to "bring about the destruction of English sparrows in the streets, parks and other places where the use of fire-arms is not permitted."[19]

## Decline in abundance

At the beginning of the twentieth century, house sparrow populations declined—but not because of Barrows's recommendations. When automobiles replaced horses, sparrows in cities lost an abundant supply of food in the form of spillage of oats in horse feed and undigested seeds in horse droppings.[20] The decline in sparrow populations at the beginning of the twentieth century plateaued until about fifty years ago. Since 1966 numbers of house sparrows have dropped by 85 percent in the United States and by 62 percent in Pennsylvania.[21] In Canada they have similarly declined, the species becoming rare to absent in much of the Maritime Provinces.[22] Similar trends have occurred in Western Europe, particularly in cities, where in some cases the species has disappeared.[23] In India, declines have prompted calls for protection.[24]

Recent declines in populations of house sparrows have been attributed to many causes, none of which alone is sufficient to account for geographic differences in rates of decline. Purported reasons for the decline in cities include predation and fear of predators, particularly cats and raptors; shortages of food, including seeds and insects; competition, such as from house finches; and loss of nesting sites, especially eaves of roofs. Other putative causes include herbicides, pesticides, pollution, pathogens, parasites, vehicular traffic, and even exposure to microwaves and radio waves. Evidence in all cases is inconclusive. Decline in populations of house sparrows is probably multifactorial.[25]

House sparrows today are plentiful in Center City, but their numbers may be dropping, given recent declines in Pennsylvania and the United States. A decline in abundance of these birds downtown may not become obvious until their populations drop to levels that make the birds scarce.

*Figure 3.5* Flock of house sparrows eating bread in Independence Mall. House sparrows may appear plentiful even as their numbers plummet.

*Figure 3.6* European starling (*Sturnus vulgaris*), iridescent in direct sunlight in Independence Mall. Like the house sparrow, it is a common urban species that is declining in Pennsylvania and also generally in North America, including Canada, and in Europe.

The decline in populations of urban birds in Pennsylvania includes the house sparrow but also the European starling (*Sturnus vulgaris*), an introduced species whose omnivorous diet and disturbed habitats resemble those of the house sparrow.[26] The decline of both species in Europe[27] and North America,[28] including Canada,[29] suggests a common cause.

## Decline in supply of wild seeds

The house sparrow's dietary supply of seeds from wild herbaceous plants in downtown Philadelphia is thin. Gentry reported that house sparrows in winter eat seeds of ragweed (*Ambrosia*), goosefoot (*Chenopodium*), pigweed (*Amaranthus*), dock (*Rumex*), goldenrod (*Solidago*), and asters.[30] Ragweed is now absent from Center City except for rare plants near railroad tracks along the Schuylkill River. Goldenrod is rare or absent, and, outside of gardens, asters are absent except for heath aster (*Symphyotrichum pilosum*). Small patches of goosefoot, pigweed, and dock are scattered about, but vacant lots filled with wild plants have practically disappeared.

Homeowners and maintenance crews apply herbicides to vegetation in pavement cracks, the last refuge for wild seed-bearing plants in commercial and residential areas, outside of gardens. Green space in Center City, such as parks, is manicured. Neighborhoods with the most wild flora (i.e., "weeds") lie outside prosperous districts downtown.

Pollen counts provide a quantitative measure of changes in the regional abundance of weeds. The best published data on long-term pollen counts for this region cover the northern New Jersey–New York City metropolitan area from 1993 to 2002. They show total pollen counts decreasing by over half, particularly for herbaceous weeds, including ragweed, goosefoot, pigweed, and dock.[31]

Figure 3.7 The old South Street Bridge, facing Center City, August 2007. Wild vegetation here disappeared when the bridge was torn down and replaced.

## Declines in numbers of insects downtown

House sparrows are omnivorous, but must eat at least some insects to realize their full reproductive potential.[32] They eat insects in all common orders, plus spiders and earthworms.[33] The scarcity of weeds in Center City deprives insects of food and habitat. Grasshoppers common only a decade ago are now uncommon or absent because the patches of wild plants that supported them are gone.

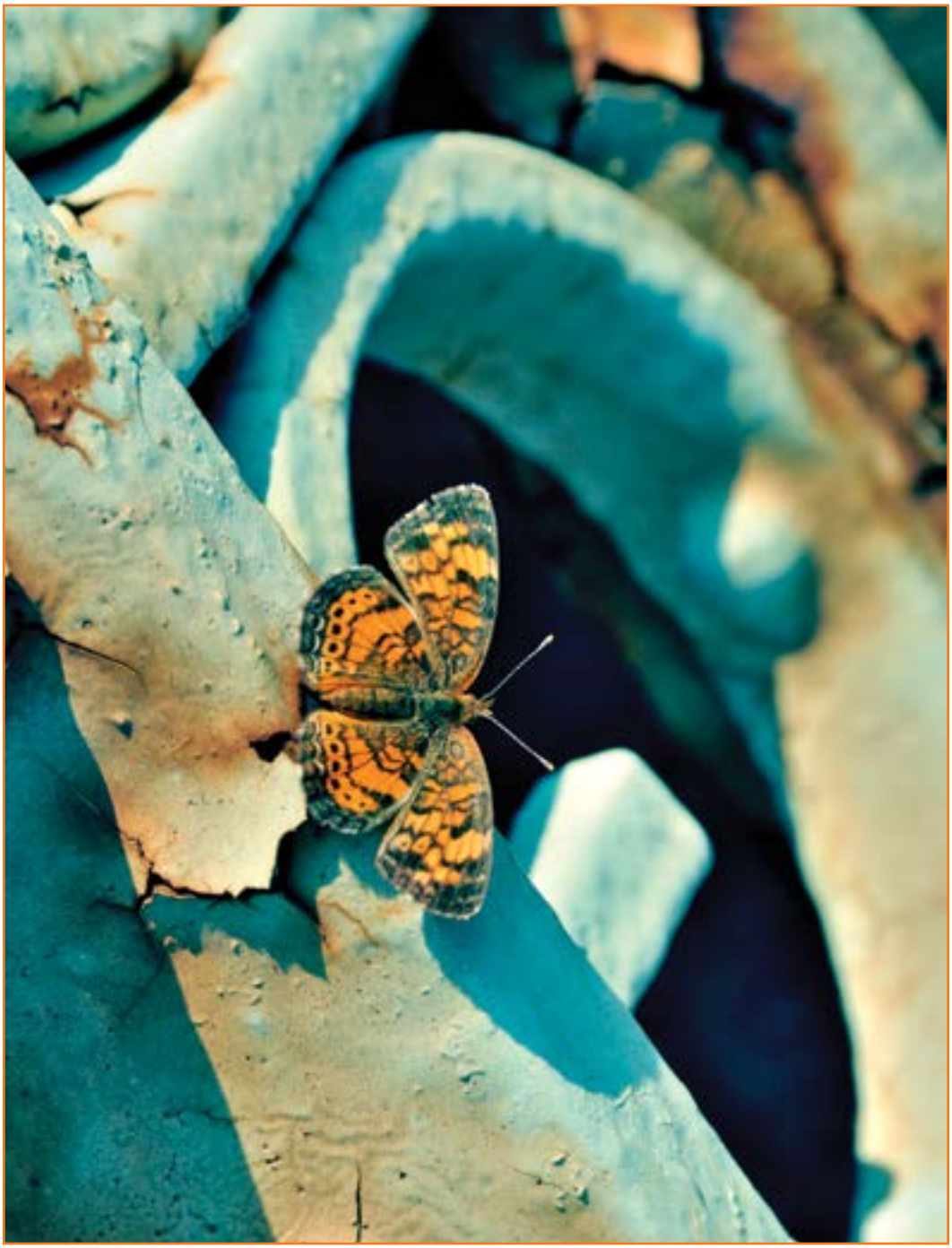

*Figure 3.8* Pearl crescent (*Phyciodes tharos*) on ornamental ironwork along the sidewalk of the old South Street Bridge, October 2007. (The ironwork is also shown in figure 3.7.) Heath aster (*Symphyotrichum pilosum*), one of its larval food plants, grew in cracks on the bridge. The insect, common in Center City a decade ago, is now rare here.

*Figure 3.9* Male herringbone grasshopper (*Melanoplus differentialis*) off Martin Luther King Drive in Fairmount Park, Philadelphia. A decade ago in Center City it was common in a field of grasses and forbs extending the length of Center City along the east bank of the Schuylkill River. Construction of a recreational park with a paved path eliminated this habitat.

To control injurious insects, Joseph Leidy's report to City Councils recommended that the city of Philadelphia plant insect-resistant species such as ailanthus, an exotic tree. Douglas Tallamy, chairman of the department of entomology at the University of Delaware, has concluded that introduction of exotic ornamentals harms populations of birds that depend on insects for food.[34]

## Exotic plants

In Philadelphia, the number of exotic species of plants that have naturalized is 627—more than in any other county in Pennsylvania,[35] even though Philadelphia is geographically the second smallest county in the state. This number is over half the total for all of Pennsylvania.[36] Alfred Ernest Schuyler, botanist at the Academy of Natural Sciences, has classified Center City trees according to whether the trees were present before European settlement. Of the 130 species on his list, only 43 met this definition of native.[37]

Ginkgo biloba, native to China, exemplifies a common exotic street tree in Center City. Around 1784 William Hamilton imported this species from England to his Philadelphia estate at Woodlands—the first introduction of ginkgo into North America.[38] Ginkgo is entomologically unusual, in that no species of insect specializes in eating it—even in China. Although insects that are generalized consumers of plants occasionally eat it, the species is remarkably pest-free.[39]

*Figure 3.10* Eleven ginkgo trees line both sides of the 2200 block of Delancey Street. No insects specialize in eating ginkgoes.

In Center City, about a mile away from Woodlands, eleven stately ginkgoes line the 2200 block of Delancey Street. By contrast, a mix of tree species native to Pennsylvania grows in Fitler Square half a block away. On an evening in late August, I strolled down Delancey Street toward Fitler Square and listened for the songs of tree crickets (*Oecanthus* sp.). I heard no crickets singing on Delancey Street, but in Fitler Square their chorus filled the air.

*Figure 3.11* Fitler Square. Native trees include sugar maple, northern red oak, eastern redbud, American elm, and flowering dogwood. On late summer nights, tree crickets sing here.

*Figure 3.12* Four-spotted tree cricket (*Oecanthus quadripunctatus*) on screen of author's house on Pine Street, two blocks from Fitler Square.

Despite the rarity of insects on ginkgoes, exotic plants do support populations of insects in cities. Arthur M. Shapiro at the University of California, Davis, found that native butterflies in local urban-suburban gardens bred mostly on alien plants, especially naturalized weeds. Almost half of these native butterflies had no known native host plants in the vicinity.[40] Others have found that adding native plants to community gardens in New York City did not increase diversity of butterflies, bees, and

wasps.[41] From the perspective of house sparrows in Center City, the concern about exotic plants is less important than the pervasive loss of wild herbaceous vegetation ("weeds"), both native and exotic.

A century and a half ago, City Councils approved the importation of house sparrows to control infestations of caterpillars defoliating municipal shade trees. Such outbreaks are now rare, and when they do occur, they are typically self-limiting. Center City and its ecosystems have aged. Enemies of insect pests have had time to move into the city and establish populations sufficient to suppress such plagues, as discussed in the next chapter.

The controversy over whether house sparrows are helpful or harmful has lost relevance. The increasing scarcity of house sparrows has reduced the competitive pressure they exert on other birds. The ecological significance of house sparrows has shifted from the birds themselves to the environmental changes responsible for depleting their numbers.