

Reflective Plate Glass— A Hazard to Migrating Birds

The use of reflective plate glass in building construction places large mirror-like surfaces perpendicular to the earth. Under some circumstances, particularly where this glass perhaps realizes its greatest aesthetic value in reflecting nearby trees or woodland, these mirrors constitute a hazard to migrant birds.

Reports of birds meeting death by colliding with man-made structures have appeared sporadically in the ornithological literature for nearly a century. Large scale mortality has been reported at lighthouses, tall buildings, and television broadcasting towers. An analysis of recent information suggests that as many as 1.25 million birds a year may die in this way in the United States (Banks, *Ann. Rev. Ecol. and Syst.*, in press). Instances of deaths of individual birds from flying into windows of homes and other buildings are less spectacular and receive less widespread notice, although total annual mortality from this cause may be as great as 3.5 million birds. This report draws attention to a new variant of the bird-strike phenomenon somewhat intermediate between large-scale mortality at tall structures and individual deaths at isolated windows and one that is likely to become increasingly important.

In early May 1973, migrating birds were abundant in the woodlots surrounding the John S. Lehmann Building

(see photo) of the Missouri Botanical Garden in St. Louis. Three sides of this building are constructed of large panes of reflective plate glass which create to human eyes the illusion of additional woodland where the building stands. Many birds, apparently flying to these illusory woods, flew into the glass. Some were killed outright by the impact while others were merely stunned. I found two partly decomposed birds in the woods approximately 30 meters from the building, suggesting that some stunned birds recovered sufficiently to return to cover, but later succumbed to injuries sustained on impact. I examined ten birds of six species at the base of the building on 1 May; other persons noted the presence of several other birds during the day. Members of the garden's staff indicated that this phenomenon was regular during a period of several weeks coinciding with the height of the spring bird migration.

On 29 and 30 November 1973, five bobwhites (*Colinus virginianus*) were killed by flying into the reflective side of the building. These nonmigratory birds were apparently flushed while feeding on the lawn near the building and flew toward the illusion rather than to safety.

Last September I was told of two birds found dead on a sidewalk in downtown Washington, D.C. at the base of a newly constructed eight-story

building that has seven stories of reflective plate glass on the north and east sides. Morning visits to the building each workday through the end of October led to the discovery of five additional birds. There is one small tree along the north side between the building and the street. Across the street to the north there are three larger, more fully foliated trees. The reflection of these trees shows clearly in the side of the building from street level. All but one of the six birds found at that building were on the north side. There is but one scrawny tree along the east side, where the other bird was found.

At another newly erected office building in downtown Washington with reflective glass on the north and east sides I found two dead birds on the sidewalk adjoining it on my first visit and two other birds on subsequent visits through October. At this building there are two small trees on the east side, where all four birds were found, and none on the north side. It appears that night-flying migrants that have descended into Washington move along tree-lined streets until they eventually mistake reflections for other trees and crash into the mirrors. The circumstances strongly suggest that the reflectivity of these particular buildings led to the death of the birds found there.

My walks to check for birds at these buildings led me past many other office buildings of similar height and corner location, several with large expanses of tinted or normal glass. I found no birds on sidewalks at buildings other than those with reflective plate glass.

Reflective plate glass is a relatively new development in the construction industry. According to corporate advertisements in national magazines, it lowers the cost and energy consumption of both heating and cooling the building. It seems likely that the use of reflective plate glass in large buildings will continue, probably at an accelerated pace. It seems reasonable to assume that the mortality of migrant birds at such buildings will increase also, especially where the glass buildings reflect trees. The aesthetic and economic values of reflective plate glass should be carefully weighed against the potential avian mortality at proposed construction sites.

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Expanses of reflective glass in the John S. Lehmann Building in the Missouri Botanical Garden, St. Louis, present a pleasing rustic scene to humans but a fatal illusion to birds. (Photo by Missouri Botanical Garden.)

