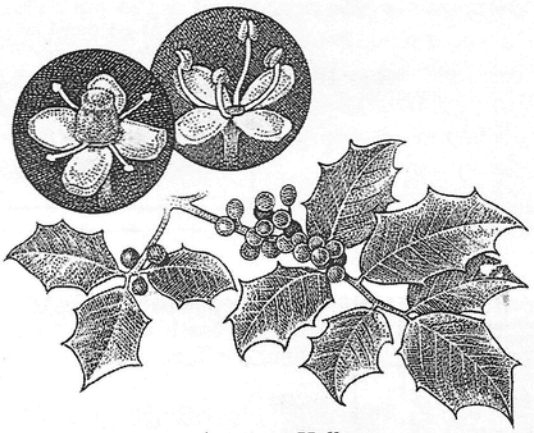
Local Nature

by Eric Dinerstein

Winter Holly

Checking the outdoor thermometer on December 25th was cause for future shock as the mercury arced past 70° Fahrenheit. Was global warming accelerating to warp speed? Over the next few days, spring bulbs started to send up shoots and cherries bloomed in warm pockets of Washington, D.C., and the Japanese quince flowers in Cabin John said hello three months early. What would be the next early botanical responder to unseasonable warmth?



American Holly:
(insets) Holly flowers: left female: right male.

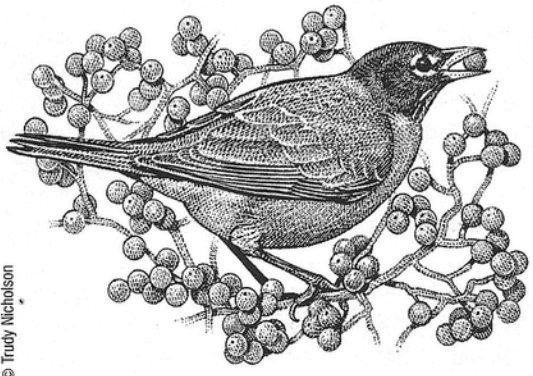
The holly trees kept to their normal schedule of fruiting in early December, displaying their bright red berries against the deep green foliage. They offered reassuring visual proof that no matter what the temperature outside, it was still Christmastime and the start of winter. Holiday revelers and florists rejoice at this constancy, but the curious naturalist has to nose in here with the question: unlike many of our other plants, why do holly trees still retain their fruit on the branches in the middle of winter, even through January and February? Why didn't some hungry starling or mockingbird or a famished squirrel strip the trees so laden with fruit at a time of relative fruit scarcity?

First, let's back up and review some helpful Holly-ecology. There are between 400 to 600 species of flowering plants in the holly family (*Aquifoliaceae*), found mostly in temperate and subtropical regions with many species in China. Botanists place all living forms of the plant in the same genus as our local holly (*Ilex*). Many are evergreen, but not all. In our area there is the native American holly (*Ilex opaca*), which can be maddeningly hard to tell apart from the widely planted and sometimes invasive European holly (*Ilex aquifolium*), also an evergreen species. But there is also a common holly shrub, winterberry (*Ilex verticillata*), that loses its leaves in the fall but holds on to its fruit throughout much of winter. We treasure our evergreen holly for decoration, but people in some other cultures consume theirs. Millions of people seek the dried and ground up leaves and stems of a common South American *Ilex* species to make a tea—the hyper-caffeinated yerba maté—the national drink of Paraguay and common in parts of Uruguay and Argentina as well.

So back to our mystery of natural history: why do our local hollies typically extend the Christmas visual of bright red berries against striking green foliage or, in the case of winterberry, bare branches and red berries into January and February? The first clue is that swallowing a few ripe fruits can cause vomiting and diarrhea in humans and ingestion of more than 20 berries may be fatal to children. That may explain why a number of other mammals leave them for the birds. But even resident birds wait almost until the end of winter to polish them off. Last February just after a heavy snowstorm, I watched a flock of American robins blitz a fruiting holly in the front yard and strip it bare by the end of the day. Was it a food source of last resort, then, when everything else sat under six inches of snow?

Think of it this way: imagine you were housebound after a snowstorm and couldn't even walk to the Bethesda Coop. You start to deplete what is left in the refrigerator, going through everything tasty and nutritious until all that is left are a few mealy old apples. That is what holly berries represent to most birds. Hollies are not alone in the low-quality fruit aisle of nature's grocery store. If you have planted a mountain ash tree (a member of the rose family), or have a female eastern red cedar in your yard, or in the

woods you notice the persistent fruits of poison ivy, greenbriar, or various viburnums—you may notice that the red or blue fruits, though looking like they would be tempting to squirrels and birds, remain uneaten until late winter. Meanwhile, high nutrition fruits such as the local spicebush, sassafras, and magnolia that are rich in fat and the various summer berries that are super-rich in sugar are long gone. Holly berries have no fat and little sugar, and thus reside at the bottom end of the nutritional scale. In short, on a short winter day, holly fruits are survival rations.



Robin eating Winterberry fruit.

By their sheer abundance, the American robin, pictured here about to feast on winterberry, seems to be doing just fine. In fact, an ornithologist friend once dubbed the American robin "the bird of the future" because this native thrush had evolved to exploit a growing new habitat—the suburban subdivision—and might possibly crowd out other native birds in the nearby forests. This same biologist friend was at the time studying the charismatic resplendent quetzals and three-wattled bellbirds of Costa Rica. We were on a forest ramble checking fruit ripeness one day when he boldly proclaimed, "Any fruit one of my study birds can eat, I should be able to eat." His hypothesis was that for a ripe fruit to be poisonous makes no evolutionary sense. After all, the point of plant reproduction is to attract dispersal agents that eat fruits, digest the surrounding pulp, and deposit the seeds to a safe place for germination, not to poison the driver of the delivery van. I do not know in formulating his hypothesis if he ever bit into an American holly. He is still alive and teaching so I assume he knew better or knew that some fruits are poisonous to certain vertebrates but not to all. It is the exceptions in ecology that you have to watch out for. —