Local Nature

by Eric Dinerstein

Bewitched

As a young child, I was puzzled by the bottle in our medicine cabinet labeled "Witch Hazel." My first idea was that doctors had distilled the potions of a witch named Hazel into this home remedy that was said to have a healing effect. Hazel, I reckoned, must have been a good witch. Only later, when I made the mistake of rolling in poison ivy or returning home from camp covered in insect bites, did I appreciate the soothing properties of this extract. Witch Hazel, I later learned, can be used to treat many other ailments and skin irritations, and has a long history as a medicinal. Native Americans, for example, extracted the juice from the bark and roots and perhaps passed the knowledge of this astringent on to Captain John Smith and other settlers.

Witch Hazel flowers, leaves and exploding seed pods

Anyone walking along the Cabin John Creek trail in Autumn can easily spot the witch hazel growing in abundance on rocky, north-facing slopes. First, look for the brilliant leaves turning various shades of purple, red, and burgundy. Witch Hazels are one of the most beautiful fall foliage plants in our native flora.

But it is after the leaves have fallen to the forest floor that the plant's true magic begins to be revealed. Around late October or early November in our area, lacy, narrow yellow petals emerge from the branches. This showy display sparks a double take to botanist and hiker alike. What madness, what evolutionary explanation could there be for a plant to flower just before the onset of winter? Could there possibly be a beetle or a gnat still alive at this time of year to pollinate these stunning, spicy-smelling flowers? The cold nights of November finish off most of the flying insects and the migratory butterflies headed south long ago. So pardon the expression, but how could any plant be so dense and still persist?

One possibility: a disgruntled sorcerer cast a spell on the Witch Hazel, directing it to bloom only in fall—long after the last aster and goldenrod, when no other plant was flowering. A better explanation would invoke not spells but the first and only law of nature: there is an exception to every rule in nature.

Looking for the exceptions in nature and explaining them can lead to the most fruitful field biology. At its heart, field biology is detective work. Either you follow clues to solve a puzzle or, through keen observation, you note phenomena that later, when a question is posed, helps you to sift through the evidence to construct a plausible answer, even if the original intent of the field study was something else entirely. One of the cleverest naturalists around, Bernd Heinrich, inadvertently discovered in 1987 the answer to the riddle of pollination while on a different investigation, out at night in the sub-zero temperatures of a Maine winter to learn how the insects that were active stayed warm at night. His focus was on owlet moths. These intrepid relatives of butterflies hide during the day under a blanket of leaves, and go into torpor, allowing their body temperatures to drop to that of their surroundings. At night they must warm themselves up to head off into the freezing cold to search for food. This warm-up requires periodic bouts of perching and "shivering" sessions, like humans do to keep warm, but the tiny moths must raise their body temperature sometimes as much as 50° F in order to fly. Once airborne they scan the forest for injured trees and feed on the oozing sap. While following the owlet moths, Heinrich discovered them tasting the blossoms of Witch Hazel. As the moths shifted from one plant to another to feed on the blossoms, they fertilized the flowers. Flowering in late fall must have some selective advantage. The pollinator pool may be much depleted but the faithfulness and

reliability of the owlet moths to move the Witch Hazel's pollen must be the basis for what seems to us an abnormal flowering time.

Next to the flowers are the fruits of the Witch Hazel, present in little capsules near the blossoms (the Latin name for Witch Hazel is *Hamamelis*, meaning flowers and fruits present at the same time). Almost as puzzling as the pollination of Witch Hazel is how its seeds are dispersed. Not by bird nor beast, but by their own action: if you are standing beside one in winter you may hear the pop of a seed pod exploding and see its seeds flung as far as 30 feet! I have yet to find a tally of the world's 250,000 species of flowering plants that rely for dispersal of their seeds on propulsion but Witch Hazel is not alone: even our native Wisteria is a cannoneer of sorts, as is Spotted-touch-me-not (*Impatiens*) and the appropriately named Jumpseed (*Persicaria virginiana*). The sound of seeds shooting out of the capsules gives the plant another common name, Snapping Hazel. All this jumping has an evolutionary explanation: to propel the seeds far from the base of the parent gives them a better chance to germinate than if they piled up underneath for the benefits of hungry chipmunks.

Its brilliant fall colors, out-of-synch flowers, mysterious nocturnal winter pollinator, and explosive seed showers make the spell of Witch Hazel almost irresistible even without the plant's evocative name. What a perfect natural contribution to Halloween when owlet moths and real witches are flying. —