

GENERAL SCIENCE

# Unfolding of Spring

The bursting wonder of spring is here again, bringing back fragrant rains, fragile flowers, sticky sap in trees, and many courtship antics of birds, beasts and even human beings.

By BARBARA TUFTY

See Front Cover

► THE FIRST DAY OF SPRING officially arrives at 3:05 p.m. EST, Saturday, March 20, but spring actually has been creeping up the Northern Hemisphere for more than a month, subtly melting streams, awakening insects from winter sleep, putting strange new vigor in human and animal spirits, and changing the voice of the cardinal from a cold drab cry into a sudden burst of melody.

Spring comes with the first haze of green showing on a field of grass, even though snow still lies across the ground in thin patches, like pieces of blown paper. It comes in the early months of the year with a yellow-orange flush of color shooting through branches of weeping willows or creeping into buds of maple trees.

Spring comes as early as December, when shafts of warm sunlight make a marsh muddy for a few days, and in a melting pond floats a real sign of awakening life—the cold jelly-like clusters of frogs' eggs, life in a simple, primitive form.

The beginning weeks of spring are filled with starts and stops, as snow flurries and cold windy skies follow warm days preg-

nant with hints of warmth and renewed life. The edges of a pond that one day are melting, may be frozen tightly again the next day, and some mornings there are caps of snow on the grey pussy willow catkins or the waxen pink buds of a magnolia tree.

Spring showers suddenly fall, caused by violent temperature changes in the clouds. Seen on this week's front cover are rolling stratocumulus clouds while cirrus clouds move at higher altitudes.

Yet each day, spring grows stronger as it moves another 15 miles up from the south in its inevitable journey that changes all living things.

Perhaps it is the soil that feels spring first, when enough warmth from the sun and water from melted snow and fragrant rains permeate into the frozen ground to permit earthworms to stir, and seeds to germinate and start to rise toward the light.

One of the first awakeners of spring is the skunk cabbage, which dares early to push its purple or yellow hooded spathes through the snow, creating its own snug world of warmth and life. Another early riser is the snowdrop, which blends white against white as its fragile green-tipped white blossoms bend toward the snow-covered earth.

As spring advances, more flowers begin to push their pointed leaves from the moist soil and unfold their buds. Many early spring flowers have pale delicate colors of white, yellow or fragile pink and blue—the wind anemones, pink spring beauties, red-veined wild geraniums and light blue scillas with tiny belled flowers.

Later, as spring becomes more sure of herself, the colors deepen and the land is bright with scarlet tulips, deep purple hyacinths and bright yellow daffodils. Higher above ground, the bushes burst into flame—redbuds of the eastern woods, paper-thin petals of the thorny Japanese quince and sunlit yellow drops of jasmine and forsythia.

Tips of trees also unfold as the syrupy carbohydrate-enriched sap is forced by root pressure from below ground and drawn by transpiration and evaporation of water from the tree tops above.

Many trees bloom in early spring before their leaves appear, so quietly and subtly that most people do not realize the life-producing drama going on above their heads. From trees such as hazels and oaks, alders, poplars and willows, hang catkins, those slender streamers of tiny male flowers filled with pollen.

On a warm breezy day, clouds of this golden dust drift through the air to fertilize the more obscure compact female flowers. Most of these fertilized seeds stay safe on the parent trees until autumn, but some fall to earth in spring.

Oval elm seeds with side wings like a halo cover the ground and fill the gutters with what looks like oatmeal flakes. The paired winged maple seeds gyrate to earth like miniature helicopters. There they immediately start to germinate—unless a small boy catches one to split the seed and stick it on his nose like a beak.

## Insects Awaken

Another kind of spring awakening goes on with those tiny six-legged creatures, the insects, which begin now to awaken from sycamore bark, apple tree twigs, holes in the ground or cracks under your back porch. Here they have been slumbering through the cold winter half-light in all the insects' natural forms—as eggs, or worm-like larvae, cocoon-like pupae or as mature adults.

Now the overlapping eggs of the katydids, lined all winter along a tree twig, begin to open; the woolly bears, which are the caterpillars of the Isabella Tiger moth, uncurl from beneath old boards and logs; a drop of trickling water loosens the soil where the sleeping mosquito lies; and the aquatic larvae of black flies and midges stir to life as ice of ponds and streams melts away.

Honeybees, which have been keeping themselves warm all winter long by dancing and fanning their wings in great buzzing balls inside hollow trees, now take short forays into the softening air to find sources of nectar. The pregnant bumblebee queen,



Fremont Davis

**SNOW-TOPPED BLOSSOMS**—Early spring is sometimes an erratic affair, when winter still lingers and fills the unfolding pink buds of a magnolia tree with snow.

sole survivor of last summer's colony of bees, flies low over the fragrant soft earth, investigating holes and crevices for a possible nest where she can lay her eggs and start this year's new colony.

Some of the more spectacular ceremonies of spring occur in the bird kingdom, where the returning bright sun and warm air bring about changes in feathers, voices and behavior. Like young boys whose voices crack and change, cardinals, thrushes and other songbirds suddenly have a change of voice from the dry cry of winter to a rich song.

This is the season when woodpeckers start to drum on trees, cock pheasants to strut in colorful spring feathers and puff out their necks, and cranes to prance an awkward but effective minuet of courtship.

Even the ubiquitous pigeon, seemingly undisturbed by encroaching civilization with noisy cities, cars and people, wakes up to spring in his own way, pursuing the female over concrete sidewalks and streets, puffing up his chest, spreading his tail, and turning around and around in pigeon-toed strutting.

### Pituitary Activity Increases

As days get longer and sunlight gets stronger, a small gland called the pituitary gland at the base of a bird's brain becomes more active, secreting a chemical hormone that sets off a chain of events changing the colors of feathers, starting birds on long migrating journeys, and stimulating the female to produce eggs in her body and the male to produce sperm.

Clouds of returning birds fly thousands of miles northward to familiar nesting areas in forests, fields and pieces of land they have known year after year. The male bird usually arrives first and takes his stand on a particular piece of ground that may be a willow patch just a few feet long or may extend for several miles beside a running stream or along a field.

Here he defies any other male to enter his territory by singing as lustily as possible. This song, known as a threatening gesture to other birds, is considered the announcement of spring to human beings.

If his song doesn't drive away a male intruder, the bird ruffles up his feathers and makes sweeping clamorous attacks until once again he is master of his domain. When a female ventures on his property, he tempts her to stay by soft chirpings, flutterings, and even by presenting gifts. A cardinal may present a berry, a heron a stick, while farther north, a male penguin offers snow or pebbles to the object of his affection.

Some birds have marvelously attuned courtship dances preliminary to the copulation that perpetuates their life on this planet. For instance, the male and female albatrosses, wanderers of the sea, face each other on a lonely seacoast, open their enormous wings, point their bills to the sky and bray like donkeys.

Water birds called crested grebes touch beaks, wag their heads from side to side, dive and present billsfull of waterweeds to each other. Then they scuttle across the surface of the pond or lake, facing each other in a sinuous dance.

High in the air, eagles circle in pairs,

suddenly dropping to earth, then rising to soar again.

The male marsh hawk sometimes plunges 60 feet through the air, screeching as he dives and turning a somersault.

A hummingbird male flies in aerial acrobatics higher and higher into the air, then dives to earth, breaking to a sudden halt at the level of the female which has been quietly sitting on a twig.

Mammals and other animals are a little more private about their courtship arrangements, since many of them are awake at night and carry on a lot of their activities deep in burrows under the earth, or in the water, or hidden in dark caves and forests.

With the smaller animals, squirrels race after each other through a maze of tree branches, jerking their bushy tails, chattering and clashing their teeth, and beating their paws on the ground.

Somewhere in the meadow, a male hedgehog circles around his chosen female for hours, puffing and extending his snout toward her before the two of them shuffle off together. Skunks have a courtship dance at dusk, bowing and bobbing, hopping toward each other on stiff legs until their noses touch.

Mating time among the elks is a noisy affair as spring comes to the northern woods. Here the males roar and crash antlers together in resounding fights to win the females. High in the Rocky Mountains, the spring air is shattered with crashing anvil sounds of the mountain goats butting each other's horns. And in the warm forests, an elephant courtship may sometimes take weeks, in good elephantine time, as the great beasts gently touch each other with sensitive trunks, sometimes twining them together as if "holding hands."

### 'Spring Fever'

Spring comes to human beings as well, causing a drowsy feeling known as "spring fever," which makes one wish to put aside work and go for a walk in the woods or dream under the sun on a park bench. This is the time of year when shop owners display bright colored clothes, vendors sell daffodils at street corners, and housewives give their homes a good spring cleaning.

School boys and girls slowly meander home in the warm air holding hands; convertible cars appear with their tops down; and the "monkey dance" and the "swim" are replaced by the latest dance called the "jerk," as young people stomp off excess energy in dances no stranger than the spring dances of other young creatures.

• Science News Letter, 87:186 March 20, 1965

## Do You Know?

*Milk* is the only food now under microbiological control.

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• Science News Letter, 87:187 March 20, 1965

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