If watching woody plants endure extreme weather is your interest, then 1996 looks no less promising than 1995.

Ambivalence, not indignation, is the healthier attitude to have towards the weather. It's not that the weather doesn't provide ample cause for complaint—it does—but any protest about the heat, or the rain, or the cold, or the snow is an invitation to compounded frustration. This spring was a case in point. Last year's drought made Arboretum horticulturists anxious for early spring precipitation, and even after the winter's record-breaking snowfall we were still tense when the end of March and first week of April turned out to be abnormally dry. The possibility of another seven-month drought was enough to give us nightmares about our favorite plants withering away on the grounds. Nervously watching long-term forecasts, we consulted our almanacs, looked for solace from meteorologists, and prayed for rain.

Then it snowed. On Monday, April 8, four inches of snow fell, most of which melted by that afternoon. Two days later it snowed for real, dumping eleven-point-five inches of wet and heavy snow across New England, covering cornelian cherries and magnolias and daffodils with nature's version of wet cement. Our much-needed precipitation did even more structural damage to the Arboretum's plants than the ice storm of March 1995.

The weak crotch between the two main leaders of this ninety-year-old red oak couldn't stand the combination of wind and wet, heavy snow brought by the snowstorm on April 10. The tree split in half, crushing a little cherry, mangling an osage orange, and stripping the lower branches from the Metasequoia in the background.
All that was left of the red oak after the storm.

About one-hundred plants were recorded by the grounds crew as needing some sort of pruning, and roughly thirty of those had to be removed entirely. Some of the destruction was spectacular, like the ninety-year-old oak growing on the southeast flank of Peters Hill that split in half, crushing a small *Prunus* and peeling all of the lower limbs from a forty-eight-year-old *Metasequoia*. The *Metasequoia* still stands but it looks like a fish skeleton that's been stripped of two-thirds of its ribs. Three mature beeches dropped thousand-pound limbs, and the snow knocked off most of the recently opened *Acer rubrum* and *A. saccharinum* flowers, creating a scarlet carpet at the bases of the larger trees. Our oldest specimen of *Magnolia zeni* (Arnold Arboretum accession 1485-80-B), the Arboretum’s official harbinger of spring since it first flowered on 31 March 1988, lost many buds and didn’t fully open until 15 April, two weeks later than usual.

But like most things that happen in a garden, the storm also provided us with new information about the collections. After spending more than a week finding and removing seriously injured trees, arborists John Del Rosso and John Olmsted began to see a pattern in the broken and fallen limbs. “Most of the serious damage we found could be traced to a pre-existing condition in the tree,” observed Olmsted. “Weak crotches [where two limbs or leaders meet and form a narrow, V-shaped intersection] and old cracks formed by prior storms or badly healed pruning cuts caused most of the big breaks,” Del Rosso added. According to Olmsted and Del Rosso, there were a lot of minor cracks and stress damage from last year’s ice storm and these grew during the subsequent drought as the wood dried and contracted. Eventually, those cracks got big enough to undermine the tree’s ability to endure the combination of wind and snow that came with the spring storm.

A few arborists claim that some species are more prone than others to breaking up in heavy winds, rain, or snow. Olmsted and Del Rosso
found little evidence to substantiate this theory: instead, they found that a tree's location is the primary determination of whether it withstands or succumbs to severe weather. Large trees planted along roads or on hillsides exposed to the wind were more likely to lose major limbs while trees protected by buildings or planted amidst other plants tended to fare better. Conifers, shaped by evolution to allow snow to slide off their branches, showed their inbred capacity to weather such an unexpected spring storm: very few of our large pines, firs, or spruces lost limbs and none had to be removed. On the other hand, many of the small ornamental cherries and apples, planted in the open to maximize the effect of their flowers, lost many large branches and about a dozen had to be removed.

This spring snowstorm added to the list of things that need to be done this season to restore and rejuvenate plants in the Arnold Arboretum. Members of the staff are still looking for the inconspicuous cracks and breaks that, if left untended, will cause spectacular damage in the future. Unfortunately, with over twelve thousand accessioned trees and tens of thousands of spontaneous plants growing on the grounds, we will never quite catch up. But even if we don't find all the damage now, we can count on future storms to show us exactly what we missed.

Acknowledgments

Thanks to arborists John Olmsted and John Del Rosso for taking time out of one of their long days of pruning to discuss what they observed on the grounds after the latest snowstorm. This has been a busy spring for John and John—the responsibility for all of the major pruning and removals at the Arboretum falls onto their shoulders, and all of our recent severe weather has left them with a considerably increased workload.

Todd Forrest is the plant recorder at the Arnold Arboretum, at least until August, when he will begin studies at the Yale Graduate School of Forestry.

Corrigendum: In the report of the Arnold Arboretum Weather Station Data—1995, which appeared in Volume 55:4, the length of the growing season was incorrect. It should have read 187 days.