VanDusen
BOTANICAL GARDEN

Tree of the Month, August 2013:
American chestnut (*Castanea dentata*)

Part of the role of a botanical garden is to provide a home for plant refugees, species that are suffering from habitat destruction, overharvesting, or in the case of the American chestnut, a devastating disease.

Castanea dentata is native to eastern North America - from southern Ontario, Canada, to the Appalachian Mountains in the USA. It was once a dominant tree species. In most eastern forests, one in four trees was once an American chestnut. Their trunks grew tall and thick; making excellent lumber. Their small, but delicious, nuts provided food for many animal species. Their serrated green leaves and white catkin flowers filled the forest canopy in summertime.

Then in 1904, someone noticed some sick chestnuts at New York Zoological Park in the Bronx. The trees had rusty orange cankers growing on their trunks. A mycologist at the nearby New York Botanical Garden identified it as *Cryphonectria parasitica*, an Asian tree fungus that probably arrived in a shipment of Chinese chestnuts (*Castanea mollisima*). This fungus, also known as chestnut blight, is common in Asia, and the Chinese chestnut had built up a resistance to it. The American chestnut, however, had no resistance. The canker would eventually spread all around the trunk, girdling the tree and preventing the flow of water and nutrients between roots, leaves and trunk tissue. Everything above the canker died, leaving only a stump.

From the Bronx, the wind-borne fungus began to spread all through the range of the American chestnut, and over the next fifty years people watched as 25 percent of the forest died. By 1950, more than 3 billion trees had been infected - reduced to skeletons and stumps.

Technically speaking the American chestnut is not yet extinct. The roots of the stumps are still alive, and will send up young shoots. Unfortunately, as these shoots grow their bark begins to crack and expand, and the fungus finds a way in and infects the young trees. Unable to reproduce, these trees can be considered functionally extinct. Eventually the roots will starve. The only survivors will be the few mature trees that remain in areas far outside the range of the blight, such as the 35-year-old specimen we have here at VanDusen.

As bleak as this seems, all is not lost. The American Chestnut Foundation, an organization dedicated to saving the species, has a number of projects underway, including studying a virus that can infect and weaken the chestnut blight as well as efforts to breed a resistant strain of the tree. Some blight-resistant seedlings have already been created by inserting anti-fungal genes from wheat into chestnut embryos. These seedlings are now growing at the New York Botanical Garden.

American chestnuts that have found refuge in botanical gardens are important genetic reservoirs for conservation efforts like those mentioned above. To protect our existing chestnuts here at VanDusen, we must be very careful to purchase only thoroughly inspected, blight-free *Castanea* for our tree collection.

Our American chestnut is located near a service gate, so please watch out for vehicles when you visit this marvelous tree.