

BILTMORE®

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Sustainable Forestry at Biltmore

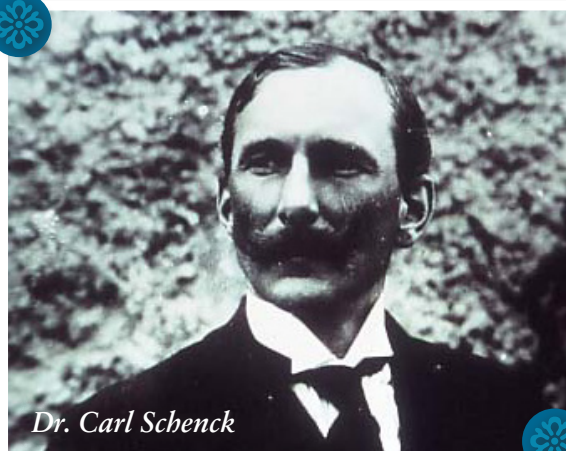
Much of the land that Mr. Vanderbilt purchased to create Biltmore had once been a beautiful forest. As more and more people came into the Appalachian Mountains, they became aware of the vast natural resources in the region. Copper, coal, and other minerals were mined. Forests were cut for lumber and cleared to create farmland.

Mr. Vanderbilt's goal was to make the land usable and healthy again. He also wanted to be able to cut the trees on his estate for timber without destroying the forest. To help him do this, he hired Gifford Pinchot, an expert in forest management.

Of the 125,000 original acres of land on the estate, more than 100,000 acres were covered by forest. Some of it was healthy, but other parts were in great need of attention. Mr. Pinchot divided the main estate into sections. He presented Mr. Vanderbilt with a plan. Only one section should be harvested (cut) each year and the estate's foresters should



Forester Gifford Pinchot in 1893



Dr. Carl Schenck

follow a strict cycle. Many years would pass before that section was harvested again. Trees that were cut would be replanted. This practice would assure a healthy forest and create the possibility of a perpetual (everlasting) harvest. The idea of sustainable forestry caught on. Other land owners and timber companies adopted the plan instead of cutting forests clear and abandoning the land.

In 1895, Gifford Pinchot left Biltmore and later became the first Chief of the newly formed U.S. Forest Service. During his time in this role, many of our country's national forests were created.



After Mr. Pinchot left the estate, Mr. Vanderbilt hired Dr. Carl Schenck to oversee the forestry operations. Dr. Schenck had been a professor in Germany who taught future foresters how to use scientific principles to manage and improve the forests. In 1898, Mr. Vanderbilt and Dr. Schenck opened the first school of forestry in America. Though more than 100 years have passed, schools of forestry around the world still teach the scientific methods that Dr. Schenck developed at Biltmore.

You can visit the Cradle of Forestry near Brevard, NC, and see some of the original forest school buildings where Dr. Schenck taught his classes. Learn more about forests and forestry practices today through their hands-on interpretive displays and classes.

Go to cradleofforestry.com for a complete listing of activities and hours.



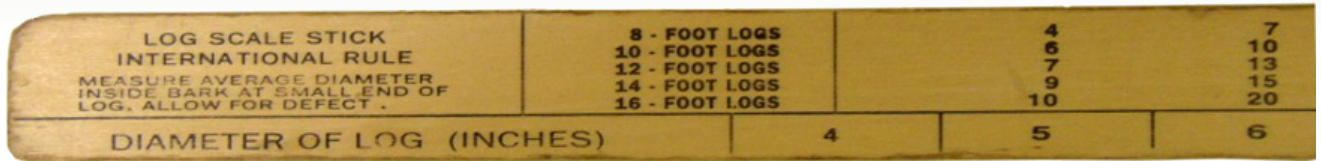
*Students of the Biltmore Forest School
Photo courtesy of the Guy Gooding Collection*



Biltmore white pine plantation, 1929

A National Forest is Born

After George Vanderbilt's death in 1914, Edith Vanderbilt sold much of Biltmore's land to the United States government to help create Pisgah National Forest, one of the first national forests east of the Mississippi River. George Vanderbilt had begun this transaction before his death. It was Mrs. Vanderbilt's wish that the land her husband had worked so hard to improve and maintain would be preserved for the enjoyment of generations to come.



The Biltmore Stick: Made to Measure!

The Biltmore Stick is a tool that was developed by Dr. Carl Schenck, who was the Chief Forester at Biltmore more than 100 years ago. His clever invention can help you determine how much lumber a tree will yield when it is cut.

Why did Dr. Schenck invent the Biltmore Stick? He and Mr. Vanderbilt wanted to know how much timber there was at Biltmore. Imagine how hard it would be to climb every tree just to measure its height!

Instead, Dr. Schenck invented the Biltmore Stick. It is a simple device which uses geometry (the relationship between distances and angles) to estimate the diameter, the height, or the volume of a tree. From these numbers, a forester can determine how much timber might be harvested for lumber from a standing tree. Owners of logging companies need this information when they are cutting timber to process into lumber.

Today optical devices costing hundreds of dollars can do a more accurate job, but some foresters and forest researchers still use the Biltmore Stick when cruising timber (measuring and marking trees).



Did You Know?

- *The first cruising sticks* were created on ax handles carried by Dr. Schenck and his foresters, with numbers handwritten on them.
- *A by-product of wood pulp is lignin.* Lignin is used in toothpaste, baby food, flavorings for ice cream, and can be found in medicine and pet food.
- Learn more about lignin and other surprising uses for trees at the *Goods from the Woods* bingo game at the barn.



Visit the Biltmore Stick
Demonstration near
Antler Hill Barn to learn
how to use a Biltmore Stick!



How to Tell the Age of a Tree

Look at the stump of a tree or a slice of its trunk. Do you see the rings on it? Each ring represents a year in the life of the tree. If you count the growth rings, you can tell how old the tree was when it was cut. An old fir tree can have more than 1,000 rings—one for each year it lived.

When a tree trunk is cut into a slice, it is called a tree cookie. It is a cross section that reveals the tree's history. Each layer tells something about the tree's life and the climate in which it grew. One light and one dark ring will be made each year. The lighter portion is called the early wood because it grows in the spring, and the darker portion is the late wood, which grows in the summer. You can tell the age of a living pine tree without cutting it down by counting the circle of branches around its trunk.

OUTER BARK protects the tree from weather, insects, disease, fire, and animals.

INNER BARK has a network of structures which carries food from the leaves or needles to the branches, trunk, and roots for growth and storage. Between these structures is **CAMBIUM**, a layer of cells that divides to produce new layers of growth. These layers are the growth rings.

SAPWOOD is made up of tiny tubes that carry water and minerals, called sap, from the roots to the leaves. Sapwood can hold a lot of water.

HEARTWOOD is the hard inactive center that gives strength to the tree so it can stand up straight.



The pill-shaped marks on this tree cookie were made by bugs. Perhaps a female insect laid her eggs on the bark and the hatching larvae ate holes in the tree.

What can you tell from this tree cookie?

- It was infested with insects.
- Since the rings are evenly shaped all around the tree, we know that all sides of the tree got the same amount of sunlight.
- Some of the rings are wider than others indicating a wetter growing season.
- How old was this tree when it was cut down? _____

Did You Know?

- *Hardwood trees have very large root systems. The tree may be almost as large below the ground as it is above.*
- *Wood pulp (wood that has been processed to separate the fibers) is used to make paper and cardboard.*