The Composition of Colebrook's Original Forest

The Primeval Forest

The earliest European writings concerning the type of forest they encountered is quite different from what the general public's conception is in the beginning of the twenty-first century.

In the valley bottoms along major rivers and streams, as well as the numerous settlements along the shore, there were open fields and cultivated land. Considerable amounts of forest were regularly burned over by the Native Americans, sometimes twice a year. This practice insured that there was a minimum of underbrush within the forest, which made hunting much easier.

There is no evidence that the first generation of English settlers had to struggle against an overabundance of timber in the forest. From the very beginning, the general courts and elected officials of towns issued decrees prohibiting the cutting of trees unless authorized by law. The earliest southern New England record of this is by the officials of just settled New Towne (Cambridge), Massachusetts Bay Colony, in 1633, which stated that "No person whatsoever shall fell any tree near the towne within the path which goeth from Wattertown to Charles Towne." In 1638, two years after it was founded, Springfield, Massachusetts forbade the felling of "any tree in ye compass of ground from ye mill river upward …. appointed for house lots."

From Town and selectmen's records 1630 – 1702, Town of Cambridge. Also Springfield, 1634 – 1886: History of Town and City.

Again, in the Proprietor's Book for Colebrook dated April 9 1744 it states: "The Proprietors of said meeting do order and agree that no tree or tree of wood or timber shall be fell or carried away in the bound of Cole:brook…without liberty granted from the proprietors…"

The primeval forest in New England consisted for the most part of tall, straight trees such as maple, bass, oak, etc., each of which had limbless trunks for the first 70 feet or so, topped by s tuft of branches. An analogy here may help to envision such a tree. If an adult man were to grasp an 18-inch long candle by its wick with his little finger, while making a fist, the proportions of one of these forest trees would be attained.

The crown branches touched one another so that they would have presented a solid carpet of foliage if observed from above or below. The bases of these trees averaged eight to ten paces apart (24 – 30 feet).

In the 1760s, when a tree was removed, it was chopped down. The initial stages of pioneering involved girdling trees and utilizing intervale (open) land to achieve usable acreage. A close look taken in the late 1990s seems to indicate that there was considerable activity conducted in Colebrook (and no doubt in all her adjacent towns) involving the girdling of primeval forest in areas considered to have the best agricultural or economic future as early as the 1730s. This would have given the Proprietors 30 – 35 years for second growth to become large enough to be made into lumber. Crews of woodsmen could have been employed to accomplish this task. This is the most likely scenario when you consider that the Proprietors granted free land to Erastus Wolcott if he could get "a good saw mill operating by May 15, 1765", and also the fact that Richard Smith had an operating sawmill at Tunxis Falls in 1771. Also, in the summer of 1773,

Smith had 1800 cords of wood stacked in Robertsville to be used in making charcoal. Having cut, split and stacked many cords of wood in my youth using only a cross-cut saw (not available to the pioneers, as raker teeth on cross-cut saws weren't invented until 1875), an ax and a sledge hammer with wedges, I will categorically state that you don't get that many cords from trees that are anywhere from 3 to 8 feet in diameter.

Clews as to the composition of the original forest in Colebrook can best be deducted by examining the notes of the surveyor in 1760. In laying out the property and roads, the survey established 265 locations as reference points. The exact wording on two adjoining parcels will show how this was done:

"Lot #1, tier #1 John Palmer 11 chains, 50 links (759 feet) from an ash stake and stone marker marked 'A. H'".

Lot #2, tier #1 Anthony Hoskins set aside a lot to Joseph Coe and Israel Burret 5 chains and 43 links (358.38 feet) to a hemlock tree by a small brook marked 'B'… and so on.

Before proceeding further, it is essential to know that the surveyor used three different objects as his physical markers; **trees** (Which were always identified by specie), **stakes** and/or **stones**, and **studdles**, which were trees that had been cut high so as to form a post, one side of which was marked with the initials of the adjoining landowner, (There will be more on studdles later on.)

Because the specie of tree, as well as the specie of studdles are identified; for the sake of establishing the composition of the forest, we will treat them as though they were a tree.

There are 19 named species of trees that occur in 197 of the 265 locations. The breakdown as to specie is as follows:

specie	Latin name	no. of occurrences	% of locations
Beech	*Fagus americana*	90	45.45
Hemlock	*Tsuga Canadensis*	49	24.75
Maple	*Acer …?…*	11	11.1
Hard maple	*Acer saccharum*	11	
Birch	*Betula …?…*	11	
Black birch	*Betula lenta*	5	
Ash	*Fraxinus…?…*	2	
Black ash	*F. negra*	2	
Red ash	*F. pennsylvanica*	1	
White ash	*F. Americana*	1	
Alder	*Alnus…?…*	4	
Witch hazel	*Hamamelis virginiana*	3	
Hazel	?	1	
Chestnut	*Castanea dentate*	2	
Bass	*Tilia glabra*	2	
Elm	*Ulmus americana*	1	
Butternut	*Juglans cinerea*	1	
Red oak	*Quercus borealis*	1	
White oak	*Q. alba*	1	

Studdle

Here is a word that presented a real challenge as to its meaning, and which ultimately gave a great deal of satisfaction.

When first encountered, dictionaries were consulted, but none of the definations pertained to surveying. A call was placed with the editorial department of Meriam Webster. They expressed great curiosity of the word and said that to their knowledge, the term describing a surveyor's post had never been documented in North America. Indeed, the last time it was used in Great Britain was in 1382!

Joyce Nelson, then the Town Clerk of Colebrook, provided a photo copy of one of the pages of the 1760 document and in due course a letter of thanks was received that said in part: "Since our evidence for studdle (or studdle) in the sense of 'a post' doesn't go past the 14th century, a citation of the word's use in 1760 is certainly worth noting in our files."

Wood and Forest Products

I addition to making charcoal, mentioned elsewhere, the forest played a vital role in the everyday life of our young, evolving nation.

Firewood for cooking and heating constituted a major use of the forest in former times. Records are difficult to come by, as the people didn't give more than a passing thought to heating wood. It was so common and ever-present that it didn't warrant writing about. A few clues can be interpreted however, and results are mind-boggling.

Keeping in mind that the average house was much smaller than those of today, had no insulation what-so-ever and probably relied upon a large central fireplace for both cooking and heating, it nevertheless required as much as 30 cords per year.

A cord of wood occupies 128 cubic feet, usually consisting of 4-foot logs stacked 4 feet high and 8 feet long. On average, it contains about 80 cubic feet of solid wood. Depending on the species and moisture content, it weighs from one to two tons. One man could cut and stack one and a half cords per day.

A modern airtight stove has a conversion efficiency of 50 – 60 %; a standard box stove, 25%; an open fireplace less than 10%.

Colebrook's town records contain other enlightening facts about firewood consumption. Each of the school districts kept on-going records of expenditures, and chief among these was the cost of firewood. In 1839, for example, the one-room schoolhouse known as the Southwest District School required 14 cords of wood for the winter session encompassing the four months commencing with the forat week in October. These 14 cords were to be delivered one cord per week beginning with the first week in November, and it was emphatically stated that all wood must be of beech, maple and black birch and split from the trunk of the tree.

The last part is interesting when you realize they didn't utilize any of the limbs or upper portion of the tree past the portion needing to be split. A good guess would be that 20 – 25% of the forest cut specifically for cordwood was burned as brush on the forest floor.

The Role of Charcoal in the Iron Industry

The average blast furnace in Litchfield County produced 40 tons of iron per week. It required from 200-250 bushels of charcoal to produce one ton of iron. Taking the lower figure of 200 bushels, it required a quarter acre of forest to supply the charcoal for one ton of iron. This equates to 8,000 bushels per week for one furnace. Another way of looking at the picture is to think of every 2,500 tons of iron equaling one square mile of forest.

There were 17 blast furnaces by the early years of the nineteenth century in Litchfield County, in addition to 60 forges. A forge took the pig iron from the furnace and by reheating and hammering, converted the cast iron into usable wrought iron at the rate of about 8 tons per week. Thus these 60 forges required 9 square miles of forest per year, making a grand total of 23 square miles of forest each and every year.

The forests receded from the vicinity of the furnaces and forges in ever-increasing radii, and the process employed thousands of men – mostly woodchoppers, charcoal makers (colliers), and ox cart drivers. By 1840 charcoal was being hauled into northwestern Connecticut from as far away as southern Vermont and New Hampshire. A two or three day wagon trip was common.

Then, as today, economics dictated innovations in order for an industry to remain competitive, so each charcoal pit, which contained about 30 cords of wood, yielding 21 to 27 bushels of charcoal per cord, were replaced during the 1870s with brick kilns. These kilns could produce up to 42 bushels of charcoal per cord of wood – a savings of 50%. None were built in this vicinity, because by that time, our forests were for the most part a fading memory. Nature is resilient however, and within 30-50 years the forest reestablished itself, but not in the same proportions as the original virgin forest.

Notes

While lumber was essential to the settlers, indeed the first building in town usually was a lumber mill, the value given to it was always low, although individual trees were sometimes assigned higher values. For example:

Norfolk town meeting, June 24, 1760:

"….voted that Luther Barber shall give three hundred feet of good sawn pine clapboard for the tree he got off the school lot and for the cherry he cut on the Parsonage Lot he shall give six shillings lawful money.

….voted that Timothy Gaylord shall give in money for the cherry log he cut on the common and undisturbed lands: two shillings".

On the other hand, when the inhabitants of Norfolk "voted on December 14, 1759 to build a meeting house forty feet wide and fifty feet long and a suitable height for gathering", they also voted "that Mr. Ozias Pettibone shall be allowed 12 shillings for the timber cut on his land for the meeting house with which he owns himself satisfied".

It is difficult to grasp a clear understanding of the value of money so long ago, but it helps to know that a man working on town roads at that time received 3 shillings per day. A general rule of thumb on the conversion of the British monetary system to that of the American would be five U. S. dollars equal to one pound, zero shillings, seven and a half cents. [Written as £1/0/7½] $1.00 equals 4 shillings, 1½ pence; .50¢ equals 2 shillings, ½ pence; .25¢; equals 1 shilling, ½ pence; 10¢ equals 5 pence and .05¢ equals 2½ pence.

In 1781, all soldiers fighting for independence received 48 shillings per month, which is estimated to have been about $11.75.

In 1784, 1,500 feet of pine boards were valued at £3 ($15.25).

In 1787, cherry boards cost .163 per foot, and in 1822, hemlock planks cost .01 cents per foot and chestnut cost 2.5¢ per foot.

The American Chestnut Tree

At the turn of the twentieth century, one quarter of all trees in the eastern Appalachians were American chestnut (*Castanea dentata*). This encompasses an area stretching from central New England in the north to northeastern Mississippi. It was perhaps the most important tree to rural dwellers and had been since early times. There is a suspicion that they may not have been evenly distributed, because often land owners made note on their land titles that a stand of chestnut trees were not to be cut or removed. Another hint is that some of the construction going on prior to the 1820s mentioned going to Sandisfield or Tolland for chestnut shingles, this despite the fact that there were several shingle mills in Colebrook. The survey of trees in 1760 only mentions two chestnut trees in the entire township, with beech, hemlock and maple making up the three most common species. This leads to the conclusion that there may have been higher concentrations in some areas than in others

Each tree produced a bumper crop of nuts every year, which were not only a staple for humans, but also many of the animals man birds in the human food chain such as wild turkeys, squirrels, deer, hogs and bear. The wood split with a straight grain and could be planed and sanded easily. It had a yellow hue before weathering to a soft gray, and when made into furniture, had a quality that seemed to glow with an inner light. The bark had a high percentage of tannin, which was used in tanning leather.

The wood, when used in construction or for fencing and posts, was almost impervious to rot, a fact that can be verified in our local woods by the existence of some skeletal remains that died no later than perhaps 1916-1917, and we have already embarked upon the twenty-first century. Another example of the longevity of chestnut may be observed in the cellar of the old parsonage in Winchester Center. This building was erected in 1774 and has the central fireplace and chimney supported by enormous chestnut beams that are as sound today as they were over two and a quarter centuries, in spite of the fact that they have been in a humid cellar with a dirt floor.

In addition to the versatility of the wood, bark and nuts, the trees would grow just about anywhere, in poor soil as well as fertile. Trees growing in the open could grow at a rate of one inch in diameter per year and sustained growth at about that rate could go on for years, as witnessed by a tree that was 60 inches in diameter after 70 years. However, a diameter of 8 inches at 29 years and 12 inches at 30 years was close to normal for forest trees. Sprout growth from around a stump could be expected to be large enough for fence posts in 15-20 years, and cross ties for railroad tracks, telephone and telegraph poles in 25-35 years.

Chestnut was the bread and butter tree of the eastern hardwood forest. For any single use (posts, shingles, beams, tannin and nuts), there was probably another tree specie that was better, but for all-around versatility and abundance, the chestnut was

unmatched. Today, we would be hard pressed to find many adults who have ever seen a healthy, mature American chestnut tree.

The disaster that befell the chestnut entered the country via the port of New York about the turn of the twentieth century. The first blight appeared on trees in the Bronx Zoo in 1904. In 1910 it was difficult to find an infected tree in Connecticut, but in five to seven years all that could be done was to salvage the wood in the dead and dying trees in our state.

With a climate that was ideal for the growth of the fungus and countless host trees stretching from Maine to Mississippi and westward to Indiana and Michigan, the scourge took a short half-century to affect the entire range.

Efforts to control the spread of the blight and to save the chestnut began around 1911 in Pennsylvania and in 1929 in Connecticut. Arthur Graves, an employee of the Brooklyn New York Botanical Garden, who owned land in Hamden, Connecticut adjacent to Sleeping Giant State Park, began crossing American chestnut trees with the more blight-resistant Chinese and Japanese chestnuts. Eventually this chestnut plantation came under the management of the Connecticut Agricultural Experiment Station and was deeded to the State; the program is ongoing.

As these events unfolded here in the United States, they were being watched very carefully and with great alarm in Europe. France and Italy have a specie of chestnut which, while not as large and stately as its American cousin, never-the-less produces a very significant economic crop. The European chestnut is just as susceptible to the blight as ours. In 1938 their fears were realized when the blight showed up in northern Italy and soon spread the length and breadth of the Italian peninsula with the rapidity of its American onslaught.

About 1950 something unusual was noted by an Italian plant pathologist who found trees that seemed unusually healthy after repeated attacks by the blight fungus. Today, the Italian chestnuts are not back to producing nuts at the pre-blight level, but the industry is healthy and there is no longer reason to think of the blight as a threat.

Of course, as soon as these events began to unfold in Europe, efforts were made to import this less virulent strain into this country. Some promising research has taken place, but for some unknown reason the reduced virulent strain does not give permanent protection to the American chestnut. It is possible that some vector, such as birds or insects may be responsible for the rapid spread of the curing strain in Italy, while these vectors may not be present here.

Many researchers and volunteers are working tirelessly to restore our chestnuts. In the forefront is the work being done in Connecticut, including a program in Colebrook where the Colebrook Land Conservancy is monitoring an area containing experimental trees.

The chestnut was one of the most beautiful and graceful of the forest trees. They were commonly planted for shade, ornament and fruit. It was easy to propagate from nuts and grew rapidly on nearly all soil types except limestone. For the first 30 years they increased in height at an average annual rate of 18 inches.

In the 1940s and 50s we used to show our young people pictures of chestnut trees taken prior to the blight infestation and point at the shoots arising from an old stump, struggling, but doomed to soon die off. We would say that they would probably never see this magnificent tree restored to its former grandeur.

We aren't as pessimistic today – in all probability our youth will see them. I wouldn't be surprised if some of us middle-aged folks might get to see some ourselves.

The American Forestry Association

This organization has established a point system for measuring and comparing trees. The formula is as follows: Trunk circumference in inches measured 4½ feet (48 inches) from the ground, plus tree height in feet, plus ¼ of the average branch spread in feet.

By giving the most significance to circumference and the second to height, this system approximates tree volume. If you prefer to think of tree size in terms of trunk diameter, divide the circumference by pi (3.1416).

The following are some additional facts concerning tree species that constituted our original forest:

White Pine

The Cathedral Pines in Cornwall, destroyed by a tornado in 1989, contained trees at least 300 years old and stood 150 feet in height. They were considered to be representative of the pines encountered by the surveyors who laid out our townships.

Colebrook's Colonial Pine was a mature tree when named in 1787 for its 13 main branches, thus representing each of the 13 original states. When measured in 2008 it was 16 feet, 3 inches in circumference, stood 120 feet tall and had a limb spread of 47 feet and had only seven branches remaining.

The largest white pine in the state grows in Morris and is 18 feet, 0 inches in circumference and 120 feet tall.

Sugar Maple

This tree is valuable not only for the syrup and sugar it produces, but has extra-ordinary value as a source of lumber and fuel and probably is the most planted of our shade trees.

The largest sugar maple in Connecticut is in Norwich. When measure in 1988, it had a circumference of 22 feet, 5 inches.

Witch Hazel

Although now almost always in the form of a shrub, in colonial times in these uplands it often took the form of a small tree.

Black Ash

A favorite tree of the Native Americans, who used it to make baskets. The wood was beaten with a mallet until it easily split into long plaits. It generally grows in swamps in these uplands.

Beech

Over a large part of the U. S., beech and maple formed the prevailing trees of the hardwood forest when the country was settled.

The largest American beech in Connecticut is in Colchester. It is 16 feet, 5 inches in circumference and stands 92 feet tall.

White Ash

The largest in Connecticut occurs in Newtown. It is 20 feet, 10 inches in circumference and stands 58 feet tall.

Red Oak

Connecticut's largest grows in Ashford; circumference 26 feet, 1 inch, height 70 feet. The largest in Litchfield County occurs in Bethlehem, having a girth of 21 feet, 3 inches and a height of 72 feet

White Oak

Our Charter Oak was of this type. The state champion currently grows in Litchfield County in the town of Sharon. Circumference 21 feet, 0 inches, height 93 feet.

The 1760 survey of Colebrook listed 19 varieties of trees; in 2008 the Colebrook Land Conservancy identified 84 different types.

For various reasons, our tree species remain under constant threat. The American chestnut and the American elm are all but gone from our landscape, and the American beech is fast succumbing to a blight as deadly as that which hit the chestnuts. Hemlocks are under threat by the wooly adelgid, and maples, ashes and birches also face an uncertain future. It is the responsibility of the public to work to assure the health and diversity of our woodlands.