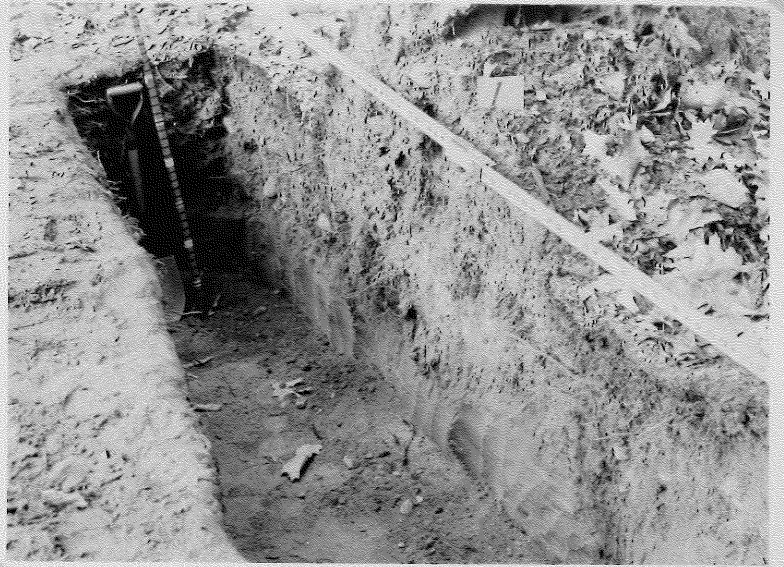


9
Plate 36. Cross section
of mound and pit #1.
Southeastern portion of
section.



Plate 34. Cross section
of mound and pit #1, age
class I. Northeastern
portion of section.



18

Plate 18. Sections of
white pine branch spike
#562 (Field #123).
Spike is at least 20
years old.



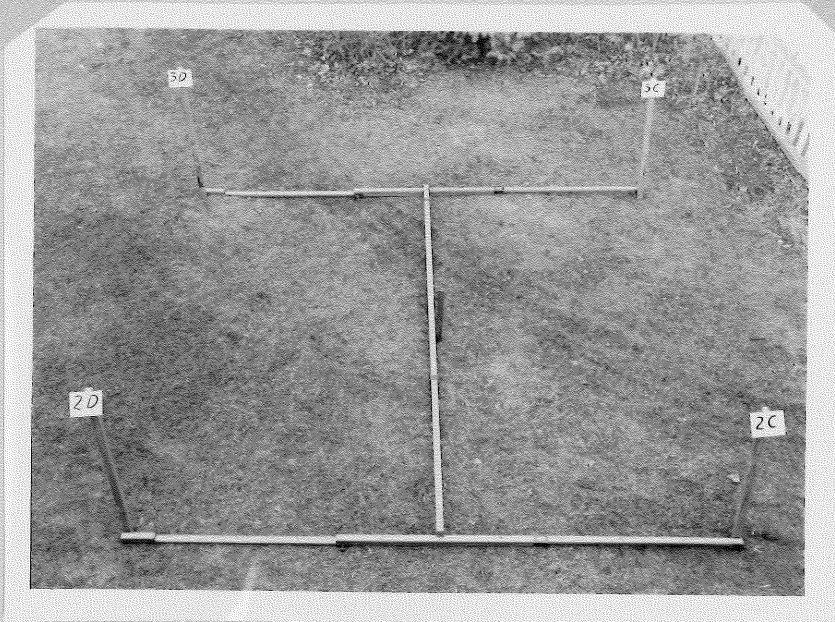


29

↑
Plate 2. Southern boundary of sample plot.
Research area is to the left.

Phase 1

2



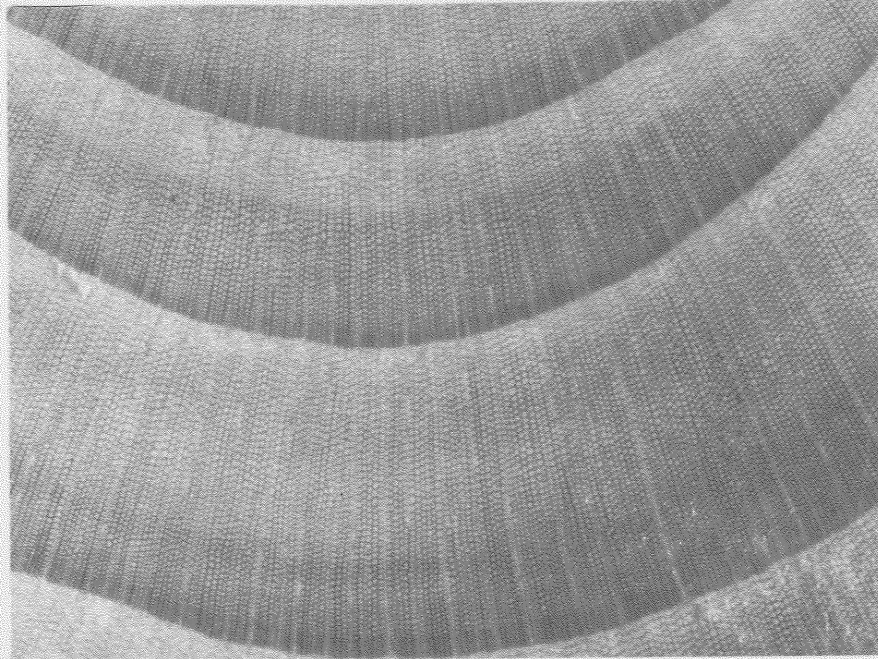


Plate 30. Polished surface of hemlock cross section (24 x). Final finish produced by 6/0 paper and vibrator sander. Tearing of springwood cells can be avoided by using finer sandpaper.

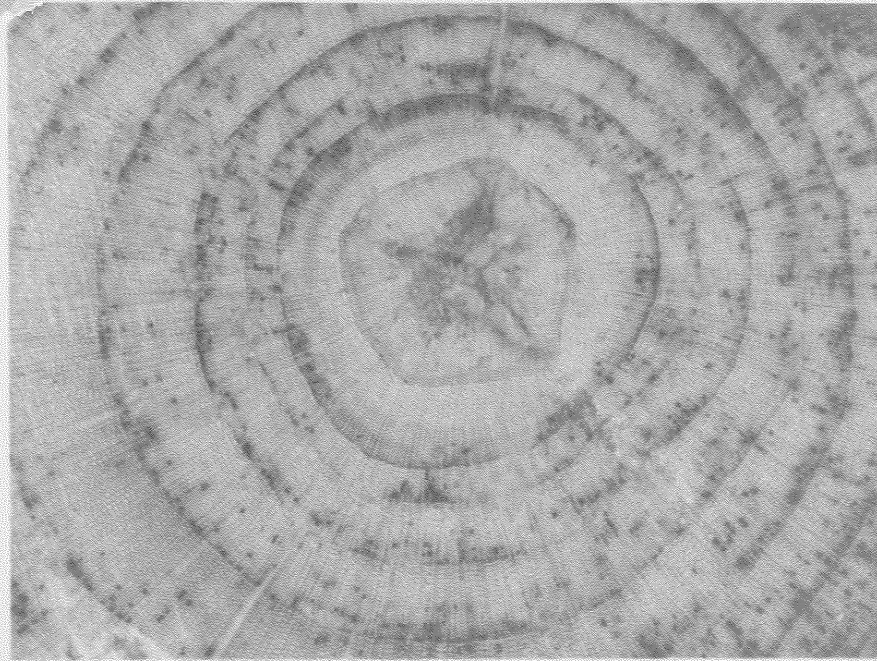


Plate 31. Polished surface of white pine cross section (24 x). 5/0 paper was used. Scratches on left side of section can be avoided by using finer sandpaper.



CS

Plate 56. Cross sections of red oak.
Smaller section is of stem directly above
the root collar and is 11 years old.
Larger section is of root directly below
the root collar and is 59 years old.
Paper scale is 2 inches long.



Plate 1. Northern boundary of sample plot.
Research area is to the right.

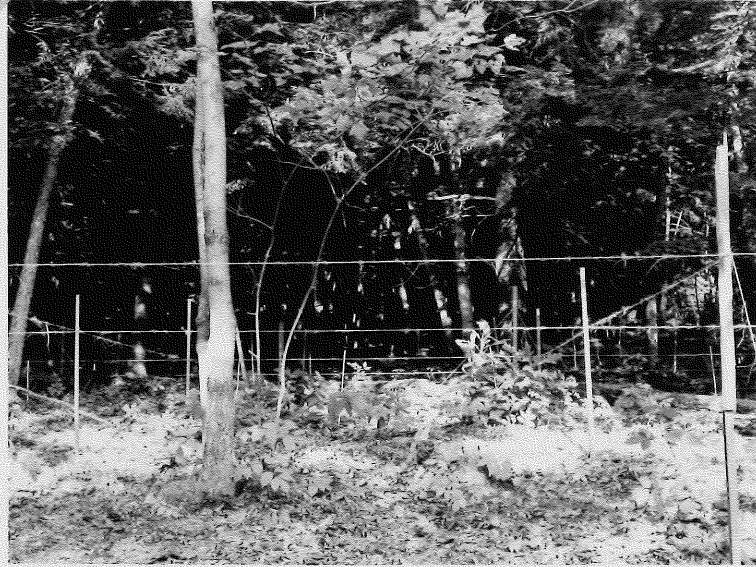


Plate 2. The 10-foot grid used for a mapping base. The grid was established with an engineer's transit and steel tape. ³The grid stakes were numbered and lettered. Each quadrat was assigned the number and letter of the stake that marked the southwest corner. Accurate mapping was easily accomplished by placing surveying rods along two sides of the quadrat and sliding another back and forth at right angles. Objects were mapped on 10 x 10 = 1 inch cross-section paper at a scale of 10 feet to the inch with a precision of 2 to 3 inches.

Phase 1

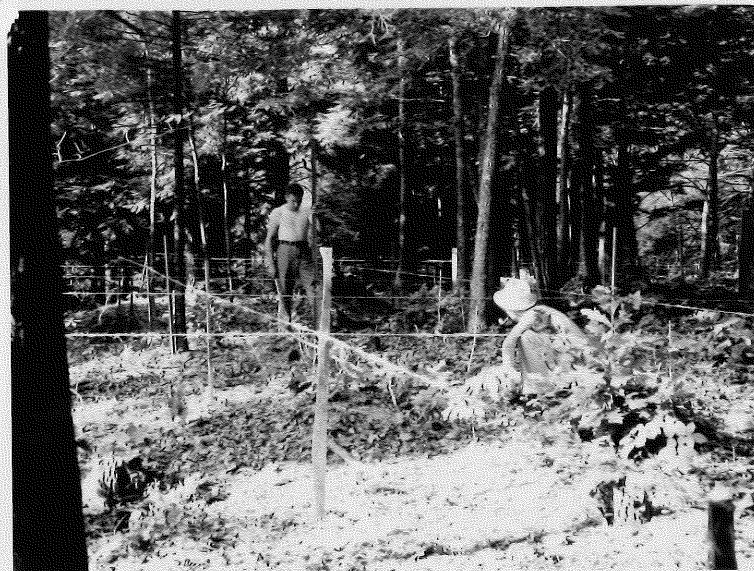


Plate 3

Fig. 3. Construction of the 6-inch contour map. A series of horizontal planes, each a multiple of 0.5 foot vertical distance above the other was suspended over the plot. The contours were established on the ground by sighting over the planes at a target on a leveling rod. The points of equal elevation were marked on the ground with bamboo pins. Eight sets of 25 pins, each set a different color, were used. After 8 contour lines had been established, their positions were mapped. Then the pins were removed, and the procedure was repeated. In the photograph, the man at the right is sighting over the plane and directing the rod man to move until the target and plane coincide, and the base of the rod touches the ground.



4
Plate 6. Hemlock #92. Tree appears to have been bent over and held in leaning position for several years. Age at ground level is 95 years. Age of straight bole at union is 60 years. Ages of the two boles suggest that tree was damaged when it was approximately 33 years old, or about 1890. Blade of saw is 14 inches long.



Plate ⁵7. Live red maple #114. The tree has two bores, 5.3 and 5.8 inches D.B.H., i.b. They are 98 years old and of stump-sprout origin. Root section is 125 years old, indicating that more than one generation is represented. Blade of saw is 14 inches long.



6
Plate 8. Hemlock #199. The tree is 10.5 inches D.B.H., i.b., 104 years old, and is growing on a prostrate oak bole that is about 16 feet long and 2 feet wide. Roots tend to conform to the shape of the prostrate bole. Some roots are now suspended in mid-air. Species of oak is not known. Blade of saw is 14 inches long.



7
Plate 9. Base of hemlock #673. Tree is 20.1 inches D.B.H., i.b. and is 136 years old. Organic accumulation is extremely thin. Pebbles occur frequently on the surface; note a number at base of knife blade. Also note the vertically eroded surface under small root at lower left.

9

8
Plate 10. White pine stump #95. Stump is 20 inches in diameter and at least 45 years old. Stump is on a boulder, the surface of which is covered with charcoal. The stump and roots show no evidence of having been burned. When stump was removed, charcoal was observed under the roots. Also, the bark was still intact where the roots rested upon the boulder. Evidence suggests that a fire occurred before the white pine became established. Blade of saw is 14 inches long. Measuring tape is 2 inches in diameter.

Phase 9



Plate 9. White pine stump #131. Stump is 20 inches in diameter. Pencil designates where section of branch whorl was removed.

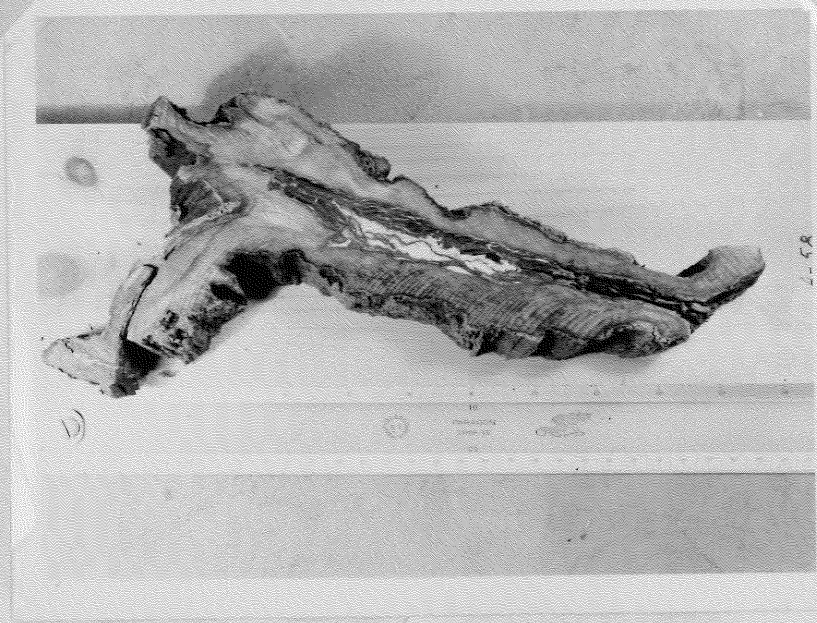


Plate 10. Section of branch whorl removed from white pine stump #131. Whorl is at least 128 years old.

[Handwritten signature]



Plate 11. Root of white pine stump #170 after it has been exposed and sectioned. Stump was 38 inches in diameter. Blade of saw is 14 inches long. long.,

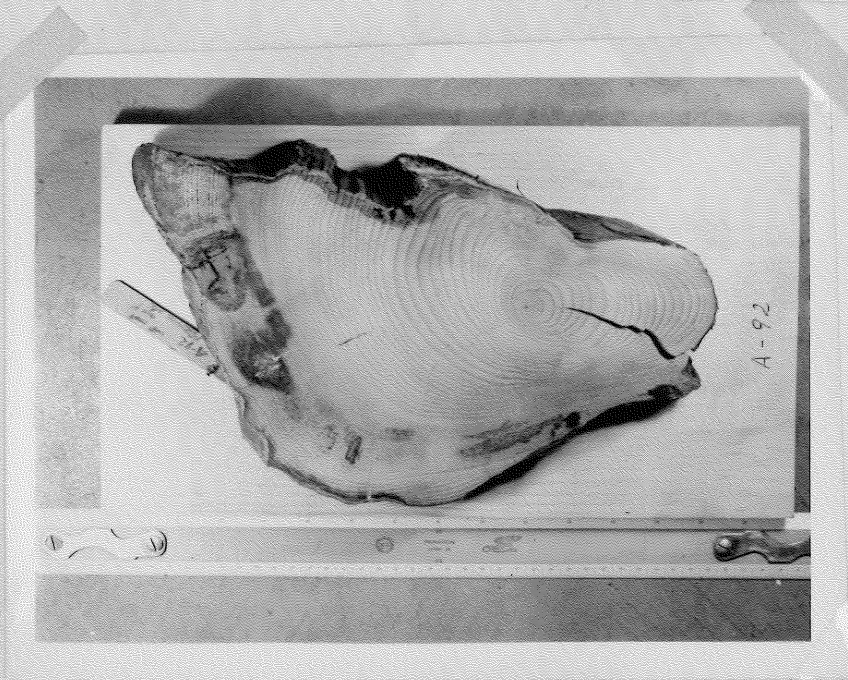


Plate 12. Root cross section of white pine stump #170. Section is at least 105 years old. Scale is 18 inches long.



Plate 13. Excavated white oak stump #209. Stump is 15 inches in diameter and had rotted to the level of the forest floor.

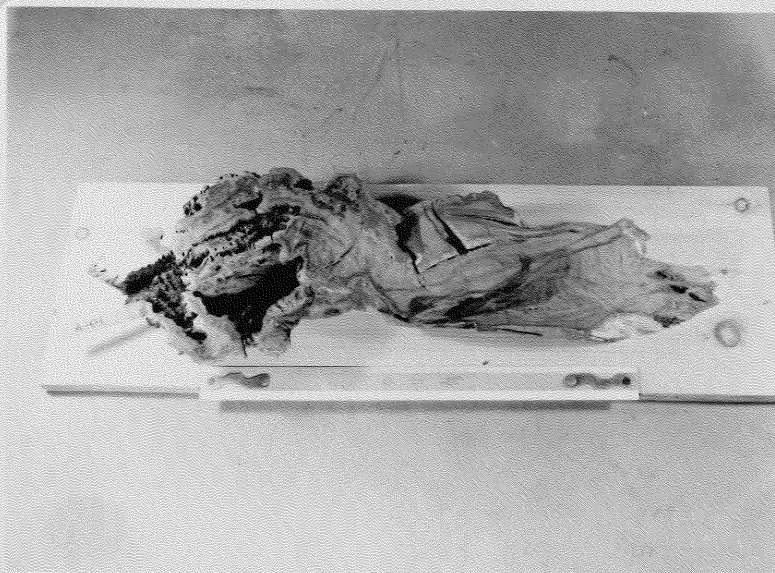


Plate 14. Cross section from white oak stump #209. The section is at least 127 years old. Scale is 18 inches long.

Handwritten scribble or signature in the upper right corner of the page.



16
Plate 21. Hemlock #138 growing on top of white pine stump #137. Hemlock is 3.5 inches D.B.H., i.b., and 62 years old. Stump protrudes above ground about 18 inches, is 30 inches in diameter, and at least 146 years old. Roots of hemlock have grown almost horizontally on top of stump, then angled sharply down over its edges. Root form suggests that hemlock became established while stump was still sound, perhaps within a few years after the pine had been logged.

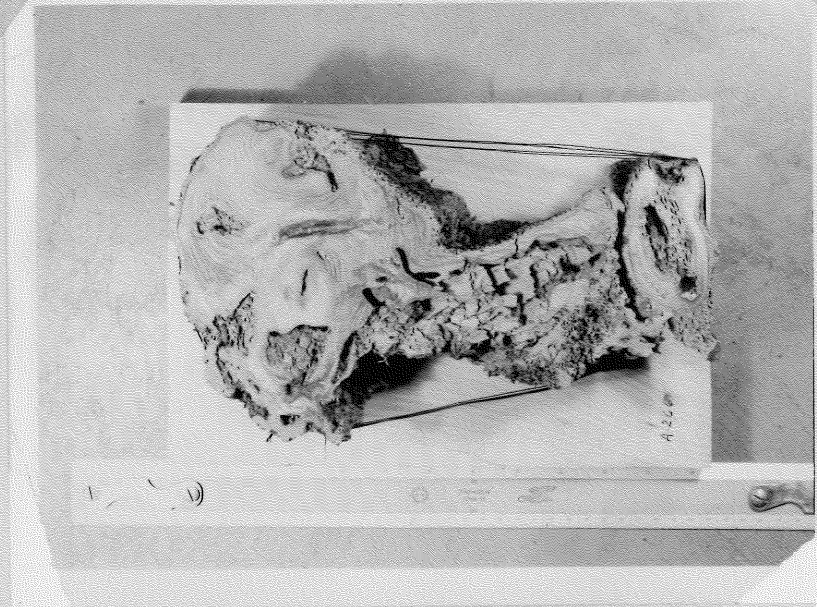


Plate 16. ³ Cross section of white pine root collar. Bound with copper wire, it was sectioned, glued together on a board, and polished. The section is at least 87 years old, and was removed from a stump that resulted from the logging operation of 1803. Scale is in inches.

Phase 2

Plate 17. White pine branch spike. Spikes are more resistant to decay than surrounding bole wood. As a result, sound spikes are apt to be found in highly decayed prostrate boles. (Photograph taken off of the research plot.)

18
Fig. ~~18~~. Chestnut root. Such large, fragile specimens were transported intact to the laboratory where they could be processed more efficiently. Scale is one foot long.





19
Plate 22. Black birch #555 (Field #267). Tree is 17.8 inches D.B.H., 1.b., 64.5 feet tall, and approximately 120 years old. General form of bole is that usually associated with a forest-grown tree. However, evidence of branch scars 2 to 4 inches in diameter within about 16 feet of ground suggests that the tree might have grown in quite open conditions when it was young. Rod against tree is 7 feet long.



20
Plate 23. Boles of two trees in immediate foreground have distinct crooks at about the same height above the ground. Several trees on margin of plot at the right have similar crooks. Croches also were observed in many other trees at about the same height.



26
 Plate ~~24~~ Hemlock #187
 (Field #110). An example of
 forest-grown form. The tree
 is 68 years old, 6.0 inches
 D.B.H., i.b., 47.0 feet tall,
 and about 10 feet wide. The
 uniformly small branches
 impart a feathery appearance
 to the crown. Branches on
 lower half of bole are dead.
 Bole is straight with gradual
 taper. Rod is 7 feet long.

27
 Plate ~~25~~ Hemlock #673
 (Field #311). An example of
 open-grown form. The tree
 is 136 years old, 20.1 inches
 D.B.H., i.b., 58.5 feet tall,
 and almost 30 feet wide.
 Coarse live branches extend
 to within 8 feet of the
 ground. Rod is 7 feet long.



Plate ~~27~~²⁸. Cross sections of black birch #555 showing ages and diameters at different heights.

Height (feet)	Age (years)	Diameter (inches)	
		I.B.	O.B.
0.0	101+	18.4	
4.5	121+	17.8	18.8
8.5	119	15.4	
12.5	116	14.8	
16.5	114	13.6	
20.5	111	13.0	
24.5	108	13.1	
28.5	104	12.2	
32.5	99	12.4	
36.5	85	7.0	
40.5	83	6.5	
44.5	78	6.8	
48.5	60	5.0	
52.5	36	1.7	
56.5	32	1.0	
60.5	25	0.6	
64.5	1	0.1	

Plate 26. Cross sections of hemlock #187 showing ages and diameters at different heights. Scale is one foot long.

Height (feet)	Age (years)	Diameter (inches)	
		I.B.	O.B.
0.0	68	6.4	
4.5	56	6.0	6.5
8.5	51	5.7	
12.5	45	5.6	
16.5	41	5.1	
20.5	36	4.9	
24.5	31	4.3	
28.5	25	3.9	
32.5	21	3.3	
36.5	16	2.0	
40.5	8	1.1	
44.5	3	0.3	

Plate 28. Cross sections of white oak #573 showing ages and diameters at different heights.

Height (feet)	Age (years)	Diameter (inches)	
		I.B.	O.B.
0.0	153	14.7	
4.5	147	10.3	10.9
8.5	145	9.1	
12.5	142	8.8	
16.5	141	9.0	
20.5	133	8.5	
24.5	128	7.9	
28.5	105	7.4	
32.5	87	6.9	
36.5	82	6.7	
40.5	77	5.9	
44.5	63	4.9	
48.5	56	3.8	
52.5	47	2.5	
56.5	34	1.6	
60.5	18	0.7	
64.5	1	0.1	

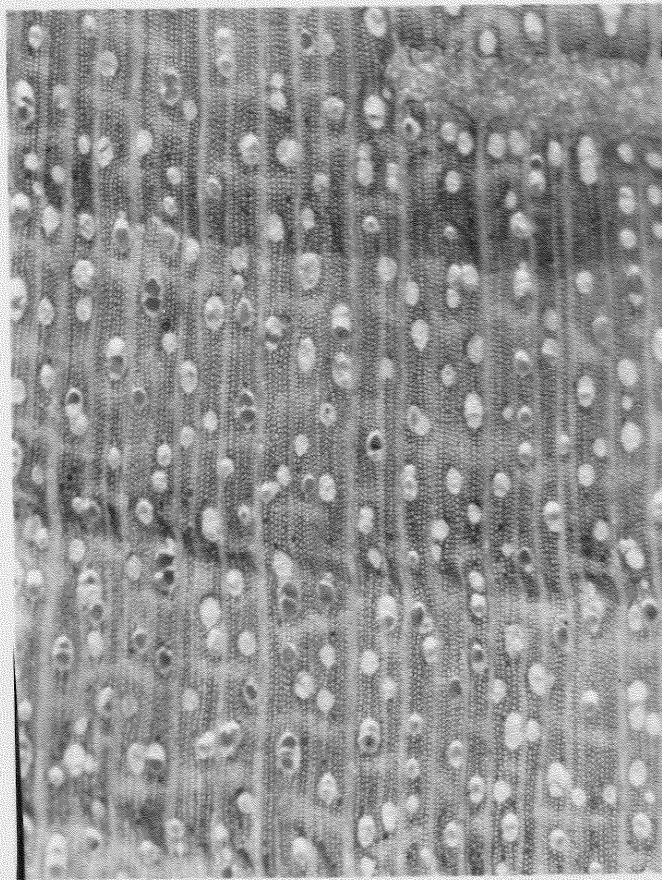


Plate 29. Polished surface of red maple cross section (24 x). Final finish applied with 8/0 paper and vibrator sander. Surfaces prepared in this manner can be observed effectively at 100 x magnifications.



27
Plate 27. ³ Cross section of mound and pit #35,
age class III. Section excavated through lower
third of mound and pit at right angles to their
long axes. Pit is to the left of the mound.
Rod is nearly 14 feet long.

age class III.



38
Plate 33. Cross section of mound and pit #35, age class III. Pit is at the left. Dark region under the leeward side of the mound is of buried organic layers of the predisturbed forest floor.



Plate 29. Cross section of mound and pit #1.
Central portion of section.



Plate ³⁰ 37. Mound and pit #1, age class I. The black birches on mound became established in 1939. Uprooting is the result of the 1938 hurricane.



Plate ³¹ 38. Largest of the black birches that had grown on mound #1, Plate 37. It is 14 years old. Note curvature of the lower bole. Scale is one meter long.



plate 37
Fig. ~~2~~. A black birch tree perched on a mound that occurred about 300 feet to the south of the plot. The ages of such trees are often easier to determine from their roots. Cross section of bole was 70 years old; that of the root, 69 years old. Scale is one foot long.

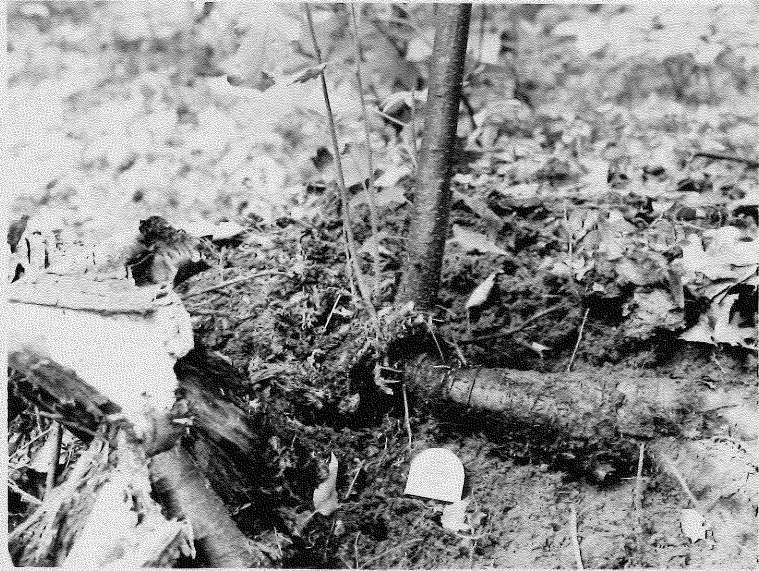


Plate 33
Fig. 3. Uprooted paper birch of mound and pit #3, age class I. Partially uprooted trees commonly sprout or root-sucker shortly after they are disturbed. The ages of such sprouts may be used to date the uprooting. This root sucker was 14 years old. The mound and pit resulted from the hurricane of 1938. Tape is 2 inches in diameter.



Plate 24
Fig. 5. Sporophore of Fomes applanatus (Pers.)
Wallr. growing on the side of a dead beech tree.
Perennial fruiting bodies of fungi may be used to
determine the minimum length of time that a tree
has been in a leaning position. The horizontal
position of the conk indicates that the tree was
leaning before sporophore developed. Fungus is
6 years old. Beech occurred about 200 feet to
the north of the plot. Scale is one foot long.

Plate 35
~~Fig.~~ . Cross section of white pine.
Tree had been partially uprooted, but was
still alive. Date of uprooting is indi-
cated by the eccentric radial growth which
began 14 years ago on the lower side of
the bole. Tree has been almost horizon-
tal since 1938.



³⁶
Plate ~~43~~. Mound is of age class III. Hemlock in immediate foreground is growing on leeward side of the mound and is 121 years old. Mound occurred about 100 feet south of the plot



³⁷
Plate ~~44~~. Close-up of 121-year-old hemlock in Plate ~~43~~.
³⁶
Concentration of decayed wood under the roots is a remnant of the tree that was uprooted.



³⁵
Plate ~~45~~. Mound and pit C, age class II. Black birch is 95 years old. Mound originated in 1851. Note curvature of lower bole. Uprooting occurred 50 feet south of the plot;



³⁶
Plate ~~46~~. Cross section of mound and pit C, age class II. Roots have conformed to the long axis of the mound. Note the loose cobbles resting on top of the base of the black birch.



Plate 40
Fig. 3. Mound and pit B, age class III. Northern side of perched black birch. Root collar is approximately 4 feet above level of forest floor. Birch is 135 years old. Hemlock to the right and on a lower level of the mound is 105 years old. Difference in ages of the two trees indicates that during first few years after uprooting the elevation of the mound receded extremely fast, almost 4 feet in 30 years. Uprooting occurred 100 feet to the south of the plot and is a result of the 1815 hurricane.



Plate 45 Eastern
Fig. 2 Mound and pit B. 2 South side of perched black birch. Exposed root system is very narrow in this place, a decided contrast to the northern side. Trees which become established on mounds shortly after the uprootings occur commonly develop roots which conform to the shapes of the mineral masses provided by the mounds. The ages of such perched trees may be used to date the occurrence of the uprootings. The age of this black birch is one year less than that of the mound and pit. Cigarette lighter in center of root mass is resting on a cobble that is being held between the roots almost 2 feet above the present forest floor.



Plate 42. Clump of dead chestnut trees. Parental stump is 24 inches in diameter, 85 years old, and resulted from the logging operation of 1889. Date of origin is 1804. Felling notch is still visible. Eight sprouts, 6 to 10 inches in diameter are present. They were 27 years old when killed by the blight in 1916. They represent the first generation of sprouts or the second generation of trees on the same clone. Scale is one foot long.



Plate 43. Ten-inch aspen stump #64. Tree was felled in 1935. In this region, bark of aspen is more resistant to decay than its wood. As a result, stumps appear as hollow cylinders standing on end.



44
 Plate 51. Live hemlock tree #76 and white oak stump #77. Oak stump is 22 inches in diameter and at least 192 years old. Hemlock is growing against stump, is 15.0 inches D.B.H., i.b. and 112 years old. Were the two trees ever contemporaries?



↑
 Plate 52. Perpendicular projected from white oak stump #77, Plate 51, into crown of hemlock #76. No evidence exists in crown to indicate that the two trees were ever contemporaries. Radial growth rate of hemlock was extremely slow during its first 13 years, then increased markedly in 1854. Observations indicate that oak was felled in 1854 when hemlock was less than 4.5 feet tall.



Plate 46
Fig. 1. The research plot in 1953, one growing season after clearcutting.

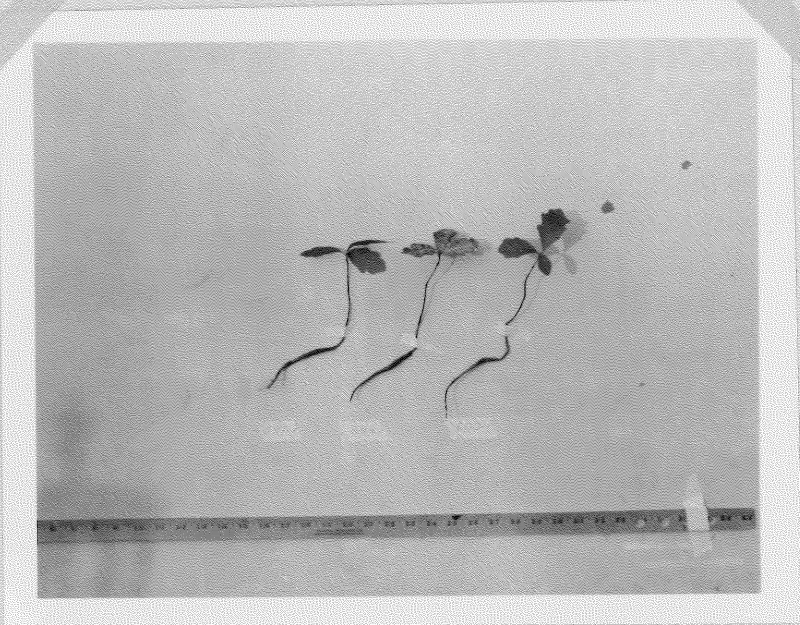


Plate ⁴⁷ ~~48~~. One-year-old white oak seedlings.



Plate 48. White oak seedling sprout. Stem is 11 years old and root is 50 years old.

11 years old and root is 50 years old.