

Aspects of the Land Use History of the Yale-Myers Forest

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The Presettlement Forest

Meyer and Plusnin (1945: 39-44) recognized seven major forest cover types in the Yale-Myers Forest: hardwood, hemlock-hardwood, swamp, pine-hardwood, pure white pine, red pine plantation, and “open”. Of these, the pure white pine, red pine plantation, and open types were understood to be the result of human manipulation and activity, either current or historical. Former agricultural land grew up to self-seeded stands of “old-field” white pine (*Pinus strobus* L.), or was deliberately planted to white pine or red pine (*Pinus resinosa* Ait.). (Most of these pine plantations had their origin during the tenure of Nathan Canterbury, the first Director of the Forest, in the 1930s [D. M. Smith, personal communication, 11 February 2003].) “Open” land was farmland still maintained as such, often rented to local farmers as hayfields. Hardwood was the most abundant of the seven cover types, and despite complex variation in structure and composition among sites, was dominated by oaks. “The Forest is dominantly an oak forest,” (Meyer and Plusnin 1945: 41), with the red oak (*Quercus rubra* L.) predominant.

Such was the Yale-Myers Forest in 1945, but the landscape as it existed then was the result of more than two centuries of manipulation and management by European settlers. Even in distant 1869, the year recorded in the Gray atlas, the scattered farmsteads covering the hills were far from new, and under the axes of the settlers, most of the forests that remained between them had already experienced several cycles of cutting and regrowth. How can we say what came before? What was the composition of the Yale-Myers Forest when the first European settlers arrived in the early 1700s?

Early published descriptions and travelers’ accounts of the landscape of southern New England are richly informative with regard to forests at the time of European settlement (Bromley, 1935), but the biases of both observer and intended audience must always be considered when examining them (Whitney, 1994). Forests were not considered as ecosystems but rather as storehouses of merchantable commodities, and writers would tend to emphasize the presence of the trees that were most useful or valuable for trade, or sometimes those they expected readers would want to hear. Thus when William Wood ([1634] 1977: 39) said, “The chief and common timber for ordinary use is oak and walnut [*Carya* spp.],” he did not necessarily mean that southern New England forests of the early seventeenth century were oak-hickory dominated, just that these genera were the most widely utilized. That said, the accounts of early observers such as Wood are broadly concurrent and reliable, and “present a panorama of oak, chestnut, and hickory upland forests in Connecticut, Rhode Island, and eastern Massachusetts,” (Spurr, 1956: 247), the area of the Yale-Myers Forest. Conifers such as white pine, and certain northern hardwoods such as sugar maple (*Acer saccharum* Marsh.), were probably less well represented in Connecticut than they are today.

One of the most powerful tools available for the reconstruction of forest conditions at the time of initial settlement is the examination of town surveys in which “witness trees” are noted as reference points. Often identified to species, witness trees provide a broad (and it can be assumed, representative) sample of forest components at a single point in time, at a resolution much greater than that available from written descriptions

(Siccama, 1971; Whitney, 1994). Examining the proprietors' surveys of 398 towns across New England, including Union, Ashford, and Woodstock, Cogbill et al. (2002) conclude that the forests of Connecticut were indeed oak-dominated (approximately 70-80% oak). Pine apparently comprised no more than about 20% of the forest cover at any place in the state, although northeastern Connecticut may have been the area of maximum occurrence.

Hemlock (*Tsuga canadensis* [L.] Carr.) was limited to approximately 5-10% of the total in the Forest area (Cogbill et al., 2002). This is consistent with Braun's (1950) assertion that the forests of southern New England exhibit elements of both the southern "Oak-Chestnut" and northern "Hemlock-White Pine-Northern Hardwoods" types.

"Virgin" remnant stands have often been presented as proxies for the pre-settlement forest, little pieces of wilderness left untouched by the hand of man, but they are problematic in their own way. Because they have escaped even common natural disturbances such as fire or hurricane windthrow, remnant stands, by definition, are atypical of the common landscape at any time (Cogbill et al., 2002). Still, by their mere existence these stands can tell us something about the heterogeneity of the landscape, and the forces and influences that shaped it. Bromley (1935) described one such remnant, logged off about 1920, that was in the immediate vicinity of the Yale-Myers Forest.

An interesting old tract...known as the Lawson lot, was located near the Woodstock-Union township line in Connecticut. Largely white pine-hemlock, a very interesting transition was shown from swamp to high dry ridge. This grove was dominated by white pine, whose crests overtopped the rest of the forest ten to forty feet, their jagged crowns outlined against the horizon, producing a landmark recognizable for miles around. The swamp sites were largely forested with white pine, hemlock, yellow birch, red maple, and elm. Large sugar maples and red oaks were scattered through the grove on the slightly higher ground; while chestnut, red oak, black oak, white oak, and sweet birch occurred on the higher, drier slopes. White pine was omnipresent; the hemlocks were everywhere but most numerous in the ravines. This was a wild-appearing woodland. Local inhabitants claimed it to be original forest. There were no signs of fire, pasturing, or cutting. The forest floor was spongy with vegetational debris and windthrown trees extended their great lengths along the ground. Moss-grown and lichen-covered trunks of standing trees gave the impression of great age, while on the lower slopes great banks of mountain laurel 7 to 15 feet high added to the wildness of the scene. (Bromley, 1935: 82)

Assuming the Lawson lot was in any way representative of prevailing forest conditions in Union and surrounding towns at the time of initial settlement, the "omnipresence" of large white pine in Bromley's description is interesting in light of Cogbill et al.'s (2002) conclusion that the species was not numerically dominant in the presettlement forest of northeastern Connecticut. As Bromley (1935) did not provide any quantitative estimates of abundance, diversity, or relative basal area, it is impossible to say just how many white pines he actually saw. The large size of the pines may have magnified their apparent abundance. Still, historical records suggest that white pine was indeed relatively abundant in Union at the time of settlement, with sufficient supply to support an extensive logging industry even as early as the eighteenth century, if only for a few short decades. As the inhabitants of Union reported pleadingly to the Connecticut General Assembly in the 1770s, "The people relied upon the pine timber in the past to help them out in their support, but now the supply is failing and the market also," (Hammond, 1893: 128).

European Settlement, Poverty, and Ecological transformation

The early history of Union provides an instructive example of changing land use and political organization in the 1600s and early 1700s. The last town in the state east of the Connecticut River to be settled, a victim of both difficult topography and a long-standing boundary dispute between the colonies of Connecticut and Massachusetts Bay, Union saw no permanent white residents until 1727 when James McNall, an immigrant from the North of Ireland, “took land and built a cabin.” He was soon joined by his brother William McNall, “who settled in the south part of town,” and in 1728 by John Lawson (Hammond, 1893: 43). James Shearer was another early settler.

Despite its late settlement the Union area was well known across southern New England, for nearly a century before McNall’s arrival, as a source of mineral wealth and other natural resources. Indeed, Union was “called by its present name long before its settlement. It is referred to in old records as ‘the Union land,’ ‘the Union lands,’ and sometimes as the ‘Union Right,’” (Hammond, 1893: 38), and the name has its origin in the contested status of the territory and its mineral rights (Upson, 1984). In 1633, the traveler and explorer John Oldham (whom Hulburt [1930: 94] called one of the “Daniel Boones of New England”) acquired several pieces of graphite in trade with Native Americans, and it was subsequently learned that the sources of the mineral were two mines, one in the area of “Quasink” (now Sturbridge, Massachusetts), and the other on a hill called “Ocquebituque” (now Lead Mine Hill, just west of the Yale-Myers Forest, on the current Union-Ashford town line). In 1657, the General Court of Massachusetts Bay granted Lead Mine Hill and the land surrounding it to Capt. Thomas Clarke of Boston (Hammond, 1893). However, the mine was already being worked by people from Connecticut, and as the Connecticut-Massachusetts boundary had not yet been fixed, a bitter contention erupted between the two colonies. Until the dispute was settled in 1713, “the mine was considered to be a part of ‘Union [i.e. shared] Lands,’” (Upson, 1984: 16). Clarke and his grandson Col. Edward Hutchinson worked the graphite deposit at Lead Mine Hill through the eighteenth century (Hammond, 1893), while the Sturbridge mine continued in operation as late as 1900 (Robinson, 1976). Mining therefore preceded agricultural settlement in Union by several decades, and when the town was finally chartered in 1720 it was optimistically required that “the fifth part of all the ore of silver and gold that may at any time be found or gotten ... is hereby saved for our sovereign the king and his successors,” (Hammond, 1893: 39).

In 1719, a committee was “appointed and impowered by the General Assembly of His Majesty’s Colony of Connecticut...to sell certain lands for the raising money for the encouragement of Yale College,” and this sale comprised the modern town of Union (Hammond, 1893: 38). [The irony is undeniable.] There were twelve buyers, all residents of Windsor. After the confirmation of the town charter by Governor Gurdon Saltonstall in 1720, the twelve proprietors each received one of thirteen shares in the new town, plus one twelfth of the thirteenth part. Only one of the twelve, James Eno, would eventually settle in Union; the rest sold their land to settlers and speculators.

It was not until 1729 that any attempt was made to organize town government in Union (the McNall brothers, John Lawson, and James Shearer having arrived in the interim), when a meeting was held in the house of William Ward of Ashford on December 26 of that year. “There were present at that meeting, in person, or by their deputies, several of the noted land agents of that period,” including Col. John Chandler, Sr. of Woodstock, Capt. John Ellsworth of Windsor, his brother-in-law Samuel Wells of East Hartford, William Ward, and his son William

Ward Jr., of Ashford, John Lawson, Col. Samuel Willard of Lancaster, Massachusetts, Hon. Samuel Brown of Salem, Nathaniel Sessions of Pomfret, Thomas Tiffany of Ashford, and the notorious Capt. John Fitch of Windham. (The McNalls were conspicuously absent.) The first order of business was “to see and secure the bounds of our land and to perambulate with Mr. Hutchinson of Boston,” the grandson of Capt. Clarke, to confirm the claim (Hammond, 1893: 40).

That so much of the town was held by speculators and absentee landlords was a source of great frustration to the early residents of Union. By the time of the Revolution, half a century after the initial settlement, one third of the people of Union were tenants to non-resident proprietors, and even many of the freeholders found it difficult to feed their families, let alone pay their taxes (Hammond, 1893).

The situation was little different to the south in Ashford. Within a decade of the chartering of Ashford in 1714, the poverty of the infant town earned it a temporary release from payment of Connecticut taxes, but conditions did not improve, and several successive poor harvests pushed its people to the brink. By the spring of 1726, the inhabitants of Ashford and adjoining towns were starving. Governor Talcott was personally visited in Hartford by a “poor man from Ashford” whose only desperate hope was that aid from the colonial government could save his family and neighbors. “In a mournful, afflicted, and affecting manner,” the man declared that “neither he nor his family had eaten bread or flesh for more than a month, but had lived wholly on brakes, roots and herbs, and wished a committee to inquire into the circumstances.” A sum of thirty pounds was allocated for the relief of “poor and indigent persons in Ashford, Voluntown and Willington, who by frost in the past year were generally cut short in their crops and reduced to a suffering and almost perishing condition,” the money to be distributed by either the minister or selectmen of each town (Larned 1874 [1]: 232-238).

In these early years it is likely that the livestock suffered as much, if not more than, their human keepers. While the towns of the Connecticut River Valley, or along the shoreline, enjoyed the luxury of natural meadows (*i.e.*, either the river “intervale”, or coastal salt marshes) that would offer plentiful fodder for their animals even before land-clearing began, the upland towns had no such advantage. “At Cornwall in Connecticut’s northwest hills, settled 1738 to 1740, early comers kept their cows alive at times with venison broth,” reports Russell (1982: 87). It can be assumed that similarly extreme measures were taken in the northeast hills of Connecticut.

Despite the tremendous hardship, within a few decades the landscape was in transition to what Cronon (1983: 127-156) called “A World of Fields and Fences.” It was a process of domestication, in which wild plant and animal species were replaced by crop and weed plants, and herds of cattle and sheep. “The period from 1710 to the end of the Revolution was a busy time for Ashford. Land was cleared, buildings constructed, fences built, and wolves and rattlesnakes exterminated,” (Knowlton, 1990: 9). Still, it was not until as late as 1837 that the last wolf was seen in Union. As the tale was told more than half a century later,

He came into town from Stafford, and went through to Woodstock, killing sheep and sucking their blood, at nearly every house. A large party of hunters followed trail and finally surrounded him in a swamp near where Luther Marcy lives. When the dogs drove him out he passed between two men, one of whom was scared and did not try to kill him. The other who was Captain Danford Morse, made repeated efforts to fire off his old flint-lock gun, but it failed him just the critical time, and the wolf escaped. [The wolf] was afterward heard of away up in New Hampshire. (Hammond, 1893: 226)

In the northeast corner of Union, at Breakneck Pond, the ledges known as the “Cat Rocks” were home to wildcats as late as the nineteenth century (Upson, 1984: 282).

Roads and Commerce

Access to transportation was one of the major themes in the economic development of the region. Indeed, along with soil conditions, the presence of roads was one of the determining factors in historical patterns of land use throughout New England (Foster, 1992). The modern road network of the Yale-Myers Forest is oriented around the east-west axis of Center Pike, from which various branch roads (e.g., French Road, Kozey Road, Axe Factory Road, Barlow Mill Road, and not least the “Private Road” itself) strike out to north and south. However, these should not be considered as mere appendages or outgrowths of Center Pike, as some of them may in fact be much older. (French Road, for example, was already in existence as early as the 1780s, [D. Noll, personal communication, 11 April 2003].) The Center Turnpike was actually one of the last roads to be opened in the area, replacing several earlier east-west routes across what would later become the Forest.

The first highways of colonial New England were ancient Native American footpaths, widened (minimally) for use by horses and wheeled vehicles. Three routes were of regional importance (Robinson, 1976: 4; Ayres, 1940). The “Bay Path” ran west from Boston to Worcester and Springfield. The “Lower Path” ran overland from Boston to Providence and then followed the shoreline to New York. Between them was the “Connecticut Path,” connecting Boston and Hartford. Running through Ashford, Eastford, and Woodstock, the Connecticut Path (known in later years as the “Connecticut Road”) carried a steady stream of trade, travel, and migration through the Forest area from the earliest period of European settlement.

In his monograph on the Connecticut Path, Ayres (1940) emphasized the distinction among the ancient Native American footpath, the bridle trail used by the earliest colonial travelers on horseback, and the later wagon road of wheeled commerce. As new modes of travel were introduced, the trail was realigned to suit new needs and the older routes fell into disuse. The existence of three successive routes, always roughly parallel and never separated by more than a few kilometers, complicates any attempt to definitively trace this “Great Trail of New England.” It is known the various routes all crossed both Ashford and Woodstock, and Crystal Pond in Eastford was a “noted trail control” (Ayres 1940: 53). Beyond these specific points, any reconstruction is sketchy at best, but it is claimed that at least one of these routes may have crossed the southern part of the Yale-Myers Forest.

Between Moose Meadow and Crystal Pond are many landmarks of the old trail, of a bridle path rather than of a wagon road...Near the little Bigelow River, in a newly growing forest, are stone roadside fences, stone foundations of barns and homes, garden walls, a stone chimney built without mortar, and other relics that seem to speak of a beautiful English countryside of generations long past...Much of that country is today the Yale forest preserve. The old path was through that area. (Ayres 1940: 96)

The physical evidence of the Connecticut Path in the Yale-Myers Forest may be fragmentary, but folklore and oral tradition are abundant. Piecing together these accounts, the purported remnants of the Path in the Forest area were recorded in the early twentieth century by brothers Charles and David Chism of Axe Factory Road, Ashford, who identified it as the route taken by the Reverend Thomas Hooker and his party when they left

Massachusetts to establish the settlement of Hartford in 1635. According to Larned (1874 [1]: 2), “Tradition reports their encampment on Pine Hill in Ashford.” As told by Charles Chism,

“The old Hooker trail, as known in our country, passes through our lands...[o]ur old homestead...at Pine Hill, one mile east of the present Westford village. There have been several Westford villages in the past...There is a tradition generally accepted in Ashford that the Hooker party encamped on Pine Hill, Ashford...Sometimes Pine Hill is associated with the present village of Ashford...[but] Ashford village is in oak and chestnut country, not pine. The Pine Hill of our old homestead was covered, even down to my time, with heavy growth of virgin pine timber. The hill was a conspicuous landmark in the Mt. Hope Valley and was visible from Willimantic and Mt. Hope.” (Ayres, 1940: 289-291)

Chism went on to describe the persistent imprint of the trail upon the landscape:

“There are landmarks eastward and westward of our Pine Hill homestead, and on the farm itself that are either the work of the Indians or else the pioneers when they crossed the country on foot. On the old homestead are two strips of the old trail that have never been plowed although in the middle of a fertile mowing field...Going eastward from Pine Hill (our old homestead) along this Hooker trail, we come to the Bigelow River. The river is about four rods wide and at times it is deep and dangerous. About five rods above the present bridge [Westford Road?] are the boulders of an old Indian or pioneer ford; they are from two feet in diameter to three and four tons in size. They were rolled in a row so that a person could step from one to another. We went across the river to school and often crossed on those boulders. In spite of the storms of past centuries, those boulders still remain although floods have moved some a few feet. After passing the Bigelow River, the trail eastward turns up the hill between the old Shippey place and the old school site. East of there are swamps with a narrow strip of heavy soil where flat rocks have been placed for stepping stones, and they are still there. This is the only place where we could conveniently cross those meadows. We have often observed, and discussed, how skillfully the trail was laid to afford good traveling and directness and a minimum of fording troubles.” (Ayres 1940: 291-292)

The relationship between this route and the various parts of the Yale-Myers Forest can be described in approximate terms as follows: From the north side of the Westford village cemetery the trail crossed Westford Road and Compartment 115 of the Forest before emerging as the Chism driveway on Axe Factory Road. The way that marks the northern edge of Compartment 124 was part of this route (D. M. Smith, personal communication, 11 February 2003), and this is the presumptive location of the stone ford across Bigelow Brook. On the Eastford side, the trail may have crossed Compartments 137 (the location of the “meadows?”), 138, and possibly 145. Pine Hill lies partly in the southern end of Compartment 122.

(Another very early east-west route across the Forest may have been the trail known by Eastford tradition as “the Cart Path”, which runs west from Crystal Pond Road between Compartments 156 and 157, and 154 and 155 before intersecting with French Road and then continuing across Branch Brook to Kozey Road and beyond. Where the Cart Path crosses French Road are the cellar hole and two wells of the house where Philip Allen is said to have lived in the late 1700s. [D. Noll, personal communication, 23 April 2003])

Evidence suggests that the Connecticut Path remained no more than a bridle trail through most of the eighteenth century (Ayres, 1940), and indeed, wheeled transportation of any kind was rare in New England prior to 1800 (Kittredge, 1904). Even after the old path had been re-routed to the south (through Ashford village) and

widened for carts and wagons, travel remained extremely difficult. The early settlers of Ashford and Union were very isolated from regional markets.

The places to which the people of Union had to go to trade were at quite a distance. There were then no thriving villages like Southbridge and Stafford Springs in the vicinity. Windham was one of the nearest places of trade. Some used to go to Providence, Norwich, Boston, and especially Hartford. They usually went with ox-teams. The story is told of one of the early residents of Union going to Boston to buy the various articles which he needed. His wife had importuned him to get her a large iron kettle, as she needed one very much. When he had got nearly home, and was driving his steers over the new, rough road in the dark, suddenly his cart overturned, and the new kettle was thrown out on some rocks and broken. "There goes Sal's kettle," exclaimed the poor man with a sigh, as he thought of all the trouble he had taken to get it. (Hammond, 1893: 223)

Cattle were often driven to the markets of Hartford and Providence, and other trade items included hoop-poles (probably of chestnut), barrels and other cooperage, and potash (Hammond, 1893: 224). As such, commerce was limited and prosperity was notably absent. When Yale president Timothy Dwight (1752-1817) passed through Ashford on the Connecticut Road on the return leg of his trip to Provincetown, Massachusetts in 1800, he was not impressed by the landscape that greeted him:

The road passes through the center of Ashford and of Bolton. In each of these townships there is a decent village. The soil of the region between Pomfret and Bolton is generally cold, but is tolerably good grazing ground...Many of the houses on this road are good farmers' dwellings. The prospects from the high grounds are extensive, but neither diversified nor handsome. (Dwight, 1821-22 [3]: 94)

The construction of turnpike roads was one of the first steps in what Bidwell (1921; also Bidwell, 1916: 315-317) called "the Agricultural Revolution in New England," linking inland farms with the cities and manufacturing centers, integrating them with the market economy. Toll roads operated and maintained by private companies, they could either be "improvements" of older roads, or entirely new highways built on purpose to fill a perceived need. Several turnpikes traversed the Forest area.

The Boston, or "Middle" Turnpike, passing through Ashford village, was established in 1797 as the franchisee of the existing highway "from Hartford, through East Hartford, Bolton, Coventry, Mansfield, Ashford, Pomfret, and Thompson, to the Massachusetts line," the rerouted Connecticut Road (Wood, [1919] 1997: 328). Subject to toll along its entire length until 1845, the Boston Turnpike was made toll-free in the Town of Eastford in 1850, and relinquished the right to collect toll altogether in 1879 (Wood, [1919] 1997: 334). Although it followed the modern Route 44 for most of the distance between Hartford and Eastford, a short section of the old Boston Turnpike in the Phoenixville area exists in "unaltered condition" as a dirt road through the woods. It is described as being "still well defined, with stone walls on each side and ditches lining a road bed of about 12 [feet] wide," (Woodward, 2000: 2).

In 1808, the Somers and Woodstock Turnpike was chartered as a western extension of the Woodstock and Thompson Turnpike, which connected with the route of the separate Thompson Turnpike to Providence (Wood, [1919] 1997). It was the first highway to penetrate the core of the Yale-Myers Forest. Unlike the earlier Boston Turnpike, the Somers and Woodstock Turnpike was built on speculation, but the rationale for its existence is

unclear. Even in the flush period of the early 1800s, there could not have been enough traffic on this odd and irrelevant route to justify the construction and maintenance of the highway. As Wood ([1919] 1997: 379) observed with some amusement, “Conditions in the northern tier of Connecticut towns must have been radically different a hundred years ago from what they are to-day or such a project would have proved a vain dream. Indeed it is hard to see how the corporation managed to pick up a fraction of its expenses, and very likely it did not.” Frustrated in their attempts to make money, the owners soon abandoned the road, and in 1831 the Assembly revoked the turnpike charter and authorized the individual towns to maintain the neglected highway on their own (Wood, [1919] 1997). The road eventually just faded away. By the time the Gray *Atlas* was published in 1869, a large part of the Eastford section of the old turnpike had disappeared from the map, although in Ashford it persists even now as that town’s Sustek Road, passing to the south of Lead Mine Hill. Although difficult to trace, remnants of the Somers and Woodstock Turnpike may still be seen in the Forest today. Crossing Bigelow Brook at Compartment 69 near Barlow Mill (where the stone abutments of the bridge are now topped with old hemlocks), it followed woods roads leading east and southeast past the old Scarborough place. After fording Branch Brook on a low bridge, it passed immediately to the south of the present Forest camp (where it formed the property line between the adjacent Morse and Carpenter farms) before crossing directly in front of the site of the Vinton (Arnold) house on the way to North Ashford. To the east, the roadway dividing Compartments 160 and 161, and 167 and 168 north of Still River Pond was also part of the Somers and Woodstock route.

Although the Somers and Woodstock Turnpike is now largely forgotten, the Center Pike is a road well known to any visitor to the Yale-Myers Forest today. The Center Turnpike Company was chartered in May of 1826 to construct an extension of the earlier (1824) Central Turnpike of Massachusetts, from Dudley to the courthouse in Tolland (Wood, [1919] 1997). In similar form to the Somers and Woodstock road, the economic justification for this project is unclear (it was redundant from the start), but it was apparently perceived as the missing link in a new route from Hartford to Boston. Upon completion, “Immediately a new line of stages appeared, and residents along the Center had the daily pleasure of watching for the passage of the ‘Boston and Hartford Telegraph’ coaches,” (Wood, [1919] 1997: 395). It intersected with the Somers and Woodstock Turnpike in North Ashford, where the Keach Hotel provided rest and accommodation for travelers (Cameron, 1976: 9, 11). Still in use along most of its route, the Center Pike provides the major means of access to the Yale-Myers Forest camp. When the State of Connecticut was reconstructing the route through “Boston Hollow” in the 1930s, workers uncovered buried remnants of the corduroy road used to cross the swampy ground in that spot (Ashford 275th Anniversary Committee, 1990: 50), in what are now Compartments 93 and 112 of the Forest. As a commercial enterprise the Center Turnpike held out longer than many of its competitors. Tolls continued to be collected until as late as 1853, when the charter was revoked and the corporation dissolved (Wood, [1919]1997).

Most of the farmsteads in the central portion of the Yale-Myers Forest (such as the Morse Farm for example) were established in the wake of turnpike construction. As new roads such as the Center Turnpike were opened through the forest, settlers followed close behind, clearing land and building houses. The same sequence is well known today in forested regions of the tropics such as Amazonia and central Africa.

It can be said that the turnpike era of the early 1800s was also the era of rural industry. Although the area of the Yale-Myers Forest lacked the extensive charcoal iron industry described by Winer (1955: 153-156) at the Great Mountain Forest, other industries were widespread. Grist- and sawmills were numerous, utilizing the abundant waterpower of Bigelow Brook, Bushmeadow Brook, and Branch Brook (once grandly known as “the East Branch of the Bigelow River”), and axe handles were manufactured at the Griggs Mill at the eastern end of Boston Hollow, which lives on in the name of “Axe Factory Road.” Union alone had as many as 17 sawmills in this period (Hammond, 1893: 229-231). Tanneries, using hemlock bark cut locally, converted the hides of farmers’ livestock into a durable commodity, and supported an extensive cottage shoemaking industry (Hammond, 1893: 229-235; Meyer and Plusnin, 1945: 11-12). (Millstones found when the Morse Sawmill was dismantled in the 1970s suggest that it may have been used to grind hemlock tanbark as well as saw timber [D. M. Smith, personal communication, 11 February 2003].) Wooden tubs and pails, as well as twine and cotton batting, were other objects of local industry. Truly, “No period of the history of these towns shows more activity and more diversified effort than the second quarter of the nineteenth century,” (Meyer and Plusnin, 1945: 12).

The coming of the railroads put an end to this prosperity. By mid-century, commerce no longer took the turnpikes, and manufacturing was becoming concentrated in the river valley towns. New England agriculture as a whole became more commercialized, but only along the railroad lines or in the immediate vicinity of the cities was agricultural specialization (*e.g.*, market gardening, fruit farming, and dairy farming) possible. Although the growth of the textile industry led to a surge in interest in sheep (Russell, 1982: 201-202), the majority of farmers, especially in the hill towns, “never went in for specialties.”

They felt the stimulating effects of the new market, and responded by attempting to increase production in the lines of general farming. They continued to keep cattle and pigs for their own supplies of meat and dairy products, hoping for the opportunity to sell a small surplus. The same policy was evident in the crops they raised, chiefly hay, corn, and potatoes. But even the general farmers could not remain unaffected by outside competition. They found their market for beef and cheese curtailed by the same influences which had destroyed the production of these articles in specialized areas. (Bidwell 1921: 691-692)

New England farmers could not compete with the productivity of the deep, stone-free soils of the newly opened Midwest, and while the population of southern New England as a whole increased rapidly through the nineteenth century, the hill towns lost population. Young men went west to settle in other states, and farmland quickly grew up to brush and trees (Meyer and Plusnin, 1945: 12-13; Hammond, 1893: 226-228; Cameron, 1976: 16-17; Russell, 1982: 245-268).

Agroecology, and the Ecological Legacy of Agriculture

More than any other factor, it was agriculture that created the Forest as we know it today. “All the vegetation here is really the result of what some farmer did or didn’t do in the nineteenth century,” says D. M. Smith (quoted by Grant, 1996). It is true that “agriculture required the elimination of the forest,” as Whitney (1994: 132) says, but agriculture also shaped the forest, directing its succession over hundreds of years, forming and molding it by plow and cow.

The major difficulty facing the early European settlers of New England was the absence of native grasslands. Adherence to the mixed-husbandry tradition of northwestern Europe placed livestock in a central position in the economy of the farm, but livestock required forage. A typical cow would need two tons of hay, or the product of one to two acres of meadow or mowing land, to survive the winter (Whitney, 1994: 250). Thus the location or creation of pastures and hay meadows was the major priority of European settlers, and their domestication of the landscape took the form of replacing closed-canopy forest with artificial grasslands.

When the first settlers came to Union in 1727, "It is said that they found the entire town covered with forest, except the Lead Mine hill...Upon this, sufficient grass grew so that the settlers used to mow it in common," (Hammond, 1893: 221). The grassy bald of Lead Mine Hill was possibly the legacy of industrial activity, but the top of Grass Hill in Westford was also reported to have been treeless: "Old residents say trees have never grown there," (Ayres, 1940: 293 note). Hilltop balds such as these may have been of Native American origin. "Beaver meadows," where beaver dams created large areas of tree death and silt accumulation, were more commonly encountered openings in the forest and were "magnetic attractors of migration," (Hulbert, 1930: 85), as they could easily be converted to artificial meadows by simply removing the dam and draining away the water. Not surprisingly, beaver meadows and other wetlands were some of the first locations of agricultural activity in Union.

The settlers aimed, as soon as possible, to clear the swamp lands so as to raise grass on them. When cleared, the grass would come up rich and luxuriant, and of pretty good quality, and it did not fail as soon as on the uplands. Hence it may be seen how nearly all the swamp land in town has been cleared and mowed at some time or other. Many of these meadows are now growing up, and with the improved cultivation of the uplands, are not valued as highly as formerly. (Hammond, 1893: 221-222)

Before it was dammed by George Myers in an attempt to redirect its drainage westward to supplement the water power of the Morse Sawmill (D. M. Smith, personal communication, 11 February 2003), Morse Meadow Pond was no doubt once managed as a hay meadow. Even today, stone walls may be seen along the Pond's shallow northern end that run directly downhill and into the water. Some lowland meadows were apparently maintained into the twentieth century, at least on paper. When Urban Carpenter sold a sixteen-acre portion of his farm on the south side of Center Pike to George Myers in 1926, it was noted in the deed that his neighbor Harmon French retained an easement across the property, namely, "a lane five rods wide at the northeast corner of said tract to Branch Brook, so-called," (Carpenter, 1926). This was almost certainly intended for access to the meadows along Branch Brook.

The meadows could provide a good supply of hay, but clearing the forest from the uplands was the major project. Two methods were available for the killing the timber, cutting or girdling, and cutting was common enough in New England that it was known as the "Yankee" method (Williams, 1989). The felled trees were then piled and burned. "They cut down the woods and burnt them on the ground for the sake of grain growing and pasturage," said Hammond (1874) of the settlers of Union. Swidden methods were integral to the arable husbandry of farms in the Forest area, even long after the initial period of settlement. "What rye is grown in town is raised on land newly cleared," said Union farmer Amasa Morse to the members of the Connecticut Agricultural Society in 1872. "The brush are burnt off; no other preparation is necessary; the rye is sowed and harrowed in," (A. Morse 1872: 285).

The technique was precisely the same as that used in the 1600s in the Massachusetts Bay Colony, where rye was “sown broadcast on burned land and scratched in with a rake or harrow,” (Bidwell and Falconer, 1941: 14). Working marginal lands at the periphery of the New England economy, the hill farmers retained many ancient methods and practices long after they had fallen out of favor in lowland towns. Although at odds with popular notions of historical European agriculture which emphasize the open-field system and the permanent grasslands of the English countryside, swidden techniques were widely used throughout Europe, especially in densely wooded countries such as Sweden and Finland (e.g. Fritzbogger and Sondergaard, 1995). Loomis (1978: 483) has suggested that open-field and swidden in medieval European agriculture were perhaps not so much alternatives (one respectable, one degenerate), as independent strategies adapted to different environments. Arguably, swidden cultivation may have been the only practical method of producing grain on these rocky, wooded uplands, given the technology at hand.

Nutrient losses from swidden cultivation were substantial. Fire converts soil nitrogen and sulfur to gaseous forms, in which they are lost from the site, and lead to increased losses of soil phosphorus by runoff. Although ashes contain high levels of soluble potassium, magnesium, and calcium, increasing the short-term availability of these cations for crop growth, their rate of loss is also increased. When fires burn hot, loss of soil carbon may also be substantial. (Brady and Weil, 1996)

The farmers of eighteenth-century Union complained loudly to the General Assembly of the poverty of their land, of “a shallow soil, the hardpan lying within twelve inches of the surface...a soil exhausted with two or three crops so that then without great manure it will not pay the labor of tillage,” (Hammond, 1893: 128), but it was not all bad. The settlers were able to employ the spatial heterogeneity of the environment to their advantage. The glacial-till uplands of the Forest area are dominated by soils of the Charlton and Hollis series, occurring on ridges and steep slopes and often excessively drained and shallow to bedrock. On Charlton-Hollis land, “Most areas, particularly the steeper areas, are better suited to trees and wildlife habitat than to most other uses.” (USDA Soil Conservation Service, 1981: 3) However, included in the Charlton-Hollis matrix are small drumlinal deposits of the Woodbridge and Paxton series, more favorable for agriculture, and these patches were chosen for the locations of farms. Long before the discipline of soil science was developed, soil and site were evaluated by tree cover, and settlers intuitively favored hardwood sites over those with conifers (Williams, 1989: 60). The result was a pattern of scattered, isolated drumlin farmsteads, with large areas of rough pasture and permanent woodlot in between them. As noted in the 1930s by Charles Chism of Axe Factory Road, Ashford, “The country is hilly but there were parcels of exceptionally good land on those farms,” (Ayres, 1940: 290).

Bidwell (1916: 321) estimated the typical size of the inland New England farm of 1800 to have been approximately 100 to 200 acres. This area would have been divided into “three roughly equal tracts, one-third being woodland, including wasteland, one-third pasturage, and the remainder divided between mowing lands and cultivated fields in varying proportions.” Physiographic features (e.g. slope, aspect, soil) were the major determinants of farm layout, but the proportion of arable land (“tillage”) in particular was dependent on proximity to commercial towns; the more isolated the farm, the greater the emphasis on mowing, pasture, and livestock, and the relatively non-perishable commodities they provided. Tillage was extremely limited on farms in the area of the

Yale-Myers Forest. Amasa Morse listed his major arable crops as corn, oats, and potatoes, saying, "I have not generally planted more than an acre of each crop per year." He added, "My principal crop is grass raised on land that I do not plow at all," (A. Morse, 1872: 284-285). That not more than three or four acres would be plowed and planted on a farm of 100-200 acres total is remarkable, but an examination of the stone walls in the Yale-Myers Forest today will bear this out. As noted by Spurr (1956: 249), what had been cultivated fields can be distinguished from pasturelands in the modern forest by the structure of the stone walls fencing them. "Stone walls made up of boulders taken from cultivated fields are typically larger and contain a greater variety of stone sizes and a greater number of stones than do simple stone walls that were erected merely to mark property lines or to fence in cattle and sheep." The vast majority of stone walls in the Yale-Myers Forest are single courses of stones of more-or-less uniform size, indicating rough upland pasture. The more massive and varied "plow walls" are very rare, most often found on flatter ground in the immediate vicinity of cellar holes.

Early Connecticut tax rolls classified land according to five categories: (1) *tillage*; (2) *upland mowing and clear pasture*; (3) *meadow*; (4) *brush pasture*; and (5) *uninclosed land*. (Bidwell and Falconer 1941: 120; Winer 1955) The "brush" of brush pasture was young tree growth, kept in check with scythe and grub hoe (Bromley 1935: 65, 79-80), a seral state of forest regeneration on old, neglected fields. In 1796, only 8.9% of all taxable land in Tolland County was classified as tillage, but 29.9% was recorded as brush pasture; Windham County was 8.8% tillage and 29.3% brush pasture. Uninclosed land, i.e. forest, comprised 35% and 34.3% of the taxable land of Tolland and Windham, respectively. (Bidwell and Falconer 1941: 120)

At any one time, at least a third of the land on one of these Connecticut hill farms would have been pastureland in varying stages of abandonment and forest regeneration. Periodically, perhaps every twenty or thirty years, the young trees would be cut for fuel wood and the brush burned off, returning the land to active use. Tax categories aside, "The distinction between pasture and woodland was probably not of great importance," (Bidwell and Falconer 1941: 120). The "brush pasture" or "brush fallow" may be understood as a form of long-rotation swidden system that spread out the impact of grazing and cultivation across large land areas and long periods of time, allowing low-input agriculture to persist on marginal lands. "True the quantity of land used seems large, but it is really overstocked," Union residents complained to the Connecticut General Assembly in the 1770s, in search of tax relief (Hammond, 1893: 129). Union farmer J. T. Hall (1869: 157-158) argued that such an extensive system was required to farm on such poor land, and no other method would be worth the effort and expense.

My pastures are mostly poor and neglected, as they are generally here, except in certain localities. They are mostly covered with wood and brush, and I doubt whether the feed would pay the expense of keeping them clean as laurel is so common. Perhaps the best way is to fence in large lots, and let the cattle run and get as much as they can, and make up the deficiency by sowing corn, or some other way. (Hall, 1869: 157-158)

Mallik (1995) has described how disturbance such as logging and fire can convert temperate forests with ericaceous understories into heaths, and the presence of mountain laurel (*Kalmia latifolia* L.) in these pastures was the direct result of the swidden methods used to create them. Another successional trajectory was noted by Henry David

Thoreau, who perceptively connected the brush pasture custom of New England farmers with the transformation of neglected pasturelands into white pine woodland. As he observed in his journal,

The custom with us is to let the pines spread thus into the pasture, and at the same time to let the cattle wander there and contend with the former for the possession of the ground, from time to time coming to the aid of the cattle with a bush-whack. But when, after some fifteen or twenty years, the pines have fairly prevailed over us both, though they have suffered terribly and the ground is strewn with their dead, we then suddenly turn about, coming to the aid of the pines with a whip, and drive the cattle out. (quoted by Whitney and Davis, 1986: 76)

The pines in time became more valuable than the poor pasture they replaced, and provided a continuing supply of timber for local sawmills. The preeminence of the white pine in the cycle of old-field succession is illustrative of the equilibrium relationship of forest and farm in the period of agriculture. From comparative rarity in the presettlement forest, white pine increased dramatically with anthropogenic disturbance, only to decline following the Hurricane of 1938 and the subsequent reemergence of hardwoods (Spurr, 1956).

Much has been written of the slovenly, predatory agricultural practices of the early New England settlers, but Bidwell (1916) argued that the farming methods in vogue in New England in the eighteenth and early nineteenth centuries were a conscious adaptation to shortage of labor, overabundance of land, and lack of markets for farm products: “The inefficiency of agriculture was not due to ignorance,” he emphasized (Bidwell, 1916: 345-353). As such, agriculture was extensive rather than intensive, and it was often more economical for the farmer to clear new land for pasture and crops rather than attempt to fertilize and rehabilitate the old. The pattern is well known to students of agriculture in the developing world today.

As extensive methods required large areas of land, it is not surprising that certain wealthier families would acquire and operate multiple farms. When the Barlow family sold out to George Myers in 1929, it was not only the Barlow sawmill and their old “Home Farm” on Bigelow Brook that changed hands, but the Mallet farm in Ashford and the Newell farm in Union as well. (H. C. Barlow et al., 1929) Operating as satellites to the “Home Farm”, the Mallet and Newell farms would have provided valuable supplemental hay and pasturage for the Barlows’ livestock. The only significant structure on the Mallet Farm at that time was a large three-bay barn; the Barlows probably used this as a so-called “field barn” (Visser, 1997), storing the hay at the source rather than carting it back to the main farm.

It was not until the 1820s that New England barns were built with so-called “barn cellars” to collect and store manure for use as fertilizer; prior to this time, manure was seen simply as a waste product for disposal, not a resource for protection (Visser, 1997; White, 2002). The continued loss of soil nutrients from pasture ecosystems resulted in a change in their floristic composition, from clover and other valued forage plants to five-fingers (*Potentilla* spp.), bracken (*Pteridium aquilinum*), and other species characteristic of low-nutrient, acidic sites (Whitney, 1994: 254). Certain species such as the nitrogen-fixing bayberry (*Myrica pensylvanica* Loisel.) remain in the Forest today as indicators of what had been depleted pastures.

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