FOREST FALLOWING AMONG THE APPALACHIAN MOUNTAIN FOLK: AN ETHNOHISTORICAL STUDY

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Abstract: The practice of clearing new fields from forests and abandoning old fields to forest fallow is an ancient agricultural adaptation. Forest fallowing was still practiced in parts of the temperate world by 1900, including the Appalachian mountains. Forest fallowing survived in Appalachia, because it was cheaper to fallow fields than to use costly fertilizers. Forest fallowing, however, required an abundance of forest land for continued success. After 1900, Appalachia lost its surplus forest land to industries and governmental agencies. Trapped on a declining land base, Appalachian mountain farming became maladaptive, resulting in rural depopulation and the demise of forest fallowing.

Résumé: La pratique qui consiste à défricher de nouvelles terres forestières et, par la suite, de les laisser en jachère est en fait un mode ancien d'adaptation agricole. Cet usage était encore d'habitude jusqu'à 1900 dans quelques pays tempérés, les montagnes des Appalaches y compris.On continuait à jachérer la campagne forestiére parce que ce procédé était plus économique que l'emploi des fertilisants. Il fallait néanmoins, pour réussir cette operation de manière continue, une grande quantité de terre forestière. Après 1900, le territoire des Appalaches perdit son excédent de terre forestière au profit des industries et des agences gouvernementales. Une fois la réduction des terres amorcée, l'exploitation agricole du territoire de montagne des Appalaches ne pouvait s'effectuer, entraînant la baisse de la population rurale et l'échec du système de la jachère forestière.

The inhabitants of the Southern Appalachian Mountains (Figure 1) do not refer to themselves as "hillbillies." Nor do they call themselves "mountaineers," or more politely, "highlanders" (Williams 1972:49, 54). They simply refer to themselves as "just plain folks," which is precisely what most of them are—the descendants of the "plain folks" of the Old South.

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Figure 1: The Southern Appalachian Mountains

The History of the Appalachian Mountain Folk

Historian Frank L. Owsley first drew attention to the "plain folks" of the Old South (1784-1860)—the white agriculturalists who lived outside the plantation economy and who formed the bulk of the Southern free population. The plain folks included slaveholding farmers with fewer than twenty slaves as well as the more numerous slaveless farmers. Although some folks acquired dozens of slaves and entered the ranks of cotton planters, most aspired to own "land and other property sufficient to give them and their children a sense of security and well-being" (Owsley 1969:36).

To achieve this sense of security and well-being, plain folks pursued a farming and grazing economy. On their farmsteads, they practiced "patch" farming, clearing temporary fields, or "patches," from the forests, planting corn until yields declined, abandoning the old fields, and then clearing new fields from the remaining forests. Patch-farming of corn provided food for families as well as a source of cash, if the corn was distilled into whiskey. In the unfenced woodlands, or "open-range," which lay beyond their farmsteads, they grazed cattle and other livestock, allowing the animals to forage in the forests during most of the year. Once or twice a year, they collected their animals for butchering and marketing. Livestock-grazing thus furnished meat for home consumption as well as surplus livestock for sale. Taken together, grazing and farming permitted plain folk families to meet easily their subsistence and cash needs, and these agricultural practices provided the economic base for a distinctive way of life (Otto 1983:29-31; Peterson, Pearson, and Snow 1982).

Most plain folk families lived on isolated farmsteads, surrounded by tracts of unfenced woodlands, but they were not socially isolated. Each farmstead belonged to a dispersed rural neighbourhood, or "community," whose numbers were united by friendship, marriage, and kinship. Though dispersed over several square miles, the members of a community called on their friends, relatives, and in-laws for aid in clearing land, gathering corn, collecting livestock, and slaughtering animals (Otto 1981a:76-81).

By 1861, the eve of the Civil War, the plain folk way of life was found from Virginia to Texas (Otto 1985:199-200). In the Southern Appalachian mountains, the vast majority of the free inhabitants lived this way. Before the Civil War, the Appalachian mountain folk attracted little more attention than did those in Virginia or Texas or anywhere else. Their way of life differed little from that of the plain folk who lived elsewhere in the Old South (Otto 1981b:20-27).

The Civil War (1861-65) and the postbellum cotton boom shattered the old plain folk economy. After the war, high cotton prices encouraged planters to expand their cotton acreage. Since the plain folk still grazed their livestock on the open-range, cattle often strayed into cotton fields. Hoping to protect

valuable cotton fields from wandering cattle, planters in postbellum state legislatures enacted laws forcing plain folk to fence in their stock. Because these fencing laws effectively ended open-range grazing in much of the South, many plain folk turned to cotton-growing as a livelihood. They borrowed money for cotton seed, fertilizer, and equipment. If prices were high, they paid off their debts and made a small profit. If cotton prices were low, they became debtors, often losing their farms in the process. Landless folks then joined the growing mass of "poor white" tenant farmers and mill workers (McDonald and McWhiney 1980:1115-1118).

Cotton growing, however, proved unfeasible in much of the Southern Appalachian mountains, because of the poor soils, rugged terrain, and unpredictable frosts (U.S. Bureau of Agricultural Economics 1935:9-10). Thus, the Appalachian mountains remained something of a plain folk enclave in the years after the Civil War. At the turn of the twentieth century, the bulk of the Appalachian mountain folk pursued a grazing and farming economy as their plain folk ancestors had done. To obtain cash to pay taxes and to buy a few consumer goods, some mountain folk sold illegal corn whiskey, but most sold surplus livestock. Cattle, for example, were driven on the hoof to nearby markets and sold for a clear profit (Semple 1901:600-603; Kephart 1913:42-43, 123). Though cattle-raising was both legal and profitable, it required an abundance of open-range for continued success. Since every range cow needed at least fifteen acres of woodlands pasture, even a modest herd of only twenty cattle required as much as 300 acres of woodlands range (see Hilliard 1972:136).

But by 1900, extractive industries such as coal mining and logging were competing with mountain farmers for the use of the woodlands. Beginning in the 1880s, private mining and timber companies acquired vast tracts of mountain woodlands. Whole valleys were given over to railroads, coal mines, and coal towns, while forested slopes were denuded of their trees, leaving eroded, cut-over lands (Eller 1982:86-112, 128-160). And after the passage of the Weeks Act of 1911, which permitted the federal government to acquire forested watershed lands, the U.S. Forest Service added thousands of acres of woodlands and cut-over lands to its public forests (Kahn 1974). By 1930, only 60 percent of the land in the Southern Appalachian Mountains was still owned by farm families (Gray 1933:9).

Losing their woodlands range to extractive industries and to the growing federal forests, mountain folk were no longer able to raise sizeable herds of livestock on the open-range. Retaining a few cows for milk and a few hogs for meat, mountain farmers turned from livestock-grazing to corn-growing in an effort to make a living. Raising corn to feed their families as well as to make whiskey to sell in the nearby towns, farmers continued the traditional practice of patch farming (Caudill 1963:147-149). They followed a "cycle of

clearing steep hillsides, cultivating them to corn for a few years, abandoning them to pasture and then to brush and forest growth, subsequently replacing the abandoned area by a new clearing" (Gray 1933:9). This cycle of rotating fields with forest is better known to anthropologists as "shifting cultivation," "slash-and-burn farming," or more accurately, as "forest fallowing" (see Whittlesey 1937; Conklin 1954; Freeman 1955; Schlippe 1955; Conklin 1961; Geertz 1963; Boserup 1965; Russell 1968; Clarke 1976; Christiansen 1981).

The Nature of Forest Fallowing

The custom of clearing temporary fields from forests, planting crops until yields decline, and then allowing the fields to revert to forest fallow is a well-known anthropological phenomenon. This seemingly primitive type of agriculture may be an effective adaptation to forest environments, where heavy annual rainfall leaches nutrients from the soils. On such soils, trees develop complex root systems to collect leaching minerals and maintain them in a nearly closed cycle in the living vegetation. By clearing and burning the vegetation on a new field, farmers break the cycle, releasing accumulated minerals in the form of fertilizing ash. After a few seasons, the ash leaches out, the topsoils erode, crop yields decline, and the old field reverts to forest fallow. When the old field is reforested and the nutrients are restored, it may be cleared and farmed anew. Since tropical forests have amazing recuperative powers, an old field may be fully reforested and restored within a decade. But in temperate forests, where winter interrupts the growth cycle, it may be decades before an old field is fully reforested and restored (see Geertz 1963:20-25; Sanchez 1976:347-359, 404-405; Clarke 1976:247-249; Russell 1968:59, 61-62).

The most successful forest fallowing adaptations are those based on root-crops, which are grown in temporary fields claimed from tropical forests. Root-crops such as yams offer abundant yields per acre, they make few demands on soil fertility, and tropical forests recuperate their vegetation and nutrients so swiftly that old fields may be re-cleared and farmed again after only a decade. Given these advantages, the population densities of tropical root-crop cultivators in Africa and New Guinea may be "well in excess of 150 [persons] per square mile" (Harris 1972:248, 253).

Less successful forest fallowing adaptations are those based on seed-crops, which are grown in fields claimed from tropical forests. Seed-crops such as corn offer lower yields per acre than root-crops, they make greater demands on soil fertility, and tropical forests recuperate more slowly on eroded corn fields. Given these disadvantages, the population densities of tropical seed-crop cultivators are far lower than those of root-crop farmers. Among tropical seed-crop cultivators who practice forest fallowing in South

America, population densities of "less than ten [persons] per square mile are usual" (Harris 1972:248, 253-254).

The least successful forest fallowing adaptations are those based on seed-crops grown in fields cleared from temperate forests. Temperate deciduous and coniferous forests recuperate far more slowly than tropical forests; and even when mature, temperate forests accumulate less vegetation and nutrients than their tropical counterparts (Rodin and Bazilevich 1967:209, 211, 246). It has already been noted that temperate forests recuperate so slowly that old fields may not be re-cleared and farmed again for several decades. Given these problems, the population densities of temperate seed-crop cultivators are even lower than those of tropical seed-crop cultivators (Harris 1972:254-255).

During antiquity, forest fallowing was found from the temperate forests of Europe, northeastern Asia, and North America to the tropical forests of Africa, southeastern Asia, Oceania, and South America. Although forest fallowing is still prevalent in tropical forests, it has virtually vanished from the world's temperate forests (Russell 1968:59-60; Grigg 1974:62-63). To explain this disappearance of temperate forest fallowing, Esther Boserup has argued that increasing population pressures in Europe and northern Asia led to the evolution of more intensive types of agriculture, wherein the same fields were cropped yearly and fertility was maintained by manuring and crop rotation. Though intensive agriculture required more labour, time, and capital than forest fallowing, it increased crop yields, thus feeding a growing population (Boserup 1965:16-20, 33, 44-46; Boserup 1976:23-24). As population pressures intensified in temperate Eurasia, intensive agriculture superseded forest fallowing. By 1900, temperate forest fallowing was found only in the sparsely-settled fringes of Russia, Finland, Japan, and Korea (Linnard 1970:192; Mead 1953:44-45; Jones 1921:18-19; Grajadanzev 1944:95) as well as in the Southern Appalachian mountains of the United States.

Forest Fallowing in the Appalachian Mountains

The remarkable survival of forest fallowing in the temperate Appalachian mountains was rather well documented, thanks to outside interest in the region during the late nineteenth and early twentieth centuries. A series of family feuds, including the infamous Hatfield-McCoy vendetta, focused national attention on the Appalachian mountains. Appalachia was first "discovered" by travelers and journalists, who were soon followed by missionaries, educators, folklorists, sociologists, geographers, and agronomists. From the 1870s to the 1930s, an outpouring of literature on the Appalachian mountains described the landscape as well as the lifeways of the inhabitants. Inspired by outside interest in Appalachia, some native mountaineers also published accounts of local life (Klotter 1980). Few who wrote about Appa-

lachian mountain life failed to comment upon the local agricultural practices, since farming altered the landscape, provided subsistence for the bulk of the population, and competed with logging and coal-mining for land, forests, and labour (Edwards 1935).

Given the relative plenitude of written sources about Appalachian agriculture during the late nineteenth and early twentieth centuries, these sources may provide the data base for an ethnohistorical study of forest fallowing from the 1870s to the 1930s. Ethnohistory is defined as the synchronic ethnographic description of a past stage of culture, especially a description based on written sources that are contemporary with that stage (Sturtevant 1968:454). Ethnohistory utilizes written sources about past cultural phenomena, but its aims are essentially those of cultural anthropology—the describing and understanding of cultures and cultural processes (Carmack 1972:232). In this case, the ethnohistorical sources from the late nineteenth and early twentieth century described the cultural phenomenon of forest fallowing in considerable detail, including such aspects as land-clearing, crop-planting, and the cycle of rotating fields and forest.

The cycle of Appalachian forest fallowing began with the laborious task of clearing the forest growth from new fields. To ease this task, a mountain farmer called on his neighbours for help, forming communal work groups to clear the land. The farmer then returned the favour by working to clear his neighbours' fields in turn (Morton 1903:53; Haney 1906:86-87).

Appalachian land-clearing began with "grubbing" or rooting up the forest undergrowth with hoes:

> Not far beyond, a dozen men were grubbing a piece of new land. Each workman had assigned to him a strip one rod wide extending across the field. . . . All underbrush and all the sapling trees were removed and the roots torn out, but large trees were left to be girdled. (Morton 1903:64)

After piling and burning the undergrowth, farmers "deadened" the large trees by "girdling"—cutting a ring in the bark with axes so sap could not rise to nourish the branches (Raine 1924:30):

> In clearing new ground, everyone followed the ancient custom of girdling the tree trunks and letting them stand in spectral ugliness until they rotted and fell. This is a quick and easy way to get rid of the shade that otherwise would blunt the crops, and it prevents such trees as chestnut, buckeye, and basswood from sprouting from the stumps. (Kephart 1913:37)

Girdling the trees conserved labour and allowed farmers to plant crops the first season in their partially-cleared fields (Primack 1962:485). After fencing their fields with split-rails (Whitaker 1918:10), Appalachian mountain farmers planted a succession of crops which invariably included corn—a

versatile, high-yield crop which served as food, fodder, or even a source of cash if distilled:

> Corn or buckwheat is usually grown on these newly cleared fields between the girdled trees during the first season. . . . Following this, corn may be planted one or two years more; then small grains, either wheat, rye, or oats, for one or two years, then fallow [of] worthless weeds. (U.S. Department of Agriculture 1902:58)

Clearing and cultivating exposed the soil to the elements, leading to soil depletion and erosion:

> Unless it is well cared for, the land has by this time become poor, for it has lost its original humus. The soil has become less porous and less able to absorb the rainfall and erosion begins. Means are rarely taken to prevent or check this erosion, so it increases rapidly and the field is soon abandoned and a new one cleared. (Glenn 1911:11)

Although this Appalachian cycle of fields and forest closely resembled modern tropical forest fallowing (see Boserup 1965), Appalachian forest farming also included features that are rarely or never found in contemporary tropical forest farming. Typically, modern tropical forest farmers live in villages, they own land communally, they till their crops with hand-held tools, and they rarely keep large domestic animals such as cattle (Harris 1972:248; Grigg 1974:57-58; Boserup 1965:35, 78). Appalachian forest farmers, on the other hand, lived on dispersed farmsteads, they owned land individually, they tilled crops with ox-drawn plows, and they used old fields as pastures for their cattle.

Appalachian farmsteads followed the mountain valleys and straggled up the mountain slopes and ridges. Some mountain families "squatted" on public lands without obtaining formal title, but most owned or rented farms (Vincent 1898:3; Allen 1886:58). Individual mountain farmsteads often incorporated dozens of acres, but most of the acreage was in "old fields" and forests. Only a fraction of a typical farmstead was tilled at any given time (Semple 1901:600; Davis 1924:31-33). To till their fields, Appalachian mountain farmers used ox-drawn "bull-tongues" (scratch plows that lacked moldboards but possessed shares) to "scrabble the ground two or three inches deep for the planting" of corn (Spaulding 1915:66; Thompson 1910:30). After a few years of tillage, fields no longer yielded remunerative crops of corn but still offered a few seasons of grass and weeds, serving as rough pasture for cattle before reverting to forest (Jillson 1928:13).

Since the cycle of fields and forest in Southern Appalachia noticeably altered the landscape, few visitors to the mountains failed to comment on the "deadenings" (fields filled with girdled trees) as they passed through the mountains (eds., Ziegler and Grosscup 1883:258; Warner 1888:21, 53; Elliott

1906:489-490). Visitors to the mountains also viewed ox-drawn plows, split-rail fences, log cabins, homemade furnishings, and even homespun garments—all the familiar attributes of American pioneer life. Many observers felt as if they had been transported back to the time of Daniel Boone, Davy Crockett, and Abe Lincoln's boyhood. By the 1890s, academic visitors were proclaiming the Appalachian mountains to be a "retarded frontier," whose people belonged to "the last century." Appalachia was regarded as an isolated enclave of pioneer culture, where visitors could hear archaic words, listen to traditional ballads, be regaled with folktales about witches, and view log cabins surrounded by "deadenings." Given this context, Appalachian forest farming was perceived as yet another survival from the pioneer past (eg., Vincent 1898; Frost 1900; Semple 1901).

In dismissing forest farming as a pioneer survival, visitors to the Appalachian mountains may have overlooked the advantages that forest fallowing offers its practitioners. The most laborious aspect of forest farming is the periodic clearing of new fields in forests to replace the old fields turned out to forest fallow, but this task is lightened by reliance on communal work groups and by the use of fire to burn forest vegetation. Since the burning of forest growth also releases nutrients in the form of fertilizing ash, even the poorest soils are enriched for a few seasons (Boserup 1965:348; Netting 1977:61). Requiring little labour and no fertilizer, forest fallowing may have proved highly beneficial to Appalachian mountain farmers, who confronted such agricultural problems as poor transportation, little capital, untimely frosts, nutrient-poor soils, and steep slopes.

A farmer's ability to sell his crops and to purchase commercial goods depends upon his access to reliable transportation such as railroads (Hays 1977:71). After the Civil War (1861-65), railroads began penetrating Southern Appalachia, but the railways generally by-passed the mountains and followed the larger valleys. After 1900, railroads also began entering the mountains, but the lines generally serviced the coal mines and sawmills and not the agricultural settlements. For many mountain folks seasonal paths along mountain streams remained their only link to the larger American economy (Price 1883:172; Schockel 1916:115-118; Davis 1930:99).

Since poor transportation limited most mountain folks' participation in the market economy, they retained self-sufficient farming practices that were based on corn-cropping and forest fallowing (Davis 1924:61-62). Given their limited cash incomes and capital resources, mountain folks could not acquire the latest farming equipment and techniques. Even commercial fertilizers were priced beyond the means of most mountain farmers. During the early twentieth century, fertilizers retailed for more than $23.00 a ton. In fact, fertilizers were so expensive that Southern farmers used commercial manures only on their cash crops such as cotton and rarely on their corn crops. Even

so, many Southern farmers went deeply into debt in order to buy commercial fertilizers (Taylor 1953:491-495, 510-512). Mountain farmers wisely avoided undue expense and indebtedness by raising corn—a crop which offered high yields without commercial fertilizers and which was grown in "deadenings" claimed from mountain forests (Davis 1924:67-68).

"Deadenings" impressed outsiders as pioneer survivals, but these partially-cleared fields with their standing, girdled trees may have offered mountain farmers a means of coping with an unpredictable climate. In the Appalachian mountains, frosts could occur during ten months of the year. The air currents generated between deadenings and the neighbouring woods fostered the formation of dews and fogs, often saving corn crops from untimely frosts (Thomas 1926:27-28; U.S. Bureau of Agricultural Economics 1935:9; Lang 1968:53).

In addition to unseasonable frosts, the Appalachian climate was characterized by heavy yearly rainfall, which leached minerals from mountain slopes, creating acidic, nutrient-poor soils. Trees living on Appalachian mountain soils possessed complex root networks to collect the leaching minerals and lock them up in the living vegetation. Nutrients were restored to soils by burning the forest vegetation, thus releasing the entrapped minerals and fertilizing even the poorest soils for a few years (U.S. Bureau of Agricultural Economics 1935:10; Soil Survey Staff 1975:412-413, 421, 428; Steila 1976:143; Clark and Haswell 1970:40-41).

In the Appalachian mountains, farmers generally burned the forest vegetation in two stages. During the first seasons, workers removed and burned the undergrowth, but they girdled the large trees. After a few years of cultivation, farmers often removed the girdled trees by calling on their neighbours for a "log-rolling"—the formation of a communal work group to fell, pile, and burn the dead trees (U.S. Department of Agriculture 1902:58; Morton 1903:54). Burning the forest growth not only released nutrients locked up in underbrush and trees, but the heat from fires killed insect pests and weeds. And since the forest vegetation was removed in stages, the root networks of the girdled, dead trees helped retain the thin topsoils for a few years of cultivation, even on steep mountain slopes (Clark and Haswell 1970:42; Keith 1928:27; Lutz and Chandler 1946:455).

Despite these advantages which forest farming may have offered its practitioners, forest fallowing possessed a major disadvantage: it imposed a ceiling on agricultural productivity. Mountain farmers typically cultivated less than a third of the acreage on their farms at any given time. The bulk of their farm acreage was in forest or in "old fields" undergoing gradual reforestation. After being cultivated until crop yields declined or soils eroded, old fields were fallowed, serving as scrub pasture until finally giving rise to mixed hardwood forest. After an old field was reforested, it could then be

cleared and farmed anew. But if the field was cultivated before reforestation and restoration of nutrients in the forest growth was completed, then declining yields, soil exhaustion, and severe erosion resulted. Since the reforestation of old fields took decades in temperate Appalachia, farmers were constantly clearing new fields to replace the land turned out to forest fallow. And since the reforestation of old fields lagged behind the clearing of new fields, the continued success of Appalachian forest farming required a surplus of fresh woodlands to provide new corn fields (Davis 1924:33-34, 61; Jillson 1928:13; Keith 1928:27; Glenn 1911:11-12).

Fortunately, Appalachian mountain farmers lived within one of the world's largest temperate deciduous forests (Committee 1926). One government survey estimated that three-fourths of Southern Appalachia was still forested as late as 1910 (Glenn 1911:8-9). But during the late nineteenth and early twentieth centuries, extractive industries and the federal forest service acquired millions of acres of forest land. By 1930, private companies and federal agencies controlled 40 per cent of the land in Southern Appalachia (Gray 1933:9).

Although mountain farmers still retained 60 per cent of the land, their farm acreage was being subdivided by the practice of partible inheritance, or dividing family lands among all the heirs. This practice allowed the heirs to pursue farming as a way of life, but it steadily subdivided the agricultural land, increasing the number of farms and decreasing their average size and productivity. As an example, there were about 35,000 family farms in Kentucky's Cumberland Plateaus in 1880, and the average farm was 176 acres in size. If no more than a third of a farm's acreage was cultivated at one time, the average mountain farm of 1880 provided less than 58 acres of cropland. Forty years later, in 1920, there were more than 71,000 farms in the Kentucky Cumberlands, and the average farm was only 83 acres in size. If no more than a third of a farm's acreage was cultivated at a time, the average mountain farm of 1920 provided less than 27 acres of cropland (Barron 1977:212-213; Davis 1924:48-53). As mountain farms declined in size, their productivity also declined, either as a function of smaller cultivated plots or more rapid rotation of previously tilled fields. Writing in 1927, one observer found the typical Kentucky mountain farm contained 37 acres of forest, 23 acres of fallow and only 22 acres of cropland which was "far from first quality" (Cooper 1927:13).

Mountain farmers were attempting to feed a growing population on a declining agricultural base. Southern Appalachia had the highest birth rate in the United States, for mountain families needed children to aid in the farm work. Larger families, of course, increased the population pressures on the remaining land. By 1910, population densities in Kentucky's Cumberland Plateaus had reached an average of 43 persons per square mile (Barron

1977:212; Schockel 1916:118)—a population density far surpassing that of modern seed-crop cultivators (Harris 1972:248). Appalachian forest farming failed to support the growing rural population. During the 1910s and 1920s, many mountain families migrated to Oklahoma and Texas, hoping to continue the agricultural way of life as tenant farmers. Others abandoned farming altogether, settling in the coal towns and logging camps of Southern Appalachia (Combs 1913:43-44; Shackelford and Weinberg, eds., 1977:193-209).

During the Great Depression of the 1930s, some of these migrants returned to Southern Appalachia, further swelling the ranks of mountain farmers. About 400,000 farms were found in the Appalachian mountains during the 1930s; half of them were less than fifty acres in size, and one-fourth were smaller than twenty acres. Such minuscule farms offered little more than space for a house, a vegetable garden, and an eroded corn field. Farmers living on such tiny tracts could no longer clear new fields to replace the old fields turned out to forest fallow. They continued to cultivate their old fields; and soil exhaustion and severe erosion became common complaints on mountain farms (Taylor 1938:13; Clayton and Nicholls 1932:86-88).

World War Two (1941-45) and a booming national economy precipitated a new wave of out-migration from Southern Appalachia. Between 1940 and 1960, over two million people left the mountains to seek jobs in the industrial cities of the Midwest and South. Among the migrants were hundreds of thousands of farmers who simply abandoned their eroded hillside farmsteads (Brown and Hillery 1962:54-78; Harris, Tolley and Coutu 1963:44-47).

Private timber companies acquired some of the abandoned farm acreage, but more land passed into the federal forests. By 1930, the U.S. Forest Service managed seven national forests in Southern Appalachia, incorporating more than two million acres. And by 1960, the nine federal forests of Appalachia contained more than eleven million acres (U.S. Department of Agriculture 1949:711-713; Gibbard 1962:115).

Coal companies also expanded their holdings at the expense of Appalachian farmland, when they introduced strip-mining after World War Two. Bulldozers, power shovels, and trucks removed the overburden covering coal seams at a fraction of the cost of underground mining. Strip-mining, nonetheless, removed soils and vegetation as well as overburden, transforming fields and forests into barren slopes. By 1964, about 800,000 acres in Southern Appalachia had been disturbed by strip-mining; less than half of this total had been permanently restored (Caudill 1963:309-324; Gibbard 1962:108-109; Hart 1968:429).

Strip-mining, the expansion of the federal forests, and rural depopulation contributed to the loss of thousands of acres of farm land that was once cultivated by forest fallowing techniques. The acreage of harvested cropland in the Cumberland-Allegheny Plateaus of Kentucky, West Virginia, and Tennessee plummeted from 576,300 acres in 1939 to only 35,300 acres in 1974 (Hart 1978:5-16). In much of contemporary Southern Appalachia, farming is presently confined to the larger valleys, where transportation as well as terrain permits intensive commercial agriculture based on tobacco, grains, and livestock. Commercial fertilizers and modern machinery have now become commonplace on the remaining Appalachian farms (Raulston and Livingood 1974:224-226).

Conclusions

At first glance, the decline of forest fallowing in the Southern Appalachian Mountains seems to support the Boserup hypothesis: population pressures in the temperate world led to the abandonment of forest fallowing and the adoption of more intensive agricultural techniques (Boserup 1965:16-18). At the turn of the twentieth century, most mountain farmers practiced forest fallowing to maintain soil fertility. Forest fallowing permitted mountain farmers to raise corn with little labour and no fertilizer. They cleared temporary fields from the forests, planted corn in the fields until yields declined, and then abandoned the fields to gradual reforestation—a process which took two or more decades in the temperate Appalachian mountains. Given the slow reforestation and restoration of old fields, mountain farmers cultivated less than a third of their total land, since the bulk of their acreage was in forest fallow. Forest fallowing thus imposed a ceiling on agricultural productivity. As the rural population increased during the twentieth century, forest farming failed to feed the additional mouths, resulting in massive out-migration and the abandonment of forest fallowing.

The demise of Appalachian forest fallowing was not, however, simply a function of increasing population pressures on the land. The vulnerability of Appalachian mountain farming to population pressures was enhanced by the practice of individual land tenure, the use of plows to till fields, and the grazing of cattle on old fields—features which seldom appear among tropical forest farmers who hold land communally, till crops with hand-held tools, and rarely graze livestock on old fields.

The prevalence of individual land tenure and the custom of partible inheritance among Appalachian mountain farms led to the subdivision of agricultural land, yielding smaller and less productive farms. By the late 1930s, an estimated 100,000 mountain farms were smaller than twenty acres in size. This meant that thousands of families were "trying to make a living on from 3 to 10 acres of poor land" (Taylor 1938:13). On such small tracts,

farmers could no longer practice forest fallowing. They continued to plant corn in old fields year after year, resulting in soil exhaustion and erosion.

Soil erosion was accelerated by the use of plows in cultivation and by the grazing of cattle on old fields. In the 1940s, U.S. Forest Service researchers studied the effects of plow cultivation and cattle-grazing on experimental fields in the Blue Ridge Mountains of western North Carolina. They removed the forest cover from fields, cultivated successive corn crops with "bull-tongue" plows, and exposed the mountain soils to rainfall. They recorded soil losses approaching one ton per acre per year. After a few years of cultivation and declining crop yields, they turned the corn fields out to fallow, allowing cattle to graze on weeds and brush in the old fields. Browsing cattle, however, had an impact upon the soil, reducing its ability to absorb and retain rainwater. Soil losses on the old field pastures approximated three-fourths of a ton per acre per year. Thus, the cumulative effect of plowing and grazing on mountain fields was severe soil erosion (Dils 1953:7, 17-18, 20, 23, 25-26, 49-52). The more severely a field was eroded, the more slowly the forest growth recuperated. Reforestation was further delayed if farmers continued to use the old fields as fallow pastures, since grazing cattle fed on tree sprouts and saplings. Reforestation of severely eroded fields required a generation or more (Glenn 1911:9; Johnson 1952).

Since grazing and plowing greatly lengthened the time needed to reforest old fields, Appalachian mountain farming required a surplus of fresh forest land to provide new fields, while fallow fields were undergoing gradual restoration. But during the twentieth century, Appalachia's surplus of forest land was lost to the extractive industries and governmental agencies, which penetrated the region. By 1930, private corporations and public forests claimed almost half of Appalachia's land. Forest land, which had once served as temporary fields for corn crops or as open-range for livestock, was lost to Appalachian mountain farming. Trapped on a declining land base, Appalachian forest farming succumbed to low productivity, soil exhaustion, and population pressures.

Therefore, the decline of forest fallowing in temperate Appalachia may be attributed to external economic and political pressures as well as to internal pressures created by inheritance patterns, inappropriate farming practices, and increasing population. Since the Boserup hypothesis explains the demise of temperate forest fallowing only in terms of internal population pressures, it may be necessary to reformulate her hypothesis: the abandonment of forest fallowing in the temperate world may have resulted from external economic and political pressures as well as from internal social, technological, and population pressures. There may be no single cause to explain the disappearance of forest fallowing in the modern temperate world.

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