

A Sand County Almanac

AND

SKETCHES HERE AND THERE

BY *Aldo Leopold*

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To my ESTELLA

INTRODUCTION

* || ing, humility, and love—is itself expressed in the essays. What he sees as necessary to that full understanding of who and where we are in the universe—a reunification of poetry and science—is itself the means by which its pages work their power on us. *A Sand County Almanac* gives us not only a promising philosophy to follow, but a warm, human, admirable figure to emulate. In rendering for us the intellectual drama of a man becoming whole through his understanding of, and relationship with, his natural surroundings, Aldo Leopold succeeded in creating a remarkably whole book, a rich and enduring work of literature.

Brewster, Massachusetts
June 1987

Robert Finch

PART I *A Sand County Almanac*

January

January Thaw

Each year, after the midwinter blizzards, there comes a night of thaw when the tinkle of dripping water is heard in the land. It brings strange stirrings, not only to creatures abed for the night, but to some who have been asleep for the winter. The hibernating skunk, curled up in his deep den, uncurls himself and ventures forth to prowl the wet world, dragging his belly in the snow. His track marks one of the earliest datable events in that cycle of beginnings and ceasings which we call a year.

The track is likely to display an indifference to mundane affairs uncommon at other seasons; it leads straight across-country, as if its maker had hitched his wagon to a star and dropped the reins. I follow, curious to deduce his state of mind and appetite, and destination if any.

* * *

The months of the year, from January up to June, are a geometric progression in the abundance of distractions. In January one may follow a skunk track, or search for bands on the chickadees, or see what young pines the deer have browsed, or what muskrat houses the mink have dug, with only an occasional and mild digression into other doings

January observation can be almost as simple and peaceful as snow, and almost as continuous as cold. There is time not only to see who has done what, but to speculate why.

A meadow mouse, startled by my approach, darts damply across the skunk track. Why is he abroad in daylight? Probably because he feels grieved about the thaw. Today his maze of secret tunnels, laboriously chewed through the matted grass under the snow, are tunnels no more, but only paths exposed to public view and ridicule. Indeed the thawing sun has mocked the basic premises of the micro-tine economic system!

The mouse is a sober citizen who knows that grass grows in order that mice may store it as underground haystacks, and that snow falls in order that mice may build subways from stack to stack: supply, demand, and transport all neatly organized. To the mouse, snow means freedom from want and fear.

A rough-legged hawk comes sailing over the meadow ahead. Now he stops, hovers like a kingfisher, and then drops like a feathered bomb into the marsh. He does not rise again, so I am sure he has caught, and is now eating, some worried mouse-engineer who could not wait until night to inspect the damage to his well-ordered world.

The rough-leg has no opinion why grass grows, but he is well aware that snow melts in order that hawks may again catch mice. He came down out of the Arctic in the hope of thaws, for to him a thaw means freedom from want and fear.

The skunk track enters the woods, and crosses a glade where the rabbits have packed down the snow with their tracks, and mottled it with pinkish urinations. Newly exposed oak seedlings have paid for the thaw with their newly barked stems. Tufts of rabbit-hair bespeak the year's first battles among the amorous bucks. Further on I find a bloody spot, encircled by a wide-sweeping arc of owl's wings. To this rabbit the thaw brought freedom from want, but also a reckless abandonment of fear. The owl has reminded him that thoughts of spring are no substitute for caution.

The skunk track leads on, showing no interest in possible food, and no concern over the rompings or retributions of his neighbors. I wonder what he has on his mind; what got him out of bed? Can one impute romantic motives to this corpulent fellow, dragging his ample beltline through the slush? Finally the track enters a pile of driftwood, and does not emerge. I hear the tinkle of dripping water among the logs, and I fancy the skunk hears it too. I turn homeward, still wondering.



February

Good Oak

There are two spiritual dangers in not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace.

To avoid the first danger, one should plant a garden, preferably where there is no grocer to confuse the issue.

To avoid the second, he should lay a split of good oak on the andirons, preferably where there is no furnace, and let it warm his shins while a February blizzard tosses the trees outside. If one has cut, split, hauled, and piled his own good oak, and let his mind work the while, he will remember much about where the heat comes from, and with a wealth of detail denied to those who spend the week end in town astride a radiator.

The particular oak now aglow on my andirons grew on the bank of the old emigrant road where it climbs the sandhill. The stump, which I measured upon felling the tree, has a diameter of 30 inches. It shows 80 growth rings, hence the seedling from which it originated must have laid its first ring of wood in 1865, at the end of the Civil War. But I know from the history of present seedlings that no oak grows above the reach of rabbits without a decade or more of getting girdled each winter, and re-sprouting during the following summer. Indeed, it is all too clear that every sur-

viving oak is the product either of rabbit negligence or of rabbit scarcity. Some day some patient botanist will draw a frequency curve of oak birth-years, and show that the curve humps every ten years, each hump originating from a low in the ten-year rabbit cycle. (A fauna and flora, by this very process of perpetual battle within and among species, achieve collective immortality.)

It is likely, then, that a low in rabbits occurred in the middle 'sixties, when my oak began to lay on annual rings, but that the acorn that produced it fell during the preceding decade, when the covered wagons were still passing over my road into the Great Northwest. It may have been the wash and wear of the emigrant traffic that bared this roadbank, and thus enabled this particular acorn to spread its first leaves to the sun. Only one acorn in a thousand ever grew large enough to fight rabbits; the rest were drowned at birth in the prairie sea.

It is a warming thought that this one wasn't, and thus lived to garner eighty years of June sun. It is this sunlight that is now being released, through the intervention of my axe and saw, to warm my shack and my spirit through eighty gusts of blizzard. And with each gust a wisp of smoke from my chimney bears witness, to whomsoever it may concern, that the sun did not shine in vain.

My dog does not care where heat comes from, but he cares ardently that it come, and soon. Indeed he considers my ability to make it come as something magical, for when I rise in the cold black pre-dawn and kneel shivering by the hearth making a fire, he pushes himself blandly between me and the kindling splits I have laid on the ashes, and I must touch a match to them by poking it between his legs.) Such faith, I suppose, is the kind that moves mountains.

It was a bolt of lightning that put an end to wood-making by this particular oak. We were all awakened, one night in July, by the thunderous crash; we realized that the bolt must have hit near by, but, since it had not hit us, we all



went back to sleep. Man brings all things to the test of himself, and this is notably true of lightning.

Next morning, as we strolled over the sandhill rejoicing with the cone-flowers and the prairie clovers over their fresh accession of rain, we came upon a great slab of bark freshly torn from the trunk of the roadside oak. The trunk showed a long spiral scar of barkless sapwood, a foot wide

and not yet yellowed by the sun. By the next day the leaves had wilted, and we knew that the lightning had bequeathed to us three cords of prospective fuel wood.

We mourned the loss of the old tree, but knew that a dozen of its progeny standing straight and stalwart on the sands had already taken over its job of wood-making.

We let the dead veteran season for a year in the sun it could no longer use, and then on a crisp winter's day we laid a newly filed saw to its bastioned base. Fragrant little chips of history spewed from the saw cut, and accumulated on the snow before each kneeling sawyer. We sensed that these two piles of sawdust were something more than wood: that they were the integrated transect of a century; that our saw was biting its way, stroke by stroke, decade by decade, into the chronology of a lifetime, written in concentric annual rings of good oak.

It took only a dozen pulls of the saw to transect the few years of our ownership, during which we had learned to love and cherish this farm. Abruptly we began to cut the years of our predecessor the bootlegger, who hated this farm, skinned it of residual fertility, burned its farmhouse, threw it back into the lap of the County (with delinquent taxes to boot), and then disappeared among the landless anonymities of the Great Depression. Yet the oak had laid down good wood for him; his sawdust was as fragrant, as sound, and as pink as our own. An oak is no respecter of persons.

The reign of the bootlegger ended sometime during the dust-bowl drouths of 1936, 1934, 1933, and 1930. Oak smoke from his still and peat from burning marshlands must have

clouded the sun in those years, and alphabetical conservation was abroad in the land, but the sawdust shows no change.

Rest! cries the chief sawyer, and we pause for breath.

Now our saw bites into the 1920's, the Babbittian decade when everything grew bigger and better in heedlessness and arrogance—until 1929, when stock markets crumpled. If the oak heard them fall, its wood gives no sign. Nor did it heed the Legislature's several protestations of love for trees: a National Forest and a forest-crop law in 1927, a great refuge on the Upper Mississippi bottomlands in 1924, and a new forest policy in 1921. Neither did it notice the demise of the state's last marten in 1925, nor the arrival of its first starling in 1923.

In March 1922, the 'Big Sleet tore the neighboring elms limb from limb, but there is no sign of damage to our tree. What is a ton of ice, more or less, to a good oak?

Rest! cries the chief sawyer, and we pause for breath.

with hands Now the saw bites into 1910-20, the decade of the drainage dream, when steam shovels sucked dry the marshes of central Wisconsin to make farms, and made ash-heaps instead. Our marsh escaped, not because of any caution or forbearance among engineers, but because the river floods it each April, and did so with a vengeance—perhaps a defensive vengeance—in the years 1913-16. The oak laid on wood just the same, even in 1915, when the Supreme Court abolished the state forests and Governor Phillip pontificated that 'state forestry is not a good business proposition.' (It

did not occur to the Governor that there might be more than one definition of what is good, and even of what is business. It did not occur to him that while the courts were writing one definition of goodness in the law books, fires were writing quite another one on the face of the land. Perhaps, to be a governor, one must be free from doubt on such matters.)

While forestry receded during this decade, game conservation advanced. In 1916 pheasants became successfully established in Waukesha County; in 1915 a federal law prohibited spring shooting; in 1913 a state game farm was started; in 1912 a 'buck law' protected female deer; in 1911 an epidemic of refuges spread over the state. 'Refuge' became a holy word, but the oak took no heed.

Rest! cries the chief sawyer, and we pause for breath.

Now we cut 1910, when a great university president published a book on conservation, a great sawfly epidemic killed millions of tamaracks, a great drouth burned the pineries, and a great dredge drained Horicon Marsh.

We cut 1909, when smelt were first planted in the Great Lakes, and when a wet summer induced the Legislature to cut the forest-fire appropriations.

We cut 1908, a dry year when the forests burned fiercely, and Wisconsin parted with its last cougar.

We cut 1907, when a wandering lynx, looking in the wrong direction for the promised land, ended his career among the farms of Dane County.

We cut 1906, when the first state forester took office, and fires burned 17,000 acres in these sand counties; we cut 1905 when a great flight of goshawks came out of the North and

ate up the local grouse (they no doubt perched in this tree to eat some of mine). We cut 1902-3, a winter of bitter cold; 1901, which brought the most intense drouth of record (rainfall only 17 inches); 1900, a centennial year of hope, of prayer, and the usual annual ring of oak.

Rest! cries the chief sawyer, and we pause for breath.

* * *

Now our saw bites into the 1890's, called gay by those whose eyes turn cityward rather than landward. We cut 1899, when the last passenger pigeon collided with a charge of shot near Babcock, two counties to the north; we cut 1898 when a dry fall, followed by a snowless winter, froze the soil seven feet deep and killed the apple trees; 1897, another drouth year, when another forestry commission came into being; 1896, when 25,000 prairie chickens were shipped to market from the village of Spooner alone; 1895, another year of fires; 1894, another drouth year; and 1893, the year of 'The Bluebird Storm,' when a March blizzard reduced the migrating bluebirds to near-zero. (The first bluebirds always alighted in this oak, but in the middle 'nineties it must have gone without.) We cut 1892, another year of fires; 1891, a low in the grouse cycle; and 1890, the year of the Babcock Milk Tester, which enabled Governor Heil to boast, half a century later, that Wisconsin is America's Dairyland. The motor licenses which now parade that boast were then not foreseen, even by Professor Babcock.

It was likewise in 1890 that the largest pine rafts in history slipped down the Wisconsin River in full view of my oak, to build an empire of red barns for the cows of the prairie states. Thus it is that good pine now stands between

the cow and the blizzard, just as good oak stands between the blizzard and me.

Rest! cries the chief sawyer, and we pause for breath.

* * *

Now our saw bites into the 1880's; into 1889, a drouth year in which Arbor Day was first proclaimed; into 1887, when Wisconsin appointed its first game wardens; into 1886, when the College of Agriculture held its first short course for farmers; into 1885, preceded by a winter 'of unprecedented length and severity'; into 1883, when Dean W. H. Henry reported that the spring flowers at Madison bloomed 13 days later than average; into 1882, the year Lake Mendota opened a month late following the historic 'Big Snow' and bitter cold of 1881-2.

It was likewise in 1881 that the Wisconsin Agricultural Society debated the question, 'How do you account for the second growth of black oak timber that has sprung up all over the country in the last thirty years?' My oak was one of these. One debater claimed spontaneous generation, another claimed regurgitation of acorns by southbound pigeons.

Rest! cries the chief sawyer, and we pause for breath.

* * *

Now our saw bites the 1870's, the decade of Wisconsin's carousal in wheat. Monday morning came in 1879, when chinch bugs, grubs, rust, and soil exhaustion finally convinced Wisconsin farmers that they could not compete with the virgin prairies further west in the game of wheating land to death. I suspect that this farm played its share in the game, and that the sand blow just north of my oak had its origin in over-wheating.

This same year of 1879 saw the first planting of carp in Wisconsin, and also the first arrival of quack-grass as a stowaway from Europe. On 27 October 1879, six migrating prairie chickens perched on the roof-tree of the German Methodist Church in Madison, and took a look at the growing city. On 8 November the markets at Madison were reported to be glutted with ducks at 10 cents each.

In 1878 a deer hunter from Sauk Rapids remarked prophetically, 'The hunters promise to outnumber the deer.'

On 10 September 1877, two brothers, shooting Muskego Lake, bagged 210 blue-winged teal in one day.

In 1876 came the wettest year of record; the rainfall piled up 50 inches. Prairie chickens declined, perhaps owing to hard rains.

In 1875 four hunters killed 153 prairie chickens at York Prairie, one county to the eastward. In the same year the U.S. Fish Commission planted Atlantic salmon in Devil's Lake, 10 miles south of my oak.

In 1874 the first factory-made barbed wire was stapled to oak trees; I hope no such artifacts are buried in the oak now under saw!

In 1873 one Chicago firm received and marketed 25,000 prairie chickens. The Chicago trade collectively bought 600,000 at \$3.25 per dozen.

In 1872 the last wild Wisconsin turkey was killed, two counties to the southwest.

It is appropriate that the decade ending the pioneer carousal in wheat should likewise have ended the pioneer carousal in pigeon blood. In 1871, within a 50-mile triangle spreading northwestward from my oak, 136 million pigeons are estimated to have nested, and some may have nested in it, for it was then a thrifty sapling 20 feet tall. Pigeon hunt-

ers by scores plied their trade with net and gun, club and salt lick, and trainloads of prospective pigeon pie moved southward and eastward toward the cities. It was the last big nesting in Wisconsin, and nearly the last in any state.

This same year 1871 brought other evidence of the march of empire: the Peshtigo Fire, which cleared a couple of counties of trees and soil, and the Chicago Fire, said to have started from the protesting kick of a cow.

In 1870 the meadow mice had already staged their march of empire; they ate up the young orchards of the young state, and then died. They did not eat my oak, whose bark was already too tough and thick for mice.

It was likewise in 1870 that a market gunner boasted in the *American Sportsman* of killing 6000 ducks in one season near Chicago.

Rest! cries the chief sawyer, and we pause for breath.

* * *

Our saw now cuts the 1860's, when thousands died to settle the question: Is the man-man community lightly to be dismembered? They settled it, but they did not see, nor do we yet see, that the same question applies to the man-land community.

This decade was not without its gropings toward the larger issue. In 1867 Increase A. Lapham induced the State Horticultural Society to offer prizes for forest plantations. In 1866 the last native Wisconsin elk was killed. The saw now severs 1865, the pith-year of our oak. In that year John Muir offered to buy from his brother, who then owned the home farm thirty miles east of my oak, a sanctuary for the wildflowers that had gladdened his youth. His brother declined to part with the land, but he could not suppress

the idea: 1865 still stands in Wisconsin history as the birth-year of mercy for things natural, wild, and free.

We have cut the core. Our saw now reverses its orientation in history; we cut backward across the years, and outward toward the far side of the stump. At last there is a tremor in the great trunk; the saw-kerf suddenly widens; the saw is quickly pulled as the sawyers spring backward to safety; all hands cry "Timber!"; my oak leans, groans, and crashes with earth-shaking thunder, to lie prostrate across the emigrant road that gave it birth.

Now comes the job of making wood. The maul rings on steel wedges as the sections of trunk are up-ended one by one, only to fall apart in fragrant slabs to be corded by the roadside.

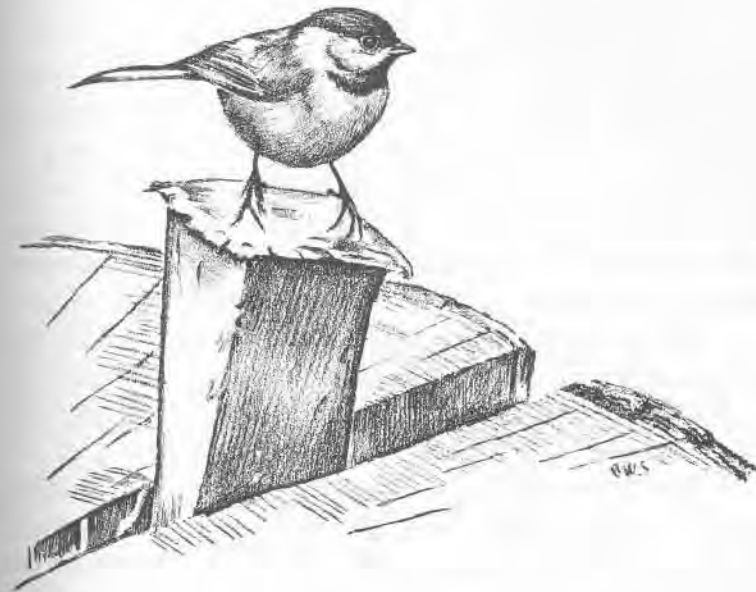
There is an allegory for historians in the diverse functions of saw, wedge, and axe.

ANALOGY The saw works only across the years, which it must deal with one by one, in sequence. From each year the raker teeth pull little chips of fact, which accumulate in little piles, called sawdust by woodsmen and archives by historians; both judge the character of what lies within by the character of the samples thus made visible without. It is not until the transect is completed that the tree falls, and the stump yields a collective view of a century. By its fall the tree attests the unity of the hodge-podge called history.

The wedge, on the other hand, works only in radial splits; such a split yields a collective view of all the years at once, or no view at all, depending on the skill with which the plane of the split is chosen. (If in doubt, let the section season for a year until a crack develops. Many a hastily driven

wedge lies rusting in the woods, embedded in unsplittable cross-grain.)

The axe functions only at an angle diagonal to the years, and this only for the peripheral rings of the recent past. Its special function is to lop limbs, for which both saw and wedge are useless.



The three tools are requisite to good oak, and to good history.

These things I ponder as the kettle sings, and the good oak burns to red coals on white ashes. Those ashes, come spring, I will return to the orchard at the foot of the sandhill. They will come back to me again, perhaps as red apples, or per-

haps as a spirit of enterprise in some fat October squirrel, who, for reasons unknown to himself, is bent on planting acorns.

March

The Geese Return

One swallow does not make a summer, but one skein of geese, cleaving the murk of a March thaw, is the spring.

A cardinal, whistling spring to a thaw but later finding himself mistaken, can retrieve his error by resuming his winter silence. A chipmunk, emerging for a sunbath but finding a blizzard, has only to go back to bed. But a migrating goose, staking two hundred miles of black night on the chance of finding a hole in the lake, has no easy chance for retreat. His arrival carries the conviction of a prophet who has burned his bridges.

A March morning is only as drab as he who walks in it without a glance skyward, ear cocked for geese. I once knew an educated lady, banded by Phi Beta Kappa, who told me that she had never heard or seen the geese that twice a year proclaim the revolving seasons to her well-insulated roof. Is education possibly a process of trading awareness for things of lesser worth? The goose who trades his is soon a pile of feathers.

The geese that proclaim the seasons to our farm are aware of many things, including the Wisconsin statutes. The south-bound November flocks pass over us high and haughty, with scarcely a honk of recognition for their favorite sandbars

and sloughs. 'As a crow flies' is crooked compared with their undeviating aim at the nearest big lake twenty miles to the south, where they loaf by day on broad waters and filch corn by night from the freshly cut stubbles. November geese are aware that every marsh and pond bristles from dawn till dark with hopeful guns.

March geese are a different story. Although they have been shot at most of the winter, as attested by their buck-shot-battered pinions, they know that the spring truce is now in effect. They wind the oxbows of the river, cutting low over the now gunless points and islands, and gabbling to each sandbar as to a long-lost friend. They weave low over the marshes and meadows, greeting each newly melted puddle and pool. Finally, after a few *pro-forma* circlings of our marsh, they set wing and glide silently to the pond, black landing-gear lowered and rumps white against the far hill. Once touching water, our newly arrived guests set up a honking and splashing that shakes the last thought of winter out of the brittle cattails. Our geese are home again!

It is at this moment of each year that I wish I were a muskrat, eye-deep in the marsh.

Once the first geese are in, they honk a clamorous invitation to each migrating flock, and in a few days the marsh is full of them. On our farm we measure the amplitude of our spring by two yardsticks: the number of pines planted, and the number of geese that stop. Our record is 642 geese counted in on 11 April 1946.

As in fall, our spring geese make daily trips to corn, but these are no surreptitious sneakings-out by night; the flocks move noisily to and from corn stubbles through the day. Each departure is preceded by loud gustatory debate, and each return by an even louder one. The returning flocks,

once thoroughly at home, omit their *pro-forma* circlings of the marsh. They tumble out of the sky like maple leaves, side-slipping right and left to lose altitude, feet spraddled toward the shouts of welcome below. I suppose the ensuing gabble deals with the merits of the day's dinner. They are now eating the waste corn that the snow blanket has protected over winter from corn-seeking crows, cottontails, meadow mice, and pheasants.

It is a conspicuous fact that the corn stubbles selected by geese for feeding are usually those occupying former prairies. No man knows whether this bias for prairie corn reflects some superior nutritional value, or some ancestral tradition transmitted from generation to generation since the prairie days. Perhaps it reflects the simpler fact that prairie cornfields tend to be large. If I could understand the thunderous debates that precede and follow these daily excursions to corn, I might soon learn the reason for the prairie-bias. But I cannot, and I am well content that it should remain a mystery. What a dull world if we knew all about geese!

In thus watching the daily routine of a spring goose convention, one notices the prevalence of singles—lone geese that do much flying about and much talking. One is apt to impute a disconsolate tone to their honkings, and to jump to the conclusion that they are broken-hearted widowers, or mothers hunting lost children. The seasoned ornithologist knows, however, that such subjective interpretation of bird behavior is risky. I long tried to keep an open mind on the question.

After my students and I had counted for half a dozen years the number of geese comprising a flock, some unex-



pected light was cast on the meaning of lone geese. It was found by mathematical analysis that flocks of six or multiples of six were far more frequent than chance alone would dictate. In other words, goose flocks are families, or aggregations of families, and lone geese in spring are probably just what our fond imaginings had first suggested. They are bereaved survivors of the winter's shooting, searching in vain for their kin. Now I am free to grieve with and for the lone honkers.

It is not often that cold-potato mathematics thus confirms the sentimental promptings of the bird-lover.

On April nights when it has become warm enough to sit outdoors, we love to listen to the proceedings of the convention in the marsh. There are long periods of silence when one hears only the winnowing of snipe, the hoot of a distant owl, or the nasal clucking of some amorous coot. Then, of a sudden, a strident honk resounds, and in an instant pandemonium echoes. There is a beating of pinions on water, a rushing of dark prows propelled by churning paddles, and a general shouting by the onlookers of a vehement controversy. Finally some deep honker has his last word, and the noise subsides to that half-audible small-talk that seldom ceases among geese. Once again, I would I were a muskrat!

By the time the pasques are in full bloom our goose-convention dwindles, and before May our marsh is once again a mere grassy wetness, enlivened only by redwings and rails.

* * *

It is an irony of history that the great powers should have discovered the unity of nations at Cairo in 1943. The geese

of the world have had that notion for a longer time, and each March they stake their lives on its essential truth.

In the beginning there was only the unity of the Ice Sheet. Then followed the unity of the March thaw, and the northward hegira of the international geese. Every March since the Pleistocene, the geese have honked unity from China Sea to Siberian Steppe, from Euphrates to Volga, from Nile to Murmansk, from Lincolnshire to Spitsbergen. Every March since the Pleistocene, the geese have honked unity from Currituck to Labrador, Matamuskeet to Ungava, Horseshoe Lake to Hudson's Bay, Avery Island to Baffin Land, Panhandle to Mackenzie, Sacramento to Yukon.

By this international commerce of geese, the waste corn of Illinois is carried through the clouds to the Arctic tundras, there to combine with the waste sunlight of a nightless June to grow goslings for all the lands between. And in this annual barter of food for light, and winter warmth for summer solitude, the whole continent receives as net profit a wild poem dropped from the murky skies upon the muds of March.

April

Come High Water

The same logic that causes big rivers always to flow past big cities causes cheap farms sometimes to be marooned by spring floods. Ours is a cheap farm, and sometimes when we visit it in April we get marooned.

Not intentionally, of course, but one can, to a degree,

guess from weather reports when the snows up north will melt, and one can estimate how many days it takes for the flood to run the gauntlet of upriver cities. Thus, come Sunday evening, one must go back to town and work, but one can't. How sweetly the spreading waters murmur condolence for the wreckage they have inflicted on Monday morning dates! How deep and chesty the honkings of the geese as they cruise over cornfield after cornfield, each in process of becoming a lake. Every hundred yards some new goose flails the air as he struggles to lead the echelon in its morning survey of this new and watery world.

The enthusiasm of geese for high water is a subtle thing, and might be overlooked by those unfamiliar with goose-gossip, but the enthusiasm of carp is obvious and unmistakable. No sooner has the rising flood wetted the grass roots than here they come, rooting and wallowing with the prodigious zest of pigs turned out to pasture, flashing red tails and yellow bellies, cruising the wagon tracks and cow-paths, and shaking the reeds and bushes in their haste to explore what to them is an expanding universe.

Unlike the geese and the carp, the terrestrial birds and mammals accept high water with philosophical detachment. A cardinal atop a river birch whistles loudly his claim to a territory that, but for the trees, cannot be seen to exist. A ruffed grouse drums from the flooded woods; he must be perched on the high end of his highest drumming log. Meadow-mice paddle rideward with the calm assurance of miniature muskrats. From the orchard bounds a deer, evicted from his usual daytime bed in the willow thickets. Everywhere are rabbits, calmly accepting quarters on our hill, which serves, in Noah's absence, for an ark.

The spring flood brings us more than high adventure; it

brings likewise an unpredictable miscellany of floatable objects pilfered from upriver farms. An old board stranded on our meadow has, to us, twice the value of the same piece new from the lumberyard. Each old board has its own individual history, always unknown, but always to some degree guessable from the kind of wood, its dimensions, its nails, screws, or paint, its finish or the lack of it, its wear or decay. One can even guess, from the abrasion of its edges and ends on sandbars, how many floods have carried it in years past.

Our lumber pile, recruited entirely from the river, is thus not only a collection of personalities, but an anthology of human strivings in upriver farms and forests. The autobiography of an old board is a kind of literature not yet taught on campuses, but any riverbank farm is a library where he who hammers or saws may read at will. Come high water, there is always an accession of new books.

There are degrees and kinds of solitude. An island in a lake has one kind; but lakes have boats, and there is always the chance that one might land to pay you a visit. A peak in the clouds has another kind; but most peaks have trails, and trails have tourists. I know of no solitude so secure as one guarded by a spring flood; nor do the geese, who have seen more kinds and degrees of aloneness than I have.

So we sit on our hill beside a new-blown pasque, and watch the geese go by. I see our road dipping gently into the waters, and I conclude (with inner glee but exterior detachment) that the question of traffic, in or out, is for this day at least, debatable only among carp.

July

Great Possessions

One hundred and twenty acres, according to the County Clerk, is the extent of my worldly domain. But the County Clerk is a sleepy fellow, who never looks at his record books before nine o'clock. What they would show at daybreak is the question here at issue.

Books or no books, it is a fact, patent both to my dog and myself, that at daybreak I am the sole owner of all the acres I can walk over. It is not only boundaries that disappear, but also the thought of being bounded. Expanses unknown to deed or map are known to every dawn, and solitude, supposed no longer to exist in my county, extends on every hand as far as the dew can reach.

Like other great landowners, I have tenants. They are negligent about rents, but very punctilious about tenures. Indeed at every daybreak from April to July they proclaim their boundaries to each other, and so acknowledge, at least by inference, their fiefdom to me.

This daily ceremony, contrary to what you might suppose, begins with the utmost decorum. Who originally laid down its protocols I do not know. At 3:30 a.m., with such dignity as I can muster of a July morning, I step from my cabin door, bearing in either hand my emblems of sovereignty, a coffee pot and notebook. I seat myself on a bench, facing the white wake of the morning star. I set the pot

beside me. I extract a cup from my shirt front, hoping none will notice its informal mode of transport. I get out my watch, pour coffee, and lay notebook on knee. This is the cue for the proclamations to begin.

At 3:35 the nearest field sparrow avows, in a clear tenor chant, that he holds the jackpine copse north to the riverbank, and south to the old wagon track. One by one all the other field sparrows within earshot recite their respective holdings. There are no disputes, at least at this hour, so I just listen, hoping inwardly that their womenfolk acquiesce in this happy accord over the *status quo ante*.

Before the field sparrows have quite gone the rounds, the robin in the big elm warbles loudly his claim to the crotch where the icestorm tore off a limb, and all appurtenances pertaining thereto (meaning, in his case, all the angleworms in the not-very-spacious subjacent lawn).

The robin's insistent caroling awakens the oriole, who now tells the world of orioles that the pendant branch of the elm belongs to him, together with all fiber-bearing milkweed stalks near by, all loose strings in the garden, and the exclusive right to flash like a burst of fire from one of these to another.

My watch says 3:50. The indigo bunting on the hill asserts title to the dead oak limb left by the 1936 drought, and to divers near-by bugs and bushes. He does not claim, but I think he implies, the right to out-blue all bluebirds, and all spiderworts that have turned their faces to the dawn.

Next the wren—the one who discovered the knothole in the eave of the cabin—explodes into song. Half a dozen other wrens give voice, and now all is bedlam. Grosbeaks, thrashers, yellow warblers, bluebirds, vireos, towhees, cardinals—all are at it. My solemn list of performers, in their

order and time of first song, hesitates, wavers, ceases, for my ear can no longer filter out priorities. Besides, the pot is empty and the sun is about to rise. I must inspect my domain before my title runs out.

We sally forth, the dog and I, at random. He has paid scant respect to all these vocal goings-on, for to him the



evidence of tenantry is not song, but scent. Any illiterate bundle of feathers, he says, can make a noise in a tree. Now he is going to translate for me the olfactory poems that who-knows-what silent creatures have written in the summer night. At the end of each poem sits the author—if we can find him. What we actually find is beyond predicting: a rabbit, suddenly yearning to be elsewhere; a woodcock, fluttering his disclaimer; a cock pheasant, indignant over wetting his feathers in the grass.

Once in a while we turn up a coon or mink, returning late from the night's foray. Sometimes we rout a heron from his unfinished fishing, or surprise a mother wood duck with her convoy of ducklings, headed full-steam for the shelter

of the pickerelweeds. Sometimes we see deer sauntering back to the thickets, replete with alfalfa blooms, veronica, and wild lettuce. More often we see only the interweaving darkened lines that lazy hoofs have traced on the silken fabric of the dew.

I can feel the sun now. The bird-chorus has run out of breath. The far clank of cowbells bespeaks a herd ambling to pasture. A tractor roars warning that my neighbor is astir. The world has shrunk to those mean dimensions known to county clerks. We turn toward home, and breakfast.

Prairie Birthday

During every week from April to September there are, on the average, ten wild plants coming into first bloom. In June as many as a dozen species may burst their buds on a single day. No man can heed all of these anniversaries; no man can ignore all of them. He who steps unseeing on May dandelions may be hauled up short by August ragweed pollen; he who ignores the ruddy haze of April elms may skid his car on the fallen corollas of June catalpas. Tell me of what plant-birthday a man takes notice, and I shall tell you a good deal about his vocation, his hobbies, his hay fever, and the general level of his ecological education.

Every July I watch eagerly a certain country graveyard that I pass in driving to and from my farm. It is time for a prairie birthday, and in one corner of this graveyard lives a surviving celebrant of that once important event.

It is an ordinary graveyard, bordered by the usual spruces, and studded with the usual pink granite or white marble

3rd - land?

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headstones, each with the usual Sunday bouquet of red or pink geraniums. It is extraordinary only in being triangular instead of square, and in harboring, within the sharp angle of its fence, a pin-point remnant of the native prairie on



which the graveyard was established in the 1840's. Heretofore unreachable by scythe or mower, this yard-square relic of original Wisconsin gives birth, each July, to a man-high stalk of compass plant or cutleaf *Silphium*, spangled with saucer-sized yellow blooms resembling sunflowers. It is the sole remnant of this plant along this highway, and perhaps the sole remnant in the western half of our county. What a thousand acres of *Silphiums* looked like when they tickled the bellies of the buffalo is a question never again to be answered, and perhaps not even asked.

This year I found the Silphium in first bloom on 24 July, a week later than usual; during the last six years the average date was 15 July.

When I passed the graveyard again on 3 August, the fence had been removed by a road crew, and the Silphium cut. It is easy now to predict the future; for a few years my Silphium will try in vain to rise above the mowing machine, and then it will die. With it will die the prairie epoch.

The Highway Department says that 100,000 cars pass yearly over this route during the three summer months when the Silphium is in bloom. In them must ride at least 100,000 people who have 'taken' what is called history, and perhaps 25,000 who have 'taken' what is called botany. Yet I doubt whether a dozen have seen the Silphium, and of these hardly one will notice its demise. If I were to tell a preacher of the adjoining church that the road crew has been burning history books in his cemetery, under the guise of mowing weeds, he would be amazed and uncomprehending. How could a weed be a book?

This is one little episode in the funeral of the native flora, which in turn is one episode in the funeral of the floras of the world. Mechanized man, oblivious of floras, is proud of his progress in cleaning up the landscape on which, willy-nilly, he must live out his days. It might be wise to prohibit at once all teaching of real botany and real history, lest some future citizen suffer qualms about the floristic price of his good life.

* * *

Thus it comes to pass that farm neighborhoods are good in proportion to the poverty of their floras. My own farm was selected for its lack of goodness and its lack of highway;

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indeed my whole neighborhood lies in a backwash of the River Progress. My road is the original wagon track of the pioneers, innocent of grades or gravel, brushings or bulldozers. My neighbors bring a sigh to the County Agent. Their fencerows go unshaven for years on end. Their marshes are neither dyked nor drained. As between going fishing and going forward, they are prone to prefer fishing. Thus on week ends my floristic standard of living is that of the backwoods, while on week days I subsist as best I can on the flora of the university farms, the university campus, and the adjoining suburbs. For a decade I have kept, for pastime, a record of the wild plant species in first bloom on these two diverse areas:

Species First Blooming in	Suburb and Campus	Backward Farm
April	14	26
May	29	59
June	43	70
July	25	56
August	9	14
September	0	1
Total visual diet	120	226

It is apparent that the backward farmer's eye is nearly twice as well fed as the eye of the university student or businessman. Of course neither sees his flora as yet, so we are confronted by the two alternatives already mentioned: either insure the continued blindness of the populace, or examine the question whether we cannot have both progress and plants.

The shrinkage in the flora is due to a combination of clean-farming, woodlot grazing, and good roads. Each of these necessary changes of course requires a larger reduction in the acreage available for wild plants, but none of

them requires, or benefits by, the erasure of species from whole farms, townships, or counties. There are idle spots on every farm, and every highway is bordered by an idle strip as long as it is; keep cow, plow, and mower out of these idle spots, and the full native flora, plus dozens of interesting stowaways from foreign parts, could be part of the normal environment of every citizen.

The outstanding conservator of the prairie flora, ironically enough, knows little and cares less about such frivolities: it is the railroad with its fenced right-of-way. Many of these railroad fences were erected before the prairie had been plowed. Within these linear reservations, oblivious of cinders, soot, and annual clean-up fires, the prairie flora still splashes its calendar of colors, from pink shooting-star in May to blue aster in October. I have long wished to confront some hard-boiled railway president with the physical evidence of his soft-heartedness. I have not done so because I haven't met one.

The railroads of course use flame-throwers and chemical sprays to clear the track of weeds, but the cost of such necessary clearance is still too high to extend it much beyond the actual rails. Perhaps further improvements are in the offing.

The erasure of a human subspecies is largely painless—to us—if we know little enough about it. A dead Chinaman is of little import to us whose awareness of things Chinese is bounded by an occasional dish of chow mein. We grieve only for what we know. The erasure of Silphium from western Dane County is no cause for grief if one knows it only as a name in a botany book.

Silphium first became a personality to me when I tried to dig one up to move to my farm. It was like digging an oak sapling. After half an hour of hot grimy labor the root was



still enlarging, like a great vertical sweet-potato. As far as I know, that Silphium root went clear through to bedrock. I got no Silphium, but I learned by what elaborate underground stratagems it contrives to weather the prairie drouths.

I next planted Silphium seeds, which are large, meaty, and taste like sunflower seeds. They came up promptly, but after five years of waiting the seedlings are still juvenile, and have not yet borne a flower-stalk. Perhaps it takes a decade for a Silphium to reach flowering age; how old, then, was my pet plant in the cemetery? It may have been older than the oldest tombstone, which is dated 1850. Perhaps it watched the fugitive Black Hawk retreat from the Madison lakes to the Wisconsin River; it stood on the route of that famous march. Certainly it saw the successive funerals of the local pioneers as they retired, one by one, to their repose beneath the bluestem.

I once saw a power shovel, while digging a roadside ditch,

sever the 'sweet-potato' root of a Silphium plant. The root soon sprouted new leaves, and eventually it again produced a flower stalk. This explains why this plant, which never invades new ground, is nevertheless sometimes seen on recently graded roadsides. Once established, it apparently withstands almost any kind of mutilation except continued grazing, mowing, or plowing.

Why does Silphium disappear from grazed areas? I once saw a farmer turn his cows into a virgin prairie meadow previously used only sporadically for mowing wild hay. The cows cropped the Silphium to the ground before any other plant was visibly eaten at all. One can imagine that the buffalo once had the same preference for Silphium, but he brooked no fences to confine his nibblings all summer long to one meadow. In short, the buffalo's pasturing was discontinuous, and therefore tolerable to Silphium.

It is a kind providence that has withheld a sense of history from the thousands of species of plants and animals that have exterminated each other to build the present world. The same kind providence now withholds it from us. Few grieved when the last buffalo left Wisconsin, and few will grieve when the last Silphium follows him to the lush prairies of the never-never land.

power, and that the bedlam of other singers will follow in predictable sequence. In autumn, on the other hand, the robin is silent, and it is quite unpredictable whether the covey-chorus will occur at all. The disappointment I feel on these mornings of silence perhaps shows that things hoped for have a higher value than things assured. The hope of hearing quail is worth half a dozen risings-in-the-dark.

My farm always has one or more coveys in autumn, but the daybreak chorus is usually distant. I think this is because the coveys prefer to roost as far as possible from the dog, whose interest in quail is even more ardent than my own. One October dawn, however, as I sat sipping coffee by the outdoor fire, a chorus burst into song hardly a stone's throw away. They had roosted under a white-pine copse, possibly to stay dry during the heavy dews.

We felt honored by this daybreak hymn sung almost at our doorstep. Somehow the blue autumnal needles on those pines became thenceforth bluer, and the red carpet of dew-berry under those pines became even redder.

October

Smoky Gold

There are two kinds of hunting: ordinary hunting, and ruffed-grouse hunting.

There are two places to hunt grouse: ordinary places, and Adams County.

There are two times to hunt in Adams: ordinary times,

and when the tamaracks are smoky gold. This is written for those luckless ones who have never stood, gun empty and mouth agape, to watch the golden needles come sifting down, while the feathery rocket that knocked them off sails unscathed into the jackpines.

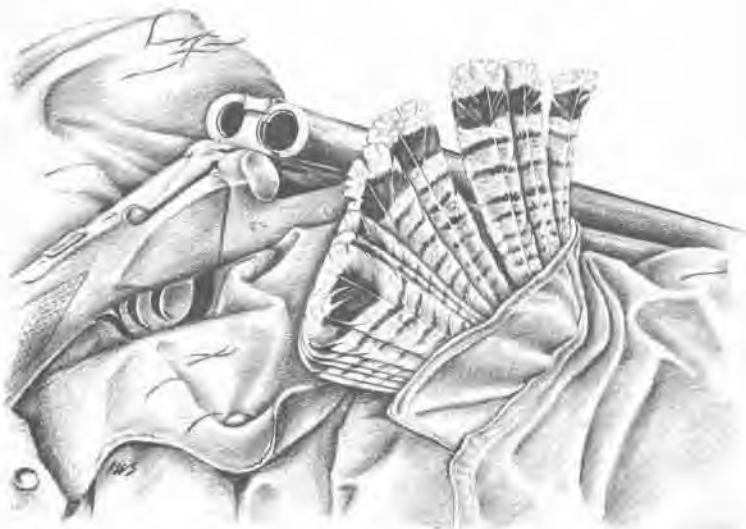
The tamaracks change from green to yellow when the first frosts have brought woodcock, fox sparrows, and juncos out of the north. Troops of robins are stripping the last white berries from the dogwood thickets, leaving the empty stems as a pink haze against the hill. The creekside alders have shed their leaves, exposing here and there an eyeful of holly. Brambles are aglow, lighting your footsteps grouseward.

The dog knows what is grouseward better than you do. You will do well to follow him closely, reading from the cock of his ears the story the breeze is telling. When at last he stops stock-still, and says with a sideward glance, 'Well, get ready,' the question is, ready for what? A twittering woodcock, or the rising roar of a grouse, or perhaps only a rabbit? In this moment of uncertainty is condensed much of the virtue of grouse hunting. He who must know what to get ready for should go and hunt pheasants.

Hunts differ in flavor, but the reasons are subtle. The sweetest hunts are stolen. To steal a hunt, either go far into the wilderness where no one has been, or else find some undiscovered place under everybody's nose.

Few hunters know that grouse exist in Adams County for when they drive through it, they see only a waste of jackpines and scrub oaks. This is because the highway intersects a series of west-running creeks, each of which heads in a

swamp, but drops to the river through dry sand-barrrens. Naturally the northbound highway intersects these swampless barrrens, but just above the highway, and behind the screen of dry scrub, every creeklet expands into a broad ribbon of swamp, a sure haven for grouse.



Here, come October, I sit in the solitude of my tamaracks and hear the hunters' cars roaring up the highway, hell-bent for the crowded counties to the north. I chuckle as I picture their dancing speedometers, their strained faces, their eager eyes glued on the northward horizon. At the noise of their passing, a cock grouse drums his defiance. My dog grins as we note his direction. That fellow, we agree, needs some exercise; we shall look him up presently.

The tamaracks grow not only in the swamp, but at the foot of the bordering upland, where springs break forth.

Each spring has become choked with moss, which forms a boggy terrace. I call these terraces the hanging gardens, for out of their sodden muck the fringed gentians have lifted blue jewels. Such an October gentian, dusted with tamarack gold, is worth a full stop and a long look, even when the dog signals grouse ahead.

Between each hanging garden and the creekside is a moss-paved deer trail, handy for the hunter to follow, and for the flushed grouse to cross—in a split second. The question is whether the bird and the gun agree on how a second should be split. If they do not, the next deer that passes finds a pair of empty shells to sniff at, but no feathers.

Higher up the creeklet I encounter an abandoned farm. I try to read, from the age of the young jackpines marching across an old field, how long ago the luckless farmer found out that sand plains were meant to grow solitude, not corn. Jackpines tell tall tales to the unwary, for they put on several whorls of branches each year, instead of only one. I find a better chronometer in an elm seedling that now blocks the barn door. Its rings date back to the drouth of 1930. Since that year no man has carried milk out of this barn.

I wonder what this family thought about when their mortgage finally outgrew their crops, and thus gave the signal for their eviction. Many thoughts, like flying grouse, leave no trace of their passing, but some leave clues that outlast the decades. He who, in some unforgotten April, planted this lilac must have thought pleasantly of blooms for all the Aprils to come. She who used this washboard, its corrugations worn thin with many Mondays, may have wished for a cessation of all Mondays, and soon.

Musing on such questions, I become aware of the dog

down by the spring, pointing patiently these many minutes. I walk up, apologizing for my inattention. Up twitters a woodcock, batlike, his salmon breast soaked in October sun. Thus goes the hunt.

It's hard on such a day to keep one's mind on grouse, for there are many distractions. I cross a buck track in the sand, and follow in idle curiosity. The track leads straight from one Jersey tea bush to another, with nipped twigs showing why.

This reminds me of my own lunch, but before I get it pulled out of my game pocket, I see a circling hawk, high skyward, needing identification. I wait till he banks and shows his red tail.

I reach again for the lunch, but my eye catches a peeled popple. Here a buck has rubbed off his itchy velvet. How long ago? The exposed wood is already brown; I conclude that horns must therefore be clean by now.

I reach again for the lunch, but am interrupted by an excited yawp from the dog, and a crash of bushes in the swamp. Out springs a buck, flag aloft, horns shining, his coat a sleek blue. Yes, the popple told the truth.

This time I get the lunch all the way out and sit down to eat. A chickadee watches me, and grows confidential about *his* lunch. He doesn't say what he ate, perhaps it was cool turgid ant-eggs, or some other avian equivalent of cold roast grouse.

Lunch over, I regard a phalanx of young tamaracks, their golden lances thrusting skyward. Under each the needles of yesterday fall to earth building a blanket of smoky gold; at the tip of each the bud of tomorrow, preformed, poised, awaits another spring.

constituted mainly as a fitting interlude between Octobers, and I suspect that dogs, and perhaps grouse, share the same view.

November

If I Were the Wind

The wind that makes music in November corn is in a hurry. The stalks hum, the loose husks whisk skyward in half-playful swirls, and the wind hurries on.

In the marsh, long windy waves surge across the grassy sloughs, beat against the far willows. A tree tries to argue, bare limbs waving, but there is no detaining the wind.

On the sandbar there is only wind, and the river sliding seaward. Every wisp of grass is drawing circles on the sand. I wander over the bar to a driftwood log, where I sit and listen to the universal roar, and to the tinkle of wavelets on the shore. The river is lifeless: not a duck, heron, marsh-hawk, or gull but has sought refuge from wind.

Out of the clouds I hear a faint bark, as of a far-away dog. It is strange how the world cocks its ears at that sound, wondering. Soon it is louder: the honk of geese, invisible, but coming on.

The flock emerges from the low clouds, a tattered banner of birds, dipping and rising, blown up and blown down, blown together and blown apart, but advancing, the wind wrestling lovingly with each winnowing wing. When the

flock is a blur in the far sky I hear the last honk, sounding taps for summer.

It is warm behind the driftwood now, for the wind has gone with the geese. So would I—if I were the wind.



Axe-in-Hand

The Lord giveth, and the Lord taketh away, but He is no longer the only one to do so. When some remote ancestor of ours invented the shovel, he became a giver: he could plant a tree. And when the axe was invented, he became a taker: he could chop it down. Whoever owns land has thus assumed, whether he knows it or not, the divine functions of creating and destroying plants.

Other ancestors, less remote, have since invented other tools, but each of these, upon close scrutiny, proves to be either an elaboration of, or an accessory to, the original pair of basic implements. We classify ourselves into vocations, each of which either wields some particular tool, or sells it, or repairs it, or sharpens it, or dispenses advice on how to do so; by such division of labors we avoid responsibility for the misuse of any tool save our own. But there is one vocation—philosophy—which knows that all men, by what they think about and wish for, in effect wield all tools. It knows that men thus determine, by their manner of thinking and wishing, whether it is worth while to wield any.

* * *

November is, for many reasons, the month for the axe. It is warm enough to grind an axe without freezing, but cold enough to fell a tree in comfort. The leaves are off the hardwoods, so that one can see just how the branches intertwine, and what growth occurred last summer. Without this clear view of treetops, one cannot be sure which tree, if any, needs felling for the good of the land.

I have read many definitions of what is a conservationist, and written not a few myself, but I suspect that the best one is written not with a pen, but with an axe. It is a matter of what a man thinks about while chopping, or while deciding what to chop. A conservationist is one who is humbly aware that with each stroke he is writing his signature on the face of his land. Signatures of course differ, whether written with axe or pen, and this is as it should be.

I find it disconcerting to analyze, *ex post facto*, the reasons behind my own axe-in-hand decisions. I find, first of all, that not all trees are created free and equal. Where a white pine

and a red birch are crowding each other, I have an *a priori* bias; I always cut the birch to favor the pine. Why?

Well, first of all, I planted the pine with my shovel, whereas the birch crawled in under the fence and planted itself. My bias is thus to some extent paternal, but this cannot be the whole story, for if the pine were a natural seedling like the birch, I would value it even more. So I must dig deeper for the logic, if any, behind my bias.

The birch is an abundant tree in my township and becoming more so, whereas pine is scarce and becoming scarcer; perhaps my bias is for the underdog. But what would I do if my farm were further north, where pine is abundant and red birch is scarce? I confess I don't know. My farm is here.

The pine will live for a century, the birch for half that; do I fear that my signature will fade? My neighbors have planted no pines but all have many birches; am I snobbish about having a woodlot of distinction? The pine stays green all winter, the birch punches the clock in October; do I favor the tree that, like myself, braves the winter wind? The pine will shelter a grouse but the birch will feed him; do I consider bed more important than board? The pine will ultimately bring ten dollars a thousand, the birch two dollars; have I an eye on the bank? All of these possible reasons for my bias seem to carry some weight, but none of them carries very much.

So I try again, and here perhaps is something; under this pine will ultimately grow a trailing arbutus, an Indian pipe, a pyrola, or a twin flower, whereas under the birch a bottle gentian is about the best to be hoped for. In this pine a pileated woodpecker will ultimately chisel out a nest; in the birch a hairy will have to suffice. In this pine the wind

will sing for me in April, at which time the birch is only rattling naked twigs. These possible reasons for my bias carry weight, but why? Does the pine stimulate my imagination and my hopes more deeply than the birch does? If so, is the difference in the trees, or in me?

The only conclusion I have ever reached is that I love all trees, but I am in love with pines.

As I said, November is the month for the axe, and, as in other love affairs, there is skill in the exercise of bias. If the birch stands south of the pine, and is taller, it will shade the pine's leader in the spring, and thus discourage the pine weevil from laying her eggs there. Birch competition is a minor affliction compared with this weevil, whose progeny kill the pine's leader and thus deform the tree. It is interesting to meditate that this insect's preference for squatting in the sun determines not only her own continuity as a species, but also the future figure of my pine, and my own success as a wielder of axe and shovel.

Again, if a drouthy summer follows my removal of the birch's shade, the hotter soil may offset the lesser competition for water, and my pine be none the better for my bias.

Lastly, if the birch's limbs rub the pine's terminal buds during a wind, the pine will surely be deformed, and the birch must either be removed regardless of other considerations, or else it must be pruned of limbs each winter to a height greater than the pine's prospective summer growth.

Such are the pros and cons the wielder of an axe must foresee, compare, and decide upon with the calm assurance that his bias will, on the average, prove to be something more than good intentions.

The wielder of an axe has as many biases as there are species of trees on his farm. In the course of the years he

imputes to each species, from his responses to their beauty or utility, and their responses to his labors for or against them, a series of attributes that constitute a character. I am amazed to learn what diverse characters different men impute to one and the same tree.

Thus to me the aspen is in good repute because he glorifies October and he feeds my grouse in winter, but to some of my neighbors he is a mere weed, perhaps because he sprouted so vigorously in the stump lots their grandfathers were attempting to clear. (I cannot sneer at this, for I find myself disliking the elms whose resproutings threaten my pines.)

Again, the tamarack is to me a favorite second only to white pine, perhaps because he is nearly extinct in my township (underdog bias), or because he sprinkles gold on October grouse (gunpowder bias), or because he sours the soil and enables it to grow the loveliest of our orchids, the showy lady's-slipper. On the other hand, foresters have excommunicated the tamarack because he grows too slowly to pay compound interest. In order to clinch this dispute, they also mention that he succumbs periodically to epizootics of saw-fly, but this is fifty years hence for my tamaracks, so I shall let my grandson worry about it. Meanwhile my tamaracks are growing so lustily that my spirits soar with them, skyward.

To me an ancient cottonwood is the greatest of trees because in his youth he shaded the buffalo and wore a halo of pigeons, and I like a young cottonwood because he may some day become ancient. But the farmer's wife (and hence the farmer) despises all cottonwoods because in June the female tree clogs the screens with cotton. The modern dogma is comfort at any cost.

I find my biases more numerous than those of my neigh-

bors because I have individual likings for many species that they lump under one aspersive category: brush. Thus I like the wahoo, partly because deer, rabbits, and mice are so avid to eat his square twigs and green bark and partly because his cerise berries glow so warmly against November snow. I like the red dogwood because he feeds October robins, and the prickly ash because my woodcock take their daily sunbath under the shelter of his thorns. I like the hazel because his October purple feeds my eye, and because his November catkins feed my deer and grouse. I like the bitter-sweet because my father did, and because the deer, on the 1st of July of each year, begin suddenly to eat the new leaves, and I have learned to predict this event to my guests. I cannot dislike a plant that enables me, a mere professor, to blossom forth annually as a successful seer and prophet.

It is evident that our plant biases are in part traditional. If your grandfather liked hickory nuts, you will like the hickory tree because your father told you to. If, on the other hand, your grandfather burned a log carrying a poison ivy vine and recklessly stood in the smoke, you will dislike the species, no matter with what crimson glories it warms your eyes each fall.

It is also evident that our plant biases reflect not only vocations but avocations, with a delicate allocation of priority as between industry and indolence. The farmer who would rather hunt grouse than milk cows will not dislike hawthorn, no matter if it does invade his pasture. The coon-hunter will not dislike basswood, and I know of quail hunters who bear no grudge against ragweed, despite their annual bout with hayfever. Our biases are indeed a sensitive index to our affections, our tastes, our loyalties, our generousities, and our manner of wasting weekends.

MOST
IMPORTANT
LAST
- HAWKWOODS
TOWNSHIP

Be that as it may, I am content to waste mine, in November, with axe in hand.

A Mighty Fortress

Every farm woodland, in addition to yielding lumber, fuel, and posts, should provide its owner a liberal education. This crop of wisdom never fails, but it is not always harvested. I here record some of the many lessons I have learned in my own woods.

Soon after I bought the woods a decade ago, I realized that I had bought almost as many tree diseases as I had trees. My woodlot is riddled by all the ailments wood is heir to. I began to wish that Noah, when he loaded up the Ark, had left the tree diseases behind. But it soon became clear that these same diseases made my woodlot a mighty fortress, unequaled in the whole county.

My woods is headquarters for a family of coons; few of my neighbors have any. One Sunday in November, after a new snow, I learned why. The fresh track of a coon-hunter and his hound led up to a half-uprooted maple, under which one of my coons had taken refuge. The frozen snarl of roots and earth was too rocky to chop and too tough to dig; the holes under the roots were too numerous to smoke out. The hunter had quit coonless because a fungus disease had weakened the roots of the maple. The tree, half tipped over by a storm, offers an impregnable fortress for coondom. Without this 'bombproof' shelter, my seed stock of coons would be cleaned out by hunters each year.

My woods houses a dozen ruffed grouse, but during

periods of deep snow my grouse shift to my neighbor's woods, where there is better cover. However, I always retain as many grouse as I have oaks wind-thrown by summer storms. These summer windfalls keep their dried leaves, and during snows each such windfall harbors a grouse. The droppings show that each grouse roosts, feeds, and loafs for the duration of the storm within the narrow confines of his leafy camouflage, safe from wind, owl, fox, and hunter. The cured oak leaves not only serve as cover, but, for some curious reason, are relished as food by the grouse.

These oak windfalls are, of course, diseased trees. Without disease, few oaks would break off, and hence few grouse would have down tops to hide in.

Diseased oaks also provide another apparently delectable grouse food: oak galls. A gall is a diseased growth of new twigs that have been stung by a gall-wasp while tender and succulent. In October my grouse are often stuffed with oak galls.

Each year the wild bees load up one of my hollow oaks with combs, and each year trespassing honey-hunters harvest the honey before I do. This is partly because they are more skillful than I am in 'lining up' the bee trees, and partly because they use nets, and hence are able to work before the bees become dormant in fall. But for heart-rots, there would be no hollow oaks to furnish wild bees with oaken hives.

During high years of the cycle, there is a plague of rabbits in my woods. They eat the bark and twigs off almost every kind of tree or bush I am trying to encourage, and ignore almost every kind I should like to have less of. (When the rabbit-hunter plants himself a grove of pines or an orchard,



the rabbit somehow ceases to be a game animal and becomes a pest instead.)

The rabbit, despite his omnivorous appetite, is an epicure in some respects. He always prefers a hand-planted pine, maple, apple, or wahoo to a wild one. He also insists that certain salads be preconditioned before he deigns to eat them. Thus he spurns red dogwood until it is attacked by oyster-shell scale, after which the bark becomes a delicacy, to be eagerly devoured by all the rabbits in the neighborhood.

A flock of a dozen chickadees spends the year in my woods. In winter, when we are harvesting diseased or dead trees for our fuel wood, the ring of the axe is dinner gong for the chickadee tribe. They hang in the offing waiting for the tree to fall, offering pert commentary on the slowness of our labor. When the tree at last is down, and the wedges begin to open up its contents, the chickadees draw up their white napkins and fall to. Every slab of dead bark is, to them, a treasury of eggs, larvae, and cocoons. For them every ant-tunneled heartwood bulges with milk and honey. We often stand a fresh split against a near-by tree just to see the greedy chicks mop up the ant-eggs. It lightens our labor to know that they, as well as we, derive aid and comfort from the fragrant riches of newly split oak.

But for diseases and insect pests, there would likely be no food in these trees, and hence no chickadees to add cheer to my woods in winter.

Many other kinds of wildlife depend on tree diseases. My pileated woodpeckers chisel living pines, to extract fat grubs from the diseased heartwood. My barred owls find surcease from crows and jays in the hollow heart of an old basswood; but for this diseased tree their sundown sere-

nade would probably be silenced. My wood ducks nest in hollow trees; every June brings its brood of downy ducklings to my woodland slough. All squirrels depend, for permanent dens, on a delicately balanced equilibrium between a rotting cavity and the scar tissue with which the tree attempts to close the wound. The squirrels referee the contest by gnawing out the scar tissue when it begins unduly to shrink the amplitude of their front door.

The real jewel of my disease-ridden woodlot is the prothonotary warbler. He nests in an old woodpecker hole, or other small cavity, in a dead snag overhanging water. The flash of his gold-and-blue plumage amid the dank decay of the June woods is in itself proof that dead trees are transmuted into living animals, and vice versa. When you doubt the wisdom of this arrangement, take a look at the prothonotary.

