The Kingdom of Apples

Picking the fruit of immortality in Washington's laden orchards

By David Guterson

The state of Washington is divided north to south by the great wall of the Cascade Range, a formidable barrier of high ridges and peaks rising from the Canadian to the Oregon border, dense with snow and conifers. West of these mountains lies terrain confirming what visitors expect of Washington--green forests, gray light, mist-covered saltwater, rain falling on a citizenry liberal in its sensibilities. To the east, though, lies arid steppe, the sage lands of the mythic American West, a country of Republicans, wheatgrass, and rattlesnakes vaguely reminiscent of west Texas. In hue it is auburn, tan, and dun, broken by canyons of willow and sumac, bleached by the sun, desiccated. Whatever dies here remains like a warning--the mandible of a cow, the scapula of a horse, the feathers left from a coyote kill, the hide of a mule deer on the ground like a cloak, empty, vermin-infested. A hint of the lethal rides on the wind, in the desperate, waterless grass of the steppe, in the languorous stillness of afternoon, and in the futile expanse of the sky. Most prominent is the odor of sagebrush--Artemisia tridentata, named for the virgin huntress, Artemis, goddess of wild nature--its clean, astringent, and erotic fragrance freshly powerful at the hour of dawn.

It is in this unexpected northern desert that Washington's much-touted apples are grown, those apples available from Djakarta to Paris that signify and evoke the state in the way oranges conjure Florida and pineapples Hawaii. Washington's orchards are profoundly vast, and travelers familiar with the quaint apple provinces of, say, upstate New York are often astounded by the scale of them, by the magnitude and sweep of their lay across the hills, and by the sheer volume of 52 million apple trees growing from Omak to Walla Walla and from the eastern slopes of the Cascades far into the arid sage lands.

On my side of the state, the wet, west side, the chief industry now is the invention of software, followed by the manufacture of airplanes. There are still loggers and fishermen about, but the policy of state government is to retrain them, when willing, for jobs in the high-tech and service sectors. The east side, though, is still the kingdom of apples--fruit of immortality, Johnny Appleseed, Aphrodite, Avalon, and Eve. Each fall they are handpicked, 12 billion apples, in a harvest that passes through the land like a fever, and in which I have participated for the past three years in the guise of a novelist conducting research.

The pastoral of Washington's apple country is a fine illusion, sweet to indulge. What is more inviting to the urban dweller than the sight of apple trees hung with fruit? What is more beautiful than an orchard?

On September 4, 1998, early in the harvest season, I rise before dawn at Clarke and Clarke Orchard, a mile west of Peshastin, Washington, where eighty acres of pears and apples grow on a gentle south-facing slope above the Wenatchee River. Doug Clarke, a big, bearded man in his early forties who starts his day with white bread and jam, coffee, and a Marlboro Light, has let me sleep on the deck of his log house at the tail of Anderson Canyon, and now, in the dark, we head into his orchard, a day of picking apples in front of us.

The year's El Nino-inspired weather has been less than kind to the burgeoning crop, a cool wet spring wreaking havoc with the bloom, a summer heat wave burning the young fruit, etching brown spots into the skins of apples wherever they face the sun.(1) This sunburn has been hard on Doug Clarke's Jonagolds--30 percent have succumbed to it--and has kept his Red Delicious apples from achieving the full blush that markets desire; what's more, the vast majority of his fruit is smaller than he would prefer. Clarke, though, is fortunate: Peshastin is higher in elevation and therefore cooler than the giant orchards eastward in the Columbia

Basin, where sunburn can be devastating. More, the frigid autumn nights in Peshastin, which sits in the last, trailing foothills of the Cascades, allow him to grow five varieties of pears that might sustain him through a lean apple season.

The night before, as we sat on his deck, listening to the sprinklers run in the orchards, Clarke had discoursed knowledgeably on the implications of temperature for apples; it was too cool here for Fujis, Braeburns, Winesaps, or Granny Smiths, none of which mature promptly enough to beat autumn's first freeze. The entire apple country, he explained, could be quantified and mapped in terms of "heat units"--a measurement, in essence, of the amount of heat in an orchard during a given day--a piece of information so vital to growers that it is broadcast throughout the growing season on local radio stations. Peshastin's orchards, this late in the season, have accumulated about ten days less heat than the orchards in the desert eastward, which means that Clarke has less sun to work with but also more information. By checking on the condition of fruit to the east, Clarke can anticipate where' his own fruit is headed. He can see events before they happen.

We make our way to his maintenance shed, where we meet Jose Reyes, Javier Saldana, Salvador Saldana, Pedro Cerros, and Refugio Rodriquez. Here, at first light, we lean against tractors, four-wheel-drive Massey-Fergusons, each equipped with forklift spears, that will be used to haul full fruit bins from the orchards to roadside for pickup. Like many fruit pickers in Washington, the crew on the Clarke orchard is of Mexican descent, "resident aliens" holding registration receipt cards, though Jose, Javier, and Salvador will all be citizens before the new year under the provisions of a federal amnesty program mandated in 1986. Once, most of the apple pickers in Washington were Dust Bowl refugees from Oklahoma and Kansas, Depression-era unemployed from as far south as Texas and Arkansas, and drifters from Appalachia. Labor shortages during World War II pulled many of them into manufacturing jobs, engendering the government's *bracero* program, which brought farm

workers north from Mexico. In the shed, the crew gathers ladders and picking bags, jugs of water and plastic sacks of food, and heads up into the orchard. The idea today is to harvest Galas, sweet and juicy dessert apples, leaving behind the unripe fruit to be picked at a later time. Essential to this work is a fine discrimination of each Gala's base color, the shade of green, blond, or gold that underlies the reddish, dappled hue prominent on its surface. A green Gala will not ripen properly once removed from the lifeblood of its tree, and a Gala picked yellow and overripe will not keep for any duration. A highly palatable and durable Gala has a blond background countenance, and it is this that the picker's eye must distinguish, underneath the surface red, from shades of yellow and green.

We walk under fruit-heavy limbs, through johnsongrass and pigweed, then up between rows of Galas. Doug Clarke has three and a half acres in this variety, each planted with over 500 trees, or five times the number in a traditional orchard--the spacious, open sort of orchard his father, Ed Clarke, established here forty-seven years ago. All over the state, such dense plantings are in vogue, and the grand, spreading trees we associate with orchards are being pulled up and replaced with crowded dwarf trees trained to spindles, guy wires, and trellises in the European fashion. These new plantings, which look like vineyards, yield larger, more efficient harvests, but in this year of relentless sun, Doug Clarke remembers the old days wistfully, when twenty-foot spacings and majestic canopies meant less loss to sunburn.

At 7:00 A.M., a pink light hovers over Icicle Ridge, and the pickers set their ladders in the grass. A train of the Burlington Northern line follows the north bank of the Wenatchee River; on the south bank, like old-fashioned toys, apple trucks run on Highway 2. Somewhere to the east, a helicopter is spraying, the drone of its rotors sounding rough, its engine in need of a tune-up. In another block of the Clarke orchard, arcing sprinklers shower the fruit, tangents traveling so predictably it is possible to walk through the heart of them, dry, given proper deference to their timing. It is cool yet, but by 8:30 the sun. is

filtering through the limbs and begins to dry the dew. The pickers stop to pull off their rubber boots and change into low-top sneakers. After an hour and a half of work, each has a full bin or more of Galas and has earned $25, at least, minus social security and worker's compensation. On an average day, a picker can fill five bins with Galas worth $125 in wages.

With the sun the white apple leafhoppers come out, ethereal insects the size of mosquitoes, sleekly long and almost transparent, pale harvesters of orchards too, that use their piercing tube-like mouths to suck chlorophyll out of leaves. Leafhoppers cast their excrement on fruit and dapple leaves an unsightly yellow-white but by comparison to other pests are insignificant to orchardists. Pickers, though, are irritated by them. By nine o'clock, in the rising heat, they are lodged in our ears, noses, and mouths. When a ladder is moved, a thousand take flight, and the tick of their tiny wings is audible, a faint friction in the breeze.

It is eighty-five degrees in the orchard, and at lunch everyone seeks shade. The pickers sit beneath apple trees or under Ponderosa pines along an irrigation ditch where chokecherry and wild rose thrive, elderberry, snowberry, and blackberry. Clarke and I eat peanut butter on white bread and canned bean soup in his kitchen. His children, Kelly and Mason, are at school, and his wife, Sue, is at her in-laws' house, keeping the orchard's books.

Clarke smokes another Marlboro Light and volunteers that he sometimes has days when the orcharding business prompts him to pop a considerable number of antacid tablets. His Galas, he says, produced $1,200 an acre in 1997, or $4,200 in pre-tax profit, but this summer's El Nino heat suggests a gloomier forecast. Temperatures over ninety degrees slow down the growth of Galas, so his fruit is especially paltry. The ideal crop is small in volume but composed of big and deeply red apples; the present harvest is just the opposite, a profusion of undersized, bland-colored fruit. What's more, Clarke is losing trees to fire

blight, a disease, he says, he must treat like gangrene--by cutting out entire trees--or risk the death of his orchard.(2)

Clarke works his fingers through his beard--a habitual mannerism, especially after meals--and presents for me a pocket history of his life as a Gala grower.-Guessing they might be a profitable variety at the turn of the century and beyond, he'd placed the order for his trees, Imperial Galas on a hardy dwarf rootstock, in 1985. Three years later the trees arrived, and he planted them high on his orchard slope--pulling out old Red Delicious cultivars--to minimize exposure to frost. There were long days drilling holes with a tractor augur at five-foot intervals, then planting the trees, backfilling, tamping with a hand shovel, and laying irrigation pipe. Clarke put in hundreds of treated-wood supports, anchors, tighteners, and high-tensile wire. When he was done, he'd spent $30,000.

It took three years to break even on these trees, but the job of maintaining them in a productive state has been perpetual. In February, Clarke prunes out their suckers; in March and April, he sprays against insects; in May, he begins blossom thinning. Throughout the summer he irrigates, and by September he is picking. A normal work week is fifty hours; at harvest time, it's eighty.

In 1980, at age twenty-five and fresh out of ag school, Clarke made more money working as a field man for a fruit-packing warehouse than he has made most years as an orchardist. He earns about $30,000 annually, after risking more than $500,000, sometimes as much as $600,000--a yearly high-stakes bet. For a while, Clarke had a pinched nerve in his neck until he began to accept that the weather, as well as many other things--among them, the global economy--was simply beyond his dominion.

This feeling of helplessness is widespread, these days, among Washington's orchardists, some

of whom have not turned a profit since 1995. For three consecutive seasons, growers have been assailed by market forces--a tariff war with Mexico, devaluations of Asian currencies, fresh competition from a vigorous and burgeoning Chinese apple industry--that have cast a pall of impending doom over the orchard country. China produced enough apples last year to fill close to a billion standard boxes, four times what the United States produced, and now drives the global market for juice-concentrate apples, its superabundance of low-grade culls pulling prices down.(3) Further, China has taken advantage of the currency woes besetting Asian economies, selling Fujis in Thailand, for example, at less than half the cost of Fujis from Washington. Sales of Washington apples are down by a third in Thailand since 1997. Sales in Indonesia, once the third-largest importer of Washington apples, are 25 percent of what they once were.

Equally injurious to Washington growers are the consequences of a recent tariff war with Mexico, long the state's leading apple market outside the United States. Alleging that Washington was dumping apples in an effort to push out domestic growers, Mexico imposed a 101 percent tariff on all U.S. Delicious apples in September of 1997. Since then, Washington growers have lost $100 million and are now resigned to a trade agreement that reduces their share of the Mexican market indefinitely.

At home, high-density plantings and new orchards have undermined the balance of supply and demand, fomenting an atmosphere of crisis. One hundred and four million boxes of apples were forecast for the harvest of. 1998, for a projected market of only 90 million. There are too many trees and too many orchards as a result of the same unwarranted optimism that overheated the U.S. economy throughout the late Eighties and Nineties. Companies planted vast holdings in central Washington, partly to write off the losses inherent in any orchard's startup (that tax loophole has since been closed), partly as an investment in orchard land that will pay off not when the apples are marketed but when the

land, someday, is sold. Meanwhile, businesses controlling not only the growing of apples but their packing, storing, and marketing have found that vertical integration--power over everything from tree plantings to sales--makes orcharding losses an acceptable expense in an otherwise profitable operation.(4) Small orchardists like Doug Clarke are left to worry that their expenses per box--planting, spraying, pruning, thinning, irrigating, picking, packing, overhead--might be higher than the market can return. So maybe today's Galas are not worth picking. Maybe we should take an extended lunch, let these apples rot.

Despite the grim economic news, we once again confront the fruit, the leafhoppers, and the late-summer heat. The pickers work up a considerable sweat, but this doesn't seem to affect their morale or slow them perceptibly. Two wear handkerchiefs on their heads; the others wear billed field caps. Their hands move rapidly through the fruit, their forefingers sever the stems deftly, their bags swell against their bellies so that they look like pregnant women. Within two days, they'll be picking Anjou and Bosc dessert pears, eventually Clarke's Red and Golden Delicious, and finally, at the tail end of the season, his Romes and Jonagolds.

It is mundane, repetitive labor, romantic primarily to travelers who view it from the windows of passing cars. For the next sixty days, these men will work, reaching under and around tree limbs, and standing on their three-pointed ladders they will feel the weight of the fruit in their bags pulling them toward the earth. I, too, have felt this weight and have fought the battle with tedium--but always as someone who can quit at any time, convince himself that his business lies elsewhere, rest in the shade, take notes. It is not for me what it is for them, though we all bury our faces in the leaves and forget the world behind us. We find bizarre, misshapen apples wedged between the suckers. Twigs and bark whorls scratch our hands; the detritus and litter fall Of trees festoon our heads. Always, we work from the top down, so as not to carry loads of apples toward the higher fruit. We finish building each load on the ground, then slide our apples gently into bins, avoiding bruising and denting, as

if apples were eggs.

At first the mind stays close to this work, until it becomes second nature. Then the picker merely witnesses his labors, once removed, elsewhere. Time passes in a daze of heat and inexorable exhaustion. In the afternoons, exhaustion takes precedence, and the picker unwillingly returns to a present in which he is still picking apples. They fill the world like a fragrant punishment, too much of a very good thing.

By the close of a day of picking apples, I, for one, carry their memory, sometimes in my sleep. I shut my eyes and see them there, in among the interstices of leaves, and while I rest I harvest apples, driven by some synaptic compulsion, a shadow labor, a dream. It is as Robert Frost wrote in "After Apple-Picking":

Magnified apples appear and disappear,
Stem end and blossom end,
And every fleck of russet showing clear.
My instep arch not only keeps the ache,
It keeps the pressure of a ladder-round.
I feel the ladder sway as the boughs bend.
And I keep hearing from the cellar bin
The rumbling sound
Of load on load of apples coming in.

At the end of the work day, when it finally arrives, the pickers are glad for the imminence of twilight. Ladders slung across their shoulders, they thread their way through the rows of trees, hauling their rubber boots and canvas bags, their empty water jugs. They pass out of the orchard and into the light dappling a curve in the two-lane road that runs from Leavenworth to Peshastin. A forklift is loading a truck with filled bins. A pale moon has

emerged in the sky. Starlings veer over the treetops, bank gracefully, then disappear.

Fifteen miles east of the Clarke orchard, straddling the gray breadth of the Columbia River, the town of Wenatchee sits in a bowl of high auburn hills. Its outlying neighborhoods are tidy and quiet, the homes with deep porches and sheltering willows; but downtown are stoplights in inordinate number, numerous gaudy fast-food outlets, thronged parking lots and strip malls. Wenatchee bills itself as the Apple Capital of the World, is home to an annual Apple Blossom Festival, and each May, amid much revelry, anoints a local high school girl its Apple' Blossom Princess. On its outskirts, fruit trees flow toward it from arid heights, the green fingers of apple orchards penetrating the edge of town, mingling with yards and homes.

In the late 1870s, a Wenatchee man named Philip Miller rode a mule two hundred miles to Walla Walla and returned with enough apple nursery stock to start a commercial orchard.(5) Miller put in an irrigation ditch that headed in the Squilchuck Creek and sold water rights by the "miner's inch" (a measurement of eleven gallons per minute). Others soon discovered that Wenatchee's rich volcanic soil, once irrigated, was highly conducive to fruit growing. Dry wheatfields and sage lands were feverishly converted to apple orchards, and, in the first decade of the new century, the Great Northern Railroad line was hauling boxes of Wenatchee apples three thousand miles to New York City.

The valley of the Apple Capital of the World is today home to farm-machinery retailers, agricultural chemical companies, the Washington Growers Clearing House and the Washington State Horticultural Association, attorneys advertising *Se Habla Espanol*, beekeepers offering pollinating hives, a diver who specializes in irrigation-pump inspections, a Chamber of Commerce and a prominent newspaper that both use the apple as their logo. Manufacturers of bins and boxes; suppliers of spindles, trellises, and wire;

purveyors of fruit pollens and fruit-packing supplies; irrigation-ditch consultants; apple research laboratories; restaurants called The Apple Bin and The Apple City Burger Barn; and, finally, enormous industrial complexes--known locally as packing sheds--devoted to the bagging, boxing, sorting, storing, and selling of fruit.

Stemilt Growers is one of these complexes, owned and operated by the Mathison family, an extended clan with orchards and facilities scattered across the state. Holding over 3,000 acres, and managing 8,000 more, the Mathisons are among Washington's largest growers: their Wenatchee packing operation, in 1998, processed 6 million boxes of apples, 600,000 of pears, and 1.5 million of cherries.

Orchardists may grow and tend the state's apples, but their paychecks, in the end, are signed by packers, who therefore exert a dominating influence over which varieties orchardists will raise, the acreage orchardists will devote to each, the techniques and practices of horticulture they will use, and the dates they will conduct their harvests. Some orchardists control their own destinies by packing and marketing through cooperatives, but most are contracted to packers-for-profit, whose trucks collect the orchardists' filled bins and whose ability to process and sell apples makes them indispensable and powerful. Many packers, like Stemilt, pack fruit from their own considerable holdings as well as the fruit of others.

These vertically integrated companies understand that in years when supply outpaces demand there is more money to be made in packing apples than in merely growing them. Companies with the resources to engage in both can weather losses, watch small orchardists struggle and decline, then buy their land out from under them at bargain-basement prices. In this manner, orcharding in Washington has become, increasingly, corporate. The small family operation must either find a tangential niche--early-season pears, organic Winesaps, a new variety like the Cameo--or declare bankruptcy.

At Stemilt, packing is a gargantuan enterprise, a tightly organized, high-speed endeavor that goes forth with unceasing monotony in a complex covering fifty-five acres. The fruit is washed, rinsed, and dried; culled for defects; waxed for market; sized, graded, and stickered. The din of the machines; the clinical work lights; the catwalks, conveyors, forklifts, and bins; the smell of soap and carnauba wax, of cardboard, cold fruit, and trodden leaves--in this clattering world of traveling apples, hundreds of women sort and pack, bag, or rapidly place fruit in trays, rotate acting as "apple turners" and "catchers" of filled trays. For the most part, they do it expeditiously, with frank speed, flashing hands, and the unconscious dexterity of experience, for an average wage of $9.38 an hour.(6)

Boxes are bar-coded, sealed, set on pallets, and wrapped in polyurethane, then tagged in the name of recordkeeping and stamped by state inspectors. Some go immediately into refrigerated trucks and are trundled off to world markets, but far more go into controlled-atmosphere storage, a chilly domain of mostly male workers, some dressed in arctic gear, others in insulated coveralls, all laboring with a dense mist spewing from their maws. The forklift drivers here, generally speaking, take unabashed joy in driving recklessly. They remind me of snowmobilers.

Centuries ago, orchardists discovered that apples stowed in caves, where low temperatures are relatively constant, remained pleasing to the palate for many months. Growers in the upper Midwest once packed their apples in barrels of sawdust and submerged them in lakes at freeze-up, resurrecting the fruit at spring thaw to put it on the market. Apples, traditionally, were stored in cold cellars, hand-dug pits, heaps of straw. Most apples, though, were sold fresh in autumn, until the advent of controlled-atmosphere storage made it possible to harvest fruit in September and eat it the following August. In 1947, a Washington grower named Francis Marley and a tree-fruit researcher named Archie Van Doren

converted a shed to an airtight room, filled it with freshly harvested apples, reduced the temperature to thirty-one degrees, decreased the level of oxygen from the 21 percent in the atmosphere to under 2.5 percent, and in May put crisp apples on the market at $9.10 a box--nearly three times their autumn price. They sold readily, and by the 1960s Washington had more controlled-atmosphere storage than any fruit region in the world. That is why, in the middle of July, it is possible to buy a Washington State apple at a market in Taipei or Philadelphia.

Stemilt has 152 controlled-atmosphere rooms, all of them explicitly nightmarish--dark, frigid, immense tombs sealed by heavy sliding doors and filled with enough silent sleeping produce to sustain Washington State through the apocalypse. These chambers of suspended animation arrest an apple's respiration, its post-harvest imperative to slough carbon dioxide as its starches metamorphose into sugars. The conditions in each room have been separately manipulated to ensure that these apples, so gravely comatose, will awaken precisely when the market beckons--the Winesaps in March for London and Bangkok, the Fujis in May for Dubai. The particular mix of temperature, humidity, nitrogen, oxygen, and carbon dioxide is so critical to this market timing that Stemilt maintains its own department devoted to research, development, and the fine-tuning of storage.

Standing in front of Stemilt's Room 50, which holds 1,850 bins of sleeping apples, I scrawl "Snow White" in my notebook. According to the Brothers Grimm, Snow White slept the sleep of the living dead in a glass coffin embossed with gold letters after one bite of her stepmother's poisoned apple. Room 50's apples seem, too, like victims of a vindictive spell, a vast exercise in cryogenics. Yielding to the science of preservation, they will be awakened not by a prince's kiss but instead by the signing of a purchase order. Meanwhile, as these apples sleep, geneticists are attempting to clone a new apple whose flesh will not turn the slightest tint of brown when cored, sliced, or peeled. One of these, we might expect,

properly stowed in controlled-atmosphere storage, its DNA sufficiently revised, could be eaten fresh a century from now by consumers yet unborn. The sun of our time feeding children of another. An extravagant curiosity, a faddish gift, a lark.

In the version of creation known as Genesis, God creates fruit very early in his project, immediately after the land and sea but before the sun, before the moon, before Adam, Eve, or the animals. His first exhortation to us is, "Be fruitful," and His first prohibition is against eating fruit from the tree at the center of His garden. Creation's first crisis originates with fruit: when Eve and Adam partake of the produce growing on the Tree of the Knowledge of Good and Evil, God sends them to a harsh exile, in part from fear that in His garden they will also be tempted by the Tree of Life, whose fruit confers immortality.

No apples grew in the ancient Fertile Crescent, yet by a persistent brand of cultural consensus we have located them in the Garden of Eden, a projection suggesting the apple's central role in the Judeo-Christian psyche. It is the fruit of immortality and passion from the Middle East to Norway, the fruit that Arthur finds at Avalon, the fruit served in Asgard to the Gods, the fruit of Apollo and Aphrodite. It is also the fruit of death and discord, stolen by Hercules from the daughters of Atlas, engendering the war at Troy.(7) American mythology includes a forest-spirit known as Johnny Appleseed, whose chosen work, whose destiny, was to make the wilderness safe for democracy by sowing it with apples.(8) A thing truly American is as American as apple pie. "Mom, dad, and apple pie" is a kind of American oath.

The apple, as oracle, has long been ubiquitous. All over the world its various parts--seeds, peels, cores, flesh--have been hurled, pierced, clutched, sliced, spat, seared, stuck to eyelids, squeezed between fingers, tossed at ceilings, chewed before mirrors, and wedged between the breasts of young virgins--all in search of portents. Scottish girls ate apples in solitude in

the hope of conjuring visions of bridegrooms, Moorish sultans tossed apples into harems, amorous Greeks sent bitten apples as tokens of eternal love, women in Kyrgyzstan rolled under apple trees to increase their odds of bearing children. Sicilian girls dropped apples from their windows, praying that marriageable boys would find them; Celtic boys bobbed hopefully for the fruit to know if their love went unrequited. On Chesapeake Bay, divination required apple peels, which were twirled around the head three times and flung, swirling, onto the ground, to be read like bloody entrails.

Purity, beauty, eternal life, sex, love, desire. Destruction, temptation, bewitchment, betrayal, death, evil, sin. "Slice the apple from stem to flower," Frank Browning writes in his fine book Apples, "and its female erotic imagery is plain.... Slice it horizontally, however, and the five seeds, or pips, at its core describe the points of a perfect pentagram.... "An apple, held, is a talisman, magical. A breast, an orb, a shiny jewel, as deeply red as human blood, as anger, as an apple. He's a bad apple. An apple a day, etc. She's the apple of my eye. An Apple is a computer, too. The Big Apple is a city of enticements.

In mid-October, I cross the Columbia River and head south, into the desert. The people of this place, years ago, were Wanapum, gatherers of bitterroot, camas, and goose eggs, fishers of salmon and eels. At Pna, on the Columbia, in the late nineteenth century, a mystic among them called Smohalla led the chants of the Dreamers. The Dreamers sought trance, were loath to plow ground. Their object was to renounce the present, repudiate agriculture and land ownership, conjure a disappearance of settlers. Shall I take a knife and tear my mother's bosom? Smohalla asked in the tule-mat lodge where the ceremonies of the Dreamers were held. Shall I dig under her skin for her bones?

Pna now lies beneath the river, not far from Priest Rapids Dam. The river there has become a lake, and the territory of the Wanapum has been carved up and dedicated to military

training, nuclear-waste management, and the cultivation of millions of apple trees along the Wahluke Slope.(9)

On the east bank of the Columbia, north of Priest Rapids at Sentinel Gap and a few miles from the town of Mattawa, lies a makeshift encampment of tarps and tents, cardboard shelters, and ramshackle cars inhabited by migrant fruit pickers. The site is owned by the Grant County Public Utility District, which has provided trash bins and a handful of Port-a-Potties--the rudiments of American sanitation.

Nobody knows how many people live here, since the camp's population is constantly in flux; it is a way station for fruit pickers and harvest nomads, who by this time of year are at the northern terminus of the American West's fruit run. They stay because no one has told them to leave, because no one stops them from bathing in the river, burning campfires in the sand and weeds, and sleeping under stray sheets of plastic.

Living conditions for migrant farmworkers laboring in the Columbia Basin--Grant, Adams, and Franklin counties--are generally poor. Apple production in the basin has more than doubled in the past ten years, and much of the recently planted acreage is the property of absentee companies that buy cheap water from the federal government and cheap power from local utilities. Vast reaches of sagebrush have been transformed into apple orchards that sit silently in the sun and wind, far from the nearest town. There is no housing, no laundromat, no health clinic or grocery store for miles and miles around.

In early October of 1998, farmworker advocates came to Mattawa, occupied the state's Employment Security Department office, and negotiated by phone with Governor Gary Locke's staff in an effort to improve conditions at the camp along the riverbank. Eventually, bottled water and shampoo were doled out, along with a few other sundries, and

more than twenty families were given temporary lodging at a motel fifteen miles north.

Men on their own, though, without families, were left to shift for themselves. In mid-October, I speak to five of them, a group from the state of Sinaloa on Mexico's Pacific coast. They have come north from fieldwork in Bakersfield and Fresno, following the harvest in a battered old Cadillac bearing California plates. While we speak, they lean in a group against its trunk, lean, strong men with their arms folded, tattooed men with brown skin and mustaches, wearing soft, easy smiles. They are all from the same impoverished small town and live there in homes without flush toilets during the winter months.

In early summer, at a Wal-Mart in Southern California, they bought a pair of cheaply made tents, cotton sleeping bags, and cooking gear, and took to the open road. Dressed in sandals, faded jeans, hooded sweatshirts, and tank-top T-shirts, they have been living the lives of wanderers and fruit tramps for the past five months. Carlos Alberto Renteria, twenty-three, has a wife and two young girls in Sinaloa; his aim is to make enough money picking fruit to install electricity in their home. Martin Castro has seven children; Meichor Saulceda, four; Balentine Lugo, two.

Fausto Lopez Valenzuela, nineteen, stopped going to school five years ago and has been picking fruit ever since. He has come north, he explains quietly, in the spirit of a modest adventure, to be away from his home and family, and footloose in a strange land where he doesn't speak the language. Valenzuela, like the others, has lived in this camp on the Columbia for upwards of a month now; he describes the place as "bad for women and young children" but perfectly adequate for him. He lives, he says, on $10 a day and is able to send home at least $300 at the end of every week.(10)

Martin Castro, the father of seven, adds that one month of picking fruit in Washington will

support his family in Sinaloa for three months, if things go well. He and the other men have been picking Red Delicious apples off and on for the past four weeks, and each has made $60-$70 a day, money Castro feels good about. There is housing, he says, in Othello and Mattawa, but there is no point in renting living quarters when the work could run out at any time, prompting the pickers to move. along. Besides, he adds, the river camp is safe and quiet and doesn't cost anything. It is warm enough to sleep out of doors, and the Columbia is good for bathing. There are no *cholos* abroad in the land, no thugs, robbers, or thieves. The men from Sinaloa can leave their things on the ground here while they work at orchards miles away, and no one takes anything.

A pan of eggshells sits in the dust, old leaves blown up against it. A stack of firewood, a crate of farm eggs, a box of salt, a jar of dish soap, a kettle, some newspaper, a lighter, a lockback knife, a half-empty bottle of corn oil. Scraps of cardboard have been thrown over the tents; three towels are hung up to dry. Aluminum soda cans litter the ground near the fire pit these men have scratched out, and an old Eureka vacuum cleaner stands in the middle of their clearing. When I ask about it they laugh at the question: the vacuum cleaner, Saulceda explains, was here when they first came to live by the river, and they have seen no reason to remove it.

An old hubcap, its center ripped out, is nailed to the bark of a cottonwood about ten feet from the ground. This, says Valenzuela, is for basketball. In their free time they play basketball, though, he adds, the ball they like to use "isn't here right now."

They all admit to missing home; they will go back soon, in November. Twice a week they call Sinaloa, using the phone booths at grocery stores. They send money via Western Union. Finally, I ask about hardship, but none of them concurs with that description. "This is an adventure," Valenzuela repeats. "And we are making very good money."

Hours later, just before dusk, I see them again on the Beverly Burke road, passing my car at high speed, the vintage Cadillac bouncing on its shock absorbers, heading north toward George in the last light, Martin Castro laying on the horn, Balentine Lugo waving madly, Fausto Lopez Valenzuela turned toward me in the rear window, smiling and giving me the thumbs-up sign that means, if I understand it correctly, that everything is all right.

In the morning I drive into the Yakima Valley, whose major employers include Tree Top Inc., Stadelman Fruit, Snokist Growers, and Del Monte Foods. At Pasco, I cross the Columbia and then the Snake before turning north on the Ice Harbor Dam road toward the Broetje Orchards. With 4,000 contiguous acres, Broetje is one of the state's largest growers and among the small minority that provides worker housing. Its owners, Ralph and Cheryl Broetje, have spent $5.5 million to build eighty homes; twenty-eight apartments; a school, gym, and day-care center; a laundromat, gas station, and convenience store; a chapel and a post office.

The orchards here are of such magnitude they seem, from a distance, a shuddering mirage, an hallucination of the desert. They cover the land in an immaculate sweep, breaking over sage-strewn buttes, falling toward the Snake River. A wanderer is easily lost in their midst, down between rows of Braeburns or Fujis that have no end and lead nowhere, except to other fruit. These orchards are like an invitation, a seduction by 4,000 acres of trees, by apples hanging profusely from limbs, by warm wind stirring leaves. Broetje's pickers, 1,000 of them, fill as many as 6,000 bins a day, but still these orchards look heavily laden, boundlessly vigorous and fertile.

The Broetje Orchards' housing complex, known as Vista Hermosa, has the clean, tidy, stuccoed look of a suburban development in Phoenix or Albuquerque, the homes with green

lawns and red-tiled roofs, flower gardens and barbecues. A three-bedroom house with a single-car garage leases for $350 a month; a four-bedroom house, for $400. Garbage is picked up every Thursday, and the tuition at the elementary school, which includes breakfast, lunch, and snacks, is $25 a month. There is licensed day care at $7 a day per child, a soccer field and soccer league, movies on Friday nights in winter, concerts, and community potlucks. Many residents tend small plots of corn, squash, or tomatoes. At the edge of their lawns, the sagebrush begins. The line between irrigated lawn and dry sage stands starkly against the hills.

Vista Hermosa--"Beautiful View"--is a private community, not a municipality; everything here is subsidized by the Broetjes, a deeply religious couple with nine children, six from India, adopted. According to the rules of lease, homes are inspected every three months, and there is no drinking of alcohol out of doors, no parking of abandoned vehicles, no cluttering of driveways or yards, no speeding or "misconduct" or fighting. No alcohol or cigarettes are sold at Jo Jo's Orchard Market, which does rent a handful of videos with G and PG ratings. The chapel offers worship services, the community center runs Bible classes, and once a year in Vista Hermosa there is a Christian Talent Contest.

I ask Ralph Broetje, in his office, if he has heard of the camp near Mattawa, with its Porta-Potties and fire pits, cardboard huts and tents. A self-effacing man of fifty-three who speaks dispassionately most of the time, Broetje nods, strokes his beard, and argues that decent worker housing increases productivity in an orchard by cutting down on turnover and encouraging a stable, motivated workforce that is not disgruntled or disenfranchised. Still, he adds, "if you just look at the bottom line, it doesn't make financial sense to spend so much on Vista Hermosa. But it does make human sense."

The state of Washington, for many years, has not heeded Ralph Broetje on this point. From

1994 to 1996, according to the office of the governor, the state spent no money on migrant housing and stood to one side while migrant workers, literally by the tens of thousands, slept in cars, tents, and shacks throughout the harvest season. Recently, the state improved its record: it spent $1.3 million to transform seagoing cargo containers into living units and $1.7 million on permanent housing for migrant workers. The legislature has slated $40 million to construct housing for 10,000 people over the next ten years.

These measures, while salutary, will also help corporate orchardists realize a considerable savings. Already the recipients of subsidized water and subsidized electricity, they will now have subsidized labor too, with taxpayers underwriting the cost of housing migrant workers. In this way, Washington State secures the dominion of corporate growers and increases the likelihood that small family orchards will continue in their decline. The state doesn't ask of large growers what it did not have to ask of Ralph Broetje, who, despite the millions he has spent on worker housing, still runs a profitable business. Broetje, ever straight-faced and calm, offers no response when I mention to him that he is sometimes dismissed by certain growers as an evangelical fanatic. Nor can I coax him into criticizing growers who ignore the needs of workers. "It's a hard business," he reminds me. "But the Lord has really blessed us here. It's good land for apples."

Meanwhile, westward across the mountains near Seattle, a company called Newton Research Labs is developing the basic technology to build robotic pickers. Its "vision system," known as Cognachrome, can discern the color and shape of small objects and is already used to sort blueberries. Newton's scientists envision a world in which Cognachrome-guided robot pickers progress between the rows of trees, employing retractable, swiveling arms to harvest apples at two to ten times the speed of the fastest human hands. These robots could be carefully programmed to pick only mature fruit. With built-in artificial lights, they could proceed with their picking even at night, uninterrupted by the setting of the sun or the

human need to sleep.

As the harvest season rises to a peak, the cottonwood leaves turn russet yellow and the cattails by ponds and in irrigation wasteways take on a bold golden cast. Tumbleweed skitters across back roads and up against barbed wire fences; full bins wait at sidings. The props are pulled from under limbs freshly freed from the weight of fruit, and everywhere the haul trucks run, even on the dusty lanes that wind, unnamed, across the land.

It's at this time that I travel north, past Lake Chelan and the town of Brewster, then along the Okanogan River. Growers here must contend with long winters, chilly weather during bloom, and the near likelihood, every spring, of devastating frost. Situated north of the federal government's irrigation project, they do not have access to the subsidized water that helps make orchards to the south so profitable. Corporate growers have shied away from this region, making the northern reaches of the apple country a last bastion of the family orchard and of the marketing and packing cooperative. Recently, though, a number of small family operations have freshly succumbed to the onslaught of global market forces--21 percent in Douglas County alone between 1992 and 1997.

I drive up the west bank of the Okanogan, then take the Monse cutoff to Brewster Flat, where I find Bob Brody, owner of the King Blossom Natural orchards, standing at the tailgate of his pickup truck and sorting through a box of apples. The apples, as it turns out, are a gift for me--a kindness performed for a journalist--and Brody is busily hand-turning them so that they sit in their purple eggshell nests in perfect symmetry.

Brody is a, blunt, straightforward man who wears a King Blossom cap and keeps a calculator permanently attached to his steering wheel with Velcro. He is widely known in the apple country as plainspoken and opinionated; he has no sympathy for the United States Trade

Representative, Bill Clinton, or the media. Against expectation, he grows organic fruit, the sort one finds in co-op groceries and upscale-market produce sections. "I happen to be very conservative," he says, "but I sell to very liberal people."

We go for a drive in Brody's truck; he wants me to tour his operation. It is cold enough now that the pickers wear jackets, stocking caps, and flannel shirts. Brody maneuvers between . the narrow rows, apples so close on either side we might pick them from our windows. A traveling *taqueria*, or taco wagon--a ubiquitous sight in orchard country--is temporarily parked among the trees, and a man in a stained white restaurant apron is hawking burritos, jojos (small french fries), and soft drinks from its narrow serving window. Windfall apples litter the ground here. The trees are still, as if poised for something. The pickers move with a steady grace, plucking the apples rapidly, leaning and reaching like jugglers or magicians practiced at sleight-of-hand.

Brody assures me, forcefully, that organic apples are not, for him, a philosophical proposition. He does not grow them to promote biodiversity, keep chemicals off my plate, save energy, or protect the earth. In fact, for twenty years, until the late Eighties, Brody grew conventional apples and used conventional pesticides and chemical fertilizers. Then in 1989, CBS's 60 Minutes ran a story alleging that Alar, a growth hormone once widely used on apples, was powerfully carcinogenic. Within a week, Brody recalls, apple sales slowed to a trickle, and, like many other Washington orchardists, he was forced to donate fruit to food banks to keep it from rotting on the ground.

Brody and ten other growers filed a $200 million product-disparagement suit against CBS and an environmental group that did not prevent 60 Minutes' allegations from having a disastrous effect. Consumers shied away from apples, and a number of orchards went bankrupt. Brody, searching for a means to survive, went organic instead.

Organic growers, to be certified as such, must meet strict horticultural standards that prohibit, among other practices, the use of most synthetically derived fertilizers, insecticides, fungicides, and herbicides. They also must accept the fact that a portion of their crop, every year, will inevitably be claimed by pests. Brody, for example, has seen his orchards inundated by campylomma--more commonly known as the mullein plant bug--which feeds on blossoms and developing fruit early in the season. Conventional growers can combat this pest with the properly timed spraying of insecticides, but organic growers like Bob Brody must stand aside and watch grimly while campylomma takes as much as one third of their fruit.

We bump along through a block of Galas, Brody talking at high speed but driving at a stately pace. He is glad, he says, that tree-fruit researchers and entomologists are developing new measures for pest control to replace the conventional insecticides once standard across the industry. These insecticides, he adds, were at first effective and inexpensive, and growers used them liberally, engaging in broadcast spraying regimens whether pests were present or not. One result of this widespread practice was the gradual emergence of new pests that, until the advent of broadcast spraying, had been held in check by natural enemies now reduced by lethal pesticides. A second result was the steady rise of insecticide-resistant pest generations, which only prompted further rounds of ever more expensive, ever more toxic spraying.

Brody stops to emphatically remind me that he is no friend of the sustainable agriculture movement, the EPA, or the Sierra Club. Some of these new measures for pest control are simply better, he argues--less expensive, more effective, and, best of all, in Brody's case, legal for organic growers.

One example is a novel technique--aimed primarily at a pest called the codling moth--known as mating disruption. The codling moth, Cydia pomonella, whose scientific name suggests an interest in apples, is a widespread, tenacious orchard dweller whose larvae bore deeply into fruit, feeding on the flesh as they penetrate, then on the seeds at the core.(11) They leave their excrement, known as brown frass, in piles by their entry holes--holes they further excavate and enlarge to serve as eventual exits. Adults mate most actively on warm summer evenings, flitting through orchards restlessly, their gray and white wings beating the night air. Females lay their eggs on leaves, branches, and newly developing fruit, or even in the calyxes of tender blossoms, so that newly hatched larvae will be situated for the feast when apple seeds begin to grow.

Mating disruption, a biological intervention, is only the latest strategy employed in a century of war with the codling moth. For decades the widespread measure of choice was to spray lead arsenate as many as nine times a season, but this left a toxic, gray residue on the fruit that was costly and difficult to wash away, and exposed the public to the possibility of lead poisoning from eating Washington State apples. Lead arsenate was replaced by DDT, but by the 1960s it was clear to entomologists that orchard pests like the codling moth were developing resistance to this new insecticide, and by the 1970s DDT, widely understood as ecologically lethal, was banned by federal law.

Unlike lead arsenate or DDT sprays, mating disruption controls the codling moth without introducing toxic chemicals into the orchard environment. The technique derives from an increased understanding of the moth's sexual behavior, particularly the revelation that females of the species announce their sexual willingness by releasing plumes of pheromone that waft downwind through an orchard. Using keen olfactory receptors located on their antennae, the males are capable of detecting this pheromone from as far off as a hundred yards, and are adroit at tracing it relentlessly upwind until they arrive at its source.

Copulation is a quick affair, after which the male flutters off, his antennae raised high once again, in search of yet more pheromone.

Manufacturers like Shin-Etsu Chemical and Hercon Environmental have learned to synthesize female codling moth pheromone and now sell it to orchardists in a variety of slow-release dispensers. Each emits as much as 10,000 times the pheromone naturally emitted by a female, suffusing the air with so much scent the males can't track the females. Confused by the odor of sex everywhere, these males wander in anxious confusion, unfulfilled and frustrated. In time, populations of codling moths dwindle to acceptable numbers.

A permutation of mating disruption known in the industry as "attract and kill" gives orchardists yet another weapon in the war with the codling moth. The Swiss chemical company Novartis has developed a pheromone product aptly named Last Call, which is laced with permethrin, an insecticide. Applied in sticky droplets to the bark of trees, Last Call lures males to untimely deaths, victims of their sexual appetites. Meanwhile, in British Columbia, millions of moths sterilized by radiation have been released to mate with wild moths--a program so enormously successful that control of the pest is in sight there. These measures may have problems of their own, but they are generally acknowledged to be far more benign than the chemical sprays of the past.

Like most organic growers in Washington, Bob Brody would not be in business today without new biological weapons like mating-disruption technologies. He admits as much as we drive out of his orchard, though at the same time he believes fervently in the efficacy and safety of most chemical insecticides and suspects that the EPA is the hand puppet of environmental organizations. It takes a lot of environmentalists, he tells me--paranoid ones with plenty of money--to ensure a market for organic apples, which often cost three times as

much as their non-organic counterparts. This market, he adds, is growing rapidly, but so is the supply of organic fruit, a fact that might eventually drive down prices and perhaps nudge Brody from the cozy niche he inhabits at the moment.

When I leave, I take with me a box of organic apples and another of organic pears. Brody is right about one thing: King Blossom Natural's fruit is excellent, worth the premium price. I sample it as I make my way south and find that even his Red Delicious apples, so often bland and disappointing, are unusually sweet and flavorful. The Bosc dessert pears are marvelous, too. Their juice is thick, ambrosial. Sitting on the bank of the Columbia with three pieces of fruit in my lap, I eat until I am surfeited, a mistake I've made earlier this harvest season but haven't learned from yet. I indulge in fruit as people have since at least the Neolithic era, when they wandered gathering wild apples, pears, plums, cherries. Our word "fruit" derives from the Latin *fruor*: "to delight in."

Downriver forty miles from Bob Brody's place is the Little Owl Orchard, run by Doyle and Thyra Fleming. They are in their kitchen when I come to call, seated at the table with their son, Tye; the three are soberly answering questions put to them by Geraldine Warner, editor of a magazine called Good Fruit Grower. The Flemings are modest, thoughtful people whose home feels inundated, throttled, by orchards; they are also widely known as innovators, celebrated across the apple country as risk-takers and dreamers. Warner is here for the same reason I am--to learn more about the Flemings' latest venture, a new apple called the Cameo, which now grows on nearly half of the Flemings' 170 acres.

The Cameo was discovered by an orchardist named Darrel Caudle near Dryden in the early 1980s. Picking in a block of Red Delicious, Caudle was astonished to find a tree in which the fruit was rounder and less red than in surrounding trees, tapered at the calyx but without points. This new, unfamiliar apple, mildly tart and aromatic, had a fine firm texture, creamy

white flesh, and an exquisitely subtle sweet taste. It might be, hoped Caudle, a marketable variety, though as yet it had no name.

New, unnamed apple varieties are by no means rare in orchard country. This is because apples are heterozygous, meaning that every one of their seeds, even those from the same piece of fruit, is genetically unique. The seeds of an apple are like human siblings, related individuals with distinct destinies encoded in their DNA---one unable to thwart a hint of frost, the next susceptible to fire blight. Were you to cut open a Rhode Island Greening, successfully propagate the seeds at its core, then nurture them over sufficient time until each grew into a bearing tree, eventually you would harvest, from the branches of each, a separate and unique variety of apple--large, small, green, russet, perhaps tart, perhaps aromatic, but the produce of each distinct from the next, and none of it Rhode Island Greenings.

Such unpredictability, Doyle Fleming tells me, is anathema to orchardists, who cannot afford to plant randomly in a world where the vast majority of apple seeds bear less than desirable fruit. The solution since the time of Pliny has been an elegantly simple one--rather than planting unreliable seeds, orchardists wedge the buds or branches of trees they know to be good producers into slits cut in other trees, where they sprout parasitically, making use of the host tree's rootstock. Budding and grafting are the sole means by which orchards of single varieties are established; in fact, every apple in the grocery store is the product not of a planted seed but of budding or grafting by human hands. Nursery workers in apple country cultivate rootstock that is disease resistant, hardy under frost conditions, persevering through drought or flood, generally stalwart and vigorous, but they do not care what sort of fruit it will bear if left to its own devices. Instead, they graft marketable varieties to it--say, MM111 rootstock grafted with Gibson Golden Delicious, or EMLA 7 rootstock grafted with Ace Spur Red Delicious--and sell it to orchardists for planting.

Doyle, who looks vaguely like Robin Williams as the mad professor in the recent remake of Flubber, explains that a new apple like the one Darrel Caudle found results when a nursery's graft breaks off, allowing the rootstock itself to sprout. At other times, new apples are found growing by fences or in weeds, the result of seeds dropped aimlessly by birds, or of the seeds of apples that have rotted on the ground and successfully propagated. Most of the time, the progeny of rootstock or of dropped seeds turns out to be unmarketable--poor keepers, susceptible to sunburn, bitter, coarse, soft, juiceless, easily ravaged by pests. Occasionally, though, a new variety appears that holds the same promise as the first Red Delicious, the first Rome Beauty or Granny Smith.(12) Every orchardist dreams quietly--in the way people dream of lottery luck--of one day discovering the perfect apple growing innocently among his weeds, of putting his personal trademark on it, and of reaping for many years to come the royalties that are sure to accrue as his apple becomes hugely popular.

Caudle's new apple fell into the hands of a field horticulturist named Fred Valentine, who kept a few in controlled-atmosphere storage and one day brought two to Doyle Fleming. Fleming was impressed not only by its taste but by its astonishing durability: Caudle's apple, after ten months in storage, was still toothsome and fragrant. With buds and branches from Caudle's mother tree, Fleming, Valentine, and a horticulturist named Bob Gix initiated a series of experiments. Fleming, eventually, planted seventy acres, and the Caudle Corporation--Gix, Caudle, Valentine, Fleming--decided to launch its new apple in an already crowded marketplace.

The Cameo has excelled in consumer taste tests and commands, already, substantial buyer loyalty, but it has also arrived on the scene at a time when difficulties for apples abound. The consumption of apples in the United States has been flat for the last decade, while

consumption of such exotic fruits as kiwi and mango has increased dramatically and processed foods like potato chips have expanded their share of the snack market. Current global apple production is more than sufficient to meet world demand, and the projection for 2005 is that apple production will outpace population growth by approximately 20 percent. By then there will be 77 million tons of apples, in proliferating varieties, available on the world market--Australian Pink Ladies, Chinese Fujis, Elstars, Royal Galas, Ginger Golds. All of these apples will be looking for buyers, and consumers will have to select, from among them, Darrel Caudle's Cameo if the Flemings are to survive.

In the corner of their kitchen on this afternoon, a computer is humming incessantly, its monitor's screen saver stacking boxes with Sisyphean doggedness, its keyboard stained from constant use. Doyle stays in contact, by e-mail, with growers and marketers in Western Europe, Japan, China, Australia, and New Zealand; he is interested in learning about new varieties and in investigating whether the Cameo is being properly promoted worldwide. The focus, he says, should be on eating quality, not on the polished, high red color that has long been the mainstay of apple promotion, particularly for Washington State apples. Doyle finds it enormously disconcerting that the industry persists in touting high color, which, he fumes, prompts many orchardists to compromise the flavor of their fruit in favor of comeliness. "Red fruit," insists Doyle, "doesn't fool today's buyers. They're after something with taste."

Doyle, Tye, and I go out into the hardening light of a late-fall afternoon. The wind has whipped up and is funneling downriver; it bends the limbs of the poplars and agitates the flight of birds, who blast over the treetops as if shot out of cannons. We walk through a block of Fuji apples planted with 6,000 trees per acre, trees so dense they form a wall; the rows have the feel of hedges. The Cameos are planted in vertical axes--the limbs lie draped across four wires, to which they are fixed with staples. There are cherries, pears, apricots, Gala and Braeburn apples. Finally we visit, on a bench above the river, the Flemings'

personal breeding plot, where about 4,000 apple varieties grow in crowded rows. None of the fruit here has a name, and we wander among it with our pocketknives open, sampling like connoisseurs, seeking the proper descriptive language, and pondering whether anything we've tried might be worth grafting to rootstock and peddling in the marketplace. The range of fruit is beyond imagining--a kingdom of varied treasures. I try an apple that tastes like a banana, a timid apple, an apple of spice, an apple that smells like watermelon. One is no bigger than the common plum; another is as big as a coconut. One has a waxy, bitter skin; another is tough and coarse in the mouth; a third, dry and pungent, musty; a fourth, delicate, ethereal. Russeted like a small mosaic, surprisingly weighty in the palm of the hand, potato-fleshed, mealy, invigorating, fine-grained, piquant, astringent, a spitter. Doyle chews and wipes juice from his chin with a slightly crazy grin on his face, barely containing his ecstasy, his exultation. The world seems a fine place to the three of us just now. There is nothing in it but apples.

In an orchard as various and promising as this, as wild, glorious, and thoroughly enchanted, it is easy to see that the factory apple--the one produced in uniform rows to ripen into a uniform color at a market-optimum uniform size; the one handled in a warehouse like a widget, waxed to a lifeless, plastic sheen, stuffed into cold storage for months on end, shipped to every corner of the world, and displayed at retail like a veritable clone of every apple it is mounded with--is in effect only a paltry substitute for the real thing here in Doyle's orchard. It is easy to think that the experience of an apple, for most of us, most of the time, is already less than it ought to be, and that the apple's power, its mythic resonances, its poetry and poignancy, is increasingly diminished in the contemporary world, perhaps already lost.

The close of the harvest season is not long off. The bin's and ladders will soon be put away, the canvas bags hung up for winter, every apple removed from every tree, the orchards

brought to a leaden silence, the pickers moving on, disappearing south, leaving the country hushed and lonely, not even an evening breeze.

Going home, I stop at the verge of a still orchard and collect windfall apples. Already some leaves are on the ground, as dry as bone, weightless, curled in on themselves. Already my own harvest season is done--I will not be this way again to taste this fruit against my tongue, the white flesh of an apple, the juice Of an apple, the heft of an apple, palmed. The word for how I feel is autumnal. I'm pierced by the beauty of orchards, of apples. I fashion my coat into a kind of sack in order to tote my gathered fruit, and do not want this fall to end, though of course it already has. The fruit of immortality, of passion, is also the fruit of sad desire, of unrequited love for this earth, whose loveliness torments us. Yet I am glad to have had this harvest season. I carry apples in the sack of my coat, two dozen windfalls nestled there, each a kind of good fortune, each a gift to be met with gladness that the world includes such things as this. In this way, I bring my apples home, my windfall fruit, to eat.

(1) Orchardists have come up with a variety of means to protect fruit from sunburn. A few hang giant shades over orchards, immense sails that catch the wind and cast shadows across the trees. Others pump water through sprinkler heads that cast a cooling mist above their orchards. Frost, too, is battled with water. On cold spring nights when frost is imminent, growers run irrigation sprinklers until sheaths of ice coat the apple blossoms. As water freezes, it gives off heat--just enough to protect each bud enclosed in its skin of ice.

(2) Many diseases found in orchards bear names that are frankly descriptive of symptoms: powdery mildew, sprinkler rot, perennial canker, apple scab. Fire blight, which blackens leaves, is caused by Erwinia amylovora, a bacteria that attacks the tree's inner bark, especially during spring rains. Highly communicable and highly virulent, it spreads from blossoms to twigs to limbs with great rapidity. Fire blight's symptoms were noted by

orchardists in upstate New York in 1790; today it appears in forty countries, almost around the world. A notable exception is Japan, which has resisted efforts to open its domestic market by rigorously inspecting--and ultimately rejecting--the vast majority of Washington's fruit, fearing it will spread disease.

(3) In 1994, China produced 583 million boxes of apples, or twice what the United States produced. By 1998, China's production had grown 68 percent, and in the next six years it is expected to reach 1.5 billion boxes, or 40 percent of the world's production.

(4) In 1997, the year of the last agricultural census, an elite 10 percent of apple growers controlled 62 percent of Washington State's orchard acreage. At the same time, 2,626 small orchardists---or nearly two thirds--controlled a mere 10 percent. Between 1992 and 1997, the trend toward more land in ever fewer hands has accelerated: the number of orchardists engaged in growing apples decreased by 8 percent, while the total acreage given over to apple growing rose by more than one fifth.

(5) The incongruous endeavor of growing apples in the desert--a place where rainfall is just sufficient for the sustenance of bunchgrass and sagebrush--began in the middle of the nineteenth century, at approximately the time that the Oregon Country was ceded to the United States by Great Britain. The history of fruit growing in the Northwest has been suffused with myth ever since. One story has it that grafted trees were brought overland from the new state of Iowa and planted by settlers in Milwaukee, Oregon, in 1847. The trees made the journey, apparently, in covered wagons with canvases that could be unfurled to the sun and rain: traveling nurseries.

(6) The average wage for packing-line workers in Washington was $7.84 in 1997. Stemilt and another packer, Washington Fruit & Produce Company, have recently battled the

International Brotherhood of Teamsters, which has sought to unionize the packing industry, thus far without success.

(7) The Welsh name for Avalon means "Isle of Apples." Arthur, fatally wounded at Camelot, repaired to Avalon as his final sanctuary and there gained eternal life, sustained by magic apples. At Asgard, the goddess Idunn kept apples in a golden casket that were eaten continuously by the gods to maintain their perpetual youth. After the death of Adonis, Aphrodite turned Melus, her priest, into an apple tree. Hence the apple is Malus, and, like the pear, is also a pome--a name derived from Pomona, the Roman goddess of orchards.

(8) Land grantees in the Northwest Territories were required, contractually, to plant apple or pear trees as evidence of their earnest commitment to tame the wilderness. An orchard laid out in orderly rows, demanding attention for many years before it produced anything palatable, was a sure sign of permanent settlement.

(9) The Slope would grow little but sagebrush and wheatgrass were it not for the Columbia Basin Project, an endeavor of the Bureau of Reclamation. Water drawn from Franklin D. Roosevelt Lake--formed in 1941 when the Grand Coulee Dam was completed--is pumped through a series of tunnels and canals to irrigate half a million acres; the bureau plans to irrigate a half-million more as the system is improved and extended. Much of the cost is borne by taxpayers and by revenue from the sale of hydroelectric power, which means that apple growers in this region are significantly subsidized.

(10) A fast apple picker can earn $12 an hour, but the average income for tree-fruit workers in Washington is $7.88 an hour, $3,822 a season.

(11) Codling moth is found nearly everywhere but, like fire blight, is absent in Japan,

which notoriously tests imported apples for signs of the pest's presence. American growers generally believe that these tests are far more stringent than necessary and are used, primarily, to prevent foreign fruit from competing on the Japanese market.

(12) Red Delicious came to light as a chance seedling in Jesse Hiatt's orchard near Peru, Iowa, circa 1870. The Rome Beauty, meanwhile, derives from a shoot put out by rootstock below the point at which it had been grafted; the mother tree was named for Rome Township, Ohio, and dates from the 1820s. Granny Smith is an Australian apple; legend has it that it sprouted from apples left to rot by a Mrs. Smith in 1868.

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