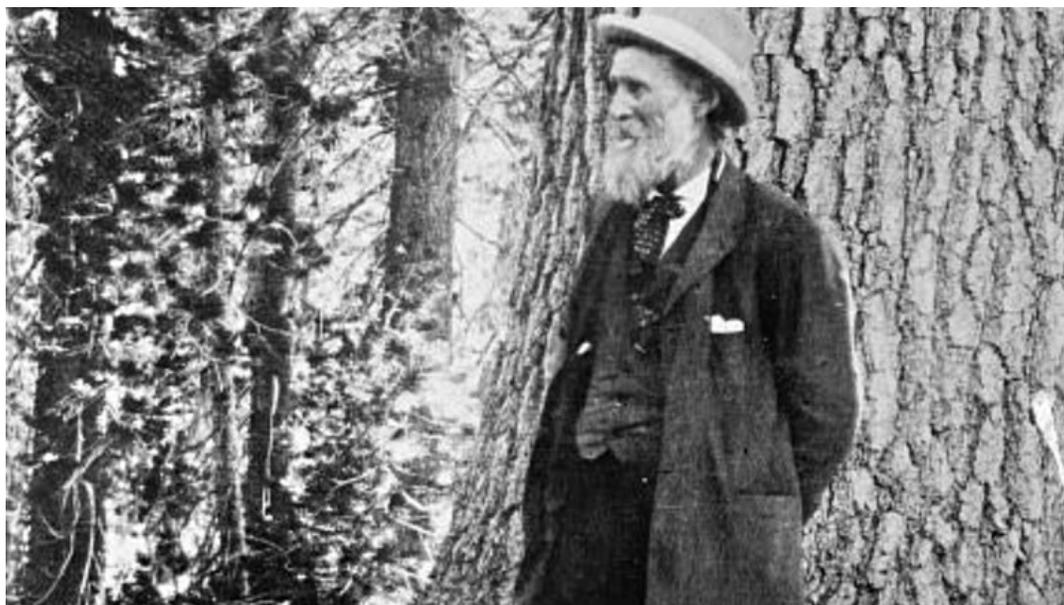


TECHNOLOGY

The American Forests

"God has cared for these trees, saved them from drought, disease, and avalanches; but he cannot save them from fools—only Uncle Sam can do that."

JOHN MUIR AUGUST 1897 ISSUE



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The forests of America, however slighted by man, must have been a great delight to God; for they were the best he ever planted. The whole continent was a garden, and from the beginning it seemed to be favored above all the other wild parks and gardens of the globe. To prepare the ground, it was rolled and sifted in seas with infinite loving deliberation and forethought, lifted into the light, submerged and warmed over and over again, pressed and crumpled into folds and ridges, mountains and hills, subsoiled with heaving volcanic fires, ploughed and ground and sculptured into scenery and soil with glaciers and rivers,—very feature growing and changing from beauty to beauty, higher and higher. And in the fullness of time it was planted in groves, and belts, and broad, exuberant, mantling forests, with the largest, most varied, most fruitful, and most beautiful trees in the world. Bright seas made its border with wave embroidery and icebergs; gray deserts were outspread in the middle of it, mossy tundras on the north, savannas on the south, and blooming prairies and plains; while lakes and rivers shone through all the vast forests and openings, and happy birds and beasts gave delightful animation. Everywhere, everywhere

over all the blessed continent, there were beauty, and melody, and kindly, wholesome, foodful abundance.

These forests were composed of about five hundred species of trees, all of them in some way useful to man, ranging in size from twenty-five feet in height and less than one foot in diameter at the ground to four hundred feet in height and more than twenty feet in diameter,—lordly monarchs proclaiming the gospel of beauty like apostles. For many a century after the ice-ploughs were melted, nature fed them and dressed them every day; working like a man, a loving, devoted, painstaking gardener; fingering every leaf and flower and mossy furrowed bole; bending, trimming, modeling, balancing, painting them with the loveliest colors; bringing over them now clouds with cooling shadows and showers, now sunshine; fanning them with gentle winds and rustling their leaves; exercising them in every fibre with storms, and pruning them; loading them with flowers and fruit, loading them with snow, and ever making them more beautiful as the years rolled by. Wide-branching oak and elm in endless variety, walnut and maple, chestnut and beech, ilex and locust, touching limb to limb, spread a leafy translucent canopy along the coast of the Atlantic over the wrinkled folds and ridges of the Alleghanies,—a green billowy sea in summer, golden and purple in autumn, pearly gray like a steadfast frozen mist of interlacing branches and sprays in leafless, restful winter.

To the southward stretched dark, level-topped cypresses in knobby, tangled swamps, grassy savannas in the midst of them like lakes of light, groves of gay sparkling spice-trees, magnolias and palms, glossy-leaved and blooming and shining continually. To the northward, over Maine and the Ottawa, rose hosts of spiry, rosinny evergreens,—white pine and spruce, hemlock and cedar, shoulder to shoulder, laden with purple cones, their myriad needles sparkling and shimmering, covering hills and swamps, rocky headlands and domes, ever bravely aspiring and seeking the sky; the ground in their shade now snow-clad and frozen, now mossy and flowery; beaver meadows here and there, full of lilies and grass; lakes gleaming like eyes, and a silvery embroidery of rivers and creeks watering and brightening all the vast glad wilderness.

Thence westward were oak and elm, hickory and tupelo, gum and liriodendron, sassafras and ash, linden and laurel, spreading on ever wider in glorious exuberance over the great fertile basin of the Mississippi, over damp level bottoms, low dimpling hollows, and round dotting hills, embosoming sunny prairies and cheery park openings, half sunshine, half shade; while a dark wilderness of pines covered the region around the Great Lakes. Thence still westward swept the forests to right and left around grassy plains and deserts a thousand miles wide: irrepressible hosts of spruce and pine, aspen and willow,

nut-pine and juniper, cactus and yucca, caring nothing for drought, extending undaunted from mountain to mountain, over mesa and desert, to join the darkening multitudes of pines that covered the high Rocky ranges and the glorious forests along the coast of the moist and balmy Pacific, where new species of pine, giant cedars and spruces, silver firs and sequoias, kings of their race, growing close together like grass in a meadow, poised their brave domes and spires in the sky three hundred feet above the ferns and the lilies that enameled the ground; towering serene through the long centuries, preaching God's forestry fresh from heaven.

Here the forests reached their highest development. Hence they went wavering northward over icy Alaska, brave spruce and fir, poplar and birch, by the coasts and the rivers, to within sight of the Arctic Ocean. American forests! the glory of the world! Surveyed thus from the east to the west, from the north to the south, they are rich beyond thought, immortal, immeasurable, enough and to spare for every feeding, sheltering beast and bird, insect and son of Adam; and nobody need have cared had there been no pines in Norway, no cedars and deodars on Lebanon and the Himalayas, no vine-clad selvas in the basin of the Amazon. With such variety, harmony, and triumphant exuberance, even nature, it would seem, might have rested content with the forests of North America, and planted no more.

So they appeared a few centuries ago when they were rejoicing in wildness. The Indians with stone axes could do them no more harm than could gnawing beavers and browsing moose. Even the fires of the Indians and the fierce shattering lightning seemed to work together only for good in clearing spots here and there for smooth garden prairies, and openings for sunflowers seeking the light. But when the steel axe of the white man rang out in the startled air their doom was sealed. Every tree heard the bodeful sound, and pillars of smoke gave the sign in the sky.

I suppose we need not go mourning the buffaloes. In the nature of things they had to give place to better cattle, though the change might have been made without barbarous wickedness. Likewise many of nature's five hundred kinds of wild trees had to make way for orchards and cornfields. In the settlement and civilization of the country, bread more than timber or beauty was wanted; and in the blindness of hunger, the early settlers, claiming Heaven as their guide, regarded God's trees as only a larger kind of pernicious weeds, extremely hard to get rid of. Accordingly, with no eye to the future, these pious destroyers waged interminable forest wars; chips flew thick and fast; trees in their beauty fell crashing by millions, smashed to confusion, and the smoke of their burning has been rising to heaven more than two hundred years. After the

Atlantic coast from Maine to Georgia had been mostly cleared and scorched into melancholy ruins, the overflowing multitude of bread and money seekers poured over the Alleghanies into the fertile middle West, spreading ruthless devastation ever wider and farther over the rich valley of the Mississippi and the vast shadowy pine region about the Great Lakes. Thence still westward the invading horde of destroyers called settlers made its fiery way over the broad Rocky Mountains, felling and burning more fiercely than ever, until at last it has reached the wild side of the continent, and entered the last of the great aboriginal forests on the shores of the Pacific.

Surely, then, it should not be wondered at that lovers of their country, bewailing its baldness, are now crying aloud, "Save what is left of the forests!" Clearing has surely now gone far enough; soon timber will be scarce, and not a grove will be left to rest in or pray in. The remnant protected will yield plenty of timber, a perennial harvest for every right use, without further diminution of its area, and will continue to cover the springs of the rivers that rise in the mountains and give irrigating waters to the dry valleys at their feet, prevent wasting floods and be a blessing to everybody forever.

Every other civilized nation in the world has been compelled to care for its forests, and so must we if waste and destruction are not to go on to the bitter end, leaving America as barren as Palestine or Spain. In its calmer moments in the midst of bewildering hunger and war and restless over-industry, Prussia has learned that the forest plays an important part in human progress, and that the advance in civilization only makes it more indispensable. It has, therefore, as shown by Mr. Pinchot, refused to deliver its forests to more or less speedy destruction by permitting them to pass into private ownership. But the state woodlands are not allowed to lie idle. On the contrary, they are made to produce as much timber as is possible without spoiling them. In the administration of its forests, the state righteously considers itself bound to treat them as a trust for the nation as a whole, and to keep in view the common good of the people for all time.

In France no government forests have been sold since 1870. On the other hand, about one half of the fifty million francs spent on forestry has been given to engineering works, to make the replanting of denuded areas possible. The disappearance of the forests in the first place, it is claimed, may be traced in most cases directly to mountain pasturage. The provisions of the code concerning private woodlands are substantially these: No private owner may clear his woodlands without giving notice to the government at least four months in advance, and the forest service may forbid the clearing on the following grounds: to maintain the soil on mountains, to defend the soil against

erosion and flooding by rivers or torrents, to insure the existence of springs and watercourses, to protect the dunes and seashore, etc. A proprietor who has cleared his forest without permission is subject to heavy fine, and in addition may be made to replant the cleared area.

In Switzerland, after many laws like our own had been found wanting, the Swiss forest school was established in 1865, and soon after the Federal Forest Law was enacted, which is binding over nearly two thirds of the country. Under its provisions, the cantons must appoint and pay the number of suitably educated foresters required for the fulfillment of the forest law; and in the organization of a normally stocked forest, the object of first importance must be the cutting each year of an amount of timber equal to the total annual increase, and no more.

The Russian government passed a law in 1888, declaring that clearing is forbidden in protection forests, and is allowed in others "only when its effects will not be to disturb the suitable relations which should exist between forest and agricultural lands."

Even Japan is ahead of us in the management of her forests. They cover an area of about 29,000,000 acres. The feudal lords valued the woodlands, and enacted vigorous protective laws; and when, in the latest civil war, the Mikado government destroyed the feudal system, it declared the forests that had belonged to the feudal lords to be the property of the state, promulgated a forest law binding on the whole kingdom, and founded a school of forestry in Tokio. The forest service does not rest satisfied with the present proportion of woodland, but looks to planting the best forest trees it can find in any country, if likely to be useful and to thrive in Japan.

In India systematic forest management was begun about forty years ago, under difficulties—presented by the character of the country, the prevalence of running fires, opposition from lumbermen, settlers, etc.—not unlike those which confront us now. Of the total area of government forests, perhaps 70,000,000 acres, 55,000,000 acres have been brought under the control of the forestry department,—a larger area than that of all our national parks and reservations. The chief aims of the administration are effective protection of the forests from fire, an efficient system of regeneration, and cheap transportation of the forest products; the results so far have been most beneficial and encouraging.

It seems, therefore, that almost every civilized nation can give us a lesson on the management and care of forests. So far our government has done nothing effective with its forests, though the best in the world, but is like a rich and

foolish spendthrift who has inherited a magnificent estate in perfect order, and then has left his rich fields and meadows, forests and parks, to be sold and plundered and wasted at will, depending on their inexhaustible abundance. Now it is plain that the forests are not inexhaustible, and that quick measures must be taken if ruin is to be avoided. Year by year the remnant is growing smaller before the axe and fire, while the laws in existence provide neither for the protection of the timber from destruction nor for its use where it is most needed.

As is shown by Mr. E. A. Bowers, formerly Inspector of the Public Land Service, the foundation of our protective policy, which has never protected, is an act passed March 1, 1817, which authorized the Secretary of the Navy to reserve lands producing live-oak and cedar, for the sole purpose of supplying timber for the navy of the United States. An extension of this law by the passage of the act of March 2, 1831, provided that if any person should cut live-oak or red cedar trees or other timber from the lands of the United States for any other purpose than the construction of the navy, such person should pay a fine not less than triple the value of the timber cut, and be imprisoned for a period not exceeding twelve months. Upon this old law, as Mr. Bowers points out, having the construction of a wooden navy in view, the United States government has today chiefly to rely in protecting its timber throughout the arid regions of the West, where none of the naval timber which the law had in mind is to be found.

By the act of June 3, 1878, timber can be taken from public lands not subject to entry under any existing laws except for minerals, by *bona fide* residents of the Rocky Mountain States and Territories and the Dakotas. Under the timber and stone act, of the same date, land in the Pacific States and Nevada, valuable mainly for timber, and unfit for cultivation if the timber is removed, can be purchased for two dollars and a half an acre, under certain restrictions. By the act of March 3, 1875, all land-grant and right-of-way railroads are authorized to take timber from the public lands adjacent to their lines for construction purposes; and they have taken it with a vengeance, destroying a hundred times more than they have used, mostly by allowing fires to run into the woods. The settlement laws, under which a settler may enter lands valuable for timber as well as for agriculture, furnish another means of obtaining title to public timber.

With the exception of the timber culture act, under which, in consideration of planting a few acres of seedlings, settlers on the treeless plains got 160 acres each, the above is the only legislation aiming to protect and promote the planting of forests. In no other way than under some one of these laws can a citizen of the United States make any use of the public forests. To show the

results of the timber-planting act, it need only be stated that of the 38,000,000 acres entered under it, less than 1,000,000 acres have been patented. This means that less than 50,000 acres have been planted with stunted, woebegone, almost hopeless sprouts of trees, while at the same time the government has allowed millions of acres of the grandest forest trees to be stolen, or destroyed, or sold for nothing. Under the act of June 3, 1878, settlers in Colorado and the Territories were allowed to cut timber for mining and agricultural purposes from mineral land, which in the practical West means both cutting and burning anywhere and everywhere, for any purpose, on any sort of public land. Thus, the prospector, the miner, and mining and railroad companies are allowed by law to take all the timber they like for their mines and roads, and the forbidden settler, if there are no mineral lands near his farm or stock-ranch, or none that he knows of, can hardly be expected to forbear taking what he needs wherever he can find it. Timber is as necessary as bread, and no scheme of management failing to recognize and properly provide for this want can possibly be maintained. In any case, it will be hard to teach the pioneers that it is wrong to steal government timber. Taking from the government is with them the same as taking from nature, and their consciences flinch no more in cutting timber from the wild forests than in drawing water from a lake or river. As for reservation and protection of forests, it seems as silly and needless to them as protection and reservation of the ocean would be; both appearing to be boundless and inexhaustible.

The special land agents employed by the General Land Office to protect the public domain from timber depredations are supposed to collect testimony to sustain prosecution, and to superintend such prosecution on behalf of the government, which is represented by the district attorneys. But timber-thieves of the Western class are seldom convicted, for the good reason that most of the jurors who try such cases are themselves as guilty as those on trial. The effect of the present confused, discriminating, and unjust system has been to place almost the whole population in opposition to the government; and as conclusive of its futility, as shown by Mr. Bowers, we need only state that during the seven years from 1881 to 1887 inclusive the value of the timber reported stolen from the government lands was \$36,719,935, and the amount recovered was \$478,073, while the cost of the services of special agents alone was \$455,000, to which must be added the expense of the trials. Thus for nearly thirty-seven million dollars' worth of timber the government got less than nothing; and the value of that consumed by running fires during the same period, without benefit even to thieves, was probably over two hundred millions of dollars. Land commissioners and Secretaries of the Interior have repeatedly called attention to this ruinous state of affairs, and asked Congress to enact the requisite legislation for reasonable reform. But, busied with tariffs,

etc., Congress has given no heed to these or other appeals, and our forests, the most valuable and the most destructible of all the natural resources of the country, are being robbed and burned more rapidly than ever. The annual appropriation for so-called "protection service" is hardly sufficient to keep twenty-five timber agents in the field, and as far as any efficient protection of timber is concerned these agents themselves might as well be timber.

That a change from robbery and ruin to a permanent rational policy is urgently needed nobody with the slightest knowledge of American forests will deny. In the East and along the northern Pacific coast, where the rainfall is abundant, comparatively few care keenly what becomes of the trees as long as fuel and lumber are not noticeably dear. But in the Rocky Mountains and California and Arizona, where the forests are inflammable, and where the fertility of the lowlands depends upon irrigation, public opinion is growing stronger every year in favor of permanent protection by the federal government of all the forests that cover the sources of the streams. Even lumbermen in these regions, long accustomed to steal, are now willing and anxious to buy lumber for their mills under cover of law: some possibly from a late second growth of honesty, but most, especially the small mill-owners, simply because it no longer pays to steal where all may not only steal, but also destroy, and in particular because it costs about as much to steal timber for one mill as for ten, and therefore the ordinary lumberman can no longer compete with the large corporations. Many of the miners find that timber is already becoming scarce and dear on the denuded hills around their mills, and they too are asking for protection of forests, at least against fire. The slow-going, un-thrifty farmers, also, are beginning to realize that when the timber is stripped from the mountains the irrigating streams dry up in summer, and are destructive in winter; that soil, scenery, and everything slips off with the trees: so of course they are coming into the ranks of tree-friends.

Of all the magnificent coniferous forests around the Great Lakes, once the property of the United States, scarcely any belong to it now. They have disappeared in lumber and smoke, mostly smoke, and the government got not one cent for them; only the land they were growing on was considered valuable, and two and a half dollars an acre was charged for it. Here and there in the Southern States there are still considerable areas of timbered government land, but these are comparatively unimportant. Only the forests of the West are significant in size and value, and these, although still great, are rapidly vanishing. Last summer, of the unrivaled redwood forests of the Pacific Coast Range the United States Forestry Commission could not find a single quarter-section that remained in the hands of the government.

Under the timber and stone act of 1878, which might well have been called the "dust and ashes act," any citizen of the United States could take up one hundred and sixty acres of timber land, and by paying two dollars and a half an acre for it obtain title. There was some virtuous effort made with a view to limit the operations of the act by requiring that the purchaser should make affidavit that he was entering the land exclusively for his own use, and by not allowing any association to enter more than one hundred and sixty acres. Nevertheless, under this act wealthy corporations have fraudulently obtained title to from ten thousand to twenty thousand acres or more. The plan was usually as follows: A mill company desirous of getting title to a large body of redwood or sugar-pine land first blurred the eyes and ears of the land agents, and then hired men to enter the land they wanted, and immediately deed it to the company after a nominal compliance with the law; false swearing in the wilderness against the government being held of no account. In one case which came under the observation of Mr. Bowers, it was the practice of a lumber company to hire the entire crew of every vessel which might happen to touch at any port in the redwood belt, to enter one hundred and sixty acres each and immediately deed the land to the company, in consideration of the company's paying all expenses and giving the jolly sailors fifty dollars apiece for their trouble.

By such methods have our magnificent redwoods and much of the sugar-pine forests of the Sierra Nevada been absorbed by foreign and resident capitalists. Uncle Sam is not often called a fool in business matters, yet he had sold millions of acres of timber land at two dollars and a half an acre on which a single tree was worth more than a hundred dollars. But this priceless land has been patented, and nothing can be done now about the crazy bargain. According to the everlasting laws of righteousness, even the fraudulent buyers at less than one per cent of its value are making little or nothing, on account of fierce competition. The trees are felled, and about half of each giant is left on the ground to be converted into smoke and ashes; the better half is sawed into choice lumber and sold to citizens of the United States or to foreigners: thus robbing the country of its glory and impoverishing it without right benefit to anybody,—a bad, black business from beginning to end.

The redwood is one of the few conifers that sprout from the stump and roots, and it declares itself willing to begin immediately to repair the damage of the lumberman and also that of the forest-burner. As soon as a redwood is cut down or burned it sends up a crowd of eager, hopeful shoots, which, if allowed to grow, would in a few decades attain a height of a hundred feet, and the strongest of them would finally become giants as great as the original tree. Gigantic second and third growth trees are found in the redwoods, forming magnificent temple-like circles around charred ruins more than a thousand

years old. But not one denuded acre in a hundred is allowed to raise a new forest growth. On the contrary, all the brains, religion, and superstition of the neighborhood are brought into play to prevent a new growth. The sprouts from the roots and stumps are cut off again and again, with zealous concern as to the best time and method of making death sure. In the clearings of one of the largest mills on the coast we found thirty men at work, last summer, cutting off redwood shoots "in the dark of the moon," claiming that all the stumps and roots cleared at this auspicious time would send up no more shoots. Anyhow, these vigorous, almost immortal trees are killed at last, and black stumps are now their only monuments over most of the chopped and burned areas.

The redwood is the glory of the Coast Range. It extends along the western slope, in a nearly continuous belt about ten miles wide, from beyond the Oregon boundary to the south of Santa Cruz, a distance of nearly four hundred miles, and in massive, sustained grandeur and closeness of growth surpasses all the other timber woods of the world. Trees from ten to fifteen feet in diameter and three hundred feet high are not uncommon, and a few attain a height of three hundred and fifty feet, or even four hundred, with a diameter at the base of fifteen to twenty feet or more, while the ground beneath them is a garden of fresh, exuberant ferns, lilies, gaultheria, and rhododendron. This grand tree, *Sequoia sempervirens*, is surpassed in size only by its near relative, *Sequoia gigantea*, or big tree, of the Sierra Nevada, if indeed it is surpassed. The sempervirens is certainly the taller of the two. The gigantea attains a greater girth, and is heavier, more noble in port, and more sublimely beautiful. These two sequoias are all that are known to exist in the world, though in former geological times the genus was common and had many species. The redwood is restricted to the Coast Range, and the big tree to the Sierra.

As timber the redwood is too good to live. The largest sawmills ever built are busy along its seaward border, "with all the modern improvements," but so immense is the yield per acre it will be long ere the supply is exhausted. The big tree is also to come extent being made into lumber. Though far less abundant than the redwood, it is, fortunately, less accessible, extending along the western flank of the Sierra in a partially interrupted belt about two hundred and fifty miles long, at a height of from four to eight thousand feet above the sea. The enormous logs, too heavy to handle, are blasted into manageable dimensions with gunpowder. A large portion of the best timber is thus shattered and destroyed, and, with the huge knotty tops, is left in ruins for tremendous fires that kill every tree within their range, great and small. Still, the species is not in danger of extinction. It has been planted and is flourishing over a great part of Europe, and magnificent sections of the aboriginal forests have been reserved as national and state parks,—the Mariposa Sequoia Grove,

near Yosemite, managed by the State of California, and the General Grant and Sequoia national parks on the King's, the Kaweah, and Tule rivers, efficiently guarded by a small troop of United States cavalry under the direction of the Secretary of the Interior. But there is not a single specimen of the redwood in any national park. Only by gift or purchase, so far as I know, can the government get back into its possession a single acre of this wonderful forest.

The legitimate demands on the forests that have passed into private ownership, as well as those in the hands of the government, are increasing every year with the rapid settlement and upbuilding of the country, but the methods of lumbering are as yet grossly wasteful. In most mills only the best portions of the best trees are used, while the ruins are left on the ground to feed great fires which kill much of what is left of the less desirable timber, together with the seedlings on which the permanence of the forest depends. Thus every mill is a centre of destruction far more severe from waste and fire than from use. The same thing is true of the mines, which consume and destroy indirectly immense quantities of timber with their innumerable fires, accidental or set to make open ways, and often without regard to how far they run. The prospector deliberately sets fires to clear off the woods just where they are densest, to lay the rocks bare and make the discovery of mines easier. Sheep-owners and their shepherds also set fires everywhere through the woods in the fall to facilitate the march of their countless flocks the next summer, and perhaps in some places to improve the pasturage. The axe is not yet at the root of every tree, but the sheep is, or was before the national parks were established and guarded by the military, the only effective and reliable arm of the government free from the blight of politics. Not only do the shepherds, at the driest time of the year, set fire to everything that will burn, but the sheep consume every green leaf, not sparing even the young conifers when they are in a starving condition from crowding, and they rake and dibble the loose soil of the mountain sides for the spring floods to wash away, and thus at last leave the ground barren.

Of all the destroyers that infest the woods the shake-maker seems the happiest. Twenty or thirty years ago, shakes, a kind of long boardlike shingles split with a mallet and a frow, were in great demand for covering barns and sheds, and many are used still in preference to common shingles, especially those made from the sugar-pine, which do not warp or crack in the hottest sunshine. Drifting adventurers in California, after harvest and threshing are over, oftentimes meet to discuss their plans for the winter, and their talk is interesting. Once, in a company of this kind, I heard a man say, as he peacefully smoked his pipe: "Boys, as soon as this job's done I'm goin' into the duck business. There's big money in it, and your grub costs nothing. Tule Joe made five hundred dollars last winter on mallard and teal. Shot 'em on the Joaquin,

tied 'em in dozens by the neck, and shipped 'em to San Francisco. And when he was tired wading in the sloughs and touched with rheumatiz, he just knocked off on ducks, and went to the Contra Costa hills for dove and quail. It's a mighty good business, and you're your own boss, and the whole thing's fun."

Another of the company, a bushy-bearded fellow, with a trace of brag in his voice, drawled out: "Bird business is well enough for some, but bear is my game, with a deer and a California lion thrown in now and then for change. There's always a market for bear grease, and sometimes you can sell the hams. They're good as hog hams any day. And you are your own boss in my business, too, if the bears ain't too big and too many for you. Old grizzlies I despise,—they want cannon to kill 'em; but the blacks and browns are beauties for grease, and when I get 'em just right, and draw a bead on 'em, I fetch 'em every time." Another said he was going to catch up a lot of mustangs as soon as the rains set in, hitch them to a gang-plough, and go to farming on the San Joaquin plains for wheat. But most preferred the shake business, until something more profitable and as sure could be found, with equal comfort and independence.

With a cheap mustang or mule to carry a pair of blankets, a sack of flour, a few pounds of coffee, and an axe, a frow, and a cross-cut saw, the shake-maker ascends the mountains to the pine belt where it is most accessible, usually by some mine or mill road. Then he strikes off into the virgin woods, where the sugar-pine, king of all the hundred species of pines in the world in size and beauty, towers on the open sunny slopes of the Sierra in the fullness of its glory. Selecting a favorable spot for a cabin near a meadow with a stream, he unpacks his animal and stakes it out on the meadow. Then he chops into one after another of the pines, until he finds one that he feels sure will split freely, cuts this down, saws off a section four feet long, splits it, and from this first cut, perhaps seven feet in diameter, he gets shakes enough for a cabin and its furniture,—walls, roof, door, bedstead, table, and stool. Besides his labor, only a few pounds of nails are required. Sapling poles form the frame of the airy building, usually about six feet by eight in size, on which the shakes are nailed, with the edges overlapping. A few bolts from the same section that the shakes were made from are split into square sticks and built up to form a chimney, the inside and interspaces being plastered and filled in with mud. Thus, with abundance of fuel, shelter and comfort by his own fireside are secured. Then he goes to work sawing and splitting for the market, tying the shakes in bundles of fifty or a hundred. They are four feet long, four inches wide, and about one fourth of an inch thick. The first few thousands he sells or trades at the nearest mill or store, getting provisions in exchange. Then he advertises, in whatever way he can, that he has excellent sugar-pine shakes for sale, easy of access and cheap.

Only the lower, perfectly clear, free-splitting portions of the giant pines are used,—perhaps ten to twenty feet from a tree two hundred and fifty in height; all the rest is left a mass of ruins, to rot or to feed the forest fires, while thousands are hacked deeply and rejected in proving the grain. Over nearly all of the more accessible slopes of the Sierra and Cascade mountains in southern Oregon, at a height of from three to six thousand feet above the sea, and for a distance of about six hundred miles, this waste and confusion extends. Happy robbers! dwelling in the most beautiful woods, in the most salubrious climate, breathing delightful doors both day and night, drinking cool living water,—roses and lilies at their feet in the spring, shedding fragrance and ringing bells as if cheering them on in their desolating work. There is none to say them nay. They buy no land, pay no taxes, dwell in a paradise with no forbidding angel either from Washington or from heaven. Every one of the frail shake shanties is a centre of destruction, and the extent of the ravages wrought in this quiet way is in the aggregate enormous.

It is not generally known that, notwithstanding the immense quantities of timber cut every year for foreign and home markets and mines, from five to ten times as much is destroyed as is used, chiefly by running forest fires that only the federal government can stop. Travelers through the West in summer are not likely to forget the fire-work displayed along the various railway tracks. Thoreau, when contemplating the destruction of the forests on the east side of the continent, said that soon the country would be so bald that every man would have to grow whiskers to hide its nakedness, but he thanked God that at least the sky was safe. Had he gone West he would have found out that the sky was not safe; for all through the summer months, over most of the mountain regions, the smoke of mill and forest fires is so thick and black that no sunbeam can pierce it. The whole sky, with clouds, sun, moon, and stars, is simply blotted out. There is no real sky and no scenery. Not a mountain is left in the landscape. At least none is in sight from the lowlands, and they all might as well be on the moon, as far as scenery is concerned.

The half dozen transcontinental railroad companies advertise the beauties of their lines in gorgeous many-colored folders, each claiming its as the "scenic route." "The route of superior desolation"—the smoke, dust, and ashes route—would be a more truthful description. Every train rolls on through dismal smoke and barbarous melancholy ruins; and the companies might well cry in their advertisements: "Come! travel our way. Ours is the blackest. It is the only genuine Erebus route. The sky is black and the ground is black, and on either side there is a continuous border of black stumps and logs and blasted trees appealing to heaven for help as if still half alive, and their mute eloquence is most interestingly touching. The blackness is perfect. On account of the

superior skill of our workmen, advantages of climate, and the kind of trees, the charring is generally deeper along our line, and the ashes are deeper, and the confusion and desolation displayed can never be rivaled. No other route on this continent so fully illustrates the abomination of desolation." Such a claim would be reasonable, as each seems the worst, whatever route you chance to take.

Of course a way had to be cleared through the woods. But the felled timber is not worked up into firewood for the engines and into lumber for the company's use; it is left lying in vulgar confusion, and is fired from time to time by sparks from locomotives or by the workmen camping along the line. The fires, whether accidental or set, are allowed to run into the woods as far as they may, thus assuring comprehensive destruction. The directors of a line that guarded against fires, and cleared a clean gap edged with living trees, and fringed and mantled with the grass and flowers and beautiful seedlings that are ever ready and willing to spring up, might justly boast of the beauty of their road; for nature is always ready to heal every scar. But there is no such road on the western side of the continent. Last summer, in the Rocky Mountains, I saw six fires started by sparks from a locomotive within a distance of three miles, and nobody was in sight to prevent them from spreading. They might run into the adjacent forests and burn the timber from hundreds of square miles; not a man in the State would care to spend an hour in fighting them, as long as his own fences and buildings were not threatened.

Notwithstanding all the waste and use which have been going on unchecked like a storm for more than two centuries, it is not yet too late, though it is high time, for the government to begin a rational administration of its forests. About seventy million acres it still owns,—enough for all the country, if wisely used. These residual forests are generally on mountain slopes, just where they are doing the most good, and where their removal would be followed by the greatest number of evils; the lands they cover are too rocky and high for agriculture, and can never be made as valuable for any other crop as for the present crop of trees. It has been shown over and over again that if these mountains were to be stripped of their trees and underbrush, and kept bare and sodless by hordes of sheep and the innumerable fires the shepherds set, besides those of the millmen, prospectors, shake-makers, and all sorts of adventurers, both lowlands and mountains would speedily become little better than deserts, compared with their present beneficent fertility. During heavy rainfalls and while the winter accumulations of snow were melting, the larger streams would swell into destructive torrents; cutting deep, rugged-edged gullies, carrying away the fertile humus and soil as well as sand and rocks, filling up and

overflowing their lower channels, and covering the lowland fields with raw detritus. Drought and barrenness would follow.

In their natural condition, or under wise management, keeping out destructive sheep, preventing fires, selecting the trees that should be cut for lumber, and preserving the young ones and the shrubs and sod of herbaceous vegetation, these forests would be a never failing fountain of wealth and beauty. The cool shades of the forest give rise to moist beds and currents of air, and the sod of grasses and the various flowering plants and shrubs thus fostered, together with the network and sponge of tree roots, absorb and hold back the rain and the waters from melting snow, compelling them to ooze and percolate and flow gently through the soil in streams that never dry. All the pine needles and rootlets and blades of grass, and the fallen decaying trunks of trees, are dams, storing the bounty of the clouds and dispensing it in perennial life-giving streams, instead of allowing it to gather suddenly and rush headlong in short-lived devastating floods. Everybody on the dry side of the continent is beginning to find this out, and, in view of the waste going on, is growing more and more anxious for government protection. The outcries we hear against forest reservations come mostly from thieves who are wealthy and steal timber by wholesale. They have so long been allowed to steal and destroy in peace that any impediment to forest robbery is denounced as a cruel and irreligious interference with "vested rights," likely to endanger the repose of all ungodly welfare.

Gold, gold, gold! How strong a voice that metal has!

| "O wae for the siller, it is saepreva'lin'."

Even in Congress, a sizable chunk of gold, carefully concealed, will outtalk and outfight all the nation on a subject like forestry, well smothered in ignorance, and in which the money interests of only a few are conspicuously involved. Under these circumstances, the bawling, blethering oratorical stuff drowns the voice of God himself. Yet the dawn of a new day in forestry is breaking. Honest citizens see that only the rights of the government are being trampled, not those of the settlers. Merely what belongs to all alike is reserved, and every acre that is left should be held together under the federal government as a basis for a general policy of administration for the public good. The people will not always be deceived by selfish opposition, whether from lumber and mining corporations or from sheepmen and prospectors, however cunningly brought forward underneath fables and gold.

Emerson says that things refuse to be mismanaged long. An exception would seem to be found in the case of our forests, which have been mismanaged

rather long, and now come desperately near being like smashed eggs and spilt milk. Still, in the long run the world does not move backward. The wonderful advance made in the last few years, in creating four national parks in the West, and thirty forest reservations, embracing nearly forty million acres; and in the planting of the borders of streets and highways and spacious parks in all the great cities, to satisfy the natural taste and hunger for landscape beauty and righteousness that God has put, in some measure, into every human being and animal, shows the trend of awakening public opinion. The making of the far-famed New York Central Park was opposed by even good men, with misguided pluck, perseverance, and ingenuity; but straight right won its way, and now that park is appreciated. So we confidently believe it will be with our great national parks and forest reservations. There will be a period of indifference on the part of the rich, sleepy with wealth, and of the toiling millions, sleepy with poverty, most of whom never saw a forest; a period of screaming protest and objection from the plunderers, who are as unconscionable and enterprising as Satan. But light is surely coming, and the friends of destruction will preach and bewail in vain.

The United States government has always been proud of the welcome it has extended to good men of every nation, seeking freedom and homes and bread. Let them be welcomed still as nature welcomes them, to the woods as well as to the prairies and plains. No place is too good for good men, and still there is room. They are invited to heaven, and may well be allowed in America. Every place is made better by them. Let them be as free to pick gold and gems from the hills, to cut and hew, dig and plant, for homes and bread, as the birds are to pick berries from the wild bushes, and moss and leaves for nests. The ground will be glad to feed them, and the pines will come down from the mountains for their homes as willingly as the cedars came from Lebanon for Solomon's temple. Nor will the woods be the worse for this use, or their benign influences be diminished any more than the sun is diminished by shining. Mere destroyers, however, tree-killers, spreading death and confusion in the fairest groves and gardens ever planted, let the government hasten to cast them out and make an end of them. For it must be told again and again, and be burningly borne in mind, that just now, while protective measures are being deliberated languidly, destruction and use are speeding on faster and farther every day. The axe and saw are insanely busy, chips are flying thick as snowflakes, and every summer thousands of acres of priceless forests, with their underbrush, soil, springs, climate, scenery, and religion, are vanishing away in clouds of smoke, while, except in the national parks, not one forest guard is employed.

All sorts of local laws and regulations have been tried and found wanting, and the costly lessons of our own experience, as well as that of every civilized

nation, show conclusively that the fate of the remnant of our forests is in the hands of the federal government, and that if the remnant is to be saved at all, it must be saved quickly.

Any fool can destroy trees. They cannot run away; and if they could, they would still be destroyed,—chased and hunted down as long as fun or a dollar could be got out of their bark hides, branching horns, or magnificent bole backbones. Few that fell trees plant them; nor would planting avail much towards getting back anything like the noble primeval forests. During a man's life only saplings can be grown, in the place of the old trees—tens of centuries old—that have been destroyed. It took more than three thousand years to make some of the trees in these Western woods,—trees that are still standing in perfect strength and beauty, waving and singing in the mighty forests of the Sierra. Through all the wonderful, eventful centuries since Christ's time—and long before that—God has cared for these trees, saved them from drought, disease, avalanches, and a thousand straining, leveling tempests and floods; but he cannot save them from fools,—only Uncle Sam can do that.

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