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God's First Temples. How Shall We Preserve Our Forests? The Question Considered by John Muir, the California Geologist-The Views of a Practical Man and a Scientific Observer-A Profoundly Interesting Article. (Communicated To The Record-Union.)

John Muir

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"GOD'S FIRST TEMPLES."

HOW SHALL WE PRESERVE OUR FORESTS?

The Question Considered by John Muir, the California Geologist—The Views of a Practical Man and a Scientific Observer—A Profoundly Interesting Article.

[COMMUNICATED TO THE RECORD-UNION.]

EDS. RECORD-UNION: The forests of coniferous trees growing on our mountain ranges are by far the most destructible of the natural resources of California. Our gold, and silver, and cinnabar are stored in the rocks, locked up in the safest of all banks, so that notwithstanding the world has been making a run upon them for the last twenty-five years, they still pay out steadily, and will probably continue to do so centuries hence, like rivers pouring from perennial mountain fountains. The riches of our magnificent soil-beds are also comparatively safe, because even the most barbarous methods of wildcat farming cannot effect complete destruction, and however great the impoverishment produced, full restoration of fertility is always possible to the enlightened farmer. But our forest belts are being burned and cut down and wasted like a field of unprotected grain, and once destroyed can never be wholly restored even by centuries of persistent and painstaking cultivation.

The Practical Importance

Of the preservation of our forests is augmented by their relations to climate, soil and streams. Strip off the woods with their underbrush from the mountain flanks, and the whole State, the lowlands as well as the highlands, would gradually change into a desert. During rainfalls, and when the winter snow was melting, every stream would become a destructive torrent, overflowing its banks, stripping off and carrying away the fertile soils, filling up the lower river channels, and overspreading the lowland fields with detritus to a vastly more destructive degree than all the washings from hydraulic mines concerning which we now hear so much. Dripping forests give rise to moist sheets and currents of air, and the sod of grasses and underbrush thus fostered, together with the roots of trees themselves, absorb and hold back rains and melting snow, yet allowing them to ooze and percolate and flow gently in useful fertilizing streams. Indeed every pine needle and rootlet, as well as fallen trunks and large clasping roots, may be regarded as dams, hoarding the bounty of storm clouds, and dispensing it as blessings all through the summer, instead of allowing it to gather and rush headlong in short lived devastating floods. Streams taking their rise in deep woods flow unfailingly as those derived from the eternal ice and snow of the Alps. So constant indeed and apparent is the relationship between forests and never failing springs, that effect is frequently mistaken for cause, it being often asserted that fine forests will grow only along streamsides where their roots are well watered, when in fact the forests themselves produce many of the streams flowing through them.

The Main Forest Belt

Of the Sierra is restricted to the western flank, and extends unbrokenly from one end of the range to the other at an elevation of from three to eight thousand feet above sea level. The great master-existence of these noble woods is sequoia gigantea, or big tree. Only two species of sequoia are known to exist in the world. Both belong to California, one being found only in the Sierra, the other (sequoia sempervirens) in the Coast Ranges, although no less than five distinct fossil species have been discovered in the tertiary and cretaceous rocks of Greenland. I would like to call attention to this noble tree, with special reference to its preservation. The species extends from the well known Calaveras groves on the north, to the head of Deer creek on the south, near the big bend of the Kern river, a distance of about two hundred miles, at an elevation above sea level of from about five to eight thousand feet. From the Calaveras to the South Fork of King's river it occurs only in small isolated groves, and so sparsely and irregularly distributed that two gaps occur nearly forty miles in width, the one between the Calaveras and Tuolumne groves, the other between those of the Fresno and King's rivers From King's river the belt extends across the broad, rugged basins of the Kaweah and Tule rivers to its southern boundary on Deer creek, interrupted only by deep, rocky canyons, the width of this portion of the belt being from three to ten miles.

In the Northern Groves

Few young trees or saplings are found ready to take the places of the failing old ones; and because these ancient, childless sequoias are the only ones known to botanists, the species has been generally regarded as doomed to speedy extinction, as being nothing more than an expiring remnant of an ancient flora, and that therefore there is no use trying to save it or to prolong its few dying days. This, however, is in the main a mistaken notion, for the Sierra as it now exists never had an ancient flora. All the species now growing on the range have been planted since the close of the glacial period, and the Big Tree has never formed a greater part of these post-glacial forests than it does to-day, however widely it may have been distributed throughout pre-glacial forests.

In Tracing the Belt

Southward, all the phenomena bearing upon its history goes to show that the dominion of Sequoia Gigantea, as King of California trees, is not yet passing away. No tree in the woods seems more firmly established, or more safely settled in accordance with climate and soil. They fill the woods and form the principal tree, growing heartily on solid ledges, along water courses, in the deep, moist soil of meadows, and upon avalanche and glacial debris, with a multitude of thrifty seedlings and saplings crowding around the aged, ready to take their places and rule the woods.

Nevertheless Nature in her grandly deliberate way keeps up a rotation of forest crops. Species develop and die like individuals, animal as well as plant. Man himself will as surely become extinct as sequoia or mastodon, and be at length known only as a fossil. Changes of this kind are, however, exceedingly slow in their movements, and, as far as the lives of individuals are concerned, such changes have no appreciable effect. Sequoia seems scarcely further past prime as a species than its companion firs (*Picea amabilis* and *P. grandis*), and judging from its present condition and its ancient history, as far as I have been able to decipher it, our sequoia will live and flourish gloriously until A. D. 15,000 at least—probably for longer—that is, if it be allowed to remain in the hands of Nature.

Waste and Destruction.

But waste and pure destruction are already taking place at a terrible rate, and unless protective measures be speedily invented and enforced, in a few years this noblest tree-species in the world will present only a few hacked and scarred remnants. The great enemies of forests are fire and the ax. The destructive effects of these, as compared with those caused by the operations of nature, are instantaneous. Floods undermine and kill many a tree, storm winds bend and break, landslips and avalanches overwhelm whole groves, lightning shatters and burns, but the combined effects of all these amount only to a wholesome beauty-producing culture. Last summer I found some five saw mills located in or near the lower edge of the Sequoia belt, all of which saw more or less of the big tree into lumber. One of these (Hyde's), situated on the north fork of the Kaweah, cut no less than 2,000,000 feet of Sequoia lumber last season. Most of the Fresno big trees are doomed to feed the mills recently erected near them, and a company has been formed by Chas. Converse to cut the noble forest on the south fork of King's river. In these milling operations waste far exceeds use. After the choice young manageable trees have been felled, the woods are cleared of limbs and refuse by burning, and in these clearing fires, made with reference to further operations, all the young seedlings and saplings are destroyed, together with many valuable fallen trees and old trees, too large to be cut, thus effectually cutting off all hopes of a renewal of the forest.

These Ravages,

However, of mill-fires and mill-axes are small as compared with those of the "sheep-mens'" fires. Incredible numbers of sheep are driven to the mountain pastures every summer, and in order to make easy paths and to improve the pastures, running fires are set everywhere to burn off the old logs and underbrush. These fires are far more universal and destructive than would be guessed. They sweep through nearly the entire forest belt of the range from one extremity to the other, and in the dry weather, before the coming on of winter storms, are very destructive to all kinds of young trees, and especially to sequoia, whose loose, fibrous bark catches and burns at once. Excepting the Calaveras, I, last summer, examined every sequoia grove in the range, together with the main belt extending across the basins of Kaweah and Tule, and found everywhere the most deplorable waste from this cause. Indians burn off underbrush to facilitate deer-hunting. Campers of all kinds often permit fires to run, so also do mill-men, but the fires of "sheep-men" probably form more than 90 per cent. of all destructive fires that sweep the woods.

Fire, Then, is the Arch Destroyer

Of our forests, and sequoia forests suffer most of all. The young trees are most easily fire killed; the old are most easily burned, and the prostrate trunks, which *never rot* and would remain valuable until our tenth centennial, are reduced to ashes.

In European countries, especially in France, Germany, Italy and Austria, the economies of forestry have been carefully studied under the auspices of Government, with the most beneficial results. Whether our loose jointed Government is really able or willing to do anything in the matter remains to be seen. If our law makers were to discover and enforce any method tending to lessen even in a small degree the destruction going on, they would thus cover a multitude of legislative sins in the eyes of every tree lover. I am satisfied, however, that the question can be intelligently discussed only after a careful survey of our forests has been made, together with studies of the forces now acting upon them.

A law was constructed some years ago making the cutting down of sequoias over sixteen feet in diameter illegal. A more absurd and shortsighted piece of legislation could not be conceived. All the young trees might be cut and burned, and all the old ones might be burned but not cut.

JOHN MUIR.