August 2024

1936 Wild Flower Magazine Articles About Vegetation & Wilderness Around Rocky Mountain National Park

Wild Flower Preservation Society

WILD FLOWER

Title Registered in U. S. Patent Office

Vol. 13 | October 1, 1936 | No. 4

Official National Organ of the WILD FLOWER PRESERVATION SOCIETY, Inc., Washington, D. C.
Published Quarterly by the OHIO CHAPTER, Box 5, Campus Station, Cincinnati, Ohio.

"Nature is drowsy; her work is done,
Now she awaits her winter rest."

MORTARS

The deer comes from the cedars unmolested
To browse on the young corn and tender stalks.
Gone are the Indian braves who once contested
The land with the white settlers. The Miwoks
Are gone. Their warriors left no mark to show
Their prowess with the tomahawk and bow.
They have been driven away like straws
Before the wind, but in great flat rocks, squaws
Have left memorials of their race
In mortars large and small, which deface
The granite stones. In her simple way the squaw
Founded her home on the solid rock and saw
The necessity of constant grinding care
In providing her family's daily fare.

—GERTRUDE A. CASAD, in
Yosemite Nature Notes, April, 1935.

OTHER CAMPFIRES

OUT of the thousands who annually pass over the Trail Ridge road, perhaps only a few give a thought to those humans of long ago who used practically the same route to cross over the Continental Divide.

Before the automobile road was built, guides, tourists, and rangers, on foot and by horse followed the trail that wound across the uplands; before them the hunters and prospectors passed this way following the trail left by the mountain men and the Indians who in turn had followed a trail that was already old, made hundreds, possibly thousands of years ago by game and the feet of men we know very little about. The Indians had a saying which translated means, "Other camp fires have burned here before."

One day I found some automobile parts beside the highway. On the old trail I found a rusty horseshoe; a couple of years ago I found an old pin fire cartridge (it is about beyond the memory of the past generations when such ammunition was used) along the trail I found an arrow head, very likely Ute or Arapahoe; and in a little gravel spot on a bare hill top far above timberline, part of a Yuma point. Men who have made a study of such things say these points date back almost to the last ice age.

While standing on the hilltop, trying to picture in my mind a pageant of the life that had passed through the little pass below, I noticed a line of rocks running down either side of the slope and at right angles to the pass. Now tipi rings are fairly common but here was something different. The more I looked the plainer it became, winding this way and that to take advantage of large boulders. Without a doubt it was the remains of an old wall, almost obliterated in places. I could not help but wonder what many of our present walls would look like if left to the elements for a thousand years. The rocks had not been moved in ages, many were imbedded in the sod, and all were covered with lichens.

For several weeks I pondered over this line of rocks and one day, with Dean Kirby, went back to look at it, and he noticed another old wall running parallel to the pass but about one hundred and fifty feet north, and

—Courtesy, *American Forests,* the
Magazine of the American Forestry Association.

The Deer Comes Unmolested

at a right angle to the one I had found. Later I went back with compass and tape line and got some data.

The total length of both walls is 750 feet. It must have taken considerable effort to make them, and naturally the thought arises; what was the purpose? My first thought was of a fortification and yet, it hardly seems possible that men who lived in that remote time, men whose very life depended upon constant vigilance, would not see miles away something suspicious in such walls. A large party of Indians, or mountain men may have met another large hostile party here and hastily fortified themselves but roving bands of such men usually knew what was on other sides of mountains before they crossed over. Over a period of several years, and on going over the ground again after noticing the wall, I have only found four arrow heads in the vicinity. My second thought was that it might be some sort of game trap, but there are many places on Trail Ridge that seem to me much better fitted for such a purpose, and the absence of arrow heads or broken points argues against it. Ceremonial purposes? Possibly. Who knows what the minds of men in that dim past may have tried to express in ceremonies on the high rocky barrens above timber line, surrounded by a vast sea of hills and canyons.

Some day we may find a clue that will lead to the secret, but at present only one thing is certain, "Other camp fires have burned here before."—JACK C. MOOMAW, in *Nature Notes* from *Rocky Mountain National Park,* January, 1934.

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INDIAN USE OF THE PINYON PINE

THERE can be no doubt that the Pinyon Pine was and still is an important tree in the lives of the native Indians inhabiting the great Southwest which, of course, includes the Indians inhabiting the Grand Canyon region of Arizona.

One of the many popular fallacies held by white people in regard to Indians is that their diet was almost exclusively a meat diet. Yet if one would do a little investigating into the food of our aboriginal Americans one would soon find that all resident tribes made good and full use of the vegetal products of the region. This it would be found constituted a considerable part of their diet. Not only that, but wherever agriculture could be practiced in a region it was practiced by the Indians.

This tree has the scientific name of *Pinus edulis,* Engelm., and is known throughout the Southwest as the Pinyon Pine. It is the dominant tree on the South Rim of Grand Canyon and extends for about a thousand feet below the Canyon rim. Pinyon Pine is also found in a few places on the North Rim. It is the characteristic tree of the Upper Sonoran Zone.

To identify it one need only remember that the needles of all pine trees grow in bundles. The Pinyon Pine has only two needles to a bundle and they are short. This, coupled with the stunted appearance of the tree, and, as a rule, its association with the juniper or "cedar" tree in the same zone make its identification easy. The cones are about the length of the needles and about as broad as they are long. Between the scales of the cone are the nut-like edible seeds. When ripe the seeds are large and have a very thin shell covering. These seeds are called "pine nuts" or "pinyon nuts" and on some news stands, "Indian Nuts."

Used as Food

The meats of this pinyon nut evidently were highly prized by the ancients in this region as well as by the present day Indians. Today it is considered a delicacy not only by Indians and Mexicans but by the white people as well. We find also that the squirrels, birds and rodents are fond of the nuts, and that unwittingly they help the Indians in harvesting the crop. The rats gather the nuts and store them away in their storehouses for the winter. The Indian, ever wise in the ways of the creatures about him finds the storehouses and loots them. There is, however, one thing he does not do, and that is to take the entire store of food from the rats. He will always leave some to tide them over the winter.

We know that the Pinyon Pine was important to the pre-historic peoples for many specimens of the nuts and objects made of pinyon wood and its gum have been found associated with the remains of man in caves and rockshelters as well as in ruins of the region. Pinyon nuts have been found associated with Basket Maker remains. The Basket Makers were the people occupying the region prior to the Pueblo peoples, before the time of Christ.

The tree was used architecturally, for we find that posts of Pinyon Pine were used by the Basket Makers. It was used also by ancient pueblos in pit-house and earth lodge construction as roof supports. Smaller timbers, two and a half inches in diameter, were set on end in the form of a palisade to form the sides of walls. The wood is used extensively by the modern Hopis in house construction. It is an excellent firewood and is much used as such wherever it grows.

Of all its uses, however, none is as important as the use of its seeds as food. The nuts are gathered in great quantities and stored for winter use by all the natives of the region. They constitute one of the choicest of their foods.

The Indians of the region, as a rule, make quite a picnic of pinyon nut gathering. It is, nevertheless, a serious matter, and, although there is much banter and fun, a great deal is accomplished. Different tribes use different methods of gathering the nuts.

From autumn until spring the Havasupai peoples dwell on the South Rim and Plateau of the Grand Canyon. In the fall, families go off to places where pinyon nuts have been reported plentiful.

The gathering of the Pinyon nut crop may sometimes become a hazardous undertaking. The reader may recall that a few years ago some Navaho Indians were caught in a blizzard while harvesting the nuts. Being thus isolated, they were without adequate food supply and protection against the elements. The people of the nation became much concerned about them. The newspapers gave quite a bit of space to the matter and the Federal Government sent airplanes in search of these Indians. When they were discovered, the plane dropped food to them so that they might not perish.

Domestic Uses

Of the other uses made of the Pinyon Pine by the American aborigines of the Southwest we find that the wood was sometimes employed by the Havasupai

people in making handles for a special hatchet, sometimes called a mescal knife. These were made of stone and now, of course, are made of iron. This special tool was used to trim off the green portion of the leaves of the mescal plant (*Agave utahensis*) in preparing it for roasting in stone pits. The handle was held fast to the blade by the use of lashing and pinyon pitch.

In collecting information on adhesives or glue used by the Indians, it is found that the authorities differ in the names they use for the sticky exudation found on the pinyon pine trees. Sometimes it is referred to as resin, then again as pitch and also as gum. It seems that any one of these three names would apply sufficiently.

As an adhesive or glue, the pinyon gum is used in many ways. It was the principal adhesive of the Yavapai. They employed it to fasten the wooden handles to their gourd rattles.

The Havasupai Indians cap their mescal fiber hair brushes with buckskin held in place by pinyon pitch and lashed with a thong.

The people at the Hano pueblo use the resin of the pinyon for the mending of cracked water-jars.

The Hopi use the pinyon gum as a binder in making the green paint used for painting their katchina dolls. The gum is boilled in water and ground copper added. The water is then poured off and the residue allowed to cool. When dry, the mass is kneaded and pulled, then made up into small balls for future use.

Probably one of the principal uses of the Pinyon Pine gum is that of waterproofing. The Havasupai Indians apply a heavy coating of pinyon pitch to their basketry water bottles as well as a yucca or soapweed paste. They gather the clear gum from the bark and boil it for several minutes until it takes on a dark brown color. It is then ready for waterproofing the basket. The pitch, after hardening, does not run or soften to any extent when exposed to the sun. The writer has seen pitched basketry water bottles in use among the Paiute Indians of southern Nevada.

When preparing it for use in coating their basketry bottles the Yavapai gather their supply of pinyon pitch in a mescal stem bowl. Their method of applying the pitch to the baskets is somewhat similar to the Havasupai, differing in a few minor details only. Rubbing pulverized cedar (juniper) leaves mixed with water and at times adding red clay over the basket before applying the pitch, is one of these details. Another use to which the pitch of the Pinyon Pine is put by the Havasupai is coating liberally the wrappings on their cradle boards. The Pueblo Indians of Hano smear pinyon pitch over their earthenware canteens to make them watertight.

Medical Uses

We must not overlook the medical practices of the Indians in which the Pinyon Pine has a part. The Havasupai Indians use clear white pinyon pitch spread on a handful of plucked rabbit fur or on a piece of cloth and apply it to a wound as an antiseptic. The Zuni Indians do the same except that the pinyon gum is ground into powder and applied directly to the wound. The Pueblo Indians of Hano also use the pitch of the Pinyon Pine for excluding the air from cuts and sores. The Havasupai Indians use the pitch for filling the cavity of an aching tooth and then they rinse the mouth with cold water.

Among the Zuni Indians the needles of the Pinyon Pine are chewed and swallowed as a medicine for the cure of syphilis. Frequently a tea is made of the twigs and drunk warm in conjunction with the needles. Ulcers are treated by sprinkling powdered pinyon gum over them. If there is a swelling, it is lanced and the powdered gum sprinkled into the incision as an antiseptic.

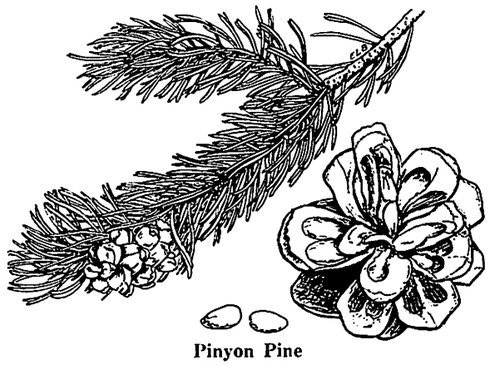
Cermonially the Pinyon Pine also enters the picture. If they desire female children, the Sword Swallower order of the Zuni Indians eat the young buds or shoots at the close of a ceremony.

The Hopi Indians, upon returning from burying the dead, bring a priest with them to the house. He proceeds to burn pinyon branches in the fireplace and sprinkles sacred meal around the room for purification purposes.

Among the Navaho Indians we find that the leader of

A Grove of Pinyon Pines

—Courtesy, American Forests, the Magazine of the American Forestry Association.



Pinyon Pine
(*Pinus edulis*)
A branch of Pinyon Pine, a cone and pinyon pine nuts.

the Yabetchi or Nine Day Night Chant directs the song and dance with a pinyon branch baton.

From this brief paper one can readily understand why the Pinyon Pine (*Pinus edulis*) is considered a highly important tree by the aborigines and by the present day Indians of this region.—LOUIS SHELLBACH III, in *Grand Canyon Nature Notes,* December, 1933.

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NAMING AN INDIAN CHILD

ON Sunday afternoon, July 16, the visitors to the Indians at the rear of the museum nature garden were greatly interested in observing an Indian naming. A little 18-month-old Indian boy from Santa Barbara, whose parents have relatives here among the Yosemite Indians, was brought to Le-mee, the recognized leader or chief of the remnants of the Yosemites. After a few introductory remarks in English, Le-mee called for the infant, who was brought by his grandfather to the foot drum on which the Indians dance.

At once Le-mee, in full regalia and paint, began a weird song accompanied by the shaking of the split-stick or dapper rattle. Then the cocoon rattle was used and occasionally a whistle or flute decorated with feathers was blown. A part of the ceremony consisted of the rhythmic dance as the song continued. Feathers were shaken around the child's head and he was tickled on the neck and face. Near the end of the ceremony the head was rather roughly grased and kneaded for a number of seconds.

To the onlookers the most remarkable thing about the whole affair was the demeanor of the child. We all felt sure that the youngster would be frightened by the grim painted face of Le-mee and by the loud singing and stamping and shaking of musical instruments. But not so. The little fellow stood straight as an arrow, apparently fascinated by the whole performance. Never once during those eight or ten minutes did he take his eyes from Le-mee. We could see him blink when the feathers struck him in the face, but that was all. He seemed to exhibit much of the stoicism we have been accustomed to attribute to the Indians of earlier days. Perhaps it was a racial inheritance. At any rate he so acquitted himself through the entire ceremony which would certainly have been a most trying ordeal to the ordinary white child, that at its conclusion Le-mee simply said, "His name is Che-ne Me-che La-ma—Little Straight Tree."—B. A. THAXTER in *Yosemite Nature Notes,* September, 1933.

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INDIAN SUMMER

INDIAN summer? When is Indian summer? There is no date. It is when in the Harvest Moon the Great Spirit decrees a lazy man's holiday. The warmth is of summer, the breezes are of spring. The sun rises high in a cloudless sky. Maize is ready for the husking. Apples redden in the clearing. Acorns patter on the hillside. The walnut, hickory, butternut and beech are ripening their harvest for the squirrel.

The horizon is ever bluer. A haze, the smoke from the Peace Pipe of the Nations, hangs over the rim of the earth. Languor fills the veins. Man should have naught to do but to regard the wampum of the forest, the golden panoply of autumn. Oak, maple, gum and beech have donned their paint of festival. Thickets of alder, spice bush, buttonball, still harbor late-staying birds. The cicada and his brethren still cling to the delusion of this last fitful burst of summer. A bee hovers over the foreground of woodland asters, ironweed and goldenrod searching vainly for the perfume of summer.

The sun drops like a bolt in the late afternoon. The West is a brazen bowl. Now is there chattering of blackbirds and the honk of geese as they settle for the night. The sun hangs, a red disk, and is gone.

The wan moon mounts up. Now it is good to draw close to the fire. Is that the sound of a distant whip-poorwill, or is it but a memory? The night song of summer has changed. The voice of the cricket is fainter. There may be frost tonight.

Draw nearer to the fire. It is no longer summer. Soon there will be the death of all things that burst forth to make the spring. Another moon and all will be but sticks in the wind of winter.

Indian Summer? It is the last whisper of Manitou—his pledge to mankind of another spring.—*Cincinnati Enquirer.*

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THE LOGAN PASS INDIAN CEREMONY

FORTUNE has favored few white people to be witness to the pageantry, blazonry, and solemnity to certain significant events of aboriginal history, especially those of intertribal nature, such as peace pacts. Astride the Continental Divide which parts its waters through the tortuous course of the Columbia to the Pacific and through the Plains-bounded Saskatchewan to distant Hudson Bay and hemmed in by craggy mountains, rugged and forbidding as those in fantastic prints, and wildly in harmony with the aborigines who prowled through their fastness, representatives of the Peigan (Blackfeet), Salish (Flathead), and Kootenai tribes, inveterate enemies in days of the buffalo, congregated to seal a pact of peace and to celebrate the friendliness that has long existed between them. It was a day and an occasion already notable for several reasons: it honored the memory of the father of the National Park Service, Stephen T. Mather; it observed the first anniversary of the International Peace Fark; it marked the opening of the Going-to-the-Sun Highway.

When early in the year a ceremony to open the new highway was discussed, it had been suggested that a few Indians be assembled for color to smoke the peace pipe and to dance. The matter was presented before the Indian councils, where it took an astonishing turn. In the days when buffalo blackened the Great Plains with their numbers, the Blackfeet feared and hated, roved as masters of the headwaters of the Missouri. Back of protective mountain ruggedness dwelled the Flatheads, Kootenais, and other tribes that ever sallied forth on the expanse of plains to collect their share of meat and hides, and to wage incessant and desultory warfare against the Blackfeet. Not since 1868 had the pipe of peace passed between the head chiefs of the three tribes though the fires of hatred had long since been dulled and quenched by the passing of the buffalo and the ascendancy of a newer generation. Here was opportunity presented to assert the peace that had been lasting and to confirm the friendship that had grown with the years. The three tribes agreed among themselves, quite independent of Park or Indian Services, to smoke the pipe not in sham but in all the earnestness and sincerity of their departed ancestors.

Not even the dire misfortune of an accident to a truckload of Flatheads which snuffed out two lives could diminish the ardor with which the Indians entered upon what they considered their hereditary duty. To the Pass came ninety-year old Kustata, ancient chief of the Kootenais, and eighty-year old Duncan McDonald, respected councillor of the Flatheads. Present also were the dignitaries of the Blackfeet Nation; Birt Rattler, the judge, Two-Guns-White-Calf, he of buffalo-nickel fame and son of the last great chief of his people, the sage chief Bull, the graceful Turtle, the wise Black Weasel, the venerable Little Dog. More than a score of Flatheads, and over one hundred Blackfeet assembled on the eve of the great celebration.

The scene presented upon the Pass that evening was one of romantic grandeur. Silhouetted against a sky studded with stars were the black, serrate peaks with bright snow flecks glowing like phosphorescene in bizarre patches at random placement. On either side glowered unfathomable, inky abysses which are McDonald and St. Mary Valleys. Against the ebony of Pollock Mountain were marked two lines of the three dozen tipis, their bases hidden in Alpine fir, their tops glowing in the dull yellow light of interior camp fires. The wailing of a squaw whose husband had been killed in the accident, the groaning of another whose back had been wrenched in the same, and the sobbing of a babe were the only sounds interrupting the soothing soughing of the midnight breeze from the depths below.

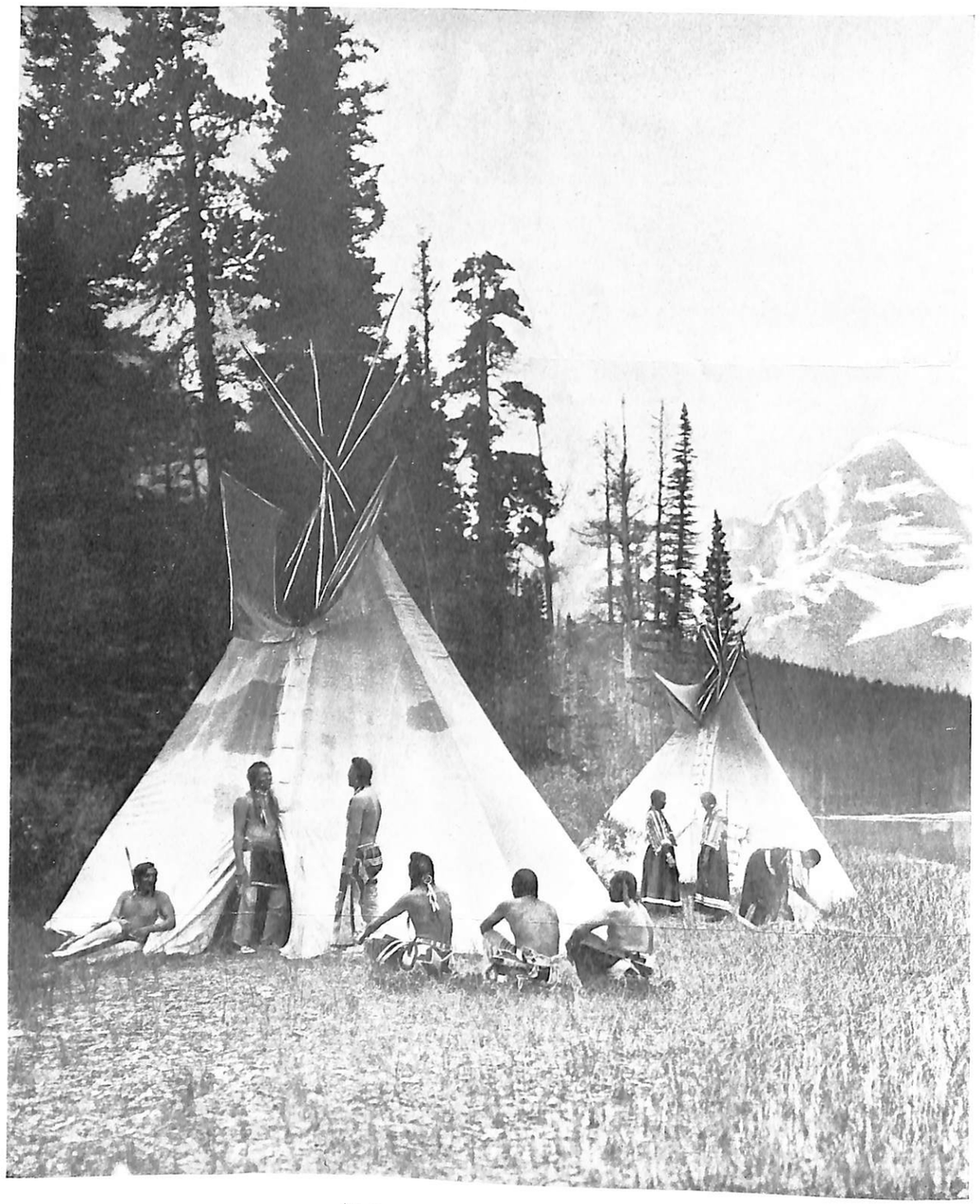
The Blackfeet were camped on a grassy swale higher on Pollock Mountain; the Kootenais on the northwest and the Flatheads on the southeast occupied a verdant spot nearer the highway. A thick hedge of Alpine fir separated the two camps which, as elsewhere on the Pass, were carpeted a golden yellow with glacier lilies. Pointed wands stuck in the ground between the two camps indicated that no peace had as yet been made between the tribes, and that communion between them was taboo. All of the lodges were colorfully painted; each was pitched with the entrance towards the east, after the general custom. Inside, they were plainly furnished with skins and primitive articles of comfort. The squaws busied themselves attending to strings of drying meat stretched across the centers of the lodges.

Earlist morning brought forth the camp heralds who passed to and from among the lodges booming in stentorian voice to assemble for general council, called by the park naturalist as master of ceremonies. Three interpreters were selected, Chief Bull for the Blackfeet, Pilkoo for the Flatheads, Hewankorn for the Kootenais. The bucks, grave and silent, assembled in a great arc, each with the rigid expressionlessness of a statue carved in wood, each with his own tribe, the Flatheads on the right, the Kootenais in the center, the Piegans on the left. As the naturalist spoke, each interpreter repeated to his tribe in his native tongue what was said, First, there was given a word of welcome and an expression of sympathy over the accident. A recapitulation of the aims and purposes of the Park Service and of the impending dedication followed. The relationship between Glacier National Park and its officers to the Indians was stressed. Lastly the story of the ceremony was repeated and felicitation expressed over its realization at such a time and place.

The Indians ejaculated approval in deep, guttural grunts and returned to their tipis to bedeck themselves in all the foppery of beads, furs, and feathers. They rubbed themselves with oil, and bestreaked their features with ochre and vermillion. Calmly awaiting the appointed hour, they smoked and laughed in small groups, still each with his own people, or tried out their horses on the flats. Youths, changed through contact with white schools, did not feel the tribal isolation of their parents; they intermingled for dashes, mock football scrimmages, or playing catch.

The great ceremony was preceded by a historical and explanatory prologue by the naturalist. Representatives of the three tribes, introduced themselves and their people in sign language which was interpreted to the assembled multitude.

Bedizened with fluttering feathers and bedaubed with paint, a mounted Blackfeet war party, with scouts in advance, approached the summit from the east and sighted a party of Flatheads and Kootenais in the west. The scouts advanced alone and placed on top of the Pass a bent stick decorated with eagle feathers, horse hair and tobacco to signify that the Blackfeet desired peace, that they wished to smoke the pipe together, and to exchange gifts and horses. Were the stick straight, pointed, and undecorated, war would be signified. Upon the retreat of the scouts, Flathead and Kootenais scouts approached to examine it and get its message, which they carried to their chieftains. The two parties slowly advanced towards each other, chanting their war songs which were echoed by squaws gathered on the adjacent slopes to watch the proceedings. The leading chiefs hailed each other and conversed together in signs; the braves dismounted and, kneeling, faced each other in two parallel lines and smoked the sacred pipe, passing it from right to left with great



An encampment of Blackfeet Indians

—Courtesy, *American Forests, the Magazine of the American Forestry Association.*

solemnity. An exchange of gifts and mounts followed. As a symbol that the three tribes were now at peace forever, and that a new route of communication had been opened between the lands of their ancestors, the Blackfeet passed over the highway into the territory of their former enemies; the Flatheads and Kootenais advanced into the land of the Blackfeet.

Upon returning to the Pass, the tribes held a great feast of celebration, beginning with the Grass Dance. The zest with which they threw themselves into these was well exemplified by one Flathead brave, stripped naked except for a cincture about his loins, a leather vest, and circular fan of chinese pheasant feathers dangling in the rear from his belt. His bare skin was painted bright yellow and streaked with red. He stamped and caricoled, whooped and simulated all the postures of actual fight with such frenzy and vigor that he would cast himself exhausted on the circle of benches that had been put around the dancing site to keep back the whites. Within a few minutes he would pull himself together again, tense and quivering with emotion, and would dash back among the weirdly gliding forms long before breath was again coming evenly and smoothly.

In council among themselves that evening, the three tribes decided that they had had a great and profitable time. They desired to meet on peaceful terms again next year with all of their former adversaries: Nez Perces, Crows, Sioux, Assiniboines, Gros Ventres, Snakes, Stonies, Crees, Sarcees, Kainah, Siksikas, Arapahoes, and Cheyennes. They would hold a great tribunal and the park naturalist should again be in charge of their ceremonies.—G. C. RUHLE, Park Naturalist, Glacial Drift Notes from Glacier National Park, August, 1933.

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A DAY IN THE WOODS

TO the bathing beaches and fun resorts, is the general cry of the city masses when the warm days of June approach. There are a few, however, to whom the partly clothed throng of noisemakers seems only a form of madness and they long for quiet and refreshness which apparently can be found only in nature. To these people just one day with nature in the deep woods is like visiting another world. It is full of new adventures which thrill the imagination and inspire new life. To spy upon the wildest strongholds of nature or stroll along commonly trod paths carries one far afield in the thought realms of creation.

Come with me this summer morning for a day's vacation in a New England woods and visit with the forest family, where its numerous members are both large and small as well as individualistic in their likes and dislikes. As we approach the margin of the woods, we are tempted to tarry and visit with the plants which shun the shade and the refreshing coolness of the forest canopy. These plants are known as the sun lovers and bow good morning to its first appearance. Among these sun worshipers are such flower friends as the large-leafed geranium, globe flower, tall buttercup, oyster flower and certain violets, as well as a multitude of plants whose blossoms will come forth in the middle or late summer.

Once within the borders of the forests we soon sight many plants that were adored in early April, when their beautiful blossoms were arrayed against the naked woodland glowing in the chilly winds blowing from the frenzied North. Now they are clothed in new or larger foliage tresses. The Hepatica have cast aside their winter leaves for new ones with long, shiny petioles, while the blood root, blue cohosh and wild ginger have all grown large leaves in order to absorb as much as possible of the diffused forest light, needed for the manufacture of their winter food. Even goldthread, without the delicate flower, looks surprisingly familiar growing near a soft mat of mosses with their high silk-hats. In certain areas of the woods, however, the trees stand thickly and the shade is so dense that these flowers cannot grow.

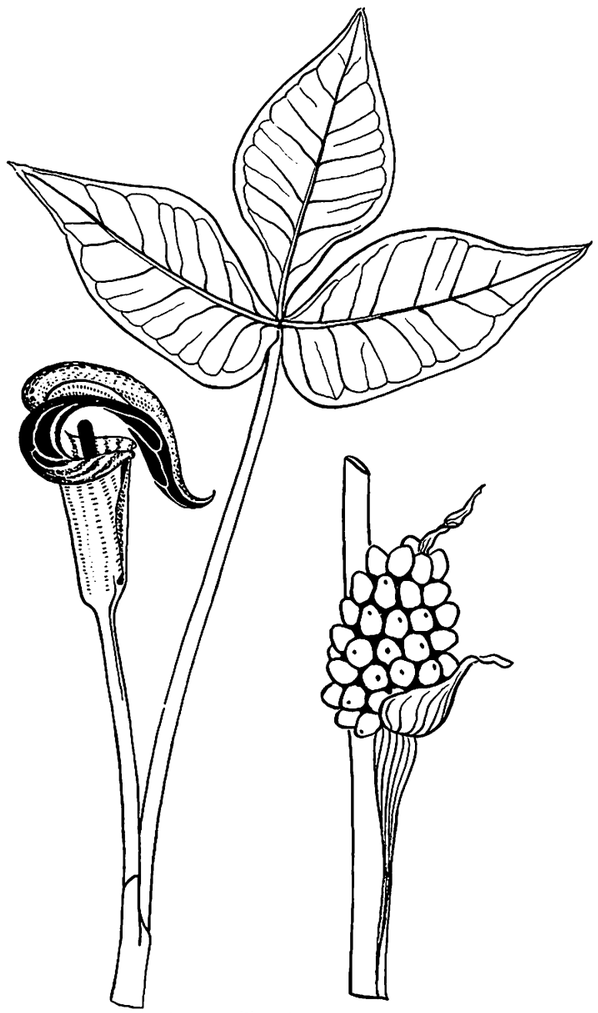
As we meander along, we wonder what role the little plants play among the forest trees other than blooming for the perpetuation of their kind, until our perplexing thoughts compel us to inquire of nature. By a hurried examination, we note that these plants have fibrous root systems which mingle with the large tap roots of the trees. This root assemblage aids in regulating the water supply of the soil and prevents erosion of the forest floor, a condition so devastating to our present forests and woods. Furthermore, each year they give their foliage to the forest floor to enrich the soil with organic matter which is nature's fertilizer. Where these little forest companions grow abundantly, there are no dust storms, no deep gullies, and like little animals and insects they play a mighty role in this world of giants.

Walking into the deeper parts of the woods where flowers and shrubs often grow in wild profusion, we see the Herb Robert geranium, which likes both the sun and the shade. The aristocrat, Jack-in-the-Pulpit, and the potentillas, are associated here with the three trilliums all dressed in different floral costumes with heads still bowed to the rising sun as in religious reverence. The first, *Trillium erectum,* has a red dress containing no pleasing odor; the second, *T. grandiflorium,* has a beautiful white gown highly scented; and the third, *T. undulatum,* has a white dress sprinkled with streaks of crimson and purple. The trilliums are interesting, not only for their beauty and charm, but because they are the only species of the lily family that wear green sepals as their going out cloaks. In the presence of so many beautiful flowers, one naturally thinks of the legends handed down from generation to generation among the Indians, that the blossoms of the woods are gifts from the Great Spirit. It now seems perfectly fitting that these native Americans should name their daughters from the flowers seen in the forest and these Indian maidens would later receive gifts of the particular flower from which they had been christened. But we must not tarry here too long in thought or even to enjoy the odoriferous perfume of the honeysuckle, a very popular shrub with the insect multitudes, for we must now enter the glen where the soil is moist and the grasses and sedges mingle in friendly relation.

In the glen we pause for a cool drink from the small meandering stream and even dare to eat a few succulent watercress plants which mildly bite our tongues to remind one that it belongs to the mustard family. To

our delight, we note here and there the forgetmenot, phlox and the lily of the valley and soon the place somehow seems sacred—sort of God's own flower garden where men should not trespass. Therefore, we walk on with the thought in mind that man should never disturb such a natural setting.

Our path now leads to the rocky slope of the steep ledge ahead and as we ascend toward the summit, we note glacial marks on the rocks which tell us a huge ice mass once passed over the region. In a small valley lying to our right, we note a bog in a deep little basin which is a remnant of glacial action. Flowers growing on and among the rocks now catch our fancy and we no longer live in the glacial period. First we observe the tiny lichens, the boldest of all pioneer plants, which challenge all sorts of climates in their onward march into unoccupied lands. Bold but not as aggressive in their adventures as the lichens and mosses are certain members of the Saxifragaceal family known as the rock breakers. They are here also and look charming with their long flowering stocks and leaf clusters arising from their root crowns. Bishop's cap is a real dignitary and by its side the foam flower appears too inviting with its small, pure white blossoms to leave unnoticed, and we must at least examine its heart-shaped leaves. Its neighbor in shady areas is often the lovely columbine, a member of the buttercup family. We stand in amazement as we note how the walking fern is slowly but surely advancing along the ledges and we wonder how the rock fern can grow in such steep and treacherous places.



From "Studies of a Plant Lover, by Elizabeth W. Perry (By permission)

Jack in the Pulpit

In the fall we find the bright red seeds which have developed from the pistillate flowers we left in the woods last spring.

For a moment we are tempted to sit upon the warm rocks and dream of what has happened creatively in the past, but why should we stop when below we see the bog which speaks of the primitive past in terms of living plants. And the lure to find something new and different urges us on and we feel for the first time the adventurous spirit of the naturalist to seek out something strangely new.

On entering the small bog we feel as though we were in an amphitheatre where evolution is in progress. In the center of the bog is a small lake that is fast yielding and shrinking before a type of vegetation which has practically conquered the primitive area. Cattails and sedges actually grow with their feet in the water and as we walk to the high areas surrounding the bog, we pass through a zone of small leather-leafed shrubs. Among these are bog-rosemary, sheep laurel, leatherleaf, Labrador tea and low growing cranberries rooted in the damp soft sphagnum moss. As we tread over this sphagnum carpet, we remember from our botany course that this remarkable moss has unusual absorptive and storage powers because of its special water-reservoir cells. An inspection of the carpet reveals that these little plants are not only "wringing wet" but cold to the touch and now we understand why bogs are called nature's refrigerators.

In the next zone we meet the Tamarack, an unusually polite gentleman. He bows a greeting as his top is forced down when one steps upon its outstretched roots superficially anchored in a foundation of sphagnum moss. It is here we also see the sundew and the pitcher plant, the carnivores or murderers of insect life. Aside from these plants, the bog outdoes itself not only in the presentation of crafty plants but also in the introduction of rare beauty in its orchids. The sight of the moccasin flower mingling with its fringed relatives stirs poetic reactions that were once crystallized into words when the poet wrote, after examining a flower: "Flowers are the most wonderful things God ever made and forgot to put a soul into".

As we homeward leave the bog with its primitiveness and witchery, there comes the desire to preach the gospel of wild life preservation that all may have the opportunity to visit the woods and learn about nature's secrets.
—VERNON A. YOUNG, Syracuse, N. Y.

AUTUMN COLORS

ONE of the most delightful signs of autumn in Yosemite is the fine colorations of the leaves of our deciduous trees, especially dogwood, aspen and oaks. Visitors come from afar to view and photograph nature's great floral display ranging from brilliant yellows to reds and from deep crimson to browns. Many people admire these color tints, but few pause to consider the marvelous change that takes place to give them their striking autumnal robes.

Frost is commonly believed to be the cause of leaves coloring and falling. The truth is, that while frost plays a part in determining the fall of the leaf and hastens this process, there are other factors mainly in the tree itself, that bring it about.

The leaf has been an important factor in manufacturing food all during the summer. If the leaves were to fall at this time there would be a considerable loss and wasting of those valuable substances produced in the leaves. This is provided for by the fact that before the period arrives when the leaf is to fall practically everything which is of value for the nutrition of the tree has been gradually transferred to other parts of the tree. The result is that the leaf which is left is little more than a skeleton whose cells contain various pigments which are of no further use to the tree. It is these pigments that color the leaves during autumn.

So with the coming of autumn we see nature preparing for a well earned rest. Our migratory birds are bidding us good-bye; bears and other hibernating animals are saying good night, and our autumn leaves are saying farewell in a blazing sunset color that makes this season a favorite for many visitors to Yosemite.—E. M. BEATTY in *Yosemite Nature Notes,* December, 1933.

DOWNY GENTIANS

(*Gentiana puberula*)

Beside the heart of the blue gentians let my heart,
With the dear prayer of the blue gentians let my prayer,
In the blue of the blue gentians let my soul
Partake of Thee.

—HARRIET STRONG, Downers Grove, Illniois.

NOVEMBER DAY IN HAZEL VALLEY

A BALMY autumn day, soft mist veiling the russet hillsides, golden sunshine—at last we are off for a day in Hazel Valley. We leave the main highway and turn east into a narrow unpaved sideroad, on either side of which rise flaming hillsides, a winding road and a winding creek occupy the narrow valley floor. We edge past an occasional jolt wagon in which ride a mountaineer and his family. Upon the mother's lap is held a box which we suppose contains precious eggs for the market—over how many miles of ruts has this box been coddled so that its cargo will reach its destination safely—there to bring perhaps ten cents or less a dozen. Children are on their way to school, a little one room schoolhouse in the wilderness. We pass the mail man in his Ford and know that we shall leave him far behind us while he chats with his neighbors and friends enroute. Our road takes us up a gradual hill, the northfacing slopes are tumbles of lichen-and moss-covered rocks which shelter delicate ferns, then we come to russet oak hickory forests and finally the road occupies the narrow crest of a ridge; flaming valley to north and south—to the right the road goes to Sunset, we turn left toward Hazel Valley.

Our road now is little more than a lane arched by flame colored trees. We ford a creek then follow it; witch hazel beginning to blossom, brushes the sides of the car; we pass through alder thickets. We stop the car to get out and admire smilax, climbing over two saplings, bearing loose clusters of brilliant red berries —some clusters almost a foot long, hanging among luxuriant green leaves. Before many days the bright red berries will ripen and loose their brilliance. We linger to listen to the gurgle of the creek and admire its tools of erosion sparkling in the sunshine.

The alders at the streamside are still a rich green, they have already prepared for spring, the staminate catkins seem fully formed ready to burst open as soon as winter is over. Close by is a lichen-covered stone wall—how many, many hours of hard toil had been expended in its construction—what a futile task to remove rocks from such a field—but what charm such walls lend to the roadside.

Ahead is a dogwood thicket, surely this piece of woods cannot be more lovely with its spring garlands, reds could be no richer nor more brilliant than those of the dogwood leaves in autumn. Not just a few trees but masses of red dogwood trees in a setting of gold hickories.

Down the stream a way we find *Rhamnus caroliniana* in fruit. The very dullness of the purple black drupes make them conspicuous in the midst of the gray coloring of its neighbors. Nearby is a thicket of sweet gum —with almost a rainbow of autumn leaves—green, yellow, orange, red, purple, purple black. We try to decide which particular foliage is loveliest and conclude that not one particular plant can be placed above all others but rather each plant contributes its own part toward the fall symphony of color.

We find a few straggling flowers; the dainty flowers of clammy Cuphea are like jewels along the roadside. Here and there a stray purple aster is still in bloom; golden rods are conspicuous in their silvery plumes.

The canadian or fragrant sumac (*Rhus canadensis*) is at its loveliest; its bright clear red leaves dancing in the sunshine. It is hoped that the great resemblance of the foliage of the cousins *Rhus toxicodendron* and *Rhus canadensis* will save the latter from extermination so that it may always contribute to our color symphony.

On our homeward journey we pass many piles of white oak logs waiting to be made into barrel staves. We hear that the woodmen are rejoicing over their present prosperity—they have had many very lean years. May they be wise woodmen so that Hazel Valley will become not just a memory but a joy forever.—S. G. S.

TO THE RESCUE

God never makes a mistake
But creates each thing for some purpose.
Our intellects feel this a challenge
To discover meanings and see
Just why each object was put here—
For what its creation intended.
Our conclusions must bring satisfaction,
Our fiats be faultless and true,
Ere we dare to pronounce a thing worthless,
Or to cast it aside or destroy.

Of such is the wildflower legion—
So lovely, so fragile and rare.
Showing indescribable beauty,
Additional service they render
In binding of soils together,
And thereby preventing erosion
That menace to Man's survival,
Through threatening famine and cold.

Through counless ages they flourished,
Richly attractive they grew,
But today stand in need of protection
From ruthless and grasping hands.

Thoughtless indeed is the oaf
Who carelessly culls to destruction
A heritage, priceless and free,
So generously spread for his pleasure.
And naught but a vandal's the brute
Who selfishly gathers to kill,
Uncaring that others should share
This legacy left to the race.

A tree can be felled in an hour,
Which used fifty long years in the growing.
Come, friends! To their rescue with me!
Let us block this extermination
Of creatures so useful and free,
So richly adorning our landscapes.
We'll preserve so that all may enjoy
What we shall leave unmolested.

—CLARA DEGMAN HOOK, Cincinnati, Ohio.

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FORESTRY IN FLOOD PREVENTION

AMERICA'S pioneers found a country far different from that which we now know. Indians had made but little use of agricultural possibilities. There was an abundance of wildlife, huge virgin forests, herbaceous and shrubby vegetation was profuse. Mountain streams ran clear and were filled with trout. Even the desert supported good stands of perennial grasses. Nature was employing every trick in her bag to promote absorption and infiltration of the rains and melting snows. Run-off was retarded by trees, shrubs, and grasses aided by fallen twigs and leaves and other forest litter. Absorption was increased by a blanket of humus. Areas of low altitude became marshes and swamps. Pockets and depressions in the mountain areas that developed into ponds and lakes were natural reservoirs.

But the greatest reservoir of all was underground. The flow of water through the soil to the sea was checked by all these agencies. When the spring rains and melting snows came their run-off was slowed down and reduced. The normal flow of streams during dry seasons was sustained by seepage from porous soils and shaded springs that did not dry up.

Now conditions have changed. Man has disturbed and disrupted nature's balance. And by and large the processes of denudation of timber lands and grazing grounds, the stripping of steep slopes and soils unfit for cultivation, still goes on.

Scientific investigations in the last decade or so have built up an increasing mass of evidence as to the precise influence that the destruction of forest cover has on the run-off of waters. But as convincing as anything I can recall is the homely testimony of a Southern mountaineer who has spent his life near a stream in the Blue Ridge Mountains of North Carolina, on the Southern Appalachian watershed. A beautiful stream flows by the cabin that has been his life-long home. Forty years ago, he said, that stream ran clear and was filled with fish. Then in the 90's a lumber company went up in the mountains and began cutting. Repeated fires took what little the loggers left, and in a few years the timber on the watershed was gone. The stream became muddy. In the spring he had to move out on account of floods. The bridge in front of his cabin was washed away every other year or so.

Twenty-five years ago the Government bought the cut-over land in that watershed and made it a part of a Natural Forest. With continued protection, the trees gradually came in again; forest litter increased. Soon the improvement in that watershed became evident. The stream no longer overflowed its banks with every spring freshet. Since 1920 the bridge has not gone out. Now the stream runs clear again, as it did in his father's time. When spring arrives, he no longer has to move out. Forest destruction brought frequent and recurring floods in that stream. Forest restoration on the watershed has checked them.

Knowledge of this relationship between forests and floods is not new. It was investigated in Germany, for example, more than 50 years ago. After disastrous floods on the Rhine and its tributaries in 1882-3, a governmental commission was appointed to go into the whole matter. A significant conclusion of the thorough investigation was that forest cover is a prime factor in retarding surface run-off; that the binding effect on the soil by forest and vegetative cover was of great importance hydrographically.

There is, however, no need to go so far afield as Germany for evidence of these things. In the Ohio Valley one inch of forest soil absorbs water 50 times as fast as field soil. In New England, litter from a mixed spruce-hardwood forest absorbs moisture up to 9 times its dry weight. Tops of virgin ponderosa pine in Idaho have intercepted 27% of the annual snowfall, while in Maine, a good pulpwood stand of spruce and fir intercepts 37% of the rainfall. Even thin litter, such as that from chapparel and conifer in light rainfall in California, will absorb 1.8 times its weight in water.

In November 1933 a fire broke out in California's Sierra Nevada Mountains. This particular fire was in

Pickens Canyon, above La Crescenta, not far from Los Angeles. Before being controlled it had gutted some 5,000 acres of steep mountain slopes, most of which had previously been covered with a luxuriant growth of brush. Not far away was the well vegetated San Dimas watershed, within which the Forest Service was conducting intensive erosion stream flow research. About a month after the fire a 12 inch downpour fell on both watersheds alike. From the burned Pickens Canyon came a flood which caused the loss of 200 homes and 34 lives. From San Dimas Canyon there was no flood. The maximum measured run-off rate was 20 times greater, and erosion was 1,000 times greater, from the burned over than from the well vegetated watershed.

Much of the damage in these two specific cases was done by boulders and large debris. Silt also presents a serious problem. It often forms a basis of agricultural wealth, it is true, but it also destroys this wealth. California's Imperial Valley is an example in point. It was formed by silt, but experts estimate that silt now brought down by the flooded Colorado requires an average annual expense of $2.00 per acre from Imperial Valley farmers who are forced each year to clear their irrigation channels and build up their levees. Nine percent of the reservoir capacity of the Elephant Butte dam in New Mexico is said to have been captured by erosion debris within 9 years after its completion. In 22 years the Zuni Reservoir in New Mexico has filled with erosion to over 70% of its capacity. Reservoir and other irrigation works of the Boise River in Idaho are now being heavily silted despite costly efforts to keep such accumulations down.

Foresters do not claim that forests and other vegetative cover can prevent all floods, or hold all silt at its source. All nature, undisturbed, has never done this. But with adequate cover on watersheds, floods are less frequent and have a lower crest than when nature's balance has been disturbed by man's ruthless hand. And the amount of water in streams is greater during dry seasons than it otherwise might be. This is forcibly illustrated on the Clearwater River in Idaho. Following a great fire of 1919, the average date of the spring peak flow from this river was advanced 14 days. It was 9.5% greater than before the fire. And the summer flow was 32% less. Here is a factor which is of vital significance to irrigationists whose need is for water in the summer months.

Forestry's aim is to apply and then maintain nature's own method of watershed protection. To a forester, a watershed is not a simple drainage basin that collects and delivers the precipitation which falls on it. It is, rather, a productive area full of life; complex and ever-changing. Precipitation is a basis for tree, herb, and other vegetative growth which helps bind the soil yet allows the moisture to percolate into and through it for orderly release to industry and agriculture below.—F. A. SILOX, *Chief of the Forest Service*, U. S. D. A.

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WHITE LIATRIS

IT was a beautiful September day, and we were driving in the country. The goldenrod and asters were in full bloom along the roadsides. At our right was the highest hill in the county and we left the car to climb to its summit. The top of the hill was flat, containing about ten acres, all covered with tall spikes of our native Liatris in full bloom. Gay Feather—blazing star are other names for this flower. The pioneers used to call it "Rattlesnake Master," believing that the root of the plant possessed properties that would cure the bite of a rattlesnake. The flowers are magneta-purple and the buds begin opening at the top of the spike. I pulled one plant that had 120 buds and florets. These florets have a fluffy disheveled appearance as the purple rays emerge in all directions.

As I stood looking at the mass of purple, I noticed something glistening white, and there among the thousands of purple—was one white Liatris. It was a beautiful specimen—with nearly a hundred florets—all snow white.

The Liatris likes a sandy soil and a well drained locaiton. It is worthy of a place in your back border.—LILLESAND E. LEANDER, *Wisconsin Horticulture*, November, 1933.

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ONE WAY TO HELP

THE Muhlenberg Botanical Club of Lancaster County, Pennsylvania, is contributing toward the preservation of a colony of Trilliums by paying a watchman to guard the colony on Sundays and holidays. He distributes to the visitors a handbill which reads as follows:

ENJOY, BUT DO NOT DESTROY, THE TRILLIUMS

This colony of *Trillium grandiflorum* is the only one in Lancaster County. Years ago the colony extended from Peach Bottom, along the river front, to Haines and some distance beyond. People who remember it tell of the countless thousands of the lovely flowers to be seen from the train in this area. Probably, if any one thought about it at all, they seemed as impossible of extermination as the passenger pigeon or the buffalo. When the railroad grade was changed most of the Trilliums along the river front were destroyed, with the exception of a scattered few extending a short distance below what is now called old Haines Station. The main colony now consists of these in the ravine extending back from the river at this point. It is these plants, reduced in numbers from countless thousands to a mere remnant that we want to save.

Every year at blooming time hordes of people descended on this colony. Doubtlessly, most of these imagined themselves to be nature lovers. They "loved" flowers so much that they were impelled to pick great bunches of them, many of which were discarded, hopelessly wilted, before they had left the ravine. What they did not understand was that true lovers of anything seek to preserve and cherish the object of their affections, not to despoil it. Most of us are so like children; we reach out eager hands for some frail bit of loveliness, only to find it ruined in our grasp. We learn, slowly, that if we take it home in our hearts it can be ours forever.

We build great art galleries where man's masterpieces are guarded with the most jealous care. Nature's masterpieces, bits of loveliness that the greatest human genius cannot create, we frequently carelessly destroy.

Besides the inroads made by so-called nature lovers, the Trilliums have been dug up in large quantities in

the past by persons who sold them. They have been dug up in smaller quantities by persons who wish to grow them in their gardens. They make a beautiful garden plant and grow readily if planted in woods ground in a somewhat shaded situation. However, there will be none left at Haines if people continue to supply their gardens from this source. They should be bought for this purpose from dealers in regions where the plants are much more plentiful. The Wild Flower Preservation Society, Inc., Washington, D. C., publishes lists of dealers. The plants may also be grown from seed.

For all these reasons the Trilliums at Haines have diminished from countless thousands to a mere remnant. Last year a ground fire swept over the area when they were just coming into bloom, apparently destroying many of the remaining plants. It will be interesting to see this season what proportion of these, if any, have survived.

The land on which the Trilliums grow is owned by the Philadelphia Electric Co. and the Mary Mercur Eshleman Estate. The Philadelphia Electric Co. land is leased to the Muhlenberg Botanical Club of Lancaster County annually for the purpose of protecting these plants. The Eshleman Estate also gives us the privilege of protecting them in any way we may see fit.

Some persons confuse these plants with the Painted Trillium, because the flowers turn pink with age. The Painted Trillium, however, is a very different plant and does not grow, in the wild state, in Lancaster Co. It is a more northern plant that likes cold mountain ravines. Some may be found in Lebanon County, but they are more plentiful in the Poconos and in other parts of northern Pennsylvania.

The *Trillium erectum,* the greenish white one that also is sometimes colored lavender to reddish purple, is found in various parts of the county. They are much more plentiful than *Trillium grandiflorum.* They do not turn pink as they age and the purple flowered ones are apt to be ill-scented. We also have the Nodding Trillium in various places. It is the least showy of all.

The Muhlenberg Botanical Club of Lancaster County asks everyone to help preserve these flowers. We want your cooperation, not your ill will. We feel sure that when you understand the situation you will join with us in protecting them.—MRS. CHARLES Y. TANGER, Cor. Sec., Muhlenberg Botanical Club, Lancaster, Pa.

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THE MESSAGE OF THE OAKS

IN these times of world unrest and concomitant strivings to change the existing order, one often wonders what the silent sages of ancient woods who have witnessed humanity's struggle through the centuries would say if they could speak. M. Jagerschmidt, an eminent forester of France, has interpreted this message from the veteran oaks of a forest that has known two centuries of skillful management.

"If the old oaks of the *Foret de Blois,* wrapped in silence and meditation, could speak to us, this is what they would say:

" 'Respect the past. Respect traditions. If you change in some part the methods followed by your predecessors, do not destroy anything good, conserve with care the heritage which the fathers have left you. Strive to transmit this heritage to your successors, not merely intact, but more beautiful and more rich. Let each one help his fellows. If we have trunks that are both straight and tall, it is because we have each profited by the reaching out of all toward the sunlight.

" 'Practice the spirit of moderation, order, and balance. This spirit animated the foresters who have given us their care through two centuries—it is the old French spirit.

" 'Practice the spirit of discernment and simplicity, of intellectual humility. You are but a link in the chain connecting the past with the future. Look far into the past, far into the future, and you will better support the trials of the present.

" 'Work for that future and do not worry about the outcome. Let God be your guide!' "—Editorial, *American Forests,* October, 1934.

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MEETINGS are held monthly from October to May, the hour and place of meeting and the program provided being fixed by the Executive Board.

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A SIMPLE PROBLEM FOR YOU TO SOLVE

Love of Natural Beauty + Knowledge × Wild Flowers = Preservation of Wild Life for all to enjoy!

Love of Natural Beauty − Knowledge ÷ Selfishness and thoughtlessness = Destruction and loss of Wild Flowers.—ILLINOIS CHAPTER W. F. P. S.