

THE OAK FAMILY IN FORESTRY

BY
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EXCEPT for purely commercial forestry, I am sure our people would not want our forests to be like those I saw this year during an extensive trip over the German forests, where only three out of over two hundred forests were by natural reproduction, all the rest being planted. For the lumberman these forests, located right handy to good transportation and continually producing an annual yield, would be ideal. For the trees grow so straight that everything from the three-inch thinnings up to the sixteen-inch full-grown trees are marketable at profitable rates and have their use in the economy of the national life of Germany. The trees reach sixteen-inch diameter in sixty-year revolutions, are protected from fire along the railroad right-of-way by fire borders and have but little fire risk and no patrol expenses, as something is always going on in nearly all the sections so that there are plenty of woodsmen about to head off incipient fires. When we get a sane system of state forest taxation taxing only the value of the yearly thinnings and the final forest crop, such forestry will become an established commercial enterprise with us, whereas our present system of taxing annually the entire value of the stand is most unjust and one of the biggest hindrances to the introduction of commercial forestry in place of our present speculative lumbering.

The Prussians have worked out commercial forestry to a mathematical science. They know to a dot just how long a given forest of larch, or sylvester pine, will take to reach maturity, just how much thinning is best and when to do it, just the right age and soil for the plantations, every known disease of the tree and its remedy, and just where to market every splinter of it at maximum profit. And their government encourages them with compulsory fire protection from the railroads and just tax laws. The same system prevails with the spruce and fir of Saxony and the hardwoods of Hesse and Westphalia, so that they make from \$6.50 an acre per year in the spruce forests of Prussia, and the annual yield from but thirty-five million acres of forest is four and one-half billion board feet! But we are far from any such exact knowledge of our tree species as this, and we have over a hundred species where they use but seven. And it is a well-known fact that many of our experiments in clear cutting and planting have so far failed. After ten or twelve successive generations of foresters have studied out our best species for pure stand raising and we have, as it were, grown up with our forests and know them as do the older nations, this system will be applicable on a large scale with us. It is being applied now to a certain extent with white pine, as witness the numerous successful, though young, stands of white pine in New England. The total area of planted forest with us is now about 1,100,000 acres. The total land that would yield best on planted forests is more than 25,000,000 acres.

The French system of *forêt régulière*, or standard forest, is the more likely one for us to use, or rather to grow into, for we are in for at least fifty years of selective forestry before any extensive use of standard forest can be introduced. In the French system three cuts are necessary when the forest reaches maturity: The seeding cut is first made, letting in sun on the forest floor, and varying in amount widely, depending upon the species of the tree. The next fall of seeds from the seeding trees results in a dense floor of young shoots, for the sun's warmth is present to germinate and to feed the young trees with sunlight. Then follows the secondary cut, when the trees have reached the age of five years and are tough enough to allow cutting operations without too many of them being killed. This cut takes nearly all the thickets from wind, frost and drought. The terminal cut follows when the young trees reach about ten years of age, and takes the last of the old stand. First thinning begins five years later and continues every ten years until the main stand reaches maturity. The thinning cuts are worth about one-third the value of the final crop. This little outline will give an idea of how much knowledge and judgment is demanded of the forester. Unless he knows exactly what he is doing, the method is dangerous and apt to result in failure of the reproduction, requiring extensive replanting. In France successive generations of foresters have worked it out to a science for the eight species of trees that are used in their forestry operations. We will accumulate this experience for our own species in time.

But the kind of forestry which we can begin to practice right now, both in woodlots and in

small private tracts, is a combination of the French system with ordinary selective forestry, that is, taking out ripe trees here and there as they mature. If you have a fair sprinkling of good oaks on your woodlot, there is no reason why you should not encourage them a little by giving them a chance to extend. If you have a tract of barren land hardly worth pasturing and for which the tax man has no terrors for you, there is no reason why you should not set it out in white pine, or sylvester pine, or whatever species your state forester specifies as suitable for the soil and climate. Keep cattle and running fires out of the woodlot, plant out your spare acorns every chance you get, use up the weed trees for cordwood, and take out worthless trees wherever they are crowding the young oaks, and you will soon be in a fair way to own a valuable oak stand. The same is true of small forest tracts of a few hundred acres, the ideal sportsman's retreat. You can practice an immense amount of culture forestry during your hunts and camps and wanderings about your tract. Here and there will be predominating areas of valuable species which only need a little encouragement to take up the whole land. You are always using firewood out of the tract. Make that firewood pay by planting the room each tree leaves with a half-dozen oak or pine seeds, or better, keep a little nursery of white pines and white oaks and draw from it as you take out worthless stuff. A white pine twelve years old is a very respectable little specimen twenty feet high and three inches across the butt. In six years it is higher than your head, and wants at least twenty square feet of room, so, before you know it, what was once a clump of soft maples and white birches is now a thicket of thrifty young pines. As regards the oaks, a sharp stick and your heel is all they need to put the acorn down two inches into the mulch. There ought to be one seedling every ten paces, with a reasonable chance at the sun, all over that part of your forest where oaks are wont to grow.

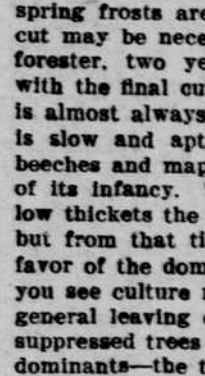
As the oaks are the most important family of the hardwoods, and one in which every sportsman is interested, I will just run over in review the most widely distributed members of the family in our country. We are blessed with many species, suitable to all kinds of soils and climates. At the head of the family stands the white oak, *quercus alba*, the noblest tree in our forests. You will know him by the familiar deeply notched leaf with nine regular lobes disposed four on a side with one at the end. Along in October it turns a fine copper color and then brown, hanging on all winter, so that, when snow is on the ground, if you see a patch of brown foliage amid the bare tree trunks, it's either a white oak or a beech. Look under the tree in early October or late September and find the long oval acorn, brown and light yellow. They grow usually in pairs with a rough knobby cup, not scaled, bowl shaped. The bark is light gray, somewhat rough, and young trees have many little tufts of twigs up and down the trunk, which will develop into side branches if the least sun gets down to them. The wood is strong and fine—no comparison with such a brash specimen as the red oak. Just try the two with a plane and saw, and report on the difference in working. None but sharp-edged tools need apply with white oak in forestry: the white oak, that is, its equivalent *quercus robur* is grown, pure, in big for-

ests in Europe. Seeding cut spher, giving a quite shady forest floor with not very many trees removed, and be careful to do it evenly so that no very open spaces are left. Scratching up the humus with the three tined forest rake to allow the acorns to find plenty of crevices to drop into is imperative just before the fall of the acorns. Seeding should be completed in one fall of seeds. When sure that the reproduction has been acquired, proceed with the secondary cut, taking but one tree in two to three, more or less, depending upon whether spring frosts are to be feared. A secondary cut may be necessary in the judgment of the forester, two years later, before proceeding with the final cut. Clearance of the seedlings is almost always necessary, as the young oak is slow and apt to be beaten out by young beeches and maples during the first few years of its infancy. Thinning: Up to the age of low thickets the stand can be left very dense, but from that time on proceed drastically in favor of the dominant trees, intervening when you see culture necessary to aid them, and in general leaving enough of the dominated and suppressed trees to protect the trunks of your dominants—the trees of the future. Return in ten years, or earlier if conditions are favorable, and take out all dead and dominated trees, and all of the dominants that are getting crooked or being left behind, the rule being to keep the tops of your best trees always with a little space to meet in, which space is filled with second stage dominated trees. Leave in the beech sub-growth and any other tolerant trees which add leaf-fall to the humus. The trees will reach eight inches diameter in thirty years and you will thin about one hundred per acre every trip. From that time on they add a great deal more to their volume every year, since they grow a new ring all around the trunk, which by this time is over two feet in circumference. Of course, as you will start with a forest with some grown trees and it, you will arrange it so as to always have some mature cutting to do, as well as thinning cuts in all other sections. The management of a forest is always a paying proposition, so long as you choose to keep at it, and while you will never see the final crops out of the sections that you regenerated, you have had a good deal of business out of the old forest and the thinning cuts of the new, and your forest or woodlot has increased in value, not deteriorated, under your hands.

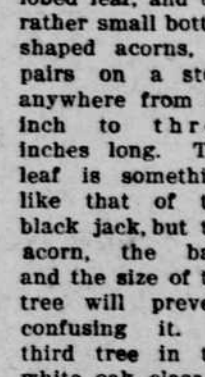
Closely allied to the white oak and sold with it, is the Swamp White Oak, *quercus bicolor*, good for your wet soils and creek bottoms. Know it by the heavy-ended, slightly lobed leaf, and the rather small bottle-shaped acorns, in pairs on a stem anywhere from an inch to three inches long. The leaf is something like that of the black jack, but the acorn, the bark and the size of the tree will prevent confusing it. A third tree in the white oak class is the Burr Oak, but with harder and tougher wood. It is also called the over-cup oak, technical name *quercus macrocarpa*. Leaf has a big lobed head with two very deep notches about half-way down. Bark of twigs always has corky wings, and the acorn is very large with scaly, fringed cup. This tree grows across the whole United States to Montana, as far south as the latitude of New York City, parallel 40 degrees. All these white oaks will grow sylviculturally under the same treat-



White Oak.



Swamp White Oak.



Burr Oak.

ment, and all seed annually. The flowers are miserable little catkins of green, pin-headed flowerets, in clusters of four or five catkins on a shoot. No forest would be complete without a few specimens of the chestnut-oak family. If you pick up a leaf with scalloped edges and find a big acorn with long oval nut, over an inch long, with fine, scaly cup, that's a *q. prinus*, the Chestnut oak. It has very strong, hard wood, durable in soil and water, used for fencing and railroad ties. Bark is fine for tanning operations and it grows well as simple or standard coppice, as described in my previous series on European Forestry. Another form of chestnut oak is known as Yellow oak, with a leaf startlingly like the chestnut itself, but the acorn gives it away. The illustration shows a representative leaf. Both the chestnut oak are annual seeders and their value in forestry is best in the shape of tan-bark coppice. A widely distributed and interesting oak, but of no value in forestry is the Black Jack. You will know it at sight by the blunt-ended leaf with three lobes, rough black bark (smooth higher up the tree) and small stemless acorn with scaly cup. As a woodsman, put it down in your memory against the time you want a very hard wood. Otherwise leave it severely alone, except to clean it out as a forest weed. It belongs to the bristle-tipped and pointed-leaved families of oaks, of which the red oak is the representative and most valuable species. Seeding is biennial. Sylvicultural treatment of red oak about the same as white oak, except that the seeding cut must be a trifle more open. The red oak is claimed to be a faster grower than the white and it certainly overtops it and crowds it out in direct competition. I am of the opinion, however, that if the white oak is given an equal amount of sunlight it will give a crop of mature trees within ten years of the corresponding plantation of red oak. From the carpenter's point of view there is no comparison between it and the white oak, nor is there when it comes to market value as the white commands nearly double the figure. Personally I find red oak much easier to work, rather brash, and nowhere near so strong as the white. It is a hardy, aggressive grower in the forest, and you will know it by its large, dark-green, shiny, pointed, lobed leaves and its big blunt acorn with the flat saucerlike cup. This acorn is the distinguishing feature, as the black oak has a very similar leaf but its acorn is half enclosed in a green, scaly cup. The red oak has the smoothest bark of any of them, nearly black, greenish tinged on the north side. Leaves turn a deep red, late in October. Now that white oak is getting so high priced the red is used a great deal in interior house trim. It will grow on dry soils, which fact often decides its choice as the forest species when choosing between it and white oak. Its cousin the black oak, and the scarlet oak, *q. cocinea*, are so like it in leaf that all that can be said is that the leaf is more deeply notched and heavier-veined. You must look to the acorn to be sure. Both scarlet and black have a deep-cupped, scaly acorn, and the inner bark of the black oak is orange-yellow, making a fine dye, used in medicine as quercitron and in the industries for tanning. Wood sells as "red oak." The scarlet oak is a much smaller tree, growing best in plenty of sunlight; inner bark reddish, kernel of the acorn is white while that of the black oak is yellow. Both of them have gorgeous orange and scarlet foliage in October, and are useful for ornamental trees. All through our moist ravines and creek bottoms you will find a tall slender oak, growing in natural pure stands, with a notched, peaky leaf like the red and black oaks. But under the tree you are sure to find abundant small round acorns with shallow cups, almost smooth. The little acorns are half an inch long and very pretty, sometimes with delicate light stripes running longitudinally. This tree is the Pink Oak or water oak, *q. palustris*. Wood is coarse and not durable; sells as "second" red oak. Pin oak, beech and black gum are, however, the three toughest woods in the forest. Sylviculturally the tree has no value; when you take one out replace it with a swamp white oak. The name pin oak comes from its value for tree nails for house building. Two more oaks that have their own peculiarities are the Willow Oak, *q. phellos*, with tiny scale-cupped acorns and long willow-like leaves, and the Shingle Oak, with perfectly smooth magnolia-like leaves, smooth bark and small shallow-cupped acorns. Both of these woods split easily, and the willow oak is tough and pliable enough when none better can be had for the purpose. In conclusion, I would mention the Post Oak of the Southwest, the "white" oak of that section, deeply lobed (seven); strong wood; small, sweet acorn, scale-cupped.

leather basket labeled with the tenor of the epistle. Thus invitations to undertake public functions of one description or another go into one basket, charitable appeals into another, the official report of the proceedings of the two houses of parliament into a smaller basket, letters of a personal character into a fourth, and so on. At the finish there is a small but highly important little pile left. This is composed of letters from the rulers of other states, personal reports from our ambassadors abroad or communications from ministers at home. These never for one instant leave the custody of whoever is entrusted with the task of opening them. There is a special box standing on the table with a slit in the top of it wide enough to take any paper. It is fastened with a patent lock, of which only the king, Lord Knollys and Lord Stamfordham have the keys. These are the first letters that are presented to the king every morning, together with a memorandum reminding him of the duties he has to perform that day. In many cases the king elects to write letters in reply with his own hand, but should this not be convenient he sends for one of his secretaries and dictates his reply. His majesty is by no means a quick thinker and likes to ponder over every word that he proposes to place on paper. In this respect he presents a curious contrast to his late father, who would reply to the most important letter in a few seconds.

KING GEORGE'S MAIL BAG

All letters addressed to the king and queen of England are sent direct to whichever of the royal residences they are occupying from the general postoffice in London in specially sealed bags, says the Strand. In the case of Buckingham palace, this bag arrives, as a rule, just as his majesty is finishing dinner, and is taken charge of by the secretary on duty, who opens it and proceeds to sort out the contents. Such letters as will ultimately demand the personal attention of King George are placed before him the same night, but it is not often that he deals with them at the moment, save in matters that will not brook delay. He glances through them, makes a few brief notes upon them, and they are then placed under lock and key until he is ready for them on the following morning. He has barely had time to deal with these before the royal breakfast is served and almost simultaneously an even larger bag of correspondence arrives. Only those who have been called upon to handle them can realize the vastness of the royal postbags, the contents of which often range from a private communication from some amiable lunatic who considers that his claim to the British throne is superior to that of King George. By the organization of a well high perfect system, however, this heavy correspondence is dealt with in remarkably quick time. Lord Stamfordham, should he be on duty, opens every communication, and, glancing at it, places the bulk of it in the large crimson

with stones, sticks and guns. A noise was made at the mouth of the hole and the snakes, becoming angry, sallied forth to fight. When the noise failed to bring them, long poles were used to prod the reptiles. As the snakes emerged from the cave they were slaughtered, and at the end of the killing, 340 dead ones were counted. None of the attackers had been bitten, though some had narrow escapes. Some of the snakes were from three to four feet in length and had many rattles, while many were young

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and with one rattle each. The party was about to leave, when one man fired a shotgun blindly into the den and a long pole brought into use pulled fifty more dead reptiles from the hole.—Three Ford (Mont.) Letter to the Butte Miner.

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"A NATION ONCE AGAIN!"



Ireland's Hope of Home Rule Nearing Realization at Last

NATURE, GRACE AND TRAINING FITTED ST. PATRICK TO HIS TASK
So Well Accomplished, Ireland Was Known for Centuries as the "Land of Saints"

ST. PATRICK says of himself in his confession that he was born at "Bannaven Taberniae," which is extremely hard to identify. Some, however, claim that Kirk-Patrick, near Glasgow, in Scotland, took its name from St. Patrick. The saint was born about 372; was a captive and a slave of the king of Dalradia, in Ireland, from 388 to 395; went to Gaul and was there ordained priest; was consecrated bishop and sent to Ireland as missionary in 432, and died at Saul, near Strangford Lough, County Down, Ulster, where many years before he had founded his church, March 17, 465, the day now sacred to his memory.

Ireland was then occupied by a great number of petty tribes, most of whom were evangelized by Patrick. So well was the work accomplished that Ireland was known in subsequent centuries as the "island of saints and scholars." The method employed was that of dealing cautiously and gently with the old paganism of the people. The chiefs were first won over and then through them their clans.

Of St. Patrick himself much that has been related is fabulous, but his autobiographical confession and his epistle to Coroticus, both of which are unquestionably genuine, reveal a devout, simple minded man, and a most discreet and energetic missionary. In his epistle he states that he was of noble birth and that his father, Calpornius, was a Roman decurion. His Mother, Conchessa, or Concelsa, was the sister of St. Martin of Tours.

The family of the saint is affirmed by the earliest authorities to have belonged to Britain, but whether the term refers to Great Britain or Brittany or other parts of France is not ascertained. Some of the quaint stories told in Ireland about St. Patrick would make the traveler imagine that the saint visited the island for the benefit of witty guides, or to promote mirth in wet weather. It is not remarkable that the subject of these stories for 16 centuries, at countless hearths, has been regarded and is today honored as the greatest man and the greatest benefactor that ever trod the Irish soil, and considering the versatility of the Irish character, it is not strange that there remains respecting the saint a vast cycle of legends—serious, pathetic and profound.

It could not be otherwise. Such a people could not have forgotten the heroic figure who led them forth in the exodus from the bondage of pagan darkness. In many instances doubtless has the tale become a tradition, the foliage of an ever active popular imagination, gathered around the central stem of fact; but the fact remained. A large tract of Irish history is dark; but the time of St. Patrick and the three centuries which succeeded it is clearly, as depicted by history, a time of joy. The chronicle is a song of gratitude and of hope, as befits the story of a nation's conversion to Christianity.

The higher legends, which, however, do not profess to keep close to the original sources, except as regards their spirit and the manners of the time, are found in some ancient lives of St. Patrick, the most valuable of which is the "Tripartite Life," ascribed by Colgen to the century after the saint's death. The work was lost for many centuries, but two copies of it were rediscovered, one of which has been recently translated by an eminent Irish scholar, Mr. Hennessy. The miracles, however, recorded in the "Tripartite Life" are neither the most marvelous nor the most interesting portion of that life.

Whether regarded from the religious or philosophic point of view, few things can be more instructive than the picture which delineates of human nature in the period of critical transition and the dawning of the religion of peace upon a race barbaric, but far, indeed, from savage. That warlike race regarded it doubtless as a notable cruelty when the new faith discouraged an amusement so popular as battle. But in many respects they were in sympathy with the faith. That race was one of which the affections as well as the passions retained an unblunted ardor, and when nature is stronger and less corrupted it must feel the need of something higher than itself, its interpreter and its supplement. It prized the

family ties, like the Germans recorded by Tacitus, and it could but have been drawn to Christianity. Its morals were pure, and it had not lost that simplicity to which so much of spiritual insight belongs. Admiration and wonder were among its chief habits. It desired a religion no smaller than the human heart itself—a religion capable of being not only appreciated and believed, but comprehended in its fullness and measured in all its parts.

Warlike as it was, it was unbowed also in loyalty, generosity, and self-sacrifice; it was not, therefore, untouched by the records of martyrs, the principles of self-sacrifice, or the doctrine of a great sacrifice. It loved the children and the poor, and St. Patrick made the former the exemplars of the faith and the latter the eminent inheritors of the kingdom.

In the main, institutions and traditions of Ireland were favorable to Christianity, and the people received the gospel gladly. It appealed to them and prompted ardent natures to find their rest in spiritual things. It had created among them an excellent appreciation of the beautiful, the esthetic and the pure.

The early Irish chroniclers show how strong that sentiment has ever been. The Borlmerian Tribute, for many years the source of relentless wars, had been imposed in vengeance for an insult offered to a woman, and a discourtesy shown to a poet had overthrown an ancient dynasty; an unprovoked affront was regarded as a great moral offense. And severe punishments were ordained not only for detraction, but for a word, though uttered in jest, which brought a blush on the cheek of the listener.

It was not that laws were wanting; a code minute in its justice had proportioned a penalty to every offense. It was not that hearts were hard—there was at least as much pity for others as for self. It was that anger was implacable, and that where fear was unknown the war field was the happy hunting ground.

The rapid growth of learning, as well as piety, in the three centuries succeeding the conversion of Ireland proved that the country had not been until then without a preparation for the gift.

Perhaps nothing human had so large an influence in the conversion of the Irish as the personal character of their apostle. By nature, by grace, and by providential training he had been especially fitted for his task. Everywhere we can trace the might and sweetness that belonged to his character; the versatile mind, yet the simple heart; the varying tact, yet the fixed resolve; the large desire taking counsel from all, yet the minute solicitude for each; the fiery zeal, yet the gentle temper; the skill in using means, yet the reliance in God alone; the readiness in action, with a willingness to wait; the habitual self-possession, yet the outburst of an inspiration, which raised him above himself—the abiding consciousness of an authority—an authority in him, but not of him, and yet the ever present humility. Above all, there burned in him that boundless love which seems the main constituent of apostolic character. It was love for God; but it was love for man also, an impassioned love, a parental compassion. Wrong and injustice to the poor he resented as an injury to God.

A just man, indeed, was St. Patrick; with purity of nature like the patriarchs; a true pilgrim like Abraham; gentle and forgiving of heart, like Moses; a praiseworthy psalmist like David; an emulator of wisdom like Solomon; a chosen vessel for proclaiming truth like the Apostle Paul; a man of grace and of knowledge of the Holy Ghost like the beloved John; a lion in strength and power; a dove in gentleness and humility; a servant of labor in the service of Christ; a king in dignity and might, for binding and loosening, for liberating and convicting.



St. Patrick.

CAVE CROWDED WITH SNAKES

Passes in Montana Seizes Chance to Wipe Out Deadly Menace to the Community.
The citizens of this community were highly excited yesterday by a discovery of a den of hundreds of rattlesnakes in the side of Rattlesnake Gulch on the Peoples ranch, several miles from the city. The discovery was made by Amos Smith, a home-

stead settler, who ran all the way to Three Forks to report the find and to get assistance. At least one hundred men and boys went to the scene and three hundred rattlers of all sizes were killed. Smith was prospecting in the gulch when he saw a rattlesnake crawl into a hole several yards above his head on the slope of the ravine. For years,

with stones, sticks and guns. A noise was made at the mouth of the hole and the snakes, becoming angry, sallied forth to fight. When the noise failed to bring them, long poles were used to prod the reptiles. As the snakes emerged from the cave they were slaughtered, and at the end of the killing, 340 dead ones were counted. None of the attackers had been bitten, though some had narrow escapes. Some of the snakes were from three to four feet in length and had many rattles, while many were young

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