the birds fly south as summer and autumn wanes but the cheerful chickadee, junco, and nuthatch come to take their place as winter residents. And for all the others of our three hundred and twenty-eight birds we could recount much of beauty, grace, song, interest.

The state-wide interest in all our birds continues to increase and if ax, plough, and gun have depleted their numbers, or driven them to new homes, the work of conservation in other fields is restoring the natural homes of the birds but keeping them in balance with enemies and food supply. Federal and state laws protect all desirable forms of bird life, even predatory eagle and osprey because they are rare and interesting.

But we need not fold our hands and let the State protect the birds from their enemies and from death by starvation. Bird protection is a form of conservation anyone can engage in. Farmers can improve habitat, urban dwellers can supply food and protection.

Farmers like clean fence rows but weeds and shrubs along fence rows in woodlots and on lands not suited to agriculture provide nesting places as well as food. Plantings made on such barren areas as sand blows, gullies, and worn-out fields can become a paradise for birds and also hinder soil erosion and may return moisture and a certain fertility to the soil.

Winter feeding stations in proper locations on farms, near schools, in villages, and in cities, and scattering of food after heavy snowfalls or sleet storms save many birds from winter killing.

In many localities marshlands and fields are burned over each spring to eliminate weeds. This practice is often disastrous to bird life for it destroys food and cover as well as many nests and young birds. Then, too, spring burning often burns the humus in the soil, thus reduces the protective covering over the soil and increases erosion.

Stray cats are bird's greatest enemy. The control of stray cats is a problem which requires the cooperation of everyone. People who move from one locality to another should either take pets with them or dispose of the animals rather than leave them to forage for themselves. The problem of abandoned cats is important in resort communities as well as in towns.

THE FINNY TRIBES

One hundred and seventy-seven different kinds of fish inhabit the waters of Michigan. One hundred and forty distinct species are recognized and are classified in twenty-eight different families.

Probably no more than forty varieties of fish are familiar to the average fisherman.

We have approximately one hundred and sixty-six kinds of native fishes. Although we continually refer to native species, all are immigrants. As stated in the chapter on geology, some 30,000 years ago Michigan was covered with a huge slab of ice hundreds of feet thick, known as the Wisconsin glacier. When the ice melted and glacial lakes and streams were formed, fish migrated into them through the St. Lawrence and Mississippi river systems. We have nine species that are truly exotics since they were introduced by man—the smelt, the landlocked salmon, the brown trout, the rainbow trout (two species), the casapedia brook trout, the carp, the goldfish and the eel. The sea lamprey and alewife have made their way into Michigan through the canals around Niagara Falls. It has been thought that the paddle fish, the gizzard shad, the shovel-nosed catfish and, perhaps, other species have reached Michigan waters by the way of canals connecting Lake Michigan with the Mississippi river system.

The lowliest among our fishes are the lampreys. Five members of the lamprey family are found in Michigan, three parasitic species, and two small larvae-like species. Our rarest fish is the paddle fish—but one is known to have been taken in Michigan waters. The rock sturgeon which has become nearly extinct in the waters of the State was once so common that fishermen considered it a nuisance. Two species of gars or "bill-fish" are found in Michigan. These and the dogfish are regarded as worthless by the angler because of their cannibalistic nature and the common prejudice against them as food.

The smelt was first introduced to provide food for the landlocked salmon which had been introduced previously. Smelt have since spread to all of the Great Lakes where they have found conditions favorable and are especially abundant in northern lakes Huron and Michigan. They have multiplied so greatly that smelt-runs occur in many of the streams flowing into the Great Lakes.

The whitefish family is represented by many varieties. The lake herring, not the true herring, is perhaps the most common. This species varies so greatly in different waters that it is represented by seventeen subspecies or local varieties; most of them are known as cisco in the waters where they occur. The two inland lake ciscoes are classed as distinct species. The chubs and bloater, the kiyi, the blackfin, and the bluefin of the deep waters of the Great Lakes are all members of the whitefish family.

The sucker family is represented by fifteen species. The buffalofish and the silvery quillback, although uncommon, have been recorded in Michigan. The white sucker, the sturgeon sucker, and the hogmolly or stoneroller are the most common. Two species of the chub sucker, the spotted sucker, and six species of the red horse and mullet group are found in abundance in suitable waters.

The minnow family is the largest family of fishes found in the state. The carp is the largest member of this family. The goldfish, which are closely related, are exotics, having been imported. The family also includes thirty-four species of minnows, chubs, dace, and shiners which make up an important part of the diet of the market and game fishes.

The bullhead and catfish family is represented by 10 species, several of which are fished for by both sportsmen and commercial fishermen. In this family are the channel catfish, the shovel headed catfish, three species of bullhead, the stone cat, and four species of madtom.

The common mud minnow is in a family all by itself.

The pike family is represented by three species in Michigan. The mud pickerel is the least important species as it rarely attains a length of more than a foot. The northern pike and the Great Lakes muskellunge, are important game fishes.

The American eel was introduced in Michigan some fifty years ago and has since disappeared from all the waters where it was planted except the landlocked lakes from which no escape could be found. When matured eels journey to the ocean to spawn, they do not return.

Only one true bass, the white bass, is found in Michigan waters. It is common in some of the waters in the southern part of the State.

The perch family is represented by a large number of species. The most common are the yellow perch and the "yellow pickerel" or "walleye." The family includes fifteen other varieties which are generally known as darters.

The sunfish family is represented by ten species among which are some of our most important game fishes,—the largemouth bass, the smallmouth bass, the warmouth bass, the rock bass, the bluegill, the pumpkinseed sunfish, the small green sunfish, and the small long eared sunfish.

The burbot or "lawyer," a freshwater representative of the cod family found in Michigan waters, was once thought worthless. The extraction of a superior grade of oil from their livers has developed a market value.

AMPHIBIANS

The two important members of the amphibian group found in Michigan are the frog and toad, both very valuable aides to man, as insects are their principal food. It is often said that the toad is the gardeners' best friend, because they destroy so many insects which prey upon garden crops.

REPTILES

Lizards, snakes, and turtles are the reptiles found in Michigan. Reptiles are primarily a tropical and subtropical animal, therefore, in Michigan's northern latitude few are found within the boundaries of the State; and the number of species gradually decreases northward so that only six species are found in the Northern Peninsula.

Only one lizard, the blue-tailed skink, is resident to Michigan. It is very rare and is found only in the most southerly part of the State. The species may have been more abundant when the State was well-forested, but such a fact cannot be proved. Animals which live and die on the uplands rarely leave records or fossils as after death their bodies and bones decay on the surface, are incorporated with the soil, and disappear.

Seventeen different species of snakes are found in Michigan. Only one, the rattlesnake (massasauga), is poisonous, however its bite has never proved fatal to anyone. The principal food of snakes consists of lizards, snakes, amphibians, insects, earthworms, small mammals, and birds. Several adult snakes and the young of several other species are highly insectivorous. The rattlesnake which is despised because of its venom is decidedly useful in controlling rats and mice.

Ten different species of turtles are found in Michigan. Two species, the snapping turtle and the soft-shelled turtle, have commercial importance as human food. Due to their increasing importance as food, they are caught at all times of the year and are not as abundant as in the past. Without protection, the species may become extinct.

Turtles have been condemned as serious predators of fish and young waterfowl. Recent studies, however, indicate that turtles are not as destructive to fish and waterfowl as formerly believed.

INSECTS

Insects, bugs, pests,—have they any place in conservation? Are they good for anything? Ask the entomologist—a person who makes a study of this, the most numerous of all the animal kingdom. Ask the forester, the gardener. The answer is "yes." For we have good and bad insects, and all fit into the marvelous economy of Nature. Some insects that injure men may be of value to plants, birds, and other animals. So numerous are the insects that we are actually living in the age of insects—we have more kinds of insects than of all the other forms of animal life put together. And to live, to compete with the insects for food, we must know more of this form of wild life. Because they are so numerous and so small, insects are the easiest of our wild life to study, and although fleas and lice are noxious insects, bees and butterflies are not. Also their infinite variety of shape, size, color, tools, industry, and ingenuity make them interesting. Have you ever been fascinated watching a colony of pesky ants at work, or marveled over a paper wasps' nest, or watched a bee draining honey from every floweret?

Insects are animals that have bodies in three parts or segments —head, thorax, abdomen, and have three pairs of jointed legs; some insects have wings. The spider is not an insect. It has a two-part body and four legs, but he is usually collected with insects and lives with and on them. Insects appeared on the earth millions of years ago in the time of the old coal forests and have learned to adapt themselves to all sorts of conditions of heat and cold, water and food supply, so that they have come to vary greatly in size, shape, color, wingspread, and the habitats they occupy. They can search for food and breeding places and can escape from their enemies by running, jumping, flying, climbing, burrowing, and can live and find food on land, in water, on plants and other animals. They produce millions of descendants in a very short time although the individual life span is usually but a few days or hours and so they have been able to increase in numbers and variety until now they as no other animal can and do live any place on the earth's surface—675,000 species of them.

Twenty thousand species live in Michigan. You could probably collect two or three hundred from a small area in a short time. Some are pests, destroy crops, eat the food of other animals and man, and carry diseases of plants and animals. They are known to destroy ten per cent of Michigan crops valued at $20,000,000 to

$25,000,000. The estimated loss in the United States caused by the seventy known insect pests is from one to two billion dollars.

On the other hand, many insects are beneficial. They pollenize plants, destroy harmful insects, are food for animals, birds, fish, and also produce foods and other materials useful to man—honey, silk, shellac, china wax, gallnuts (from which ink is made). Some are soil builders and conditioners. They destroy certain noxious weeds and prevent their spread. Man competes with the insects for the food supply of the world but many insects are on our side. Man has been indebted always to useful insects and has been troubled by the harmful ones, but much less is known about the useful than the harmful insects for it is with the insect pests that most persons are concerned.

When insects begin eating trees, crops, clothing, books, foundations of houses, and other things useful to man, they become pests. Many insects are pests only on occasion; others—the house fly, gypsy, browntail, and codling moths, the corn borer, mosquito, San Jose scale, and ten times as many more, are pests always and cause man constant grief and expense. Not all of the pests are found in Michigan now—but who knows how long they will be kept away? Each year we hear about the increase in the numbers of insects. Nature worked out a sort of balance between the good and bad bugs, so probably the most important factor in such increases is the changes civilization is continually bringing about in the balance of Nature. Disturbing existing conditions—cutting forests, plowing fields, planting crops—changes the environment and forces insects to adapt themselves to new conditions—and they are very adaptable. Our highspeed transportation, methods of packing produce, and many more of our activities, spread insects about the country. Thus a goodly share of the troubles caused by insects are man made and for them man must pay until he finds a cure, finds a way to restore Nature's balance, either by finding other insects, parasites, that will destroy the pests, birds that will keep them down or by the quicker man-made control—insecticides, fumigants and other chemical and mechanical controls.

For many years man has been scientifically combating the harmful insects, and to be efficient and successful, has had to know their methods of living, reproduction, growth; to learn how they respond to certain natural conditions; and, of most importance, it has been necessary to study the type of mouth parts to determine whether

they obtain their food by chewing or sucking. It is upon knowledge of these things that the control of insects is based. Many types of control are in use. The most important are stomach poisons, contact sprays, fumigants, and mechanical ecological controls. Insects possessing chewing mouths are controlled by stomach poisons such as arsenic. Those with sucking mouths are controlled by contact sprays—oil, pyrethrum, and others. Some are controlled by mechanical methods such as hand picking and banding trees. Fumigating is one of the oldest methods of insect control, used chiefly in homes and greenhouses. Ecological control deals with the changing of the insects' environment and habitat. You remove the food supply or destroy the nests or the materials from which they make nests. Any control method should be studied thoroughly before being applied, for many materials useful in controlling insects damage trees or other things of worth on which the insects are feeding.

The interference in his affairs occasioned by insects has forced man to spend considerable sums in promoting scientific research and working out improved methods of control. Advancing civilization and complex environments increase the problem and the complexities of the study of the insect populations of forest, field, shrub, greenhouse, land, and water. Each insect population presents opportunity for broad and systematic study. An individual can spend a lifetime studying any one of the groups without learning all about it.

This is one of the reasons why the Department of Conservation has no Division of Insect Control. That work must of necessity be left to the specialists in entomology, chemistry, and biology, and to the Department of Agriculture, since the greatest damage done by insects is to farm crops. Damage done to forests, fish, and game are reported, studied, and recorded as occasion presents and detailed work is referred to research workers outside of the Department, but it must always be remembered that good agricultural methods are good conservation methods and conservation is linked to agriculture as well as to all other activities of man. But so far, conservation in relation to insects is a study of methods of controlling pests and combatting their depredation and destruction rather than of protecting them. Because of their vast numbers, their adaptability, and ability to reproduce by the millions, insects need little protection.

WORMS AND OTHERS

The lowly earthworm is seldom considered as an animal of economic importance other than his value as an angle (fishing) worm. But his burrowing habits and digestive processes are of considerable importance in opening soil to water, heat, and light, in transferring soil and subsoil from lower to upper levels, and in adding organic matter—excrement, to the soils.

All the other forms of wild animal life, those without backbone, the spiders, centipedes, scorpions, the crayfish, clams, snails, worms, and amoeba, the plankton, are all important, although not holding so obvious a place in the scheme of existence for man and the higher animals. Some supply food for animals higher in the scale and so to man, others perform definite work in soil manufacture, change, and aeration; and others, as the shelled creatures, clams, and their kin have a definite commercial value as food and for the mother-of-pearl of the shell. Even the spider gives us a very strong silk thread that is used for cross hairs in optical instruments.

We live in a very complex animal world with all its parts nicely fitted and all of use to man. Man has been so long in finding the few uses he has made his own that civilization must go on for thousands of years before he finds the use of all of the jigsaw puzzle.

THE PLEASANT PENINSULAS

"If you would seek a pleasant peninsula, look about you." So the founders advised us on Michigan's coat of arms. When we really look, what shall we see? We may have difficulty picturing the tall pines and hardwoods, the miles of wild grape vines and sumac, the green hazel bush, the free lakes and rivers, they saw when they chose the motto. Only an artist or a philosopher can analyze such an intangible resource as scenery—but need we analyze? We can all enjoy our water, forests, far view, open plain, hills—all those natural endowments which man has not attempted to "improve"(?) At the same time we can enjoy the pleasing features of the landscape which have been modified by man:—The countryside with regular patterns of different greens during the growing season; the farmsteads; fields of rippling green, of waving yellow grain; peach, apple and cherry orchards in full bloom or laden with fruit; well tended golf courses; beautifully landscaped memorial parks; roadside plantings.

Michigan's miles of fine highways lead us up hill and down dale, around broad sweeping curves, beckoning onward to hidden views. Seventeen hundred and fifty miles of Great Lakes' shore line—longer than the shore line of any other state—presents marvel after marvel of contrast—between blue water, yellow sand of dune, beach, or "clay banks," red brown, black rocks, green forests. Shores of crescent sand beaches, of vari-colored wavewashed pebbles, beaches of huge ice-borne boulders with the star flower and gentian growing among them; shores of dark forbidding crags on which the fearless bluebell grows, sheer walls of red or black topped by the green of forest, present ever changing views whether the day be calm and peaceful with blue cloud-reflecting water sparkling in the sun, or dark and stormy with wild waves in fury dashing, smashing on the shore. In the winter the shore scenes are buried under snow, lost under heaped rows of blocks of ice. Miles of shore line, with ever changing views.

Inland lakes, great and small, make Michigan the land of the lakes. One cannot travel six miles in any direction without coming to a body of water. Torchlight, Walloon, Crooked, Charlevoix, In-

termediate, Burt, Mullet, Black lakes, all in preglacial deeps, with Grand, Long, Hubbard, Higgins, vie with the Great Lakes in variety of scenic beauty. Houghton is the largest lake. Little Summit Lake near L'Anse, 1700 feet above the sea, is the highest lake. Lake Michigamme, almost 1560 feet above sea level, is the highest large body of water in the State. Woodward Lake, near Boon, Wexford County, at 1350 feet, and Otsego, Mitchell, and Cadillac, about 70 feet lower, are the highest in the Southern Peninsula. Gun, Mitchell, and Cadillac lakes are the oldest lakes and last winter's beaver or muskrat pond the youngest. The circular sink hole lakes in the Pigeon River forest are the emeralds of the south, set in malachite and jade in the springtime, but in red gold and bronze in the fall. Sable Lake, that the early explorers named "the Sapphire of the Dunes," near Grand Marais; Lake of the Clouds, a turquoise on the silver chain of the Carp River, secure in its dark green forest, guarded by the towering cliffs of the Porcupines; Glen Lake, a bit of azure set in yellow dunes; long narrow lakes between moraines, round kettle lakes with no outlet; deep rock-walled tarns; lakes hidden in the dunes; lakes guarded by encircling bogs—and so on through all the 6,000. Every type and variety of lake and shore can be found within the borders of the State and on them and their shores our people and our tourist guests find every kind of lake enjoyment. And the vanishing lakes—the marshes and bogs—remain unexplored beauty spots for those who would seek. Every county in the State has its share of beautiful lakes, marshes, and bogs, large and small.

Not to be forgotten is Kitchitikipi Big Spring in Palms Book State Park, eight miles northwest of Manistique. The sides of the roughly oval pool set at the edge of a coniferous swamp slope abruptly to a depth of 40 feet. The unusual emerald green of the deep clear reflecting waters is probably due to the luxuriant growth of water-loving vegetation which clothes the sides of the pool and drapes the submerged trunks of fallen birch trees. Through forty feet of clear water one can plainly see the cracks in the white limestone floor through which water under heavy pressure bubbles and boils through the white sand.

Dashing, hurrying rivers, broad, stately streams, deep-valleyed, or almost level with the plain, flow down the slopes of the State to the Great Lakes and on the way turn our wheels, lure the fisherman, invite "the poetry of motion"—a silently moving slim canoe.

They served as routes of travel for the Indian and the early settler. So close are their headwaters that early in statehood days plans were proposed to connect the streams across the headwater portages by canals to make a thousand river-canal waterways criss-crossing the State. The Grand, the longest, Saginaw, the shortest, Rifle, the most rapid, Detroit, the youngest in the Southern Peninsula, the AuSable, Sturgeon, Pigeon, Thunder Bay, Manistee, Muskegon, St. Joseph, Kalamazoo, Raisin, Huron, and the Cass, Shiawassee, Flint, Tittibawassee which unite and lose their identity in the Saginaw—all these and the short, swift, or lazy streams between, lure the fisherman, canoeist, scientist, mollusk hunter, vacationist, and rewards each fully. The Tahquamenon and Manistique are slowly, calmly draining off that last glacial lake into Lake Superior. Tahquamenon approaches its upper forty foot fall with calm unruffled surface but rushes down its tree-lined gorge to the cascades of the Lower Falls, then winds slowly to Whitefish Bay. The Whitefish, Michigamme, Ontonagon, Montreal, Escanaba, Menominee, cut through rocky gorges, tumble over rock ledges and cliffs, wild and free, resisting taming in their nine hundred to twelve hundred foot fall to the Great Lakes. They have helped to make our northern highlands as rugged as a mountain region. All

THE UPPER FALLS OF THE TAHQUAMENON IN WINTER.

the streams flowing into Lake Superior fall over cliffs in cascades or misty falls before reaching their destination. St. Mary's, sidetracked by the Soo canal, is the youngest river in the State. The Black and Presque Isle rivers, rising in Wisconsin, cross the State to reach Lake Superior, rushing through dark gorges and plunging over cascades on the way. Nearly all the Northern Peninsula streams, from the mighty Tahquamenon to misty Au Train, have falls and cascades; but in the Southern Peninsula we have only two, the falls of the Rainy and of the Ocqueoc rivers. We have rivers we cannot see. The headwaters of the Biscuit rise south of the Niagara escarpment near the Trout Lake fire tower, then through a sink hole enter an underground channel and flow a quarter of a mile before emerging as a full stream. Near the Ocqueoc Falls, Disappearing River does just that and gets lost in the limestone boulders that have fallen into the channel. And we have a river that does not know just exactly which way to flow—when lake levels are high the outlet of Long Lake, Alpena County, flows through three-armed Devil's Lake to Lake Huron by way of Long Lake Creek, but during the low levels of summer, drainage is reversed and the outflow from Long Lake disappears underground through a funnel-shaped depression or sinks in the south arm of Devil's Lake. As every county has its lakes, so every county has its streams on plain or in deep ravines, has the beauty and the lure of moving water.

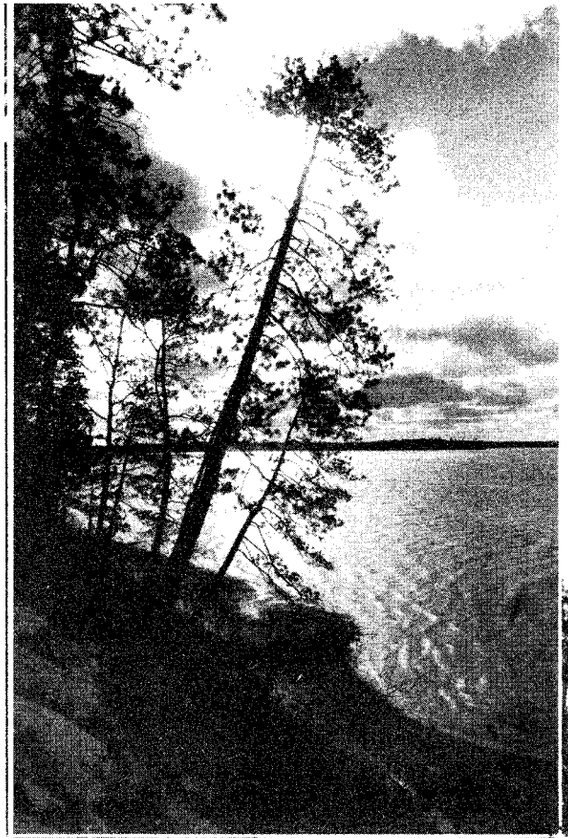
Across the waters are the islands—Isle Royale far to the north in Lake Superior, our only National Park, a calling wilderness where the moose roam free. Its wild, skerried, fjorded shores, craggy summits, long narrow valleys, hidden lakes, differ from Belle Isle in Detroit River—partly man-made, very civilized and sedate with its fountains and its zoo, its lazy canals and lazier canoes. But both are welcome places of recreation for those who can reach them. And is it not said that Belle Isle is the largest, finest island park in the world, and is not its charm equally divided between its native and its man cared-for parts? Both islands with all their contrast are Michigan's pride. Both are now wild fowl sanctuaries.

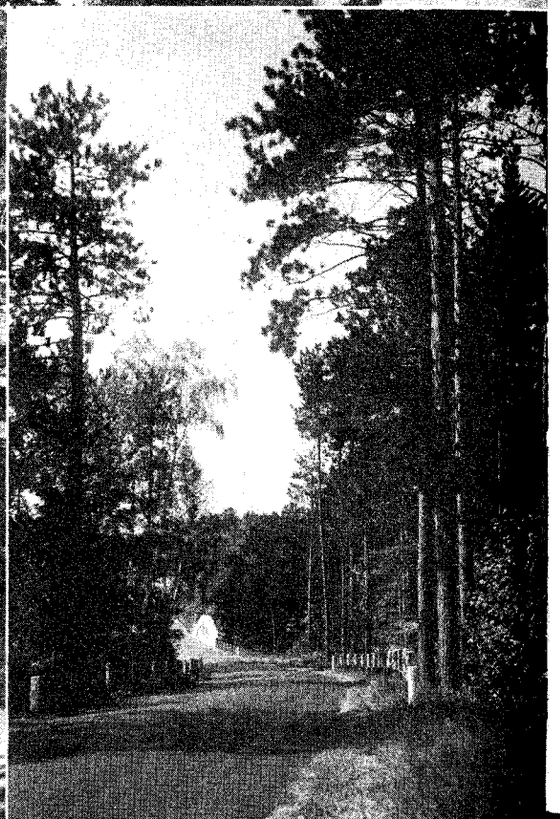
Near the foot of Lake Michigan are the Leelanau County Islands—Manitou, that the Sleeping Bear eternally watches, and the Fox Islands. Farther north, Charlevoix County includes the Beaver Island group, famed as the Mormon Utopia of King Strang. On

Big Beaver the King's Highway leads southward from St. James harbor, said to be the most perfect crescent harbor on the lakes, through a hardwood forest, having openings of sandy areas naturally landscaped with spreading juniper, to Lake Geneserath. A great dune rises high on Mount Pisgah. From it the island terraces over the juniper-strewn Nipissing beach to the broad sandy beach of Lake Michigan. Grouped in an arc about the northern end of Big Beaver are the unpoetically named islands Gull, High, Hat, Hog, Whiskey, and Garden. A yellow dune for the crown, yellow sand beach for the brim, and a row of green trees making the band, gave Hat island its name.

Fringing the north shore of Lake Huron are the beautiful fjorded Cheneaux and St. Martin's islands; Mackinac, Bois Blanc, and Round islands beckon us from the straits; Drummond, Neebish, and Sugar guard the eastern edge of the Northern Peninsula; the little Charity Islands light the way into Saginaw Bay; the muraled walls of Grand Island guard the harbor to Munising. In Grand Lake is a miniature Thousand Islands. Our islands, these and a few more, are not so numerous as are our lakes and streams but each also holds its lure for the hunter, vacationist, scientist, or plain beauty seeker.

Forests still frame in or compose many of Michigan's scenic resources whether they be remnants of the virgin growth which once covered the State, or second growth which embroiders much of the State at present. Warren Woods near Three Oaks in Berrien County, Newton Woods in Cass County, both in the south, or any one of the thousand smaller and well protected farm woodlots one notices on a short drive from any city in the State, are usually taken for granted. Yet one only needs to pass by a slashed farm woods cut without even a gesture of good management to notice the "hole in the scene" which emphasizes the scenic value of woodlands. A few remnants of original white pine forest can be seen today; the most accessible are in Hartwick Pines State Park near Grayling and Interlochen State Park in Grand Traverse County. One stand of jack pine so tall and even-aged as to rival white or red pine for beauty may be seen on a tract of private land in Lake Superior State Forest in the eastern part of the Northern Peninsula. Some remnants of virgin beech, birch, maple and hemlock forests still standing in the western part of the Northern Peninsula are happily yielding to conservative forest management and may remain



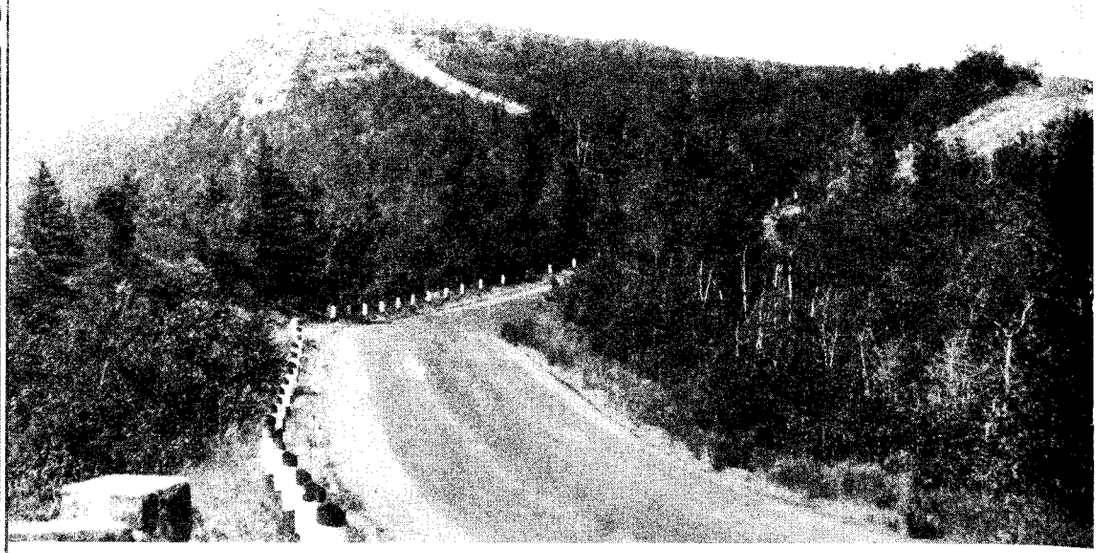


indefinitely for their scenic value, yet yield good crops of sawlogs at the same time. Wilderness State Park protects some virgin hardwood in northern Emmet County.

State roads passing through numerous state forests afford roadside views of swamp forest remnants and second growth with their own particular beauties in the heavy thickets of balsam, cedar, and spruce. Birch and aspen supply flashes of white in their trunks, light green in their spring and summer foliage, and gold in autumn. Nor are the forests of jack pine and oak in the drier plains of the north a total scenic loss. Perhaps these are the poor relations of the forest, but they do soften the bleakness and dryness of the sand plains. And in the Northern Peninsula where the jack pine grows free it bows to none in stateliness. Not the least of the forest attractions are the deer, elk, big black bear one hopes to see; excitement rises high on finding a laden beechnut tree with bear tracks on the ground and bear claw scratches on the tree trunk.

Mountains? In Michigan? Well, not peaks several thousand feet high, but highlands as rugged as any mountain terrain. The abrupt high wild granite Huron Mountains with glacially smoothed peaks and narrow canyon rift valley and the high cliffed Porcupines with Government Peak* towering 2,023 feet, offer views as impressive as many in the Appalachians. Just crane your neck to see the top of Chippewa Mountain as you drive down the Black River road. That great wall of rock, the Copper Range, pushed up west of the Keweenaw Fault carried two older peaks—now named Mount Houghton and Mount Horace Greeley to 1511 and 1532 feet above the sea. The Brockway Drive along the cliff edges of the Fault offers ever changing magnificent views of red rock, green forest and blue Lake Superior. The "ice box" of Michigan where temperatures are said to drop to 58 degrees below zero is the rugged tableland of Baraga-Iron-Marquette counties which has elevations from 1400 to 1900 feet. This broad upland slopes northward *down* to the 1100-1200 foot high Huron Mountains. Wakefield, the town of the open pit iron mine, is the highest city in the Northern Peninsula, 1551 feet above the sea, 948 feet above Lake Superior, but the little village of Beacon in Marquette County is 167 feet higher at 1718 feet—the highest community in the State. To the east the land slopes 800 feet in the seventeen miles between Ishpeming and

*In the southeast quarter of the northwest quarter of the southeast quarter of Section 26, Town 51 North, Range 43 West, boundary of Ontonagon and Gogebic counties.



THE BROCKWAY DRIVE, KEWEENAW COUNTY.

Marquette to the low eastern half of the Peninsula, which has an average elevation of 800 feet.

In the Southern Peninsula the lands are not so high, averaging 835 feet, nor so rugged, but many of the hills and highlands are none the less impressive—particularly when you remember that the high hills and ranges, with deep-cut ravines, were once the surface rock and soil of Canada. It is a bit interesting that on top of the highest hill in the Southern Peninsula (in Sherman township, Osceola County) a fragment of an ancient sea beach—a "puddingstone" boulder—and a fragment of the most ancient rock in Canada, were carried south and dumped there 1713 feet above the sea, 1135 feet above Lake Michigan. Highway M-115 passes within a half mile of the peak nine miles southeast of Cadillac. Towering above is the Cadillac fire tower, the highest tower in the State. From the summit of the hill, variously known as Dighton, Sherman, Cadillac, one can see the horizon in all directions—out over the tops of the rolling morainic hills which were once the loose surface rock and soil of Canada. Nearby you may see abandoned buildings of an old ginseng farm. The high upland covers parts of 18 counties with the towns of Big Rapids, Clare, West Branch, Mio, Atlanta, Gaylord, Cadillac, and Kalkaska, along its edge. All of it is over 1000 feet high. The business district of Gaylord is 1343 feet above sea level, but part of the residential section of Cadillac rises a few feet higher. Boon, a village northwest of Cadillac, is

the highest village in the Southern Peninsula at 1371 feet or 374 feet lower than the highest community in the Northern Peninsula. In the south, Bunday of the rugged Irish Hills rises 1284 feet, and in the Metamora-Hadley Hills of northern Oakland, southern Lapeer county, a kamic hill (p. 53) near Thomas, is nearly 1300 feet high.

We can drive near any of these rugged areas with scarcely an impression of rise, so sweeping are the highway curves, but off the highway they will be found steep and rugged, with jagged slopes and narrow ravines offering the visitor a wealth of scenic beauty, a rich variety of wild life.

But we do not owe all the beauty of our two peninsulas to the green of forest, the blue of lakes, the flashing green of rippling streams. In places the bare rock, carved by wind and water,

TURNIP ROCK AND THE THUMB NAIL OF MICHIGAN.

OCQUEOC FALLS, PRESQUE ISLE COUNTY.

rounded by glacial action, commands our view. The Grand River has cut a gorge, with branching ravines and several islands, through the brown rock near Grand Ledge, once the focus of excursions from all parts of the State. Along the shores of Lake Huron, the flat lying rocks at the tip of "The Thumb" have been carved by wind and wave to look like little ships drawn up on shore—the Pointe aux Barques of the early French voyageurs. Rock arches, shallow caves, "turnip" rocks, have all been carved from the rocky cliffs—not so imposing nor so high as similar carving elsewhere but of fascinating interest.

Ocqueoc and Rainy rivers dash in cascading falls over limestone ledges in western Presque Isle County. Disappearing River flows over and around ledges and blocks of limestone—and then flows under the surface, leading one to hope that maybe someday someone will find caves in this region of underground water flow of Cheboygan, Otsego, Montmorency, and particularly Alpena and Presque Isle counties, where the development of sink holes is impressive and spectacular. Sunken Lake in a limestone sink hole has been set aside for public enjoyment in Fletcher State Park. In Otsego County lakes of emerald are set in the sinkholes of the Pigeon River Forest.

Arch Rock, Sugar Loaf, Scott's cave, Devil's Kitchen, the Wishing well on Mackinac Island, Castle Rock, St. Anthony's rock, and others near St. Ignace, the natural rock gardens, sinkhole and underground stream near Trout Lake Fire Tower, the white cliffs of the Garden Peninsula, Les Cheneaux Islands, not to forget the sink holes of Mackinac and weird, fascinating, beautiful Big Spring—Kitchitikipi—all these and many more are the offerings of the limestone country. Facing Lake Superior is a great cliff of red and white sandstone over which little streams fall in mist 200 feet to the lake, and inland the lordly Tahquamenon drops in a sheer forty foot fall, rushes on to a cascade of surpassing beauty four miles below, then flows tranquilly to the Great Lake. High along the shore waves of an older, higher lake cut cathedral arches, castellated spires, pulpit rocks in this old Cambrian rampart. Sun and rain with iron and copper pigments have painted the rocks with colors—the Pictured Rocks of Lake Superior. West of Marquette the ancient crystalline rock changes the landscape; deep clear lakes reflect the black iron formations; north of Marquette on Presque Isle is a scene of wild forbidding desolation, eerie black crags slope wickedly into blue Lake Superior—but there the harebells sway in the breeze, and in the distance the ore boats dot the lake. Far-

WALLS OF AN OLD LIMESTONE SINK.

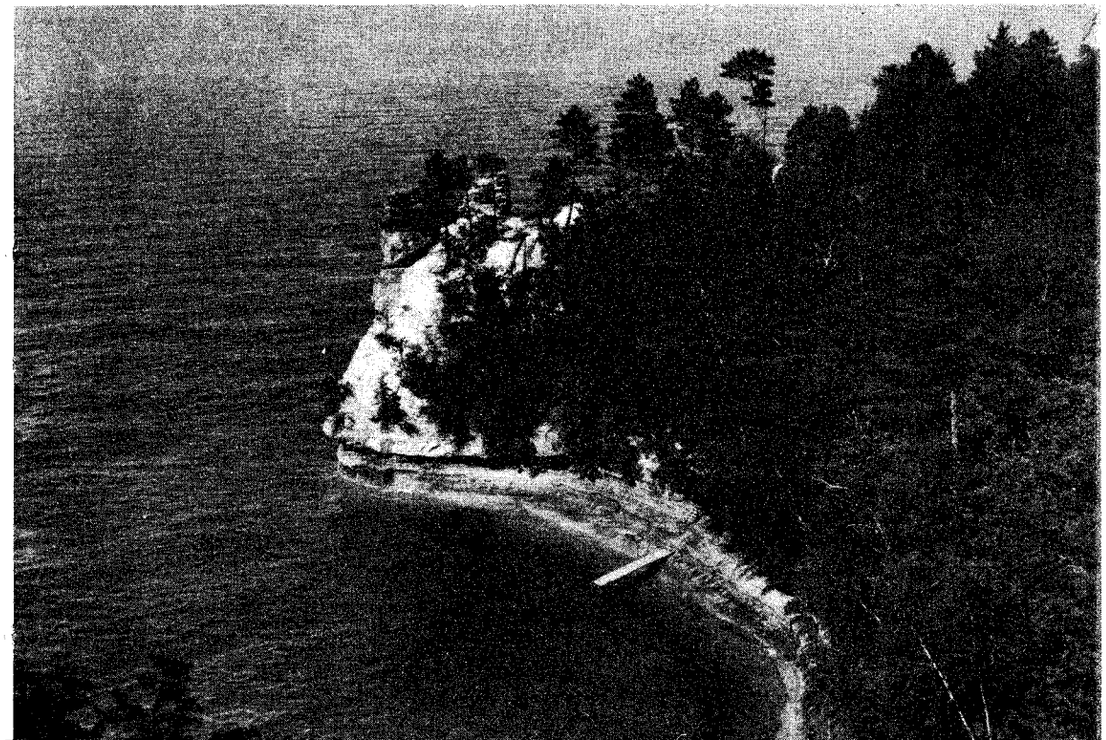
ARCH ROCK, MACKINAC ISLAND.

ther north ferns and mosses line the cleft walls in the Huron Mountains where the sun seldom shines; the shadows of the cracked granite walls of Canyon Lake fall over its floating gardens of red and green pitcher plants growing on forgotten logs of the lumbering days. There ancient granites, veined by dykes of younger rock, were smoothed, grooved and polished by glacial action. Huge blocks of broken Cambrian sandstone lie tumbled on the exposed roots of the archaic Laurentian Mountains. Near Laurium the red sandstone of the lake shore is upended in the curious walled ravine; the purple red lava flows and conglomerates and sandstones of Houghton, Keweenaw, Ontonagon counties slope westward under Lake Superior, making valley and ridge stepping down to reefs along the coast, then rising far to the northwest to form Isle Royale. Along the shores the waves have carved fantastic forms—the Devil's Washtub near Fort Wilkins State Park, the skerries of Isle Royale—to give ever-changing views. Rivers dashing, tumbling, falling through rocky gorges, hold varied allure. Malachite green forests, deep sapphire blue Lake Superior, jasper red rocks, with the romance of the old copper mines, makes this land of Keweenaw and Isle Royale the crown of the Peninsula.

Along the coasts of Lake Michigan and Lake Superior are the great dunes that change the view with every wind that blows, yellow sands that are climbing, marching inland, that man tries to halt with vegetation. The Warren Dunes of Berrien County are the highest single massif of sand dunes in the United States and vie with the dunes of southern France as the highest in the world. Rosy Mound rises near Grand Haven; Pigeon Hill was Muskegon's great dune—the meeting place of the Indians—but man is carting Pigeon Hill away to use in foundries; Ludington State Park, a dune paradise for the botanist, artist, geologist, recreationist; the great Sleeping Bear, an old dune of an ancient lake perched atop a morainic hill, cut with the winds always blowing up its sides, adding to it from the west, taking away from it to the east.

From St. Ignace westward the shore and highway are bordered by the Great Nipissing dunes. Grand Sable dunes, the singing sands near Grand Marais on Lake Superior, are also the dunes of an older lake. They cut off Grand Sable Lake, first named "The Sapphire of the Dunes" from Lake Superior and are gradually marching into it. They crowd between the rivers and the lake,

MINER'S CASTLE, FROM THE LAND.



LUDINGTON STATE PARK.

forcing the streams to flow eastward before they can break through. Along shore the strange Grand Sable Banks of hard white sand give place farther west to the Pictured Rocks. The crescent of Great Sand Bay, bordered by high dunes, is one of the show places on the Dunes Drive of Keweenaw County. And the dunes march on; they have covered and uncovered forests, Indian villages, and even a white man's town; arrow heads and Indian shards and artifacts come to light as the sands are blown inland.

Our lakes, rivers, dunes, marshes, hills, mountains, are "calling, calling,—let us go."

Unlike the more rugged and more frequently fog-ridden parts of the country, Michigan affords far views from almost any locality in the State. Long shore lines, rolling hills, plains, wide farming areas, contribute to the view. They may be dark grey-brown and sere in the winter time—but have you never seen forest, swamp and thicket transformed into a veritable fairyland by hoar frost and snow? In the spring the red-brown thickets quiver with a sheen of green which changes to the rich lush green of summer, and in the fall to the purple bronze of the oak, the glory of the red gold of beech, maple and birch, with the silver of the birch glinting through. At no time of year is the far view dull. Dilapidation and bare sand may be underfoot—but the distance bears

enchantment. We can climb the hilltops, the highest point in the Southern Peninsula is readily accessible as are many high places in the Northern, and from them we can view a panorama of hill and valley, velvet forest, checkered farm land, swamp and plain.

Much of northern Michigan is still wild, with all that means of the sort of restful view one seeks in trying to escape the works of mankind. Some of the country is wild for the second or third time and only exhibits the covering of man's activities, but it is part of the valuable scenic resource nevertheless. Nature has made a few old abandoned quarries into natural rock gardens with ferns, shrubs, and flowers covering the man-made scars.

Man has made scars on the face of Michigan but he has also added beauty marks. The shapes and cover colors of agricultural lands vary in beauty, of course, with the season, but the velvety black of muck farm, the yellow brown of new plowed soil, the first green of winter wheat, broad flat fields of sugar beets, peppermint, celery, and the harvests in corn, beans, potatoes, and fruit, all contribute to the pattern with its seasonal charm. A broad flat field of lush green grass, bordered by golden leaved wood lot with young white faced red Herefords quietly grazing invites the painter's brush. Golf courses have replaced ill-kept or abandoned farm and industrial enterprises with greens, fairways, and with occasional ordered streams and ponds. The very nature of the sport led man to tidy but not destroy the natural setting.

Parkway development in many cities and towns, which involves control and administration of considerable border territory along the roads and boulevards, has become part of Michigan's man-made scenic resources. Many towns have utilized the waterways that run through them to create beauty and rest spots, have beautified river banks and old mill ponds. Many more towns could create similar parks and parkways. None need use the highway approach to the town for the village dump. Think of the towns in which you have subconsciously wanted to stop because the approach and entrance to it was well kept and inviting? Remember those billboards, heaps of junk, tumbled down, once fine houses, that made you want to hurry through a town?

Parks on the outskirts of communities, state parks, county parks, highway drive-ins, and our one national park, vary greatly in the amount and character of man-made structures, drives, trails, and scenery. This variation is usually occasioned by the varying

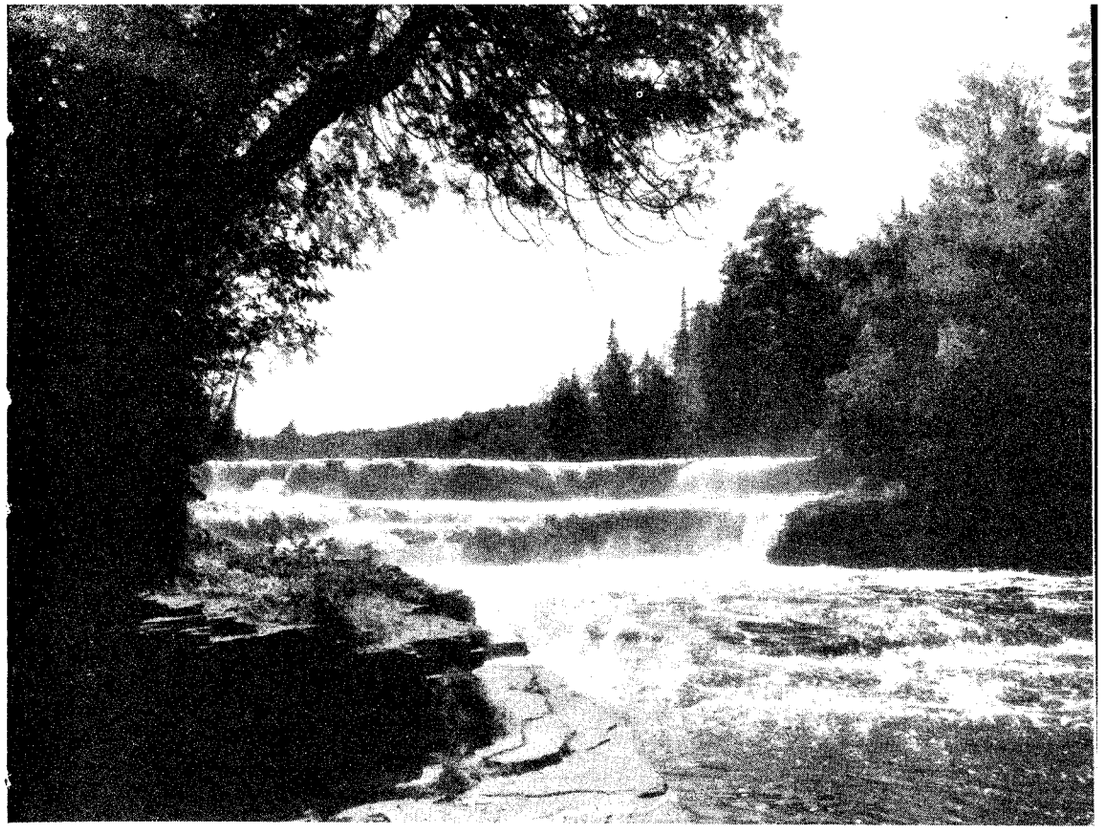
amount of human use, but generous areas in all these groups will always be needed and each will contribute an indispensable part to Michigan's scenic resources.

The scenic resource feature within the real communities of the State appear in planned, zoned, and protected residence and public use areas. Well kept residence areas, zealously guarded waterways and shores, and adequate school grounds, parkways along streets, and park areas, are no less scenic resources than they are utilities. Well kept, landscaped factory grounds are pleasing interruptions in many towns to the ugly, signboard approach along the highway. Many towns do, more can supplement, beautiful private gardens such as the Dow Gardens of Midland, by festival flower plantings as Holland plants tulips for its festival.

Much of the physical records of man's activities during his history in Michigan have been destroyed with progress. Now we are beginning to realize the heritage we have lost and are attempting to restore the records in towns and museums, to rebuild old forts and block houses, relics of the early settlements, Indian and fur-trading days, and to restore some of the stately old mansions of the 1840's—as Dexter Hall in Dexter. But we have within the State many old Indian villages and forts that would make interesting park sites if restored. These earthworks may not be as large and imposing as those of central Ohio, but they are of interest and could be made of more interest and accessibility to a greater number of people.

Nearly every town has within or nearby a site of historic interest. Many towns are marking them; many more should seek them out, restore them if possible, place a marker so that the traveller will not hurry by.

Michigan is not neglecting its scenic resources. Within the State Department of Conservation is the Division of State Parks, charged with developing and administering the seventy-five state parks for the use of Michigan people and their summer and winter visitors. Not all but much of the finest scenery is in the State parks or forests, but since they are intensively used, the division has a



LOWER FALLS OF THE TAHQUAMENON.

real task to make their scenic resources available for use without destruction and thus to conserve these resources.

Likewise, the State Highway Department maintains a group of foresters and landscape architects to conserve the forest along highways and to maintain and develop roadside parks and picnic spots. Some tree planting, considerable sodding, occasional improvement of springs and vistas, building miniature replicas of natural scenery, are parts of the scenery-conserving program.

No less important from the conservation of human resource by recreation is the placing of picnic facilities—tables and stoves—in the State and wayside parks by the two departments.

More incidental, but none the less effective, is the work of other divisions of the Department of Conservation—the Forestry Division develops the State forests, the Game Division administers the game refuges, and the Law Enforcement Division keeps the parks clean and the streams free from pollution.

County Road Commissions or similar bodies operate along county

WATERLOO AREA. An area of kamic upland naturally landscaped with juniper. An area subject to heavy gully erosion but suitable for year-round recreation.

roads much as the State Highway Department does along State roads and have even worked more intensively on the park development, particularly where extensive areas of wild land are available, as in the western part of the Northern Peninsula.

The Mackinac Island Park Commission has maintained the island as a unique bit of the horse and buggy days, restored the historic fort, constructed trails, bridle paths and roads to the many curious rock formations on the island. The historic interest and geologic phenomena are preserved.

The National Park Service, a bureau of the Department of the Interior, is in charge of Isle Royale—to be dedicated eventually as a National Park. The Service is committed to a program of development which will preserve the wilderness character of the Island, building no roads, and encouraging travel by boat and afoot from resorts at each end of the Island. The National Park Service also has supervised the development work of the CCC on two so-called

Recreation Demonstration Areas which are lands retired from marginal agriculture and assigned to more appropriate use for recreation, game management, and, to a less extent, forest production. These areas are the Waterloo tract between Jackson and Ann Arbor and the Yankee Springs tract near Hastings. Both of these are well watered and pleasant country whose scenic value should improve through good management. The National Park Service has also cooperated with the Department of Conservation in the development of State Parks through CCC agencies.

The Forest Service, a bureau of the Department of Agriculture, has a definite policy of conserving trailside, roadside, and waterway scenic resources while managing their five large national forests within the State. The Forest Service cooperates also with the Department of Conservation in exchanging lands owned by the two agencies so that the holdings of each may be blocked up for more efficient administration. The acquisition of Tahquamenon Falls near Newberry in the Northern Peninsula by the State was made possible by such an exchange; the Forest Service acquired the tract from private owners and traded it to the Department of Conservation for state-owned lands needed to block up certain National Forests.

Gems of scenery do not gravitate into public ownership nor become available automatically to the general public. If they did, the State would probably control most of the Great Lakes' shoreline, the Huron Mountains, a large remnant of the remaining virgin forests in Michigan—and many more miles of interior lake borders, stream banks, islands, and waterfalls, which are threatened by questionable development for water power.

Here are some of the problems which must be faced and worked on if Michigan is to conserve her remaining scenic resources:

Regulate equitably the placing of signboards along scenic travel routes, whether the scenery is unusual or merely pleasing.

Secure the cooperation of industries, communities, and individuals in abating such things as unscreened gravel pits, automobile graveyards, city dumps, broken-down farm and industrial buildings, disorderly and gaudily painted roadside business buildings, killed timber in artificial lakes or reservoirs.

Call a halt to the construction of unnecessary highways through the tiny remnants of true wilderness in Michigan, such as Wilderness State Park near Mackinaw City, the north shore of the North-

ern Peninsula in various places, so-called "logical route" through Ludington State Park and other dune areas.

Carry our good manners outdoors with us as a habit so that debris will not mark our trail through pleasant picnic and camping spots.

Become familiar with and encourage rural zoning, now legal in Michigan at the option of the counties. This should do much to prevent the continuing wrecking of certain lands through wrong use for marginal agriculture, unneeded suburban subdivision and land-skinning in general.

Help to reclothe and keep clothed the deforested part of Michigan which is best adapted to forest production. This means more community forests and school forests throughout the State, and a lot of good teamwork in preventing and controlling useless outdoor fires. Also more gifts and bequests of land to cities, villages, and school boards.

Gain better knowledge and appreciation of the need to deal gently with scenes and areas of natural beauty. Many a scene in Michigan today needs more than anything else, to be let alone.

Develop wild flower sanctuaries. Many towns have near them a bit of land, in places only an acre or two, which is a veritable paradise of many wild plants, but of little commercial value. Urge the purchase and setting aside of the area. Use it for school demonstration, let the public know of the beauty spot. Create a local interest. "Color tours," "Wildflower tours" could be arranged for almost any county in the State.

Search out and restore Indian mounds and forts.

Would you see a beautiful Peninsula?

Then look about you!

MAN AND HIS TOWNS

Man finds his food, pleasure, and raw materials for his livelihood in forest, streams, soils, minerals, but he lives mainly in communities, towns, cities, villages.

The early settlers established communities about the trading posts, at the crossing of Indian trails, and along streams. A home seeker in the new land stopped over night at a straits or narrows, a fording place in a stream, and remained to help the next wagon train across. Horses needed to be shod so the blacksmith set up his forge—a community was started. A miller erected a grist mill where a stream was swift and its current could turn the wheels. About the mill a settlement grew. Trading posts became the centers of communities as agriculture followed the fur trade and lumbering. Villages grew up about mines and quarries.

From such small beginnings our older cities grew—Sault Ste. Marie, St. Ignace, Detroit, Hillsdale, Jackson, Grand Rapids, Saginaw, Marquette, and many others. The site for the capital was selected near the early center of population and the town laid out on the bank of the Grand River. Many of the older communities disappeared when forests, mines, quarries, were worked out, the Indians ceased to be a menace and, as agriculture developed, widely separated farmsteads were established, leaving the grist mills alone near swift waters to show where the village had been and to molder to picturesque idleness or sorry dilapidation as progress passed them by. Many other settlements grew to the towns we know today. Many towns of tomorrow will be the town-grown communities centered about a crossroad filling station. The towns of yesterday grew in a haphazard fashion. The towns of tomorrow should be planned—what of the towns of today and their problems?

Our older towns developed along the waterfront on either side of a ford, near the mine or quarry, about a trading post, and served the fishing, forest, or agricultural area nearby. As populations increased, land was purchased in square sections, so towns came to be platted in squares and rectangles. Some were laid out on the hub and spoke plan, but all had streets leading away from the industrial, business, governmental areas, the heart of the towns, to the residential sections. But as the towns developed and manufacturing replaced rural interests, industry pushed farther and farther

from the waterfront or overland trail and the pattern became completely out of balance. The railroads came in, rights of way were secured along the edges of the towns and leading through the trade centers, creating greater lack of balance. But the streets remained the main arteries of traffic. With the coming of the automobile, industry "broke out" wherever a location could be purchased. Man upsets his own as well as nature's plans. Streets laid out as residential streets about the old heart of the town became inadequate as commercial transportation arteries when commercial and manufacturing ganglia developed in widely separated parts of the city and transformed areas once set aside as residential districts. Nor were the old streets adequate for the many other uses of city streets. Streets carry men and goods on their surface, and the essential utilities—fresh water, sewage, electricity, communication lines—flow alongside or beneath them. They are the blood vessels and nerves of a city and like blood vessels and nerves, when they become clogged abnormal conditions develop. The rectangular pattern of the early town planners hasten the "clogging" and the use of residential streets for commerce aggravate it. Many areas remaining residential retain residential width streets—too narrow for the traffic they must bear, hence the one-way street plan.

The automobile brought another problem—"parking space." Parking to the early planners was merely reserved space between the sidewalk and the street devoted to shade trees or perhaps ornamental flower beds and separating the passerby afoot on the sidewalk from the dirt and muck of horse-drawn traffic in the street. Landscaping, little intersectional and boulevard parkways were a later development.

Thus with changing times came changing needs of the population and changing uses of town land. The early plans became increasingly inadequate. As business and industry became scattered over the area the City Fathers talked of zoning ordinances and planning commissions—to make the town (urban) land serve the best needs of the greatest number of inhabitants and to prevent decadence of the town by loss of industry or inadequacy of sites. Industry keeps a town alive. If old industries move or new industries become established in a town, their location is important. Ease of transportation for men and materials, original and annual tax costs for land and buildings, as well as efficient use of municipal services and public utilities must be considered in determining sites. Industries must be so placed that they may expand without encroaching on a residential area. Such encroachment often wipes

out local investment in schools and churches as families move away, and increases taxes since public utilities—water mains, sewers, wider, hard-surfaced streets—must be increased to adequately service the industry.

No community can exist without commerce—the wholesaling and retailing of goods and services. As our communities grow to cities, traffic jams and parking problems in commercial areas become acute, a thing our early planners never dreamed about. The general store of the village has developed to the many neighborhood stores of the towns. They supply the daily food needs of the housewife who must carry her purchases and cannot be adequately supplied by far-away central areas. Use of the automobile has made super markets with adequate parking lots an answer to the daily marketing problem. For the most part they also are located in areas which will not injure residential districts.

Since 1900 Michigan's towns have developed large metropolitan areas with populations concentrated by steady migration from farms to expanding manufacturing and trade centers. Short hours mean leisure, leisure means recreation,—not only for the school child but for the adult. Recreation areas near homes are important. In areas where improvements in recreational facilities have been made fewer children are injured by automobiles and less juvenile delinquency and truancy are found. And all members of families are healthier and happier who live near and use land reserved for recreation.

Not a great deal can be done to transform land to better use in the larger old cities. But in newly forming towns and in those suburban areas developing into towns or being incorporated into larger cities most advantageous land use can and should be considered. The same principles of proper use—conservation—apply to man in his towns and country as to the soils, forests, minerals. In country and towns man's activities can be placed where they will do most good. If a farmer cuts a drain that will remove excess water from his land but spill it on his neighbor's fields down stream or deprive his upstream neighbor of needed water, he is not a conservationist. If the townsman erects a factory near a playground, school, church, in a residential district his activity, like the farmer's drain, is not where it will do the most good.

As new areas come into a city, or as an older town is zoned, forecasting and direction of future needs are necessary to avoid misuse and costly changes in original design. Streets and intersections can be designed according to the traffic they are to bear. Abutting

areas can be so planned and restricted that the desired use is encouraged and capital will flow to the area, knowing that money expended for a housing project will not be jeopardized by possible erection of a pickle factory or foundry across the street. Playgrounds and parks should be placed where they will service the greatest number of children who have no other place to play. Commercial as well as industrial activity have no place near schools, churches, or in residential districts, but the neighborhood store should be conveniently near for the housewife who must carry her purchases but must not detract from a residential section, and industry must be adequately served by public utilities.

In short, urban planning for village, town, or city must solve the problems of land use by the competing interests of transportation, industry, commerce, housing and recreation.

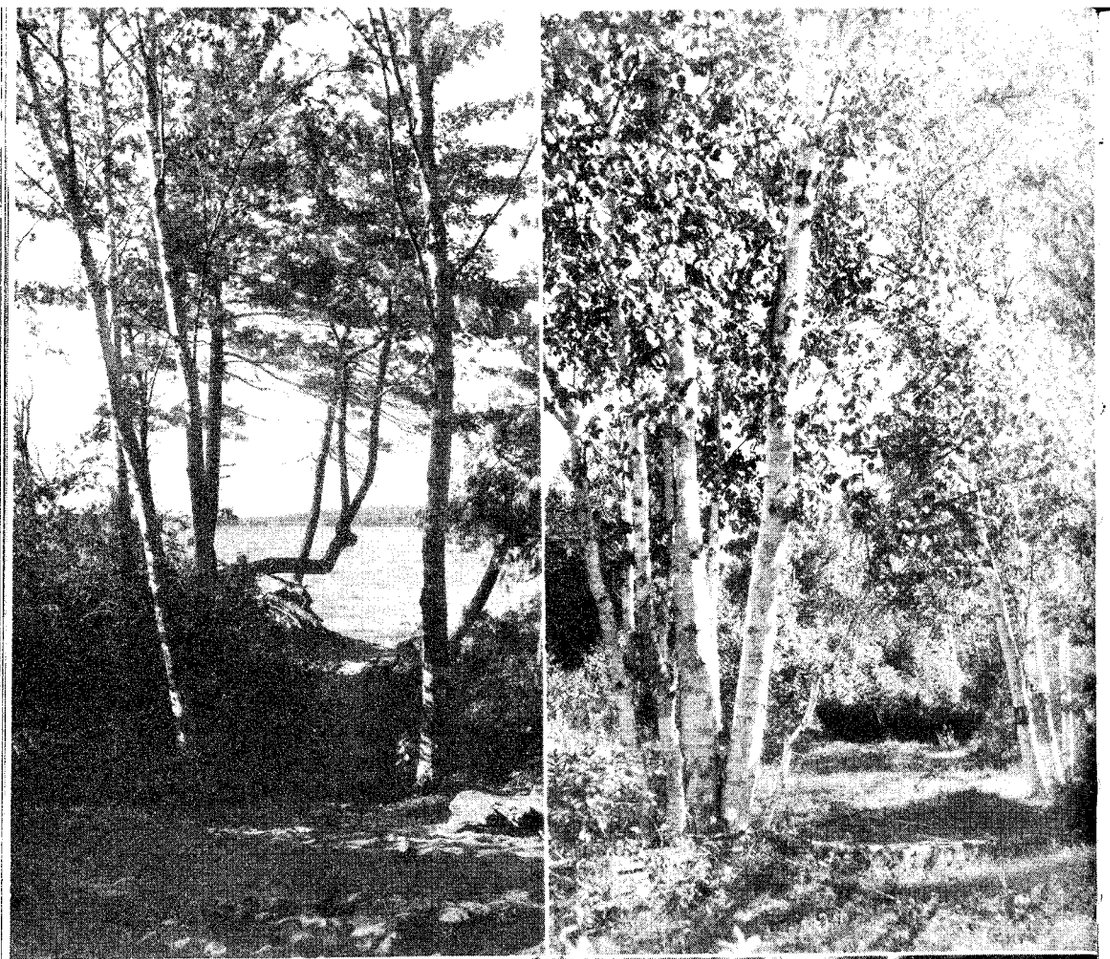
To transform his town of the future to greatest use man must also consider the water supplies. We have found that Michigan has an abundance of potable water, yet many towns find it difficult to obtain an adequate supply. So in planning a new or replanning an old town, adequate water for all needs must be obtained, and when obtained should be used in such a way that the supply is kept wholesome and cold.

Planning commissions must also decide if proposed suburban housing developments might better be left to small agriculture and truck farms to serve the cities' needs. Or be made into parks and recreation areas, and if the park areas are to be left wild or made into formal improved(?) parkways. The problem of providing adequate recreational space requires constant public attention, especially in rapidly growing areas. Too many towns have lost valuable recreation and park sites or have had to pay large sums for them because their value was not early recognized or they were not purchased when the price was low. The National Recreation Association considers one acre for every 100 people a desirable minimum area for that recreation which modern conditions of living make necessary as well as possible. Failure to conserve land for recreational use is poor social planning. In the congested metropolitan areas of Detroit, the Department of Conservation is trying to conserve land for recreation purpose. The Clinton-Huron Parkway is proposed. Along that parkway are many areas which if left in their native state can serve the urban population of southeastern Michigan as little islands of natural conditions and beauty, affording nearby the kind of recreation in wild lands sought by

those who can go farther afield—little sanctuaries of wild life lying protected at their back door.

Zoning—proper land use in parkways, recreation and beauty places—is as important to the towns growing up around a filling station as in the metropolitan area. The smaller towns in the heart of the recreational country lose attraction because of failure to conserve townlands for recreational and ornamental use. As long as our towns in the "cut-over" area fail to save land for parkways, or to plant trees, they will be unalluring to the tourist and less habitable for the residents. A small park in the center of a town, grass and a few trees planted along a broadened parkway "Main Street" adds much to charm and liveableness. Vacant lots can be made attractive. It is interesting that the garden club movement in Michigan started because one woman who hated dilapidation, planted zinnias and petunias in all the once ugly vacant lots of her town. Anyone who has travelled in New England knows how much beauty and restfulness the villages gain by their small inexpensively kept parks and commons. Such parks are rather formal but within or near most Michigan towns some beauty spot or historical site can be found which will repay preservation for recreation and which should be well kept but not improved.

Conservation concerns not only fish, game, forests, mines, but man and his towns as well.



IN CONCLUSION

Within the covers of this book we have discussed in brief Michigan's share of the products of the earth and the factors of man's relationship to them. It has not been possible to discuss one of them without reference to the others. They are all interwoven. Nor in this brief space has it been possible to clarify all the details of formation, growth, and dependencies of rocks, life, and man. We could only hint some relationships, hoping to serve as an index or guide to the many "irons in the fire" of conservation. We have told you of our towns made ghostly by vanished industries—grindstone cutting, copper mining, lumbering, grist mills. But we could not discuss all the human relationship involved. We have told you how our natural resources have developed from the initial bare rock and water. We have told you how use of our natural resources has developed, but we have not space to tell you of all the historical resources and sites left us. We have not space to tell you in detail of all the agencies interested in conservation, nor of all the research involved. We have included details of some hard-to-find facts and only referred to others on which many books have been written. If this book has opened new vistas for you, or clarified old ones, if you wish to read the details, you will find much of interest in all the bulletins and books of the bibliography of the companion volume. In addition to the many nature books, textbooks, and bulletins delightful, informative reading may be found in:

Along the Brook, Raymond T. Fuller. Reynal & Hitchcock, Inc.

Along the Hill, Carroll Lane Fenton. Reynal & Hitchcock, Inc.

American Conservation, Ovid Butler. American Forestry Association.

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Life of Long Ago, Carroll Lane Fenton. Reynal & Hitchcock, Inc.

Little Waters, H. S. Person. Washington, D. C. Superintendent of Documents.

Our Land and Our Living, Caldwell Baily Watkins. L. W. Singer Co., Syracuse, N. Y.

Our Plant Friends and Foes, W. A. DuPuy. John C. Winston Co.

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The Rock Book, Carroll Lane Fenton. Doubleday, Doran & Co.

The Soils That Support Us, Charles E. Kellog. Macmillan.

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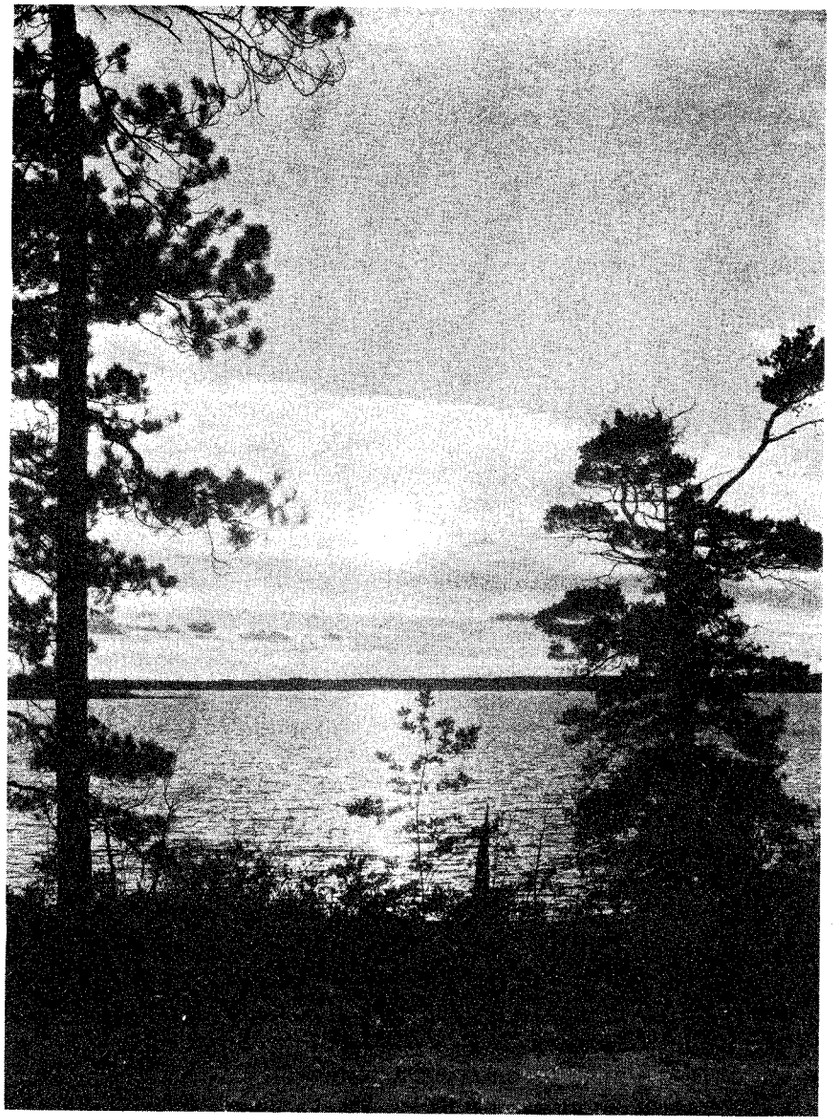
This Fascinating Oil Business, Max Ball. Bobbs Merrill.

This Flowering Earth, Charles Duncan Peatie. Putnams.

This is Our Land, Cheney and Schantz-Hansen. Webb Book Publishing Co.



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