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Louis A. Wolfanger
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Resources - Pioneers - Conservation - Citizens

LOUIS A. WOLFANGER



MICHIGAN STATE COLLEGE :: EXTENSION DIVISION

EAST LANSING

Cooperative Extension Work in Agriculture and Home Economics, Extension Service,
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CONTRIBUTION OF SOILS SECTION AND CONSERVATION INSTITUTE

The ideas and glimpses which this bulletin presents have come to the author from many vantage points: early associations while still in school with men interested in conservation affairs; a deep interest in resources and travel; some years of teaching and research in geography; and innumerable co-workers, both in and out of Michigan, who generously and enthusiastically shared their own rich experiences with him. All these are very gratefully acknowledged.

Especial appreciation is due the following men. For critical and constructive reading of the manuscript, L. R. Schoenmann, Director of the Conservation Institute, and Paul M. Barrett, Extension Specialist in Soil Conservation, of Michigan State College; P. S. Lovejoy, of the Michigan Department of Conservation. For the loan of photographs used as a basis for preparing several sketches, S. G. Berquist, Head, Geology and Geography Department, Michigan State College, and J. A. Brown, County Agricultural Agent, Presque Isle County, Michigan.

The pen and ink sketches were prepared by artists of the Museum Project of the Works Projects Administration under the direction of the author.

Foreword

Michigan is coming of age! Its pioneer days are closing. Only a few thousand acres of virgin forest remain. The homestead law has been repealed.

New forces are gathering strength. New ideas as to the wise and equitable use of our resources are forming. We are beginning to look forward toward building stronger and more wholesome communities—communities that are stable and deep-rooted, that are suitable for both work and play, and that are based upon a fair and far-sighted use of their resources.

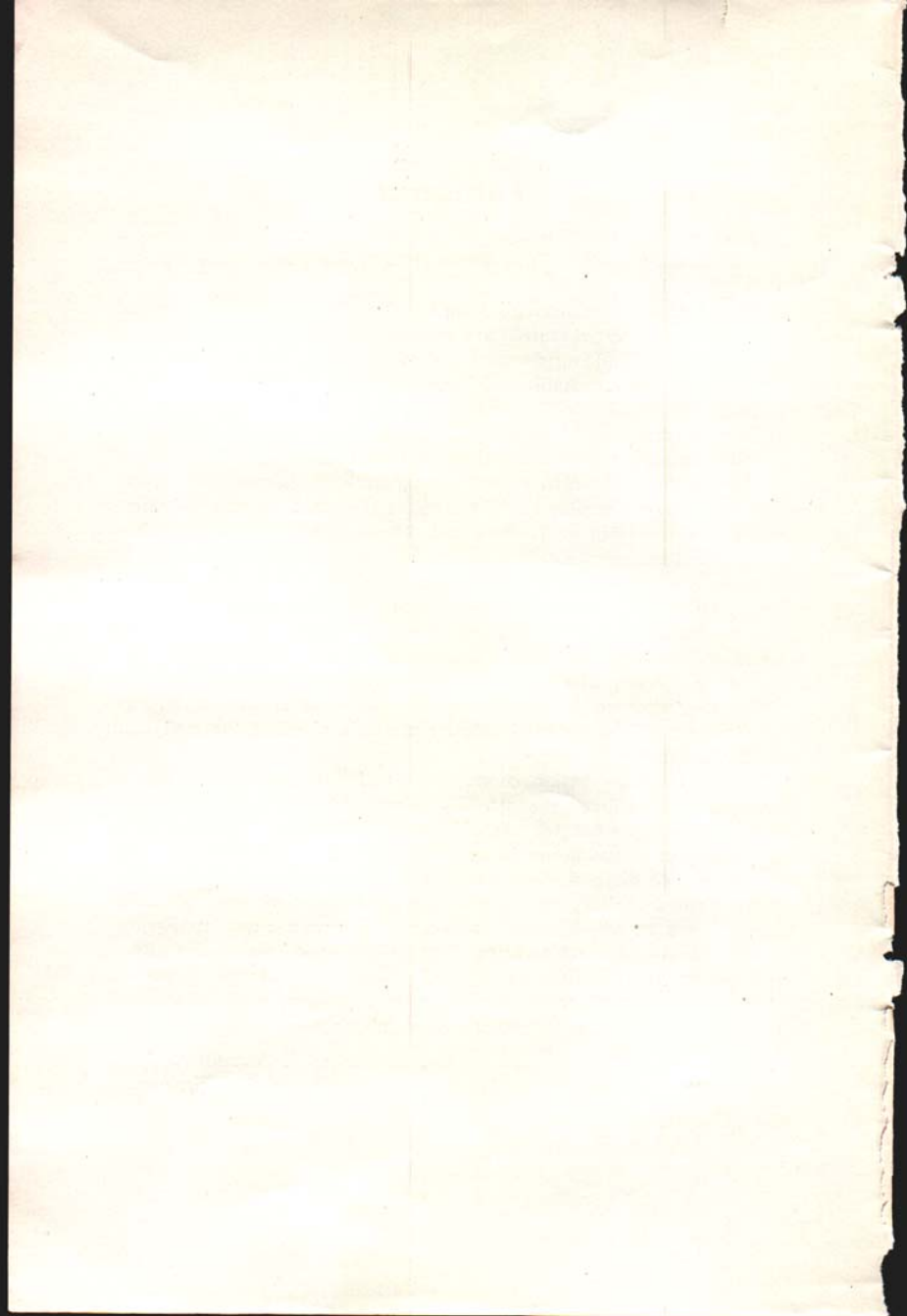
The century of pioneering that is closing has taught us much as to the nature of our resources. Looking back, we can now see many instances where the pioneer did not make the most desirable or effective use of the virgin wealth he found. The resources seemed boundless to him, and conservation an unnecessary and even fruitless effort. In addition, the frontier often imposed problems—were he hunter, lumberman, farmer, or miner—that gave him little other choice.

Even at the present time, many, if not all, of our resources are not being used conservatively or to their best advantage. Under the stress and strain of daily living and with the limited opportunity we have to really view and weigh our own actions, we have unconsciously continued many of the wasteful frontier methods of using our lands and other resources.

But good conservation comes from understanding of the nature of problems which confront us. Given knowledge and then means for action, there is no one who should not be willing and even anxious to use his resources and his environment constructively and conservatively.

The sketch of *John Pioneer* and *John Citizen* which this publication describes is a challenging account of what the use of some of Michigan's resources have been and can be, provided we use our intelligence. It draws aside the curtain of time, first to look back for a moment upon the pioneers of the 19th century and the stepping stones they laid; then ahead, to catch a glimpse of the new vista which the forward-looking citizens of the 20th century are laboring to create.

ERNEST L. ANTHONY,
Dean of Agriculture.



Resources - Pioneers - Conservation - Citizens

LOUIS A. WOLFANGER

THE PIONEERS

John Pioneer was born back East. He grew up in a community where everyone was his kinsman. Everyone was a Pioneer. The storekeeper, the doctor, the blacksmith, his teacher, were all Pioneers. They were all descendants of Pioneers who had come from farther East, or on one of the hundreds of Mayflowers that came from Europe. John's wife was a Pioneer, too. Uncleared land, freshly-turned earth and a simple, wholesome town formed the framework of their childhood community.

Commencing about 1825, a number of Pioneers began to filter westward into Michigan. John established himself northward and westward of Saginaw Bay in a forest district rich with game and fish. It was a region of mixed lands—lands of sandy plains mantled with stately pine, and lands of clay covered with magnificent stands of hardwoods. Lakes, swamps and a network of streams ran through the region. He spent his first years trapping the fur-bearers, building his house and clearing a few acres. Later he became a logger as the lumbermen came into his community, working in the forests in the winter and farming his small clearing in the summer. For a time the region became the world's greatest center for lumber production. Located within easy reach of the Bay and served by a splendid stream system, it reached its peak



Uncleared land and freshly-turned earth formed the framework.

around the sixties and seventies, and then gradually developed as a partly mixed farming and forest country as regular farm folks came in and began to clear some of the land of its stumps.

* * *

Silas Pioneer settled in southern Michigan. He had a keen eye for good farm land and wanted to grow grain. Lake Erie and the newly opened Erie Canal invited him to share in the rich grain trade with the eastern seaboard and Europe. He picked a tract of smooth gently undulating land, cut the hardwoods and built his house on a high well-drained knoll. He sold what logs he could, burned what he did not need for buildings, kept pushing back the forest, and in time was surrounded by fields of growing grain.



Kept pushing back the forest.

Jack Pioneer sought the Copper Country and the Iron Ranges. Miners were in demand. Wages were high. The growing industries of the East provided a huge market for ore. There was steady work. He enjoyed the steady temperatures of the mines; they varied but little throughout the year. There was a constant challenge and inter-

est in the unexpected problems with which the miner was confronted. He liked the rugged outlines of the copper and iron towns.

* * *

Peter Pioneer chose a lumber port on Lake Michigan. He opened a shop near the water front. He loved the bustle of a village store and the hearty sociability of the lumberjacks and the lake crew. In his spare time, he sorted the weekly mail. The port grew and prospered as the lumbermen penetrated the rich back country of virgin forest, and the spreading settlements on the dark prairies to the south and west of the Lakes demanded lumber in ever increasing volume.

* * *

Sam preferred complete freedom. Coming late in the century, his choice was to stop where opportunity for the time being appeared the most promising. But he wanted complete freedom to move whither and when he chose. He first went north and began as a trapper. He became a lumberjack. He found a job in a sawmill. He worked around a mine for awhile. He homesteaded a forty and cleared a few acres. Then he went back to trapping. When a relative willed him his homestead in the south central part of the state, he settled his family in the old farmhouse. Then one day oil was discovered in the neighborhood. A few months later he had leased the oil and gas rights on his land and a moderate-sized well began gushing oil into the new pipe line and wealth, such as he had never dreamed, into his pockets.

* * *

Tom took up farming in the stump lands of the north country. Land prices were low. The mining and lumber towns were booming and busy. The market for oats, hay and potatoes looked promising. The lumber camps offered winter jobs. While he liked the agricultural frontier, yet he also looked forward to the day when most of the land



He loved the village store.



Took up farming in the stump lands.

would be settled and his sons occupying farms on either side of the old farmstead.

* * * * *

Recent decades have been witnessing the gradual close of the Pioneer era. More than a century has passed since those persons began migrating westward and settling in Michigan. Their total number finally reached into the millions. Now virtually all of the farm land worthy of private ownership has been settled; the good lakes, stream sites and lake fronts have been taken up, and most of the choice forest, mineral, and urban lands have been occupied and exploited.

Lately new currents have set in. Much land—located largely in the northern two-thirds of the state but also scattered here and there in the southern part—is being given up or abandoned. Approximately six million acres at the present time have reverted to public ownership through tax delinquency or sale. Of very great significance was the repeal of the state homestead act a few years ago. It marked the end of the free land and free resource era, and closed the door on the Pioneer period.

THE CITIZENS

Today, John *Citizen* and his relatives are taking the place of John Pioneer and his kinsmen. The Pioneers were primarily individualists—men who struggled and dreamed and worked alone earnestly and with high courage. The frontier demanded such men. They had to face an unknown wilderness, and the resources of that wilderness seemed so vast there appeared to be more than enough for every man for all time to come. Conservation—the judicious use of resources in which the needs of tomorrow as well as those of today are taken into consideration—was still a strange and almost unknown word except to a few of unusually farsighted vision.

The *Citizens* are conservation-minded. They are community builders—men who struggle and plan and work together for their community, as well as for themselves. They are looking forward to the building of stable and enduring communities. A maturing state demands such men. It must face the fact that the frontier is gone. From now on conservation must be on every serious tongue. It must be every man's concern that the land and minerals and waters of his community are used in the best interests of *all*.

These *Citizens* are not new men. They are simply citizens in the more complete sense, and not only in the legal or politic sense. In fact many of them were once pioneers themselves, or they are the sons of pioneers. These men are primarily citizens with a new point of view. They have come to realize the changed and changing conditions in the resources of their community, and the importance of meeting these changes prudently and wisely. No longer is much wealth to be had for the mere taking. The easy-to-take and easy-to-use resources have now been largely depleted. The foundations of life must henceforth be rooted in the more fundamental and enduring resources of the community, and these resources must be conserved—neither wasted nor hoarded, but used with intelligence—if the community is to continue life on a wholesome basis.

TYPES OF RESOURCES

Resources differ widely from the conservation point of view. There is no simple conservation formula. Indeed, few if any formulas are known. We are still in the process of working them out, and we are only at the beginning of the task, not nearing the end. A million questions come to mind, but we sense the answer to only a dozen, and even these are not yet complete. The complete answers will only be born from experience and from the intelligent thinking and action of every *Citizen*.

Although each resource must ultimately have its own conserva-

tion formula, we can nevertheless recognize broad groups or types of resources whose problems are more or less similar and whose conservation will be sought in somewhat similar measures. Each of the situations described on the first few pages, with which the six Pioneers chose to associate themselves, is representative of a common type of resource and conservation problem. None of these is an entirely distinctive type, because the use and conservation of each resource is linked with and overlaps the other resource problems in the region. Nevertheless, they will serve to illustrate the contrast between the pioneer period and the new conservation era into which we are gradually moving.

In the following pages, each situation is briefly presented in three parts. The first part describes the circumstances in which each Pioneer type finds himself after some years of settlement and exploitation. The second is an outline of the conservation problems with which the thoughtful *Citizen*, who is taking his place, is wrestling. The last part is a short discussion of the more general type of resource which the situation illustrates, including the conservation thought, policies or measures that appear applicable to or are being brought to bear upon this type of resource.

FOREST AND WILDLIFE

Today, the game on which John Pioneer depended can be hunted chiefly in season only, and the forest lands where he logged are generally in second growth timber. Popple and scrub have taken the place of the virgin forest. His community—the region beyond Saginaw Bay—which once shipped hundreds of thousands of feet of lumber by water now ships only a few thousand by rail. John makes only a scant living by scavenging the swamps for pulp and railroad ties or by working for the WPA. Moreover, many of the little farms that sprang up on the heels of the lumberman are being abandoned, and schools, roads and other public services are becoming increasingly difficult to maintain. The little towns that once hoped to be big towns are not growing. A large part of the region is slowly sliding back into wilderness.

John *Citizen*, who is beginning to take the place of John Pioneer, sees hope for the country, however. He has come to realize that the basic resources of the community—forest and wildlife—are renewable. They are living resources. Having life, they can produce their kind. Here is stupendous energy—billions of tiny organisms willing and anxious to grow and generate billions of tons of plant and animal stuff. Release the energy, encourage it and help it, and the resource can be restored. Even though most of the land would grade rather low for general agricultural purposes, yet it is suitable for forestry and wildlife.

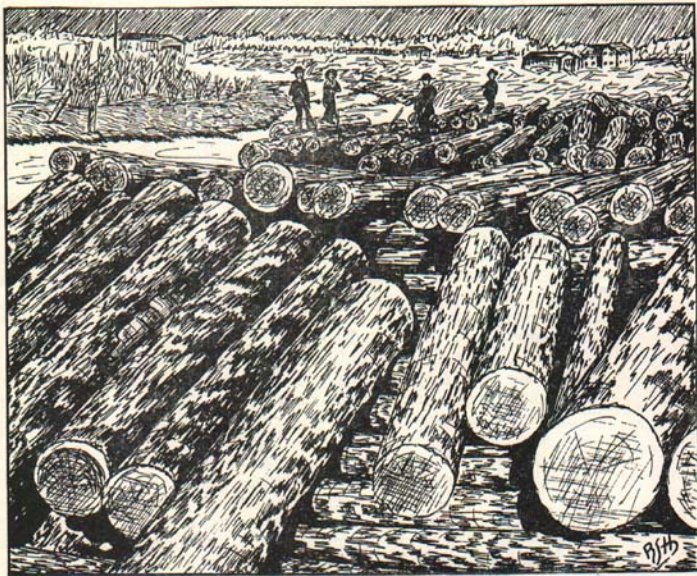
Hence, *if* the community cooperates intelligently, *if* favorable reproduction conditions are maintained, *if* the enemies (diseases, fire, insects

and sometimes man himself) are curbed, if depleted waters and lands are restocked and adequate cover and feed is maintained, John believes that the forest, the game, the fish and the land will produce crop after crop for generations, and furnish the basis for an enduring, stable community. The community which *grows* its resources, endures. There will even be an opportunity for some of the little farms to survive if they use chiefly the heavier and better located lands, although the region is primarily a forest country.

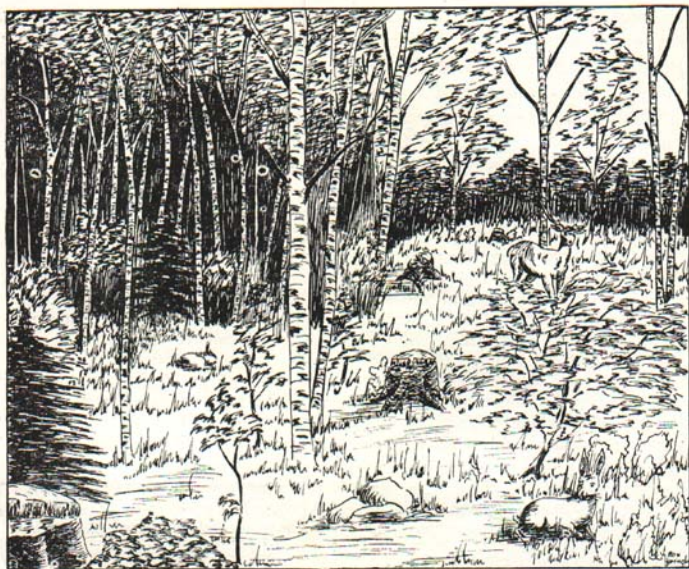
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EXHAUSTIBLE BUT RENEWABLE RESOURCES

The forest and wildlife resources illustrate a well known type: the *exhaustible but renewable*. All plant and animal resources—forests, grasslands, wildlife, game and fish—are exhaustible. But, in general, (and this is far more important) they can also be renewed or restored to somewhere near their original abundance. Having life, they can be grown. Some may even be increased beyond their original state, provided we are willing to maintain or create the natural conditions necessary for such an increase. The



Once shipped hundreds of thousands of feet of lumber by water.



Suitable for wildlife and forestry.

present deer population of the state, now estimated as nearly a million and much greater than that of pioneer days, is an example of the increase of a species beyond its original numbers when presented with conditions favorable to its growth (the increased browse arising from the cut-over conditions of the state).

What broad conservation policy, then, should be advocated for this type of resource? As a general rule, if such a resource is depleted appropriate steps should be taken to restore it, or to encourage its natural restoration. Land best suited to forest, grasslands, or wildlife, or waters best suited to fish-life, should be gradually returned to such uses and maintained therein.

There will be many local and specific exceptions, however. Because a region once supported a magnificent forest, it does not follow that good conservation calls for its reestablishment. Other uses of the land or waters may be more important at the present time. Nor is it desirable that every plant or animal resource that was native to a community be restored or maintained. Self-evident examples are highly predatory animals, or objectionable or low value types of aquatic life, or plant species of low value or noxious character. It may also be important to introduce entirely new species or associations of plants or animals.

The task of carrying out any essential conservation measures is primarily a responsibility of the community. John *Citizen* has neither the strength nor the means to achieve it alone. His responsibility is one of intelligent and active cooperation in the community program. He will do his part as he assists in the development of the program and in bringing *his* own land or *his* waters into harmony with that program.

The conservation program which the community undertakes will generally involve at least four considerations:

First, the fundamental nature of the resource. This refers to the biologic nature or the life cycle of the resource. How does it grow? How does it reproduce itself? How is it maintained? What are its enemies? How are they controlled? How much time is necessary to produce an average crop?

Second, the present condition of the resource. Is the resource depleted? To what extent? Will replanting or reintroduction be necessary? Are natural conditions still generally favorable for its restoration?

Third, the relation to other resources in the region. How will the use and maintenance of this resource affect the use and maintenance of other resources in the region? In general, the best and continuing use of one resource is dependent upon the wholesome condition of others.

Fourth, the fundamental economic, social and other human conditions of the community. How many people will the resource support? Is the population increasing or decreasing? Are the costs of labor and transportation low or high? Can people adapt themselves to the proper use and conservation of the resource? What help would they need? What use can be made of the resource, and where can it be sold? Is the restoration advisable in view of other resources which the region possesses, or because of outside competition?

Such an inventory will assist materially in determining the most desirable course of action.

At the same time, it should be noted that nature itself is constantly striving to reestablish renewable resources without the help of man. It appears to have an irresistible urge to mantle the earth with vegetation and to populate it with some kind of animal life. Land left bare is presently clothed in some kind of plant life and used by some type of creature. This tendency is an important conservation asset. It assists materially in the process of reclamation and restoration.

Such natural restoration is under way on a grand scale in the cut-over regions of the state. A new growth is establishing itself almost everywhere where fire protection has been afforded. The desolate and fire-gutted lands that were so common a decade or two ago are now relatively rare.

Unfortunately, however, nature moves through relatively slow stages when following her own course of action. The land is not immediately returned to its virgin cover, but passes through a series

of plant successions in which each generation of plants acts upon and improves the environment until it is once more favorable for the original stand. Here, therefore, is a major problem: should nature be helped or hurried by man? Will a crop consisting of the same species as the original stand really be valuable, if restored and *when* matured? Or is the present second growth which consists chiefly of non-merchantable species according to current standards the more valuable?

If nature is to be hurried and artificial reforestation employed, the site conditions under which the new stand is to be established should receive much more attention than it has generally been given, unless the cost of producing a merchantable crop is secondary. It is a curious fact that the restrictions of soil, climate, drainage and other natural conditions have long been appreciated in the field of agriculture. We have come to recognize corn lands, potato lands, and orchard lands. But it has only recently begun to be apparent that the successful and profitable growth of forests is equally dependent upon soil and other natural conditions, or, in other words, that there are submarginal, marginal and supramarginal forest lands as well as agricultural lands. This limitation is not yet generally recognized, however, and it is a common belief that all land unfit for agriculture can grow a good crop of commercial timber. Unless submarginal land possesses other unusual economic advantages such as recreational value, it is generally better left to nature's slower but less costlier routine of self-revegetation and afforded little more than necessary fire protection.

Until recently, efforts to restore wildlife resources have followed one or both of two courses. One sought to build up or to maintain the resource by merely regulating the annual "take" through appropriate legislation. Hunting and fishing regulations were enacted which, as a rule, attempt to adjust the annual "take" to certain assumed rates of growth and increase of the species. This is the basis of our so-called "one-buck" law, and other seasonal hunting and fishing laws. The other method approached the problem through artificial propagation of a desired species, followed by its release, at some stage of maturity, to shift for itself. The work of fish culture and planting is illustrative.

On the other hand, experience is indicative that the restoration of wildlife has much in common with the restoration of plant resources. Slow self-restoration may be awaited, or the process may be speeded up by reestablishing the proper habitat. As in the case of forests, however, the limitations of soil and other natural conditions appropriate to the species must also be recognized. All types of water are not equally adapted to all types of fish life, nor are all types of land adapted to all types of game birds. The peculiar cover and food conditions which are required by the species and which have their origin in the land or water must be maintained. The improvement of stream, lake or land conditions according to the species has therefore become one of the cardinal principles in restoring and maintaining wildlife resources. No more than the provision of adequate cover and a bit of feed has brought back a surprising voluntary wildlife population in many an odd corner or bit of unagri-

cultural land: songsters, pest-eaters, fur-bearers, game birds, and other useful species.

Closely linked with the general nature of the habitat is the question of carrying capacity. Food supply is quite as essential as cover. Unless numbers are adjusted to food capacity, overstocking becomes as serious a problem as it does among domestic animals. Fifty wild creatures can no more support themselves and produce young under conditions favorable for only five, than fifty head of stock can survive under grazing conditions suitable for one-tenth their number.

IRON AND COPPER

Jack Pioneer, the miner, who liked the iron and copper towns, toiled busily for many years. The expanding industries of both the state and the nation were hungry for ore. Every year the Lakes swarmed with more and bigger ore boats.

But of late years he has been facing decreasing employment. Each year the copper mines have been growing deeper and more workings have been abandoned. Each year has seen the richer and more prized iron ore depleted and greater idleness in the once thriving iron towns. Each year the competition has been growing keener, as more mines, many of them cheaper to operate and with richer ores, have opened in other Lake states, the West and abroad.

The mineral resources—iron and copper—on which his livelihood depends, are not restorable. It takes ages for iron and copper-bearing rocks to crumble, and for the ores or metals they carry to accumulate in quantities sufficiently rich for mining. Therefore, no matter how great the reserves may be, his community faces eventual decline as a mining community regardless of whether competition becomes serious. Even though new discoveries are made, or new methods of mining and refining lower-grade ores in the region are worked out, or increases in the price of iron or copper restimulate the mines, the ultimate results will be similar, because the quantity of ore is fixed. It cannot be grown like forest and wildlife.

Jack Citizen, therefore is giving serious thought to the future. It is not entirely hopeless, but does require careful planning and action. He sees three possible choices: (1) Use the present minerals conservatively, (2) find and develop new minerals, or (3) shift the basis of the community to other resources in the region. A fourth choice is to combine all of them.



Each year more workings have been abandoned.

How can the present minerals be used conservatively? For what uses are the copper, and the particular type of iron ore the community produces indispensable? How can they be reserved for these uses? What should be the rate of production and consumption? Are there substitutes which the nation should be seeking and developing? Is the income from these disappearing resources being invested in permanent improvements in the community which will render helpful service when the chief livelihood must be won from other resources of the region? How many people can the known and probable reserves support? And how long? Fifty years? Twenty years? Or only about five?

Or, in the second place, can new minerals be found and developed in the region? Butte, Mont., a younger mining community has swept through two major booms and depressions—first gold, then silver—into its present copper era. And the copper is well supported by a half dozen important by-products: zinc, lead, gold, silver, manganese, sulphuric acid and arsenic! But such good fortune is rare, and the mineral resources of Jack's community are not immediately promising. Although the state possesses a score or more of minerals, most of the deposits are relatively scattered, of low value, or occur in comparatively small deposits.

In the third place, then, can new industries be encouraged to supplement gradually or even to take the place of mining? A mixture of recreational, forest and agricultural lands surrounds the mines. Not far from the mines are interesting and scene-commanding mountain lands, and forest lands with lakes and some waterfalls, both favorites with the Indians. Why not a favorite with white men too? Why not roads or trails to the scenic spots and to the old Indian haunts. Perhaps the abandoned pits, the old mining machinery, the pre-historic mines, and other odds and ends of interest could be cleaned, dressed up and made known, and prove as attractive to the tourist and the lover of history as Bunker Hill in Boston, or the Jamestown site in Virginia.

Where can summer cottages, homes and recreational facilities be built, with the investment reasonably protected by public policy and action? Where is good fishing? Good skiing and tobogganing? Good loafing? How can everyone be coached so he knows the answer to any question the stranger may ask him? The stranger pays liberally for the right answer in the goods and services he will buy and in the new friends he brings to the community.

The local "islands" of good agricultural land offer opportunities for both general and specialized farming. Crops and products which take advantage of the climate, soils, location and recreational markets of the region need to be determined—or combinations will suggest themselves, such as part-time forestry and agriculture, or forest products and recreation, or seasonal work in nearby state and national forests. Some persons may have to migrate. The specific answer for each community must be sought in its own resources, its location, and in the number and character of its people. The exhaustion of



Not far from the mines are interesting and scene-commanding mountain lands.

the mineral resources does not necessarily mean the extinction of the community, except as a mining community, provided its roots can be shifted to other more permanent resources.

* * *

EXHAUSTIBLE AND IRREPLACEABLE RESOURCES.

Iron and copper are representative of many resources—resources which are ultimately destroyed through even careful use, and there is no known means of restoring or replacing them. We may designate such resources as *the exhaustible and irreplaceable type*. The nature of the resource, the quantity available, and the rate of use will determine its life. Some uses exhaust the resource much more quickly than others. Lead used in paint, for example, has a very short life, since it is unpractical to recover it, whereas lead pipe has long been salvaged by well organized scrap industries.

All of the metallic ores and natural mineral fertilizers including marl belong to this type of resource. Every community or enter-

prise based upon their exploitation must eventually face the prospect of decline and even extinction *insofar as its life depends upon the presence and use of any such resource*. The world has thousands of abandoned mining sites. In Michigan, the number is still small but it is increasing.

The same situation is in prospect for the community whose resources were formed by the *slow* accumulation of organic materials—the natural gas community, the petroleum community, or the muck-crop community. The only difference between them is in length of life. Since the attainable supplies of natural gas are in general the most limited among the mineral fuels, the natural gas community usually has the shortest life. While coal is generally more abundant and not so illusive to mine, since it remains fixed in place, yet the average coal community lives but a generation or two longer than the gas town.

Muck soils may be used over and over, but the muck is gradually oxidized until the gravel, or sand, or clay underlying it is all that will be left. The life of a muck-crop community will depend largely upon the thickness of the muck and the skill with which it is utilized. Protection from over drainage, from fire and from erosion by the use of adequate windbreaks is fundamental to muck conservation.

The broad conservation policies that should generally obtain in this type of resource are:

- (1) Work out practical substitutes from among the more durable or enduring types of resources.
- (2) Bring about the substitution as completely as possible.
- (3) Utilize the exhaustible resource for indispensable needs or services only, and use it as efficiently as technical knowledge permits.

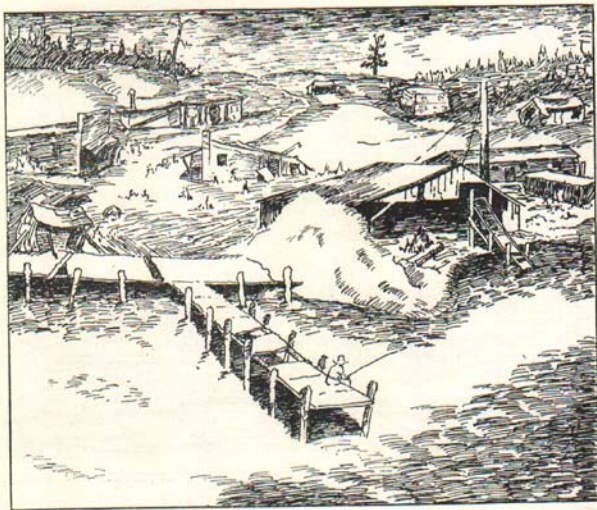
The substitution, wherever practicable, of inexhaustible water-power for exhaustible petroleum as a source of power is illustrative. Petroleum is not only exhaustible but it is also an almost indispensable source of general lubricants. Although substitutes are obtainable from the distillation of oil shales or coal, the labor involved and the difference in cost are by no means attractive. Moreover, coal is itself an exhaustible resource, and the view that coal can be relied upon as a potential source of petroleum products is merely setting up a trick system of conservation bookkeeping.

The task of working out substitutes and restricting the use of this type of resource to those that are indispensable is a challenge to the state and the nation rather than the community alone.

For the community as a whole, the primary conservation policy must be one of gradual and timely adjustment. If it is to survive, it must turn to other and more enduring resources within the region as the exhaustible resources are depleted. It has no other choice when its mineral foundation is gone.

THE LAKE SHORE

Peter Pioneer, the storekeeper who set up his shop in a lumber port on Lake Michigan, has also come upon less prosperous days since the log drives have stopped. The boisterous crowds from the sawmills and the lumber camps are gone. It's been years since the last lumber scow left, only partially loaded. The old wharves are deserted except for idle fishermen. Every year the old houses that grew up around the store are becoming increasingly tired



The old wharves are deserted except for idle fishermen.

and droopy and are slumping and sliding back into the foundations from which they sprang. Giant trucks and buses rumble along the modern highway that lies less than a mile from the store, but only an occasional local truck or passenger car stops for gas or tobacco.

But Peter *Citizen* has his eye on the water front with its shelving beach, the sandy strand, the dunes and their inner border, and the river. The lake breeze is cool in summer, and the waters look inviting. The cities and the lands away from the lake are hot. He sees great recreational possibilities. His eye pictures all-year homes; summer cottages; land-, shore-, and water-fun; new and steadier crowds.

Here is a peculiar resource. It is inexhaustible. Using it does not wear it out or destroy it. It is useful for generations. Yet the choice water frontage available to Peter Citizen's community is limited. There is only a mile or two of shallow water, sand plain, dunes and inner border that belongs or is accessible to this neighborhood. And its recreational possibilities are of funda-



His eye pictures new and steadier crowds.

mental interest to all the people of the community. Everyone will gain from the summer visitor who will feel inclined to rent or build a cottage in the dunes, to disport himself in the water, or to relax on the beach.

Peter is pondering, therefore, the question of control and ownership. Should this resource which is inexhaustible but so limited and yet so vital to the future life of the whole community be in private hands or a kind of common property, owned and administered by the whole community? Or can a kind of joint private and public system be worked out?

INEXHAUSTIBLE BUT LIMITED RESOURCES

Peter *Citizen's* water front is representative of many resources—resources which are relatively inexhaustible, but which at the same time are relatively limited in amount or quantity. Their nature is such that they are not consumed or demolished when used, yet there is only a given supply. We can call this the *inexhaustible but limited* type.

Other examples of this type of resource are recreational lakes and sites of scenic beauty and historical importance. There is only a limited number of lakes that are really suitable for recreation—a few within a community, more within a county, still more within a state. There is only a limited number of sites having unusual scenic beauty or historical importance. Yet each of these resources is relatively “inexhaustible.”

Many other similar resources will come to mind: areas having unusual natural formations of a mineral or geologic nature, or of a plant or animal nature; the water power resources of a community; the water supplies available for domestic consumption, industrial use or irrigation; natural springs; lands suitable for parks or centrally located for public services; intersection of natural highways; natural gaps, etc. Each of these constitutes a resource that is “inexhaustible” but limited in quantity.

Perhaps the most important aspect of a conservation policy bearing upon this type of resource is the question of ownership and administration. Since each resource of the type is so limited in quantity, who should have the advantage of use as the years roll on: a few fortunate owners, or the community? The answer will vary from resource to resource and from community to community. But the question should be answered in time.

There is also an important conservation problem that is preventive or preservative in nature. Peter *Citizen's* water front, for example, can be polluted or smothered with silt from mud-laden waters which flow out of an eroding hinterland; or blowing dunes may require tacking down with beach grass, or the support of skillfully placed windbreaks. In either case, preventive action to preserve the water front from deterioration becomes necessary.

Then there are positive or constructive measures of importance, such as the matter of necessary or desirable improvement work, and of timely and orderly development. Such action, in the case of Peter *Citizen's* water front, would call for a careful analysis of the recreational qualities of the shore land, the dune area, the inner border, and the near shore waters. This analysis would be followed by the preparation and enforcement of a plan of action and improvement work that would lead to a conservative development in the interests of the entire water front. How many people can be served? Where should the cottages be located? the commercial centers? the camping sites? the lifeguard-protected beach? each of the diverse types of playgrounds? the anchorage for watercraft?

PETROLEUM VERSUS LIMESTONE

When old wandering Sam Pioneer, who had tried his hand with nearly every virgin resource that promised him a fair living, had the luck to inherit an oil property, he lived in comparative luxury for a year or two. He built himself his first real house. He traded his old model-T for a late deluxe model. He laid elaborate plans to satisfy his endless urge to travel and explore new country.

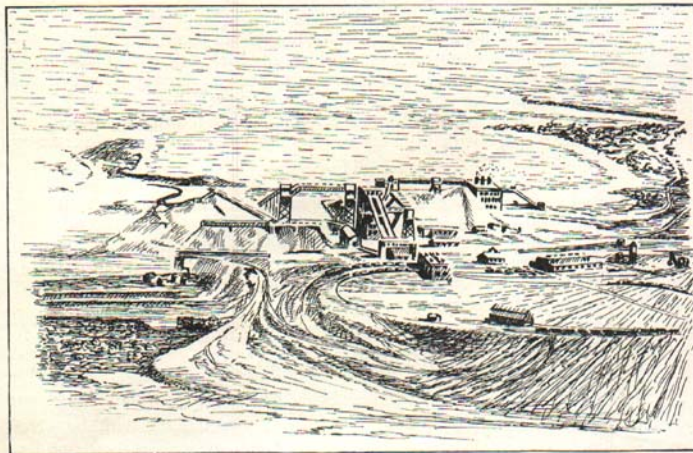
Then, suddenly, he faced the old inescapable tragedy which all must face whose livelihood is based on quickly exhaustible and limited resources. His well and those of his neighbors began dropping in yield, one after another, until most of them were mere trickles. There was a feverish hunt for new pools all winter, but only dry holes stared back at the searchers. The next spring, the new school closed its doors indefinitely, the young doctor left the community, the forest began creeping back where oil-soaked grounds did not smother its seedlings. Old Sam spent his last years hoping.



He faced the old inescapable tragedy his well began dropping in yield.

Sam *Citizen*, however, has been building his business on a rock, literally as well as figuratively. Long before old Sam Pioneer settled the family in the oil country, he sensed the great possibilities in the massive limestone outcrops off Thunder Bay. He compared the rock with stone of other regions, made rough estimates of the tonnage and eventually concluded that here was stone of exceptional quality worth quarrying. It made good cement. It was suitable for the chemical industries. It made good flux. It could be used for building stone, for road making and for concrete. Sam lost no time in establishing a quarry and now ships wherever the lakes or the railroad can carry his cargoes.

How long will his resource endure? The limestone formation is so extensive that neither he nor his son's sons beyond the tenth generation will



How long will his resource endure?

lack raw materials. Grecian and Italian quarries have been producing marble for centuries! This is the type of resource upon which some of the most durable types of community can be built!

* * *

INEXHAUSTIBLE AND SUPERABUNDANT RESOURCES

Every community has one or more resources which, to all intents and purposes, either:

- (1) Are unlimited in amount and inexhaustible in nature—wind power, sun energy, gravitational force, tidal energy, or

- (2) Exist in such abundance that the supply is virtually inexhaustible—building stone, brick-clay, sand, limestone.

The first may be simply designated as the *inexhaustible* type; the second, as the *superabundant* type. From the conservation point of view, both of these types may be considered together. Any resource which properly belongs to either classification presents us with no problem of restoration or maintenance; few, if any, restrictions or regulations of a conservation nature are usually required.

At the same time, those resources deserve serious attention from another point of view, if their proper place in the field of conservation is to be achieved. Since those resources are inexhaustible or exist in superabundance, they merit careful study with the aim of working out substitutes, from among their number, for the more perishable and limited types of resources. Iron rusts and wood decays. We protect them at great expense. While new methods for their preservation may be discovered, compare the advantages of using stone, or brick and tile made from superabundant clay—or compare the advantage of substituting, if we could, the inexhaustible power of the wind, or sun, or tides, for the irreplaceable and highly limited natural gas or oil. Serious minds are already wrestling with such problems.

Any resource which is eligible for inclusion with this type can be pressed upon with little or no restraint or concern as to exhausting either its qualities or the supply.

Possibly the greatest problem which these resources present lies in their abundance and commonplace character. They are so abundant and commonplace that their great and lasting values are easily overlooked. Yet, they are the type of resource to which the truly conservation-minded *Citizen* might give some of his most earnest attention, and over which the emotional-minded conservationist might well become more excited.

AGRICULTURAL LANDS

Silas Pioneer, the farmer, who established himself in southern Michigan, and put most of his cleared land into wheat, was blessed with bounteous and profitable crops. His humble log cabin soon gave way to a well-built frame house. He put up a hand-hewn barn to shelter his stock, and a generous granary to hold his grain.

In the course of time, the dark-colored grain lands of the West began to be settled. Lake states' timber, good and cheap (cheap because the forests were "devastated") helped promote their occupation. As competition from the dark-colored prairies increased and his soils began to show exhaustion, Silas decreased his wheat acreage, put more of his depleting land into rye and feedstuffs, gave more attention to livestock and commenced to rotate his crops. Then he reduced his uncleared land to a small-acre woodlot and began to use it for pasture. With the development of manufacturing industries in the state, and with the increase of population and the growing demands for dairy products, he replaced some of his beef cattle with dairy herds.

But his lands continued to deteriorate. Coming from the East, the land he had chosen seemed comparatively level. Yet, in detail, if one studies it closely, he will notice that it is actually made up of only scattered patches of really flat or near-flat land and that the flat land is intricately interwoven with countless slopes—short slopes, long slopes, steep slopes, gentle slopes. With fields laid out in the conventional rectangular pattern of the earlier days, and rows of clean-tilled crops running up and down the innumerable slopes, the topsoil has naturally been getting thinner, year by year. Each year, the little knolls that stud the fields have been becoming more clayey



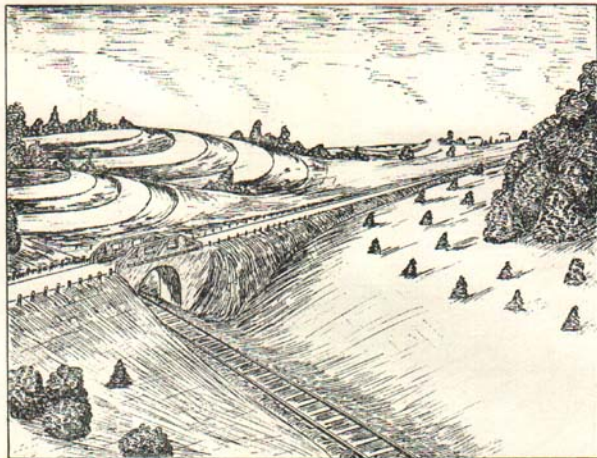
But his lands continued to deteriorate.

or gravelly and have been getting most of the manure. Each year more rills and gullies have been breaking up the fields, calling for extra effort and time to keep them filled. More than a century now has passed since old Silas migrated to Michigan, and the old farm is slowly deteriorating. The fences are more ill-kept and the granaries are less filled after the harvest.

But Silas *Citizen*, who lives down the road, has been learning the importance of conserving his soil resources and has begun fighting to maintain his land. Slowly, year by year, he is revolutionizing his practices. He began by shifting all the clean-tilled crops he could to his most level land. Then he moved his fences, where necessary, and laid out his fields in strips *around* his hills and *across* his slopes. Here he grows the additional clean-

tiled crops he requires in alternate fields or strips with his small grains and hay crops. When he plows or cultivates, he does it *across* the slopes.

His lands that are too steep for strip cropping he keeps in permanent pasture. He is also applying more lime or marl and is buying more mineral fertilizers to return to his soil what the crops and pastures and rain water take out. He makes frequent use of green manure crops to build up and maintain organic matter.



His farm will maintain and increase its productiveness.

His rough and steepest land is going into woodlots, and he is using species of high value, not merely any trees he can lay his hands on. As the trees grow, he plans to provide or encourage young stock to take the place of the maturing trees that are harvested as logs or firewood. He has planted a fringe of low growth to shelter wildlife and to stop the wind from sweeping into the trees and drying the forest floor. Fence rows and odd patches along the edge of fields are also being kept in wildlife cover. He believes that wildlife pays for its keep in the bugs and grubs it eats, in the meat and fur it produces, in the sport it provides, and even in the mere fun of having it around.

His reward for all this? He has slowed down erosion. All his fields, not only the clay spots, get the advantage of the manure. His crops and his pastures suffer less during dry spells. He uses less power by farming on the contour. The long contour rows require less turning. His yields

are larger and more dependable. All of his soils are *advancing* in productiveness. Each year his farm is increasing in value. At the end of a century, Silas Pioneer's farm has lost an important part of its productiveness; at the end of another century, Silas *Citizen's* farm will have maintained and even increased its present productiveness.

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INDESTRUCTIBLE BUT IMPAIRABLE RESOURCES

This type of resource is indestructible; not absolutely indestructible, but relatively so. Complete and absolute destruction of land is rare. In general, only its use for certain purposes is affected or "destroyed," but it continues to exist as land. In the case of Silas Pioneer's farm, his land merely declined in agricultural productivity. This is serious, of course. The soils were thinned. The content of the all-important organic matter was reduced. The smooth surface became broken by gullies. His land was impaired but it has not been utterly destroyed. He still has soil, or what used to be the subsoil under natural conditions, and he can conserve it, not by "growing" new soil, but by protecting it from further erosion, and building up its productivity through the use of legumes, mineral fertilizers, manure and other good management practices.

In general, virtually, all land and water resources belong to this type. It includes forest, pastoral, recreational, urban, and other kinds of land as well as agricultural land. It includes streams, lakes, springs, swamps, ground water and similar water types. Each of these resources is comparatively indestructible—forest and pastoral land, or streams and lakes are not ordinarily subject to any greater degree of annihilation than agricultural land—although the value of each may certainly be reduced or impaired by improper use.

The primary conservation policy demanded by this type of resource is protection from depreciation. Erosion is the greatest menace to land, be it agricultural, pastoral, forest and even recreational. Both Silas Pioneer's land and Silas *Citizen's* land included innumerable slopes, but Silas *Citizen* respected the slopes when he began to revolutionize his practices. Fire, too, is a critical enemy. So is removal or absence of plant cover. Particularly vital is the maintenance of organic matter. Without organic matter, the soil, which is the most important part of land, loses those properties which set it off from all other earth-like materials and which endow it with its peculiar productive qualities. The value of urban land is impaired by improper utilization and development, such as its use for business enterprises when the use should be residential, or conversely; by failure to provide adequate streets and parks; by too low or too high population density; by excessive suburban development, etc.

Water resources are chiefly injured by waste and pollution, by unnecessary drainage, filling or obstruction, and by failure to maintain a cover or proper cover on the watershed. To a certain extent, their conservation is closely linked to the conservation of the land with which they are associated. Waste reduces the supply. Pollution impairs its use for not only man but also the creatures

which live in or depend on the water for their living. Excessive drainage reduces both surface and ground water supplies. Obstructions affect both the quality and quantity of water, and do so above the obstruction as well as below. Filling, if complete, destroys the quality and quantity entirely. There are conditions, of course, when drainage, obstruction and even filling are good conservation. Without drainage, our muck lands would be useless for crop production. Dams are necessary for power development. Filling may check stream bank erosion by diverting currents. The question of help or hindrance is a question of place and circumstances, and not of rule.

The wise and conservative use of this type of resource in the future offers a distinct challenge to *Silas Citizen*. Men have long recognized differences in the qualities and capacities of the animals they produce and the plants they grow. Horses are distinguished from cattle, grains from root crops, hardwoods from softwoods. In turn, each of these are differentiated into species, types, varieties and strains, and much care is exercised to take advantage of the peculiar properties of each.

Such distinctions in land and in water resources, however, have not been generally recognized. Rough and ready differentiations are made, such as rolling lands and level lands, clay lands and sandy lands, or wet lands and dry lands, but the detailed and critical differences which exist within the rougher classifications have been largely ignored. Crops have generally been grown and livestock enterprises carried on with little regard for the capacity of the land to maintain that type of use. Lime and fertilizers have been figuratively spread with the wind; they have been applied to land with little or no discrimination, sometimes benefiting, sometimes harming, sometimes producing neither benefit nor harm. The use of crop rotations and management practices have been similarly negligent of differences in land qualities. The result has been innumerable crop failures, or low-yields or serious injury or actual ruination of the land. What was sauce for the goose has not always proven to be sauce for the gander.

The challenge to *Silas Citizen* lies in the task of discovering and learning the types of land in his community in a manner and detail which corresponds to his understanding of his plant and animal resources, and then in adopting his agricultural, forest and other uses of lands to the qualities of the land. Each soil and land type has its own special advantages and limitations. Good land use must take account of these conditions. Familiarity with the names and critical qualities of types of land should become as common as with types of livestock, or grains, or trees. Only then can the use of land become genuinely wise and intelligent.

Such an understanding of land capabilities would gradually bring about a major revelation in land use, but it would be a constructive revolution. Crops, livestock, rotations, fertilizers, pastures, recreational activities, forests and other land uses would then be shaped to fit the land. Most efforts until now have been directed towards whipping the land into submission, whereas the fundamental qualities of most lands are more or less fixed—not unalterably so, of course, but such changes can generally be made only at considerable

cost and effort, and then the "improvement" may lack durability. Here moreover lies the crux, or pivotal point of soil erosion. *The adjustment of land use to land quality* would largely solve that problem. Steep lands and blowable lands would not be utilized for tilled crops.

There is also reason to believe that types of agriculture could be evolved which, taking advantage of the superior adaptation of given crops to given lands, would require less use of mineral fertilizers and other soil amendments than present practices call for, or than we would have been inclined to assume would be required as time went on. Such an agriculture would not only be more economic, but the difference could either be conserved for future use or employed on land more generally in need of such amendments.

The conservation of water resources presents analogous considerations. Types need to be recognized and the use of water resources—such as the growth and maintenance of aquatic life, the development of water for power, recreation, navigation, etc.—adjusted to their characteristics. Progress is being made in the study of both land and water resources on the part of technical men, yet the field as a whole has only been barely explored and the application of both technical and practical knowledge is still very limited. But *Silas Citizen* is rising to meet the challenge.

PUBLIC LANDS

The stump lands of the north, on which Tom Pioneer began to farm, lay in a region of mixed sand plain, clay, rough boulderly hills and swamp. Although summers were cool and short, it was widely hailed as good agricultural country. Here was a growing frontier and land was cheap. It had the attraction of good markets in the busy lumber camps and the growing mines. As soon as the land was cut over, many other persons, it was said, would come into the region, and it would soon develop as the southern part of the state had done.

Tom built his house on a small tract of good clay land. During the winter he worked in the logging camps. In summer he grew hay and grain and sold them to the lumber camps or in the mining towns. He was busy, very busy. His growing family helped him plow, harvest and push back the forest. In time he planned a larger house and a real barn.

But when the lumbermen left and the mines started to reduce their operations, he began finding it more and more difficult to get outside jobs and harder and harder to find a market for his crops. Then neighbors began to leave, and soon his farm, like theirs, began to be swallowed up again by the wilderness. Roads became poorer. Now each year the land in this region is becoming more and more tax delinquent and more and more is passing into state or federal ownership. There is little money for church and school and other necessary public services.



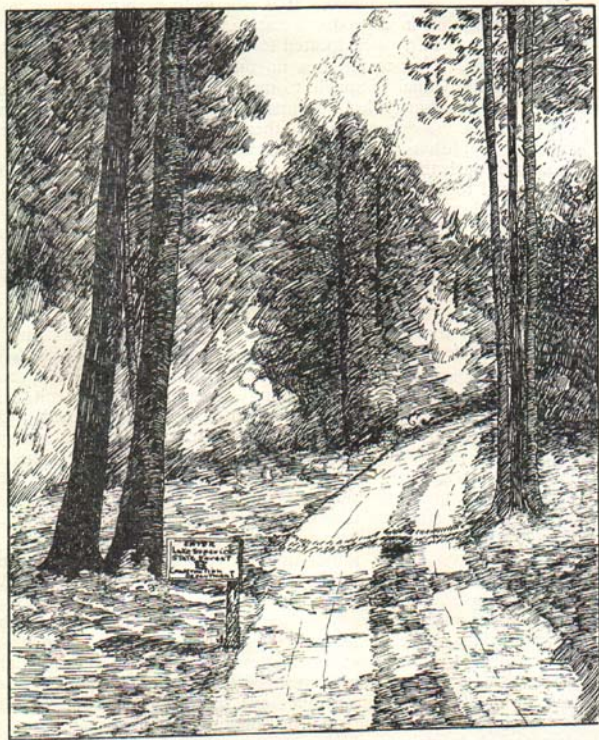
Swallowed up by the wilderness.

Yet Tom *Citizen* sees better prospects for the region in the return of so much of its land to public ownership. These are not lands that are well suited to private ownership. The array of "old cellar holes and lonesome lilac bushes," as the abandoned farmsteads have been so aptly called, has taught him that the resources per square mile are generally too meager for individual success. This is a region in which no man of small means and working largely alone should again be permitted to fritter away his years and those of his family.

He believes these are "group" lands, or "many-men" lands. They are lands on which many men, acting through their government—national, state,

county, or township, as conditions require—must join hands and brains and means to utilize their resources most advantageously and to maintain them most effectively. Such lands are the joint responsibility of *all* the people.

In supporting the return of such land to public ownership and development, *Tom Citizen* sees brighter days for his little farm in many ways. There will be part-time work in the forest to add to the small farm income. Fire protection, improvement in the forest growth, and well managed wild-life lands should bring in more vacation folk: more fishermen and nature lovers in the summer, more hunters to harvest the game and fur crop in fall and winter. In one way or another, each of these folk will want his services or the service of some member of his family, or some of the things he can



Lands which many men acting through government must utilize.

raise, or make, or have on hand. His bit of land and its location will take on new values as public interest in this public region is fostered and expanded. A limited number of farm communities scattered through a forest region and properly located should work to the advantage of both forest and farm folk.

PRIVATE VERSUS PUBLIC RESOURCES

Viewed broadly, the earth possesses two kinds of resources from the standpoint of ease of use and management. One of these is the type that can generally be developed and maintained by an average *individual*, such as ordinary farm land, orchard land, a moderate-sized recreational acreage, a small water power site, etc. It is a *comparatively* "good" resource. It is relatively easy to convert to use and to maintain in a productive state. Little or no outside help is needed. It is fairly well located for its purpose. Climate is not too unfavorable. Nature imposes no unreasonable handicaps that the ordinary individual is unable to meet. The use of such a resource does not necessarily lead to financial success, however, because financial success depends upon other factors in addition to favorable natural conditions. It merely means that the nature of the resource is such that it is generally within the means and power of an individual to use and conserve it properly.

The other type is quite the opposite. It is a resource that is best developed, managed and maintained, as a rule, by a number of people acting together in some form of organization. It presents unusual problems that are beyond the capacity of the individual to handle. The operation of a drainage or irrigation district, the use of extensive areas of recreational land, the development of large power sites, the management of forest and wildlife land, and the formation of farm-game cooperatives are illustrations. The resource is not necessarily a "poor" one, but successful use on the part of the average man working alone is very difficult if not impossible. A company or corporation must be formed. Or a cooperative. Or some unit of government must act. A group or number of people must somehow act together to utilize and conserve the resource.

There is no hard and fast distinction between the two types. Exactly what resource is suitable for individual use and which requires group action will vary from one resource to another. It will also vary in the same kind of resources as time, technical knowledge, tools, accessibility and men themselves change. What is a "group" resource today may become an "individual" resource tomorrow, and conversely. For instance, it would have been virtually impossible for an individual a few generations ago to cultivate large tracts of land he now can with machinery, although at the same time other large areas of land once utilized with some degree of success by individuals are returning to group or public ownership. Even though the distinction cannot be made hard and fast, it is helpful in working out conservation policies and action.

During the period of settlement, every effort was made to bring

the lands, the waters and other resources of the state into private or individual ownership and use. But we permitted the pendulum to swing too far. We did not realize then that the state possessed a vast acreage of land and water resources that are quite beyond the ability of the lone individual to use effectively, continuously and conservatively. We encouraged settlement in both the northern and southern part of the state that should never have taken place. There have been innumerable failures. This condition is by no means confined to Michigan, but is widespread, affecting every state. Whether we will or not, the pendulum is now swinging back, and it seems destined to continue the return swing until most of the resources that require "group" action are restored to public ownership or some form of group enterprise. The lopping off of townships and counties and their inclusion in state and national lands is the most striking example of the adjustment that is taking place. It is appalling that this adjustment has been accomplished and seems destined to be accomplished largely at the price of voluntary bankruptcy and tax delinquency.

On the other hand, the return of a region as a whole to public ownership need not and should not necessarily engulf every privately held tract of land or resource within the region. The return to public ownership creates many new opportunities for small communities of privately-owned land in the region—new markets for their products and new possibilities for their services. Good conservation calls for both the return of "group" lands to public ownership and the continuance of private lands within such regions wherever mutual advantages exist. The pendulum should not be permitted to swing back into the other extreme.

There is another angle of private versus group ownership that is quite aside from the question of whether the resource is adapted to individual use and administration. There is an extended need and demand for land and resources for public use and purposes. This may take one of two forms. It may involve resources that are essential to the business of government: township, town, county, city, state or nation. This need has long been recognized. The other involves use on the part of the individual public. The individual needs or wants park lands, hunting grounds, game reserves, wildlife refuges, trout waters, lake frontage, general recreation lands and a host of similar resources to go along with and round out his private holdings. He cannot afford individual ownership of such resources but he can group himself via government and its agencies and own and enjoy them collectively. Neither of these two types of public requirement can be overlooked in the interests of good conservation, and each will demand satisfaction regardless of the suitability of a given resource for individual use. Every community as well as the state faces the problem of determining such needs and of acquiring the necessary lands or other resources as means and conditions present themselves.

THE NINETEENTH VERSUS THE TWENTIETH CENTURY

Michigan has an area of nearly 60,000 square miles. A century and a quarter ago, when some 5 thousand Pioneers had filtered into the state, there were 12 square miles of virgin forest for every man, woman, and child if they had chosen to divide the state equally.

The present population exceeds 5 thousand thousand (5,000,000)—a thousand-fold increase! If the state were equally divided today, each 90 *Citizens* would have to *share* one square mile between them! And, there would be only scraps of virgin forest, about one-half acre, for each! This is a stupendous change.

There is good reason, therefore, why the *Citizens* insist that the days of needlessly exploiting of resources should be numbered. They pay tribute to the courageous work of the Pioneers—in breaking ground, in laying the first stone and in opening up the wilderness—but they believe that the time has passed when men should enjoy complete and unlimited freedom to utilize resources when and where they choose and without regard to the welfare of the community.

They believe that a deep-rooted community should take the place of the mushrooming settlement. They maintain that the state has passed its youth and must now prepare for maturity. Natural resources will continue to be the foundation stones of the twentieth century community, but their future use, the *Citizens insist*, should be tempered by the peculiar nature of each resource, by sound conservation principles, and by its effectiveness in rendering human services tomorrow as well as today. Men are here in America to stay.

NEW PIONEERS

The approach of the state to maturity is commonly viewed with much concern. This arises from a tendency to confuse maturity with old age and exhaustion. Maturity, however, signifies relative stability, the sound and full development of all our resources, and the perfection of all of our powers and character. The differences are much like the contrasts between the child and the man; not between the child and the patriarch.

Nor does maturity mean that the future holds any less opportunity when compared with the past. Far from it. It simply means that the basis for opportunity, for making a living and for obtaining enjoyment in life, has changed.

Old John Pioneer and his brethren based their living chiefly upon the more conspicuous and easily appropriated resources, i. e., easily appropriated for their day. The *Citizen* in turn will explore and examine the land, the mineral, the plant and animal, and the water resources of his community

to discover their less conspicuous, but more basic, more enduring, and more important qualities. He will be a kind of advanced or new pioneer. Every stone, stick, puddle and bug, so to speak, must now be studied. Every stone must be picked up and turned over, again and again, and then a dozen times more, to study and discover its truly basic qualities and its real ability to serve us permanently. Similar research is essential in the case of all of our other resources. The opportunity for such research, and the responsibility for carrying it on, lies as much with every man and woman, whatever his place in the state might be, as it lies with the technical research worker. We must know our stones from every angle.



Men who struggle and plan and work together for their community, as well as for themselves responsibility for carrying on lies with every man and woman.

Yet two other important tasks remain. Knowing our stones is but half the goal. The *location* of each stone must also be borne in mind. Then means must be discovered how best to *combine* the qualities of each with those of its neighbors and then with the land, the water, the other resources and the people of the community. The use must fit the community and no stone should be left standing alone. Strength lies in intelligent union.

Even though nearly 450 years have passed since Columbus reached the new world, our knowledge and use of its varied resources are still rather crude. A very imperfectly explored frontier still challenges the New Pioneer.

This chronicle, contrasting the very different interest in resources and in the use of resources on the part of Pioneer and *Citizen* is merely a brief glimpse of the great drama of conservation that is unfolding in the state. Only a few of our many natural resources have been touched upon; nor has it been possible to give more than passing attention to their fundamental *inter-relationships*. Few, if any, communities are confined to simple one-resource regions, and the use of *all* their land, water, plant and animal resources are inseparably associated. This association is quite as important as the fact that the presence or use of one resource may dominate or be the leading interest of a community.

The names employed for the resource types are but partially descriptive of the conservation problems which the type represents or of the objectives that may, or should, be sought. These complex relationships cannot be expressed in a single word or phrase. Furthermore, the type names suggest chiefly the negative or destructive side of conservation, whereas the new goals that may be attained through the wise use of the constructive and fundamental qualities of a resource are by all odds the more important. While John Pioneer's forest and wildlife resources are exhaustible, the more important consideration is that they are living and will beget themselves. Here is the basis for an ever expandable civilization.

It is hoped that the few moments the reader has spent with these pages will lead him to join that growing army of *Citizens* who realize, with the disappearance of the frontier, that men may no longer swarm from worn-out farms to virgin lands, from cut-over barrens to uncut wilderness, or from stripped mines to new, rich mineral deposits. On the contrary, men must now look forward to the building of sound and enduring farm lands, forest lands, grass lands, recreational lands, or city lands in the community where they now live. And if these communities are to stand as good and permanent homes of men, they must recognize the limitations, as well as the advantages which their resources possess. All tillable land is not equally good farm land; all forest land is not equally good timber land; all vegetation is not equally good wildlife cover; all lakes are not equally good fish, or waterfowl, or recreational, or drinking waters.